3.4.5 Number of research papers per teacher in the Journals notified on UGC website during the last five years

Year	2014-15	2015-16	2016-17	2017-18	2018-19	
Total No. of Journal	49	43	28	42	87	249

S.No	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number
	2014-15					
1.	Effect of Manavalaikalai Yoga With and Without Laughing Exercises on Stress and Self Confidence among Male Government Clerical Staff	Dr. S.Selvalakshmi	Yoga	International journal of recent research and applied studies	Sep-14	2349-4891
2.	Effect Of Yogic Practices on Selected Physiological Variables among Postnatal Care Women	Dr. S.Selvalakshmi	Yoga	International journal of recent research and applied studies	Jun-15	2349-4891
3.	Effect Of Yoga on Selected Physiological and Hematological Variables among Irregular Menstrual Women	Dr. S.Selvalakshmi	Yoga	International journal of recent research and applied studies	May-15	2349-4891
4.	Efficacy of varied aerobics training on biochemical variables among obese women	Dr. S.Selvalakshmi	Yoga	Asian Journal of Applied Research	2015	2395-1702
5.	Effect Of Pranayama With Meditation On Selected	Dr. S.Selvalakshmi	Yoga	STAR International Research Journal	2014	2321-676X

	Psychological Variables Among School Girls					
6.	Efficacy of Yoga Therapy on Selected Bio-Chemical Variables among Men Type 2 diabetic Patients	Dr. S.Selvalakshmi	Yoga	IJRRAS	May-15	2349-4891
7.	Tribological of Behavior of Aluminum Hybrid Metal Matrix Composite	R. Ramakrishnan	Sports Technology	Procedia Engineering	Jul-14	1877-7058
8.	Sports Video Classification Based on the Distribution of Edge Strengths of Non Subsampled Shearlet Transform	R. Ramakrishnan	Sports Technology	International Journal of Applied Engineering Research	2014	0973-4562
9.	Aluminium Metal Matrix Composite – An Insight into Solid State and Liquid State Processes	R. Ramakrishnan	Sports Technology	Applied Mechanics and Materials	Jan-15	16627482
10.	Sports Video Classification using Multi Scale Framework and Nearest Neighbor Classifier	R. Ramakrishnan	Sports Technology	Indian Journal of Science and Technology,	Mar-15	, ISSN (Print) : 0974-6846 , ISSN (Online) : 0974-5645
11.	Analysis of Selected Quality of Life Variables of Coaches from Various Organizations Working in Tamil Nadu state	Dr. S.Prem Kumar	Sports Management	International Journal of Recent Research and Applied Studies	Mar-15	2349-4891
12.	Impact of Occupations of Consumers on Information Search: A Study With Reference To Car	S.Prem Kumar	Sports Management	International Journal of Business and Administration Research Review	Sep-14	2348-0653
13.	Effect of physical activity on executive functions in children with attention deficit hyperactive disorder (ADHD)	Dr.Ahmed Shahin	Sports Psychology & Sociology	International Journal of health, physical education &computer science in sports	Sep-14	ISSN: 2231-3265
14.	Effect of visual and	Dr.Ahmed Shahin	Sports	International Journal	Dec-14	ISSN: 2349-722X

	kinesthetic imagery with single limb resistance training on self concept among intermediate level male body builders		Psychology & Sociology	of Fitness, Health , Physical Education and Iron Games		
15.	A study on comorbid disorders among children with Attention Deficit Hyperactive Disorder (ADHD)	Dr.Ahmed Shahin	Sports Psychology & Sociology	International Journal of Scientific Research	Nov. 14	ISSN: 2277-8179
16.	Effect of mental noise on sports performance	Dr.Ahmed Shahin	Sports Psychology & Sociology	International Journal of health, physical education, sports and health	Dec-14	ISSN: 2394-1685
17.	Aggression and its influence on sports performance	Dr.Ahmed Shahin	Sports Psychology & Sociology	International Journal of health, physical education, sports and health	Nov-14	ISSN: 2394-1685
18.	Psychological interventions on mental health of adolescent boys	K.Kannadasan	Sports Psychology & Sociology	Star International Journal,	Feb-15	ISSN: 2321-676X
19.	Effect of Transcendental Meditation on Playing Ability of Hockey Players	Dr.K.Kannadasan	Sports Psychology & Sociology	International Journal of Recent Research and Applied Studies	Jun-14	ISSN: 2349 - 4891
20.	Effect of relaxation technique on mental health among IT professionals	K.Kannadasan	Sports Psychology & Sociology	Star International Journal,	Dec-14	ISSN: 2321-676X, Volume 2, Issue 12(10), December (2014), 45-47
21.	Effect of In-Season Training on Skill Performance of Volleyball Players	Dr.C.Arumugam	Sports Training &Coaching	International Journal of Recent Research and Applied Studies	Jul-14	2349-4891
22.	Estimation of Tamil Nadu School Physical Education Programme on selected Physical Fitness Components among Urban School Boys	Krishnan and Dr.C.Arumugam	Sports Training &Coaching	International Journal of Recent Research and Applied Studies,	Sep-2014.	2349-4891

23.	Combined Effect of Cross Training and Instructional Skill Training on selected Physical Fitness and Skill Performance Variables of Rural School Volleyball Players	Dr.C.Arumugam	Sports Training &Coaching	Academic Sports Scholar,	Nov-14	2277-3665
24.	Combined Effect of Cross Training and instructional skill Training on selected Physical Fitness and Skill Performance Variables of Rural School Volleyball Players	Dr.C.Arumugam	Sports Training &Coaching	Review of Research Journal	Dec-14	2249-894X
25.	Manufacturing Testing of Polymer Nano composite and Analysis of Tennis Racket Frame	Dr.R.Ramakrishnan	Sports Technology	International Journal of Engineering and Technology Innovation	Jul-05	
26.	Comparative Effect Of Aerobics and Resistance Exercise On Selected Physiological Variables Among Obese Children	Dr.P.K.Senthil Kumar & Dhanalakshmi	Exercise Physiology & Biomechanics	Indian Streams Research Journal	2015	2230-7850
27.	Effect of Suryanamaskar Practices Compared With Physical Exercises on Selected Biochemical Parameters Of College Women	Dr.P.K.Senthil Kumar & Veera Parameshwari	Exercise Physiology & Biomechanics	International Journal of Recent Research And Applied Studies	2014	2349-4891
28.	Effect of Multigym Training On Selected Health Related Fitness Components Among Adult Men	Dr.P.K.Senthil Kumar & Jamuna Devi	Exercise Physiology & Biomechanics	Star International Journal	2014	2321-676X
29.	Influence of Yogasana and Pranamaya on Selected Psychological Parameters in	Dr.P.K.Senthil Kumar & Rajendrakumar Dasi	Exercise Physiology & Biomechanics	Journal of Physical Education Sports and Allied Disciplines	2014	0974-343X

	Post Graduates Students					
30.	Influence Of Physical Exercise And Surya Namaskar Practices On Selected Health Related Physical Fitness Components Of College Women	Dr.P.K.Senthil Kumar & Veera Parameshwari	Exercise Physiology & Biomechanics	Academic Sports Scholars	2015	2277-3665
31.	Effect of isolated and parallel core strength and mobility training on selected bio motor variables among cricket players	Dr.R.Subramanian	Sports Coaching	Academic Sports Scholar	Feb-15	2277-3665
32.	Influence of combined and isolated yogic practices and yogic diet on maximal oxygen uptake and vital capacity of obese engineering college women	Dr.R.Subramanian	Sports Coaching	Golden Research Thought	Jun-14	2231-5063
33.	Speed and agility as determinants of long jump performance	Dr.R.Subramanian & Hari Om Sharma	Sports Coaching	Academic Sports Scholars	Sep-2014.	2277-3665
34.	Effect of SAQ and swiss ball training on lunge and fleche performance among state level women fencers	Dr.R.Subramanian & A.Jayachitra	Sports Coaching	Journal of Physical Education Sports and Allied Disciplines	Jan-15	0974-343X
35.	Relationship between leg power, reaction time and long jump performance	Dr.R.Subrmanian & Hari Om Sharma	Sports Coaching	Golden Research Thoughts	Oct-14	2231-5063
36.	Association of shooting accuracy in hockey on speed and agility	Dr.P.Rajinikumar	Exercise Physiology & Biomechanics	Star Research Journal	Jan-15	2321-676X
37.	Relationship between spiking and vertical jumping ability among volleyball players	Dr.P.Rajinikumar	Exercise Physiology & Biomechanics	Star Research Journal	Sep-14	2321-676X
38.	Relationship of cardio pulmonary endurance and	Dr.P.Rajinikumar	Exercise Physiology &	Star Research Journal	Sep-14	2321-676X

	flexibility with moving ability in hockey		Biomechanics			
39.	Psychological Correlation of Playing Ability Among Soccer Players as a Function of Gender	Dr.P.Rajinikumar	Exercise Physiology & Biomechanics	Star Research Journal	2014	2321-676X
40.	Relationship between dribbling dodging drive with cardio pulmonary endurance and flexibility among hockey players	Dr.P.Rajinikumar	Exercise Physiology & Biomechanics	Star Research Journal	Jul-14	2321-676X
41.	Effect of cycling and swimming on the physical and physiological variables among long distance runners	Dr.P.Rajinikumar	Exercise Physiology & Biomechanics	Star Research Journal	Dec-14	2321-676X
42.	Correlation of moving ability on speed and agility among hockey players	Dr.P.Rajinikumar	Exercise Physiology & Biomechanics	Star Research Journal	Nov-14	2321-676X
43.	Biomechanical analysis of set shot in basketball	Dr.P.Rajinikumar	Exercise Physiology & Biomechanics	Star Research Journal	Nov-14	2321-676X
44.	Biomechanical analysis of penalty corner drag flick in field hockey	Dr.P.Rajinikumar	Exercise Physiology & Biomechanics	Star Research Journal	Nov-14	2321-676X
45.	Psycho Social Issues and Challenges in Higher Education	Dr.P.Gopinatha	Sports Psychology & Sociology	International Journall of Education & Humanities	Dec-14	2319-2437
46.	Quality Assurance : A Benchmark in Higher Education	Dr.P.Gopinathan	Sports Psychology & Sociology	University News A week Journal of Higher Education	Aug-14	0566-2257
47.	Effects of yogic practices on physical ,Physiological and psychological variables among school students	Dr.Gopinatha	Sports Psychology & Sociology	Indian Streams Research Journal	Nov-14	2230-7850
48.	Effect of circuit training on speed agility and explosive	Dr.P.Gopinathan	Sports Psychology &	Journal of Physical Education Sports and	Jul-14	2319-5274

	power among volleyball players		Sociology	Allied Disciplines		
49.	Effect of Complex training on agility explosive power and speed among Handball players	Dr.P.Gopinathan	Sports Psychology & Sociology	Journal of Physical Education Sports and Allied Disciplines	Jul-14	2319-5274
	2015-16					
50.	Effect of yogic practice on Selected Physiological Variables among Stressed Men Police Constable	Dr. S.Selvalakshmi	Yoga	IJRRAS	Nov-15	2349-4891
51.	Influence of varied yogic practices on selected clinical variables among information technology professionals with low back pain	Dr. S.Selvalakshmi	Yoga	Asian Journal of Applied Research	2015	2395-0382
52.	Effect of Yogic Practices on Physiological Variables Among Migraine Women	Dr. S.Selvalakshmi	Yoga	Star International Journal	Oct-15	2321-676X
53.	Effect of Yogic Practices on Selected Physiological Variables Among Cervical Spondylitis People	Dr. S.Selvalakshmi	Yoga	Star International Journal	Sep-15	2321-676X
54.	Effect of Yoga Therapy on Selected Bio-Chemical Variables Among Diabetes Mellitus Middle Aged Men.	Dr. S.Selvalakshmi	Yoga	Star International Journal	Nov-15	2321-676X
55.	Tribological and Mechanical Characterization of Aluminum Metal Matrix Composites,	R. Ramakrishnan	Sports Technology	Indian Journal of Science and Technology	Dec-16	*, ISSN (Print) : 0974-6846 , ISSN (Online) : 0974-564*
56.	Effect of Yogic Practices on Physiological and Hematological Variables among Peptic Ulcer Diseased Persons	Dr. S.Selvalakshmi	Yoga	Journal of Recent Research Applied Studies	Oct-15	2349-4891

57.	Efficacy of Yoga Therapy on Selected Bio-Chemical Variables among Middle Aged Diabetic Women	Dr. S.Selvalakshmi	Yoga	Journal of Recent Research Applied Studies	Aug-15	2349-4891
58.	Efficacy of Yoga Therapy on Selected Bio-Chemical Variables among Middle Aged Hypertensive Women	Dr. S.Selvalakshmi	Yoga	Journal of Recent Research Applied Studies	Sep-15	2349-4891
59.	Effect of sectional breathing and pranayama practice on selected physiological variables among hearing impaired boys	Dr. S.Selvalakshmi	Yoga	Asian Journal of Applied Research	Aug-15	2395-0382
60.	Influence of Safe and Healthy Working Conditions on Sports Coaches Working at Private Sector Organizations in Tamil Nadu	S Prem Kumar	Sports Management	International Journal of Business and Administration Research Review	Sep-15	2348-0653
61.	Impact of Adequate and Fair Compensation on Sports Coaches Working at Private Sector Organizations in Tamil Nadu	S.Prem Kumar	Sports Management	EPRA International Journal of Economic and Business Review	Oct-15	2347-9671
62.	A study on Factors Affecting Need Recognition for Life Insurance Policies in Chennai	U.Mani Kumar and S.Prem Kumar	Sports Management	Indian Journal of Education and Information Management	Jan-16	2277-5374
63.	Relationship of Sports Achievement Motivation, Locus of Control and Team Relationship with Performance of First Division Cricket Players in Chennai	Dr.K.Kannadasan	Sports Psychology & Sociology	International Journal of Recent Research and Applied Studies	Jan-16	ISSN: 2349 - 4891 Vol.3 No.1 (3)
64.	Effect of varied Intensities of Strength Training on selected Physical Fitness Variables	Dr.C.Arumugam & Nagasubramaniam	Sports Training &Coaching	International Journal of Recent Research and Applied Studies,	Mar-16	2349-4891

	among State Level Men Fencers			V3. 3(18),		
65.	Effect of varied Intensities of Strength Training on Aerobic Capacity and Anaerobic Power of State Level Men Fencers	Dr.C.Arumugam & Nagasubramaniam	Sports Training &Coaching	International Journal of Recent Research and Applied Studies, V3. 4(12),	Apr-16	2349-4891
66.	Effect Of Resistance Training With Varied Nutritional Supplementation On Clean And Jerk And Snatch Among Sub Junior National Wieghtlifters	Dr.P.K.Senthil Kumar, Sunkara Sriivaa Rao & R.Subramani	Exercise Physiology & Biomechanics	Academic Sports Scholars	2015	2277-3665
67.	Non Operative Treatment for Anterior cruciate Ligament Injury	Dr.P.K.Senthil Kumar & V.Mariappan	Exercise Physiology & Biomechanics	International Recognition Multidisciplinary Research Journal	Mar-16	2231-5063
68.	Influence of brisk of walking and elliptical training on basal metabolic rate and resting pulse rate among sedentary women	Dr.P.K.Senthilkumar, P.Kannadan & K.V.Balamurugan	Exercise Physiology & Biomechanics	International Recognition Multidisciplinary Research Journal	Mar-16	2231-5063
69.	Effect of Resistance Training with Whey Protein Isolates and Whey Protein Concentrate Supplementation On Muscular Power and Muscular Strength Among Sub Junior National Wightlifters	Dr.P.K.Senthil Kumar, Sunkara Sriivaa Rao & R.Subramani	Exercise Physiology & Biomechanics	International Journal of Recent Research And Applied Studies	Sep-15	2349-4891
70.	Efficacy of brisk walking and elliptical training on cardio respiratory endurance and mean arterial blood pressure among sedentary women	Dr.P.K.Senthilkumar, P.Kannadan & K.V.Balamurugan	Exercise Physiology & Biomechanics	International Journal of Recent Research And Applied Studies	Mar-16	2349-4891
71.	Effect Of Low And High	Dr.P.K.Senthil Kumar &	Exercise	Academic Sports	Mar-15	2277-3665

	Intensity Resistance Training On Selected Physical Fitness Variables Among College Level Men Kabaddi Players	Vijay Amirtharaj	Physiology & Biomechanics	Scholars		
72.	Effect Of Plyometric and Functional Core Training On Selected Body Composition Among Basketball Players	Dr.P.K.Senthil Kumar & Siby Lukose	Exercise Physiology & Biomechanics	International Journal of Recent Research And Applied Studies	Oct-15	2349-4891
73.	Effect Of Plyometric and Functional Core Training On Selected Physical Fitness Components Among Basketball Players	Dr.P.K.Senthil Kumar & Siby Lukose	Exercise Physiology & Biomechanics	International Journal of Recent Research And Applied Studies	Oct-15	2349-4891
74.	Effect Of Functional Core Training On Selected skill performance Among Basketball Players	Dr.P.K.Senthil Kumar & Siby Lukose	Exercise Physiology & Biomechanics	International Journal of Recent Research And Applied Studies	Jul-15	2349-4891
75.	Effect Of Plyometric Training On Selected Body Composition Among Basketball Players	Dr.P.K.Senthil Kumar	Exercise Physiology & Biomechanics	International Journal of Recent Research And Applied Studies	Sep-15	2349-4891
76.	Effect of Resistance Training with Varied Nutritional Supplementation On Clean and Jerk and Snatch among Sub Junior National Wightlifters	DR. R.Subramani, Dr.P.K.Senthil Kumar& Sunkara Sriivaa Rao	Sports Coaching	Academic Sports Scholars	Sep-15	2277-3665
77.	Effect of Resistance Training with Whey Protein Isolates and Whey Protein Concentrate Supplementation On Muscular Power and Muscular Strength Among Sub Junior National Wightlifters	DR. R.Subramani, Dr.P.K.Senthil Kumar& Sunkara Sriivaa Rao	Sports Coaching	International Journal of Recent Research And Applied Studies	Sep-15	2349-4891
78.	Relationship of selected	Dr.R.Subramanian	Sports	Sports Research	Oct-15	2321-6557

	motor abilities and anthropometric parameters with long jump performance of national level jumpers		Coaching			
79.	Effect of plyometric training and circuit training on speed muscular endurance amng men volleyball players	Dr.J.Anitha	Exercise Physiology & Biomechanics	International Journal of Physiology Nutritional and Physical Education	Mar-16	2156-0057
80.	Effect of plyometric training and circuit training on vital capacity anaerobic capacity among men volleyball players	Dr.J.Anitha	Exercise Physiology & Biomechanics	International Journal of Physiology Nutritional and Physical Education	Jun-16	2156-0057
81.	Kinematic Analysis of Takeoff Velocity Standing Long Jump Among College Male Students	Dr.P.Rajinikumar	Exercise Physiology & Biomechanics	Asian Journal of Multidisciplinary Research	2015	2395-1702
82.	Ball Velocity of Drag flick In Relation to Left Knee Angle and Stick Velocity	Dr.P.Rajinikumar	Exercise Physiology & Biomechanics	Asian Journal of Multidisciplinary Research	2015	2395-1702
83.	Impact of Time Of Stick Contact and Drag Length On Ball Velocity Of Drag Flick in Field Hockey	Dr.P.Rajinikumar	Exercise Physiology & Biomechanics	Asian Journal of Multidisciplinary Research	2015	2395-1702
84.	Influence of Time Of Approach And Stance Width On Drag Flick Performance	Dr.P.Rajinikumar	Exercise Physiology & Biomechanics	Asian Journal of Multidisciplinary Research	2015	2395-1702
85.	Effect of Pranamaya Practice on Psychological Variables Among Hypertensive Women	Dr.P.Rajinikumar	Exercise Physiology & Biomechanics	Asian Journal of Multidisciplinary Research	2015	2395-1702
86.	Differential of Cadence an Gait Velocity	Dr.P.Rajinikumar	Exercise Physiology & Biomechanics	Asian Journal Of Applied Research	2015	2395-1702
87.	Analysis of Free Throw In Soccer	Dr.P.Rajinikumar	Exercise Physiology & Biomechanics	Asian Journal Of Applied Research	2015	2395-1702
88.	Effect of yogic practices on	Dr.P.Gopinathan	Sports	Research Bi-Annual	Apr-16	

	self confidence among handball players		Psychology & Sociology	for movement		
89.	Effect Yoga practices with and without counseling on self confidence and self esteem among inter collegiate athletes	Dr.P.Gopinathan	Sports Psychology & Sociology	Sports Research	Apr-16	2321-6557
90.	Effect of yoga practices on mental toughness and mental health among college students	Dr.P.Gopinathan	Sports Psychology & Sociology	Research Bi-Annual for movement	Oct-15	0073-1089
91.	Combined Effect of Yogasana and Relaxation Training on Selected psychological Variables Among Tennis Player	Dr.P.Gopinathan	Sports Psychology & Sociology	Sports Research	Jul-15	2321-6557
92.	Association Between Body Mass Index and Bone Mineral Density Among Rural and Urban Post Menopausal Women	Dr.Murugavalvan	Health Centre	International Journal of Pharmaceutical and Clinical Research	Apr-16	0975 1556
	2016-17					
1.	Study on Selected Life Skills Training On Chennai Tennis Players	Dr. Shahin Ahmed & Lakhman Kumar	Sports Psychology	Indian Streams Research Journal	Dec-16	2230-7850
2.	Effect of Psycho - Regulative Training on Anxiety among Hockey Players	Dr.Shahin Ahmed & Irudayaraj	Sports Psychology	Research Ambition; An International Multidisciplinary e-Journal	Jun-17	2455-443X
3.	A Study on Mental Toughness Among Hockey Players Of Thiruvallur District (Avadi Town)	Dr.Shahin Ahmed & Irudayaraj	Sports Psychology	Research Ambition; An International Multidisciplinary e-Journal	Jun-17	2455-443X
4.	Tribological properties of micro and nanoSiC reinforced Aluminium metal matrix composites	R. Ramakrishnan	Sports Technology	International Journal of Chemtech Research	2017	ISSN: 2455-9555

5.	Tribological properties of micro and nano TiO_2 reinforced Aluminium metal matrix composites	R. Ramakrishnan	Sports Technology	", International Journal of Engineering and Technology	2017	2227-524X
6.	Design an Alert System for Motorbike Riders By Anlaysis of Hand Forces Using Wireless Sensor Network	R. Ramakrishnan	Sports Technology	International Journal of Advance Research in Computer Science and software Engineering	Jun-17	2277-128X
7.	Role of work experience of women employees in BPO industry on various dimensions of emotional intelligence	Dr.S.Prem Kumar & S.Hannah Jeyaseeli and	Sports Managment	International Journal of Business and Administration Research Review	Mar-17	2347-856X
8.	Role of Age Group of Women Employees in BPO Industry on Various Dimensions of Emotional Intelligence	Dr.S.Prem Kumar & S.Hannah Jeyaseeli and	Sports Management	International Journal of Business and Administration Research Review	Sep-16	2348-0653
9.	Combined Effect of Cross Training and instructional skill Training on selected Physical Fitness and Skill Performance Variables of School Volleyball Players	Dr.C.Arumugam	Sports Training &Coaching	Star Research Journal, V4, 10(4),	Oct-2016	2321-67X
10.	Combined Effect of Cross Training and instructional skill Training on selected Physical Fitness and Skill Performance Variables of School Volleyball Players	Dr.C.Arumugam	Sports Training &Coaching	Star Research Journal, V4, 10(4),	Nov-16	2321-67X
11.	Effect of Ambidexterity Conventional Training and Combined Training on selected Physical Fitness Variables	Dr.C.Arumugam & S.Vengadesan	Sports Training &Coaching	Indian Streams Research Journal, 6(11),	Dec-16	2230-7850

12.	Effect of Conventional Training Programme on Physical Fitness Variables of Men Cricket Players	Dr.C.Arumugam & S.Vengadesan	Sports Training &Coaching	Indian Streams Research Journal, 7(3),	Apr2017	2230-7850
13.	A Study about the Factor that Stresses an Umpire and their Decision Making Skills	Dr.C.Arumugam &A.Prabukumar	Sports Training &Coaching	Indian Streams Research Journal, 7(3),	Apr-17	2230-7850
14.	Analysis of Human Interferences as a Parameter that Affects the Decision made by the Umpires and Referees in Badminton Sports	Dr.C.Arumugam &A.Prabukumar	Sports Training &Coaching	Golden Research Thought, 6(10),	Apr-17	2231-5063
15.	Effect of Conventional Training Programme on Physical Fitness Variables of Men Cricket Players	Dr.C.Arumugam & S.Vengadesan	Sports Training &Coaching	Indian Streams Research Journal, 7(3),	Apr2017	2230-7850
16.	Impact of selected yogic practices and aerobic dance on cardio respiratory endurance and flexibility among juvenile male	Dr.P.K.Senthilkumar & Chandraprakash	Exercise physiology & Biomechanics	International Multidisciplinary Research Journal	Sep-16	2231-5063
17.	An Experimental Study On Bone Mineral Density Among Sedentary Men	Dr.P.K.Senthil Kumar & Uma	Exercise Physiology & Biomechanics	International Multidisciplinary Research Journal	2016	2231-5063
18.	Impact Of Functional Strength Training On Selected Body Composition Parameters Among Men With Osteopenia	Dr.P.K.Senthil Kumar & P.Uma	Exercise Physiology & Biomechanics	Indian Streams Research Journal	2016	2230-7850
19.	Effect of small sided games training on resting heart rate and maximal oxygen consuming among state level men football players	Dr.R.Subramanian	Sports Coaching	International Journal of Recent Research and Applied Studies	Nov-16	2349-4891
20.	Effect of plyometric training on selected physiological	Dr.J. Anitha	Exercise physiology &	International Journal of Physiology,	Jun-17	2456-0057

	variables among college level volleyball players		Biomechanics	Nutritional and Physical Education		
21.	Effect of SAQ training and interval training on selected physical fitness variables among men handball players	Dr.J. Anitha	Exercise physiology & Biomechanics	International Journal of Physiology, Nutritional and Physical Education	Dec-16	2456-0057
22.	Effect of SAQ training and interval training on selected physiological variables among men handball players	Dr.J. Anitha	Exercise physiology & Biomechanics	International Journal of Physiology, Nutritional and Physical Education	Dec-16	2456-0057
23.	Training effect of specific strength programme with selected physical physiological and performance variables among university affiliated colleges nalgonda hockey players	Dr.I.Lilly Pushpam & Yaswanth Reddy	Physical Education	Journal of Physical Education and Allied Sciences	Jun-17	2395-6895
24.	A Study of comparison of explosive strength between volleyball and football players of annamacharya institute of technology and science rajampet kadapa	Dr.I.Lilly Pushpam & Yaswanth Reddy & Nagamunai Bokkasam	Physical Education	Journal of Physical Education and Allied Sciences	Jun-17	2395-6895
25.	Effect of selected yogasana on body weight and body fat of higher secondary school obese boys	Dr.I.Lilly Pushpam & Yaswanth Reddy & M.Girinathan	Physical Education	Journal of Physical Education and Allied Sciences	Jun-17	2395-6895
26.	Effect of interval training ion sports	Dr.I.Lilly Pushpam & Yaswanth Reddy & pathakoti madhu	Physical Education	Journal of Physical Education and Allied Sciences	Jun-17	2395-6895
27.	A Study - Effect of exercise on mental health	Dr.I.Lilly Pushpam & Yaswanth Reddy & Shihabudheen Paikarathodi	Physical Education	Journal of Physical Education and Allied Sciences	Jun-17	2395-6895
28.	Comparison on Lipid Profile Level and Prevalence of	Dr.P.Murugavalavn	Heath Centre	International Journal of Pharmaceutical	Dec-16	0975 1556

	Hypertension Among Rural and Urban Post-Menopausal Women			and Clinical Research		
	2017-18					
1.	Wear properties of SiCp and TiO2p reinforced aluminium metal matrix composites	R. Ramakrishnan	Sports Technology	Indian Journal of Engineering & Materials Sciences	Feb-18	ISSN: 0971-4588, 0975-1017;
2.	Efficacy Of Vinyasa Yoga With And Without Mantra Chanting On Selected Cognitive Variables Among Children With Cerebral Palsy	Dr. S.Selvalakshmi	Yoga	Star International Journal	Jan-18	2321-676X
3.	Influence Of Astanga Yoga With And Without Super Brain Yoga On Selected Behavioral And Cognitive Parameters Among Urban School Students With Learning Disabilities	Dr. S.Selvalakshmi	Yoga	Star International Journal	Jan-18	2321-676X
4.	Influence Of Astanga Yoga With And Without Super Brain Yoga Practices On Selected Socio-Psychological Parameters Among Urban School Boys With Learning Disabilities	Dr. S.Selvalakshmi	Yoga	International Journal Of Computational Research And Development (IJCRD)	2018	2456-3137
5.	An Assessment of Governance in Indian Olympic Association	Dr.S. Premkumar & Madhu	Sports Management	Journal of Physical Education Sports And Allied Disciplines	Jul-18	0974-343X
6.	Exploring Factors That Influence Consumers on Purchase Decision of Car	S.Prem Kumar & G.Kanthimathi	Sports Management	International Journal of Business and Administration Research Review	Dec-17	2348-0653
7.	Influence of selected yogic practice and aerobic exercise	Dr.S.Manikandan	Physical Education	International Journal of Yogic, Human	Jun-18	2456-4419

	and selected physiological variables among middle aged diabetics			Movement and Sports Sciences		
8.	Efficacy of combination of SAQ drill and plyometric training on selected physiologic variables among badminton players	Dr.S.Manikandan & Dr.Lakshmanan	Physical Education	International Journal of Physiology, Nutrition and Physical Education	Dec-17	2456-0057
9.	Efficacy of speed agility quickness drills on selected bio-motor abilities among university athletes	Dr.S.Manikandan & Dr.Lakshmanan	Physical Education	International Journal of Academic Research and Development	2018	2455-4197
10.	Efficacy of combination speed, agility, quickness, skills and small sides games on selected biomotor abilities among the football players	Dr.S.Manikandan	Physical Education	International Journal of Physiology, Nutrition and Physical Education	Jun-18	2656-0057
11.	Efficacy of combination of aquatic and plyometric training on selected physiological variables among badminton players	Dr.S.Manikandan	Physical Education	International Journal of Physiology, Nutrition and Physical Education	Dec-17	2456-0057
12.	Effect of interval training and skill performance an selected motor fitness variables among football players	Dr.S.Manikandan	Physical Education	International Journal of Physiology, Nutrition and Physical Education	Jun-18	2456-0057
13.	Comparison of selected motor fitness components between men basketball and hand ball players	Dr.S.Manikandan	Physical Education	Asian Journal of Multidimensionnal Research	Febryary 2018	2278-4853
14.	Effect of continuous running and staircase climbing on strength endurance among university badminton players	K.Rajeshkumar	Physical Education	International Journal of Advanced Research and Development	Mar-18	2455-4030
15.	Effect of continuous running and stair climbing on strength	Dr.Manikandan & Dr.S.velkumar	Physical Education	International Journal of Advanced	Mar-18	2455-4030

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27.	Effects of different packages of yogic practices on mental health, plasma glucose, self esteem cortisol, high density lipoprotein, anxiety variables among overweight female in Chennai	Dr.R.Venkatesan	Exercise Physiology	International Journal of Health, Physical Education & Computer Science in Sports	September 2017	2231-3265
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30.	Effect of different packages of yogic practices o mental health, plasma glucose, self esteem , cortisol, high density lipoproteins, anxiety variables among overweight female in Chennai	Dr.R.Venkatesan	Exercise Physiology	Asian Journal of Physical Education and Computer Science in Sports	Dec-17	0975-7732
31.	Effect of randori and uchikomi training on anxiety among junior state level judokas	Dr.R.Subramanian	Sports Coaching	Journal of Physical Education Sports and Allied Discipline	Jul-18	0974-343X
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21.	Effect of Concurrent Training on selected Physical Fitness Variables of University Men	Dr.C.Arumugam	Sports Training &Coaching	International Journal of Adapted Physical Education and Yoga, 3(11),	Oct-18	2455-8958
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23.	Influence of Different Phases of Resistance Training on Selected Bio-chemical Variables of Football Players	Dr.C.Arumugam	Sports Training &Coaching	International Journal of Fitness, Health, Physical Education and Iron Games, 6(2),	May-19	2349-722X
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29.	Effect of physical training programme on selected psychomotor variables among college women students	Dr.P.Kumaravelu	Physical Education	Journal of Scientific Computing	Nov-19	1524-2560
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40.	Efficacy of Specific Skill And Nueromuscular Training on Speed and Explosive Power Among Badminton Players	Dr.P.K.Senthilkumar & T.Ganeskumar	Exercise Physiology & Biomechanics	International Journal of Physiology, Nutrition and Physical Education	Dec-18	2456-0057
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48.	Effect of yogic practices and brisk walking on functional variables among diabetics patients	Dr.P.K.Senthilkumar & Chandraprakash	Exercise Physiology & Biomechanics	International journal of fitness health, physical education & Iron games	May-19	2349-722X
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51.	Impact resistance training and fartlek training on pulse rate and endurance among college level football players	Dr.P.K.Senthilkumar & Vijay Amirtharaj	Exercise Physiology & Biomechanics	International journal of fitness health, physical education & Iron games	May-19	2349-722X
52.	Influence of Combined Cardio Resistance Training on Men Arterial Blood Pressure and Resting Pulse Rate Among Aged Men	Dr.P.K.Senthilkumar	Exercise Physiology & Biomechanics	International journal of fitness health, physical education & Iron games	2349-722X	2349-722X
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56.	Effect of physical exercise on level of pain among women with fibromyalgia	Dr.S.Thirumalaikumar& Sridharan	Physical Education	International journal of fitness health, physical education & Iron games	2019	2349-722X
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58.	Differentiation of aerobic exercises, diet modification and combined group on blood glucose level among women with NIDDM	Dr.Grace Helina & Sona Santhakumari	Exercise Physiology & Biomechanics	International journal of fitness health, physical education & Iron games	2019	2349-722X
59.	Impact of aerobic exercise with and without diet on LDL and Triglycerides among middle aged women with NIDDM	Dr.Grace Helina & Sona Santhakumari	Exercise Physiology & Biomechanics	International Journal of Physiology, Nutrition and Physical Education	Dec-18	2456-0057
60.	Influence of aerobics exercise with and without diet on systolic and diastolic blood pressure among middle women with NIDDM	Dr.Grace Helina & Sona Santhakumari	Exercise Physiology & Biomechanics	International Journal of Adapted Physical Education & Yoga	Mar-19	2455-8958
61.	Effects of aerobics training with and without moringa olifera on resting heart rate, low density, Lipoprotein, High Density Lipoprotein and Testosterone among college men athlete	Dr.R.Venkatesan	Exercise Physiology & Biomechanics	International Journal of Health, Physical Education and Computer Science	Dec-18	2231-3265
62.	Effect of aerobics training	Dr.R.Venkatesan	Exercise	International Journal	Dec-18	2231-3265

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64.	Effects of aerobics training with and without moringa olifera on resting heart rate, iron,mean arterial pressure and testosterone among college men athlete	Dr.R.Venkatesan	Exercise Physiology & Biomechanics	Asian Journal of Physical Education and Computer Science in Sports	Dec-18	0975-7732
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66.	Effect of randori and uchikomi training on stress among junior state level judokas	Dr.R.Subramanian & Uma shankar	Sports Coaching	Review of Research	Feb-19	2249-894X
67.	Correlation of Psychological variables and playing ability among football players as a function of gender	Dr.R.Subramanian	Sports Coaching	International journal of fitness health, physical education & Iron games	Jun-19	2349-722X
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72.	Effect of walking programme on selected physiological variables among middle aged women	Dr.P.Kumaravelu & Dr.C. Lakshman	PHYSICAL EDUCATION	International journal of fitness health, physical education & Iron games	May-19	2349-722X
73.	Effect of squat jump training on leg strength and explosive power among novice football players	Dr.R.Subramanian	Sports Coaching	International journal of fitness health, physical education & Iron games	May-19	2349-722X
74.	Relationship of speed leg strength and coordination on 100m sprinting performance	Dr.P.Rajinikumar	Exercise Physiology & Biomechanics	Star Research Journal	Nov-18	2321-676X
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76.	Correlation of goalkeeping performance in relation to anthropometric and physical fitness variables in field hockey	Dr.P.Rajinikumar & Kalaiselvan	Exercise Physiology & Biomechanics	International Journal of Physiology, Nutrition and Physical Education	Dec-18	2456-0057
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81.	Effect of physical exercise , fartlek sand combined training on selected physical physiological and psychological variables among men trainee sub ispector of andhra pradesh	Dr.I.Lilly pushpam	Physical Education	International Journal of Health, Physical Education and Computer Science in Sports	Dec-18	2331-3265
82.	Effect of physical exercise , Fartlek training and combined training on anxiety among men trainee sub inspector of andhra pradesh	Dr.I.Lilly pushpam & Yaswanth Reddy	Physical Education	Journal of Advance and Scholarly Research in Allied Education	May-19	2230-7540
83.	Effect of physical exercise , fartlet training and combined training on speed among men trainee sub inspector of andhra pradesh	Dr.I.Lilly pushpam & Yaswanth Reddy	Physical Education	Journal of Advance and Scholarly Research in Allied Education	Apr-19	2230-7540
84.	Effect of isolated and combine strength training endurance training on selected maximum strength and speed among women	Dr.I.Lilly pushpam & Yaswanth Reddy	Physical Education	International Journal of Yogic , Human Movement and Sports Sciences	Jun-19	2456-4419
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Original Article

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International Journal of Recent Research and Applied Studies

Effect of Manavalakkalai Yoga With and Without Laughing Exercises on Stress and Self Confidence among Male Government Clerical Staff

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Received 12th August 2014, Accepted 15th September 2014

Abstract

The present study is an outcome of the effect of manavalakkalai yoga with and without laughing exercises on stress and self confidence among male government clerical staff. To achieve the purpose of the study forty five male government clerical staffs were selected from the Chennai district and their age group were between 40-45 years. Selected subjects were divided into three equal groups, namely experimental group I, experimental group II and control group. Each group consisted of fifteen subjects. Random group design was used for the selection of the subjects. Training period of this study was six weeks. Experimental group I undergone the Manavalakkalai yoga with laughing exercises, experimental group II undergone the Manavalakkalai yoga without laughing exercises and control group undergone no training. Pre and post test were taken before and after the six weeks of training programme. To analyses,the data ANCOVA and Scheffe's post hoc test was used. The result of the study shows that there was a significant improvement on self confidence and decreased stress level among male government clerical staff due to the influence of manavalakkalai yoga with and without laughing exercises.

Keywords: Manavalakalai, Laughing Exercises, Clerical Staff, Stress, Self Confidence.

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Introduction

Clerical staff, also known as administrative or support staffs are critical components to achieving the mission of an organization. According to the Occupational Outlook Handbook of the Bureau of Labor Statistics, the largest number of job openings every year resides among the clerical profession. With the ever-growing technology boom, clerical staffs are assuming more roles that were once held for professional and managerial staff. While faxing, copying and scanning are still a part of clerk's duties, the overall job responsibilities have expanded in recent years. Today's clerical staff is tackling more complicated projects such as spreadsheet creation, company database maintenance, digital graphics creation and advanced PowerPoint presentations. Advanced computer software skills are becoming a must for clerical staff.due to job deadlines they will face stress may leads to psychological problems Yogic practices with laughing therapy can be a meaningful and enjoyable alternative to traditional forms. Yoga can play an important role in reducing stress and frustration that results from pain and disability, and increasing positive feelings and wellbeing as well as body become too good.

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Statement of the Problem

The purpose of the study was to find out the effect of manavalakkalai yoga with and without laughing exercises on stress and self confidence among male government clerical staff.

Hypothesis

It was hypothesized that would be a significant improvements on self confidence and reduce stress level among male government clerical staff.

Delimitations

1. The subjects were delimited into forty-five male government clerical staff.
2. The age groups of the subjects were between 40-45 years.
3. The selected subjects were divided into three equal groups; each group was consisted of fifteen subjects only.
4. The subjects of the study were selected from Chennai district only
5. The study was delimited to the male government clerical staff.

Limitations

Certain factors like life style, body structure, personal habits, family heredity, and motivational factors are not to be taken into consideration for this study. Certain factor like diet, environmental and climatic conditions, and economical background is not to be

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Original Article

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Journal of Recent Research and Applied Studies

Effect of Yogic Practices on Selected Physiological Variables among Postnatal Care Women

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Received 29th April 2015, Accepted 22nd June 2015

Abstract

The purpose of the study was to investigate the effects of yogic practices on physiological variables among postnatal care women. To facilitate the study, 30 postnatal women were selected from various hospitals in Gobichettipalayam as subjects at random. In this study yogic practices were given to experimental group for the period of six weeks. The pre test was taken from the post natal mothers before administering the training. The subjects were involved with their training for a period of six weeks. The subjects were monitored throughout the sessions. At the end of the six weeks training post test with respect to Systolic and Diastolic Blood Pressure were measured by using the standardized tests and methods. The significant difference between the means of the experimental group and control group for the pre test and post test scores were determined by 't' test. The level of significance was fixed at 0.05 level of confidence. It was concluded that systolic blood pressure and diastolic blood pressure of the experimental group showed significant decrease when compared to the control group.

Keywords: Yoga, Physiological, Postnatal, Women.

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Introduction

Health care is the diagnosis, treatment and prevention of illness, injury and other physical and mental impairment of human being. Health care is delivered by allied health, dentistry, midwifery, medicine, optometry, nursing, pharmacy, psychology and other health profession. According to the WHO, Health care embrasses all the goods and services designed to promote health, including preventive, curative and palliative interventions, whether directed to individuals or to populations. It is important that every women should have access to knowledge, related to their health and fitness. It has proven that the waist size measurement is more then 35 inch (89 centimeter). This is more likely to develop heart diseases and other health related problems.

The word "yoga" comes from the Sanskrit root yug, which means "union." In the spiritual sense, yoga means union of the mind with the divine intelligence of the universe. Yoga aims through its practices to liberate a human being from the conflicts of duality (body–mind), which exists in every living thing, and from the influence of the gunas, the qualities of universal energy that are present in every physical thing. (Universal energy has three qualities, known as gunas, that exist together in equilibrium: Sattva [purity]; Rajas [activity, passion, the process of change]; and Tamas [darkness, inertia]). Put simply, the follower of yoga learns to work with the forces and processes of life as a partner—coupled, rather than in conflict and uncase with their own nature. On the broadest level yoga refers to the enormous body of spiritual values, attitudes, precepts and techniques that have been developed in India over three millennia that may be regarded as the very first foundation of the ancient Indian civilization (Feuerstein, 1989).

Yoga is often presented as a complex of different paths leading to a common goal of union. Some paths or margas, include janana yoga (spiritual knowledge), bhakthi yoga(devotion), karma yoga(action or selfless work), raja yoga(meditation), mantra (sound) and hatha yoga (purification of the body-mind). Yoga is practiced all over the world it produces consistent physiological changes and have sound scientific basis. The cardiovascular changes due to the process of ageing are being pre-poned over since the past few decades. One of the yoga practices, Hatha Yoga, is based on the knowledge, development, and balance of psychophysical energies in the body and can, therefore, be referred to as the "psychophysical yoga." The three main elements used in Hatha Yoga to attain its purposes are the body, the physical part of man; the mind, the subtle part; and the element that relates the body with the mind in a special way, the breath. Hatha Yoga offers special techniques for each one of these elements. For the physical part, or body, it offers the asanas ("postures"), techniques for physical conditioning, called kriyas ("actions"), mudras ("seals"), bandhas ("locks"), as well as techniques for total and conscious physical relaxation. Although a small part of the practice of yoga, the capacity of kriyas, mudras, and bandhas to deepen

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3.4.5 -J-Y- Original Article 2014-15

IJRRAS
International Journal of Recent Research and Applied Studies
An Online Open Access Refereed e-Journal

Effect of Yoga on Selected Physiological and Haematological Variables among Irregular Menstrual Women

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Received 20th February 2015, Accepted 14th May 2015

Abstract

The purpose of the study was to investigate the effects of yogic practices on physiological and biochemical variables among irregular menstrual women. To facilitate the study, 30 irregular menstrual women were selected from various hospitals, chennai as subjects at random In this study yogic practices were given to experimental group for the period of six weeks. The pre test was taken from the subjects before administering the training. The subjects were involved with their training for a period of six weeks. The subjects were monitored throughout the sessions. At the end of the six weeks training post test with respect to body mass index, hemoglobin were measured by using the standardized tests and methods. The significant difference between the means of the experimental group and control group for the pre test and post test scores were determined by 't' test. The level of significance was fixed at 0.05 level of confidence. The result of this study proved that significant differences were recorded due to six weeks of yogic therapy for irregular menstrual women. Hemoglobin of the experimental group showed significant Increase when compared to the control group. BMI (Body mass Index) showed significant decrease when compared to the control group.

Keywords: Yoga, Physiological, Menstruation, Women.

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Introduction

Women's health in India can be examined in terms of multiple indicators, which vary by geography, socioeconomic standing and culture (Chatterjee and Paily, 2013). To adequately improve the health of Women in India multiple dimensions of wellbeing must be analysed in relation to global health averages and also in comparison to men in India. Health is an important factor that contributes to human wellbeing and economic growth (Ariana, Proochista and Arif & naveed 2009).Currently women in India face a multitude of health problems, which ultimately affect the aggregate economy's output. Addressing the gender, class or ethnic disparities that exist in health care and improving the health outcomes can contribute to economic gain through the creation of quality human capital and increased levels of savings and investment (Ariana, Proochista and Arif Naveed 2009).

Gender is one of many social determinants of health which include social, economic, and political factors that play a major role in the health outcomes of women in India (Balarajan and Selvaraj et al. 2013). Therefore, the high level of gender inequality in India negatively impacts the health of women. The role that gender plays in health care access can be determined by examining resource allocation within the household and the public sphere.

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Gender discrimination begins before birth, females are the most commonly aborted sex in India (Raj and Anitha 2013). If a female fetus is not aborted, the mother's pregnancy can be a stressful experience due to her family's preference for a son (Patel, Vikram and Merlyn Rodrigues, et al. 2013).

Irregular cycles or irregular periods is an abnormal variation in length of menstrual cycles in a female. A female usually experiences cycle length variations of up to eight days between the shortest and longest cycle lengths. Lengths ranging between eight and 20 days is considered as moderately irregular cycles. Variation of 21 days or more is considered very irregular(Kippley, John and Sheila Kippley 1996). Irregularmenstruation is a menstrual disorder whose manifestations include irregular cycle lengths as well as metrorrhagia (vaginal bleeding between expected periods).

Yogic practices are the various yogic techniques used for the purification of the body and mind. These techniques help to create an absolute balance of the interacting activities and process of the physical body, mind and the energy. The main yogic practices are Suryanamaskar, pavanamukthasana, shashankasana, Bhujangasana, ustrasana, pachimottasana, pranayama such as nadishudhi, ujjayi pranayama and relaxation. Yoga in itself is a therapy and lifestyle. The morden way of life imbalances the natural equilibrium of man with nature. This will also leads to decay of moral standard of man. The purpose of the study was to find out the effect of yogic practices on selected physiological and

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Asian Journal of Applied Research (AJAR) 2015

E-ISSN: 2395-1702 P-ISSN: 2395-0382
Volume 01- Issue 06-, pp-14-19
www.yadavapublication.com

Research Paper Open Access

EFFICACY OF VARIED AEROBIC TRAINING ON BIOCHEMICAL VARIABLES AMONG OBESE WOMEN

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Abstract

Aerobic refers to a variety of exercises that stimulate heart and lung activity for a time period sufficiently long to produce beneficial changes in the body (**Cooper, 1970**) Aerobic is a system of exercises designed to promote the supply and use of oxygen in the body) The purpose of the study was to find out the effect of varied aerobic practices on lipid profile among obese women. For the purpose of the study 30 obese women, were divided into three groups based on their BMI, one as Aerobic group, two as Step Aerobic Group,, third group served as control group. The selected subjects were measured of their Blood Lipid Profile. The interventional training programmes for this study were twelve weeks. Analysis of covariance (ANCOVA) was used to find out whether the mean differences were significant or not.

INTRODUCTION

Obesity, in absolute terms, is an increase of body adipose tissue (fat tissue) mass. Obesity is typically assessed by BMI (body mass index) and in terms of its distribution via the waist circumference. The cut-off limits for waist circumference for Indians have been recommended to be 90 cm for males and 80 cm for female. Abdominal obesity is defined by waist circumference above these limits. Today, the subject of obesity is of much concern to millions of people all over the world.. The World Health Organization (WHO) has described the problem of obesity as a "worldwide epidemic"(Pooja Malhaotra 2007).Modern world is the outcome of many scientific inventions through centuries. Scientific instruments and machinery have helped to lead the daily life with ease and comfort. Physical fitness is a universally accepted and realised terminology. The present concept of physical fitness is not only freedom from disease, but also to gain enough strength, agility, flexibility, endurance and skills to meet the demands of daily life and to build sufficient reserve energy to withstand stress and strain. The term metabolism refers to the various series of clinical reactions involved in energy production that takes place within the human body. Some of these reactions can only occur in the presence of the oxygen (based on type of exercises) we breathe while others can occur in the absence of oxygen. These reactions that require the presence of oxygen are called aerobic (aerobic — with oxygen) those not requiring oxygen are called anaerobic (anaerobic without oxygen). Aerobics is extremely beneficial for developing overall physical fitness. Aerobic dance can improve a participant's flexibility, strength, cardiovascular fitness, and reduce the percentage of body fat. In step aerobic

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STAR Research Journal

Available online at www.starresearchjournal.com (Star International Journal)

PHYSICAL EDUCATION

Star. Phy.Edn.03 (2014)

Effect of pranayama with meditation on selected psychological variables among school girls

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Abstract

The purpose of the study was to find out the effect of pranayama with meditation on selected psychological variables among school girls. To achieve the purpose of the present study, thirty school girls from Kanchipuram District, Tamilnadu, India were selected as subjects at random and their ages ranged from 15 to 17 years. The study was formulated as a true random group design, consisting of a pre-test and post-test. The subjects (n=30) were randomly assigned to two equal groups as pranayama with meditation group (PWMG) and control group (CG) in an equivalent manner. Mental health was assessed by Peter Becker Inventory and self concept was assessed by Muktha Rani Rastogi Inventory. The pranayama with meditation group participated for a period of six weeks for alternate three days in a week and the post-tests were taken. To find out the difference between the two groups paired 't' test was used. The result reveals that the pranayama with meditation group showed better performance on mental health and self concept than the control group owing to the effects of pranayama with meditation.

Key words: *Pranayama, Meditation, Mental Health, Self Concept, School Girls.*

Introduction

In yoga we call this subtle life force "Prana". Prana is pure life without this subtle life force there would be no life. Pranayama is an important and little known part of yoga. Its techniques have been practiced for centuries by the people. Recently, this art and science of yoga breathing was almost completely unknown to the common man like many other Ancient Indian Arts. It has been beyond doubt that pranayama is a very important means of preventing and curing many aliments. Its aim is to bring the traditional knowledge of this great art of the common man, so that it can be used without much external help for the maintenance as well as the restoration of wealth **(Iyengar, 2008).** Meditation is the act of focusing one's thoughts and a state of consciousness that can be understood only on a direct, intuitive level. Meditation is the royal road to the attainment of freedom a mysterious ladder that reached from earth to heaven, darkness to light, and mortality to immorality **(Joshi, 2001).** In the school times especially the teenage girls has to face so many problems like studies, their physiological functions and their friends behavior. In order to bring their mental health and self concept high this present study was focused with this purpose.

Purpose of the study

The purpose of the study was to find out the effect of pranayama with

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Original Article

IJRRAS

Journal of Recent Research and Applied Studies

Efficacy of Yoga Therapy on Selected Bio-Chemical Variables among Men Type II Diabetic Patients

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Received 30th May 2015, Accepted 20th July 2015

Abstract

The purpose of the study was to find out the efficacy of yoga therapy on selected bio-chemical variables among men type II diabetic patients. To facilitate the study, 30 subjects were selected at random from Chennai city only. Their age were ranged between 35-45 years old. They were assigned into two groups as yoga therapy group and control group. All the subjects were tested prior to and immediately after the 8 weeks treatment in progression to bio-chemical variables such as Blood Glucose and Total Cholesterol. The initial and final scores in selected bio-chemical variables were put in-to statistical treatment using Analysis of Covariance (ANCOVA) to find out the significant mean differences. Systematic eight weeks of yoga therapy reduced the Blood Glucose and Total Cholesterol more than the control group.

Keywords: Yoga Therapy, Diabetics, Cholesterol.

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Introduction

Diabetes mellitus is a chronic metabolic disorder that prevents the body to utilize glucose completely or partially. It is characterized by the raised glucose concentration in the blood and alterations in carbohydrates, protein and fat metabolism. This can be due to failure in the formation of insulin or liberation or action. Diabetes mellitus is a disorder of the body's metabolism characterized by a high blood sugar level and the subsequent excretion of sugar in the urine. The human body requires sugar for energy to maintain the organs and tissues of the body. The sugar, which is taken into the body in the form of carbohydrates, enters the blood in the form of glucose (mainly), fructose and galactose. These sugars are either immediately used by the body or else are stored for later use in the liver and muscles in the form of glycogen. Yoga is usually defined as union: union between the limited self (jiva) and the cosmic self (atman). Without trying to confuse things any further, we would like to point out that there is an anomaly in this definition. For there to be an aim or goal of union there must first be a state of separation. And in fact this separation does not exist. At this very moment you are united with the cosmic consciousness. Even this statement is not true, for you actually are the cosmic consciousness. So the aim of yoga is not really to unite you with greater self, to make you are already united. It is to make you realize your identity with the greater self, to make you know and tune in with your existing inner nature (Swami Satyananda Saraswati, 1981).

The Science of yoga begins to work on the Outermost aspect of the womenality, the physical body, which for most people is a practical and familiar starting point. Yoga is a science and its practice harmonizes the body and mind. Yoga is immensely useful for promoting total health. It also works effectively as a therapy in three ways preventive curative, rehabilitative. The yoga therapy has proved its excellence in physiological, and psychological disorders like Diabetes.

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Methodology

The purpose of the study was to find out the efficacy of yoga therapy on selected bio-chemical variables among men type II diabetic patients. To facilitate the study, 30 subjects were selected at random from Chennai city only. Their age were ranged between 35-45 years old. They were assigned into two groups as yoga therapy group and control group. All the subjects were tested prior to and immediately after the 8 weeks treatment in progression to bio-chemical variables such as Blood Glucose and Total Cholesterol. The initial and final scores in selected bio-chemical variables were put in-to statistical treatment using Analysis of Covariance (ANCOVA) to find out the significant mean differences.

Results

The statistical analysis comparing the initial and final means of Biood Glucose assessed through Blood Test (Lab) due to yoga therapy on selected Bio-Chemical variables among men type II diabetic patients were presented in Table I.

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Available online at www.sciencedirect.com

ScienceDirect

Procedia Engineering 97 (2014) 660 – 667

Procedia Engineering

www.elsevier.com/locate/procedia

12th GLOBAL CONGRESS ON MANUFACTURING AND MANAGEMENT, GCMM 2014

Tribological behaviour of Aluminium Hybrid Metal Matrix Composite

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Abstract

Aluminum based metal matrix composites (MMCs) are appropriate materials for structural applications in the aircraft and automotive industries because they are ductile, highly conductive, lightweight and have a high strength to weight ratio. Wear and Friction behaviour of Al6061 with various percentage volumes of Multiwall carbon nanotube and Silicon Carbide reinforcement through stir casting method followed by die-casting was investigated. Wear test was made by using Pin on Disc Apparatus on the prepared Specimen. It was found that, under mild wear conditions, the composite displayed lower wear rate and friction coefficient compared to Aluminium. However, for severe wear conditions, the composite displayed higher wear rate and friction coefficient and it was clarified that the friction and wear behaviour of Al–SiC-MWCNT composite is largely influenced by the applied load and there exists a critical load beyond which CNTs could have a negative impact on the wear resistance of aluminium alloy. Also the hardness of the composite was increased by increasing the percent volume of reinforcement.

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Selection and peer-review under responsibility of the Organizing Committee of GCMM 2014

Keywords: Metal matrix composites; Multiwall carbon nanotue; Silicon carbide; Pin on disc apparatus; Stir casting.

1. Main text

Materials with unusual combination of properties like low densities, strong, stiff and impact resistant and not easily corroded are needed for aerospace, underwater and transportation applications and that cannot be met by the metals, conventional metallic alloys, ceramics and polymeric materials.

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Selection and peer-review under responsibility of the Organizing Committee of GCMM 2014
doi:10.1016/j.proeng.2014.12.295

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3.4.5-J-ST-

International Journal of Applied Engineering Research
ISSN 0973-4562 Volume 9, Number 23 (2014) pp. 21835-21850
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http://www.ripublication.com

Sports Video Classification Based on the Distribution of Edge Strengths of Non Subsampled Shearlet Transform

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Abstract

Automatic video classification is an emerging field in multimedia data base and video analysis. It is very useful in video indexing and retrieval from video collections. Among the various video collections: commercial, cartoon, sports, drama and news, the classification of sports video plays an important role due to tremendous commercial demand which is a problematical task owing to the similarity between various sports video. In order to improve the performance of the sports genre classification system, distribution of edge strengths are considered by exploiting Non Subsampled Shearlet Transform (NSST). In addition, multi class Support Vector Machine (SVM) classifier is employed for automated video classification, where five categories of sports such as volleyball, basketball, tennis, cricket and football is classified. Experimental result is evaluated using dataset obtained by TV broadcast channels and classification accuracy of 99.2% is achieved.

Index terms - Non sub-sampled shearlet transform, multiclass support vector machine, histogram features and video classification.

1. INTRODUCTION

In today's world, people have access to a vast amount of video, both on internet and television. It is very difficult for a human to go through it all to find video of interest. Video classification is used to search the choice of video inside a specific video category. Over the years, extensive researches have been done for video classification. Video collections can be categories into news, sports, commercial, cartoon and the

Paper code: 28590 - IJAER

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Applied Mechanics and Materials
ISSN: 1662-7482, Vols. 766-767, pp 234-239
doi:10.4028/www.scientific.net/AMM.766-767.234
© 2015 Trans Tech Publications, Switzerland

2.4.5-I-ST-2014-15

Revised: 2015-01-28
Accepted: 2015-02-05
Online: 2015-06-08

Aluminium Metal Matrix composite – an insight into solid state and liquid state processes

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Keywords: Aluminium metal matrix composites, Ball milling, powder metallurgy, reinforcement

Abstract. Aluminium metal matrix composites (AMMCs) are being considered as a group of superior material for its lightness, strength, high specific modulus, low coefficient of thermal expansion and good wear resistance properties. Solid state and liquid state processing methods are used to fabricate AMMCs. Achieving a uniform distribution of reinforcement within the matrix is one such challenge, which affects directly on the properties and quality of composite material. Powder metallurgy route, one of the solid state processing methods can be effectively used to get uniform dispersion of reinforcements with aluminium metal matrix. This paper presents the summary of the ball milling and stir casting processes to fabricate the AMMCs and its applications. Major issues like ball milling time, dispersion of reinforcements, grain size, the stirring time and speed are discussed. Also the effect of different reinforcement for AMMCs on the mechanical properties is discussed in detail.

Introduction

Materials with unusual combination of properties like low densities, strong, stiff and impact resistant and not easily corroded are needed for aircraft industries, marine and transportation applications which cannot be met by the metals, conventional metallic alloys, ceramics and polymeric materials. Strong materials are relatively dense, and increasing the strength or stiffness generally results in a decrease in impact strength. Thus, a composite material, which consists of a combination of two or more distinctly contradictory materials can be used whose properties are greater in a specific application to those that of the original substances. There are three different types of composites as metal matrix composites, polymer composites, and ceramic composites. Metal matrix composites (MMCs) refer to a composite system that is based on metal or alloy substrate, combined with metallic or non-metallic reinforcements. The main advantage of MMCs include excellent mechanical properties, possible to be used at superior temperature, good wear resistance, low creep rate, etc.

Among the MMCs, aluminium (Al) alloy composites are forever on the peak of exploration [1] and are the most popular matrix for the MMCs. The Al alloys are fairly attractive due to their low density, their potential to be strengthened by precipitation, their excellent corrosion resistance, their elevated thermal and electrical conductivity, and their high damping capability [2]. Homogeneous dispersion of reinforcement with the aluminium matrix is one of the most important dispute has been studied which is a key factor for uniform possessions of the output. Recently there are several grades of aluminium and different reinforcement materials are in use to develop aluminium composite but choosing a better reinforcement and most favorable process is a significant factor [3].

Processing of metal matrix composites

Various fabricating methods to fabricate AMMCs are Solid state processing (SSP) methods and Liquid state processing methods (LSP). With the SSP methods, the reinforcement and the matrix are in solid phase which are categorized as Diffusion bonding processing methods and powder

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3.4.5-J-ST-2014-15

Indian Journal of Science and Technology, Vol 8(6), 529–535, March 2015

ISSN (Print) : 0974-6846
ISSN (Online) : 0974-5645

Sports Video Classification using Multi Scale Framework and Nearest Neighbor Classifier

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Abstract

Objectives: In order to achieve convenient sports video accessing without sequential scanning, automated sports video categorization is presented in this study. **Methods/Analysis:** In order to build efficient sports video categorizing system, edge features obtained from Non Subsampled Shearlet Transform (NSST) are taken into account. Then, sports genre categorization is done by Nearest Neighbor (NN) classifier due to its discriminative learning approach. The five sports category; tennis, cricket, volleyball, basketball and football are considered. **Findings:** To validate the proposed system based on NSST, experiments are carried using internal database video at frame level. Totally, 500 video clips are collected in which 100 video clips are gathered for each sports genre. The proposed system achieves maximum average classification accuracy of 94.80% at 4 directions of 2-scale NSST features while using city block distance measure in KNN classifier. For the same NSST features, the Euclidean, cosine and correlation distance measures gives an accuracy of 93.20%, 92.80% and 92% respectively. **Conclusion/Application:** The effectiveness of the system is clearly demonstrated by the experimental assessment. The proposed framework can adequately classify the sports video into one of the five predefined genre.

Keywords: Edge Features, Nearest Neighbor Classifier, NSST, Shearlet Transform, Sports Video Classification

1. Introduction

Computerized video classification has become more important due to vast availability of digital video contents based on contents in the videos. Among the various video categories such as cartoons, newspaper, commercial and sports, numerous researches have been carried out for sports video categorization due to its commercial demand. A new method of video summarization is presented in[1] based on motion analysis for sports video. Two optical flow algorithms are used to estimate the motion metrics. Then, different key frame selection criteria are used for each optical flow algorithms for video summarization and it is a threshold free approach.

Semantic event detection and classification using key frame selection approach is introduced in[2] for cricket videos. It consists of different stages such as hue histogram difference based key frames selection for indexing, classification of frames into real time or replay based on logo transitions and then real time frames are classified as field view or non field view by colour features. Automated sports video categorization based on hierarchical decision making scheme is implemented for sports categories in[3]. The main decision making mechanism is a decision tree which generate hypotheses concerning the semantics of the sports video content. Hidden Markov Model (HMM) based decision making is employed.

Automated approach for personalized music sports video generation is described in[4]. Multimodal features are extracted from audio, video and text information. Dynamic programming is employed for the classification of personalized music sports video. Audio based sports video segmentation and detection is presented in[5] for soccer video. At first, soccer sequence soundtrack is parameterized using Mel-Frequency Cepstral Coefficients (MFCC). Then it is segmented into homogenous components by

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3.4.5- Dr. Premkumar 2014-15

Original Article

ISSN: 2349 - 4891

International
Journal of Recent Research and Applied Studies
(Multidisciplinary Open Access Refereed e-Journal)

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Analysis of Selected Quality of Life Variables of Coaches from Various Organizations Working in Tamilnadu State

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Received 8th January 2015, Accepted 5th March 2015

Abstract

The purpose of the study was to carry out an extensive study in Tamil Nadu to find out the selected quality of work life among the sports coaches working for various organizations. The purpose of the study was to carry out an extensive study in Tamil Nadu to find out the level of adequate and fair compensation and safe and healthy working conditions among the sports coaches working for various organizations. For the present study the 240 sports coaches working in Tamilnadu were selected at random with 212 men coaches and 28 women coaches. Among that 65 coaches from SDAT, 20 coaches from SAI, 36 coaches from public sector undertakings, 36 coaches from sports academies, 43 coaches from sports clubs and 40 coaches from educational institutions and their age ranged from 25 to 60 years. A simple random sampling technique is also applied. The primary data were collected from the sports coaches working in Tamil Nadu. The requirement of the testing procedures was explained to the subjects so as to get full co-operation of the effort required on their part and prior to the administration of the study. The adequate and fair compensation, safe and healthy working conditions was assessed using Quality of Work Life Questionnaire constructed by Walton. To test the significance of the mean difference among the coaches analysis of variance (ANOVA) was used. In case of any significance of mean difference on the criterion measure, to find out which pair of group was better among the others, the Scheffe's post - hoc test was applied. To test the obtained results on variables, level of significance 0.05 was chosen and considered as sufficient for the study. When compared to various organization of coaches in respect to quality of work life variable adequate and fair compensation and safe and healthy working condition SDAT having highest quality followed by SAI, sports academies, sports club, educational institutions and public sector undertakings.

Keywords: Coaches, Quality of Work Life.

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Introduction

Etymologically, the English term "coach" is derived from a medium of transport that traces its origins to the Hungarian word *kocsi* meaning "carriage" that was named after the village where it was first made. The term coach is sometimes equivalent to the term manager in other developed countries in reference to the director of a sporting team. The term "coach" has been expanded greatly in American English usage especially in recent years, to include such nonsports related concepts. A coach, particularly in a major operation, is traditionally aided in his efforts by one or more assistant coaches. Many times, in major team sports the head coach has little to do with the development of details such as techniques of play or placement of players on the playing surface, leaving this to assistants while concentrating on larger issues. A head coach is a professional at training and developing sports men and women. He is typically paid more than other coaches. Other coaches are often subordinate to the head coach, often in offensive positions or defensive positions and occasionally proceeding down into individualized position coaches. One of the major features of coaching is the high turnover rate for jobs. With few exceptions college coaches often routinely change jobs, rarely staying with players. A college coach acts as the face of a team, at an age when many young players do not wish to be hounded by media. They are often called upon to discuss off the field incidents such as rule infractions or player antics.

Coaching is a very fickle profession and a reversal of the team's fortune often finds last year's "Coach of the Year" to be seeking employment in the next. Many coaches are former players of the sport themselves, and coaches of professional sports teams are sometimes retired players. Successful coaches often become as well or even better known than the athletes they coach, and in recent years have come to command high salaries and have agents of their own to negotiate their contracts with the teams. Often the head coach of a

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well known team has his or her own radio and television programs and becomes the primary "face" associated with the team. Any student athlete who enters a sport program has the right to expect quality coaching and instruction. Most parents are very particular about the educator chosen to teach their children in a school classroom, yet are not similarly concerned about who coaches their youngsters in athletics. Professionals involved in athletics agree that the coach is the single most important factor affecting the athlete. Coaches have a significant impact on the lives of their young athletes and the student athlete deserves a competent, well trained leader. The coach is an important role model and influences values and attitudes. (Sabock, 1981) Concern for the professional preparation of coaches at the high school level began as early as 1959 and in the late 1960s a coaching certification task force was formed by the Division of Men's Athletics (DMA), a subsection within the American Association of Health, Physical Education, Recreation and Dance (AAHPERD). The task force recommended the establishment of certification standards for teachers who wanted to coach by implementing coaching certification programs in conjunction with colleges to ensure a minimal degree of competency (Sisley & Wiese, 1987).

A happy and healthy employee will give better turnover, make good decisions and positively contribute to the organizational goal. An assured good quality of work life will not only attract young and new talent but also retain the existing experienced talent. By conducting this study, the researcher will be able to know the level of quality of work life among the sports coaches in Tamil Nadu. This study helps the organizations to find out the existing quality of work life in their respective work places. This would help them to understand in what areas they have to concentrate more on improving the level of the work life which will in turn make the coaches happy and motivated. Because motivated and committed coaches can make the trainees to achieve their objectives.

Methodology

The purpose of the study was to carry out an extensive study in Tamil Nadu to find out the selected quality of work life among the sports coaches working for various organizations. The purpose of the study was to carry out an extensive study in Tamil Nadu to find out the level of adequate and fair compensation and safe and healthy working conditions among the sports coaches working for various organizations. For the present study the 240 sports coaches working in Tamilnadu were selected at random with 212 men coaches and 28 women coaches. Among that 65 coaches from SDAT, 20 coaches from SAI, 36 coaches from public sector undertakings, 36 coaches from sports academies, 44 coaches from sports clubs and 40 coaches from educational institutions and their age ranged from 25 to 60 years. A simple random sampling technique is also applied. The primary data were collected from the sports coaches working in Tamil Nadu. The requirement of the testing procedures was explained to the subjects so as to get full co-operation of the effort required on their part and prior to the administration of the study. The adequate and fair compensation, safe and healthy working conditions was assessed using Quality of Work Life Questionnaire constructed by Walton. To test the significance of the mean difference among the coaches analysis of variance (ANOVA) was used. In case of any significance of mean difference on the criterion measure, to find out which pair of group was better among the others, the Scheffe's post - hoc test was applied. To test the obtained results on variables, level of significance 0.05 was chosen and considered as sufficient for the study.

Results

Table 1. Analysis of variance among coaches working on different organization on adequate and fair compensation

Source	Sum of Squares	df	Mean Square	F
Between Groups	4606.02	5	921.20	26.99*
Within Groups	7985.11	234	34.12	

*$p < 0.05$ Table F, df (5, 234) at (0.05) = 2.25

In table above table, the results of analysis of variance on adequate and fair compensation among SDAT, SAI, public sector undertakings, sports academies, sports clubs and educational institutions were presented. From the table it can be seen that the calculated 'F' value of adequate and fair compensation among the six categories was 26.99 which was greater than the table value of 2.25, indicating significant difference among the groups ($p < 0.05$) for the degree of freedom (5, 234) at 0.05 level of Confidence. Since the 'F' value was significant, the Scheffe's Post hoc test was further computed to find out which pair of group was high among the others and the results are tabulated in the table - II.

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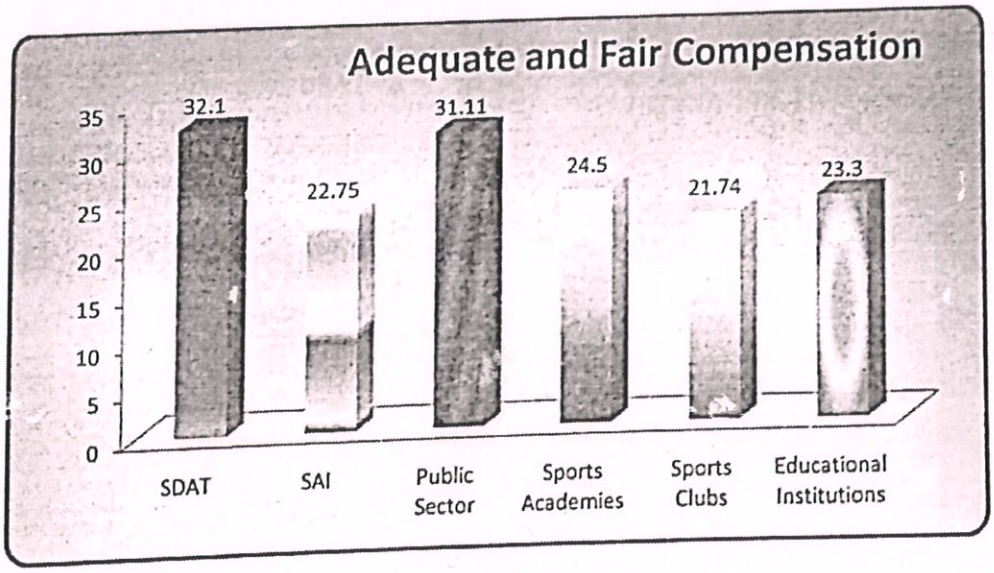
Table II. Scheffe's post hoc test of significance and difference among the means of coaches working on different organization on adequate and fair compensation

SDAT	SAI	Public Sector Undertakings	Sports Academies	Sports Clubs	Educational Institutions	Mean Difference	CI
32.10	22.75	---	---	---	---	9.35*	8.05
32.10	---	31.11	---	---	---	0.99	8.05
32.10	---	---	24.50	---	---	7.60	8.05
32.10	---	---	---	21.74	---	10.36*	8.05
32.10	---	---	---	---	23.30	8.80*	8.05
---	22.75	31.11	---	---	---	8.36*	8.05
---	22.75	---	24.50	---	---	1.75	8.05
---	22.75	---	---	21.74	---	1.01	8.05
---	22.75	---	---	---	23.30	0.55	8.05
---	---	31.11	24.50	---	---	6.61	8.05
---	---	31.11	---	21.74	---	9.37*	8.05
---	---	31.11	---	---	23.30	7.81	8.05
---	---	---	24.50	21.74	---	2.76	8.05
---	---	---	24.50	---	23.30	1.20	8.05
---	---	---	---	21.74	23.30	1.56	8.05

*p < 0.05, Confidence interval value (0.05) = 8.05

From the above table the mean difference values between SDAT and SAI (9.35), SDAT and sports clubs (10.36), SDAT and Educational Institutions (8.80), SAI and public sector undertakings (8.36), public sector undertakings and Sports Clubs (9.37) were greater than the confidence interval value (8.05) hence there exist significant difference. It was also observed that the mean difference values between SDAT and public sector undertakings (0.99), SDAT and Sports Academies (7.60), SAI and Sports Academies (1.75), SAI and sports clubs (1.01), SAI and Educational Institutions (0.55), public sector undertakings and Sports Academies (6.61), Public sector undertakings and Educational Institutions (7.81), Sports Academies and Sports Clubs (2.76), Sports Academies and Educational Institutions (1.20), Sports Clubs and Educational Institutions (1.56) were lesser than the confidence interval value (8.05) hence there exist insignificant difference. The mean values of among six categories of coaches are graphically presented in figure – I.

Figure I. Graphical depiction of the comparison of the means of adequate and fair compensation of different types of coaches



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ISSN: 2349 – 4891

Table III. Analysis of variance among coaches working on different organization on safe and healthy working conditions

Source	Sum of Squares	df	Mean Square	F
Between Groups	19950.58	5	3990.11	58.76*
Within Groups	15887.40	234	67.89	

*p < 0.05 Table F, df (5, 234) at (0.05) = 2.25

In table above table, the results of analysis of variance on safe and healthy working conditions among SDAT, SAI, public sector undertakings, sports academies, sports clubs and educational institutions were presented. From the table it can be seen that the calculated ' F ' value of safe and healthy working conditions among the six categories was 58.76 which was greater than the table value of 2.25, indicating significant difference among the groups ($p < 0.05$) for the degree of freedom (5, 234) at 0.05 level of Confidence. Since the ' F ' value was significant, the Scheffe's Post hoc test was further computed to find out which pair of group was high among the others and the results are tabulated in the table - IV.

Table IV. Scheffe's post hoc test of significance and difference among the means of coaches working on different organization on safe and healthy working conditions

SDAT	SAI	Public Sector Undertakings	Sports Academies	Sports Clubs	Educational Institutions	Mean Difference	CI
54.92	38.00	---	---	---	---	16.92*	11.36
54.92	---	53.55	---	---	---	1.37	11.36
54.92	---	---	53.56	---	---	1.36	11.36
54.92	---	---	---	36.04	---	18.88*	11.36
54.92	---	---	---	---	34.65	20.27*	11.36
---	38.00	53.55	---	---	---	15.55*	11.36
---	38.00	---	53.56	---	---	15.56*	11.36
---	38.00	---	---	36.04	---	1.96	11.36
---	38.00	---	---	---	34.65	3.35	11.36
---	---	53.55	53.56	---	---	0.01	11.36
---	---	53.55	---	36.04	---	17.51*	11.36
---	---	53.55	---	---	34.65	18.90*	11.36
---	---	---	53.56	36.04	---	17.52*	11.36
---	---	---	53.56	---	34.65	18.91*	11.36
---	---	---	---	36.04	34.65	1.39	11.36

*p < 0.05, Confidence interval value (0.05) = 11.36

From the above table the mean difference values between SDAT and SAI (16.92), SDAT and Sports Clubs (18.88), SDAT and Educational Institutions (20.27), SAI and public sector undertakings (15.55), SAI and sports academies (15.56), Public sector undertakings and Sports Clubs (17.51), Public sector undertakings and Educational Institutions (18.90), Sports Academies and Sports Clubs (17.52), Sports Academies and Educational Institutions (18.91) were greater than the confidence interval value (11.36) hence there exist significant difference. It was also observed that the mean difference values between SDAT and Public sector undertakings (1.37), SDAT and Sports Academies (1.36), SAI and Sports Clubs (1.96), SAI and Educational Institutions (3.35), Public sector undertakings and Sports Academies (0.01), Sports Clubs and Educational Institutions (1.39) were lesser than the confidence interval value (11.36) hence there exist insignificant difference. The mean values of among six categories of coaches are graphically presented in figure – II.

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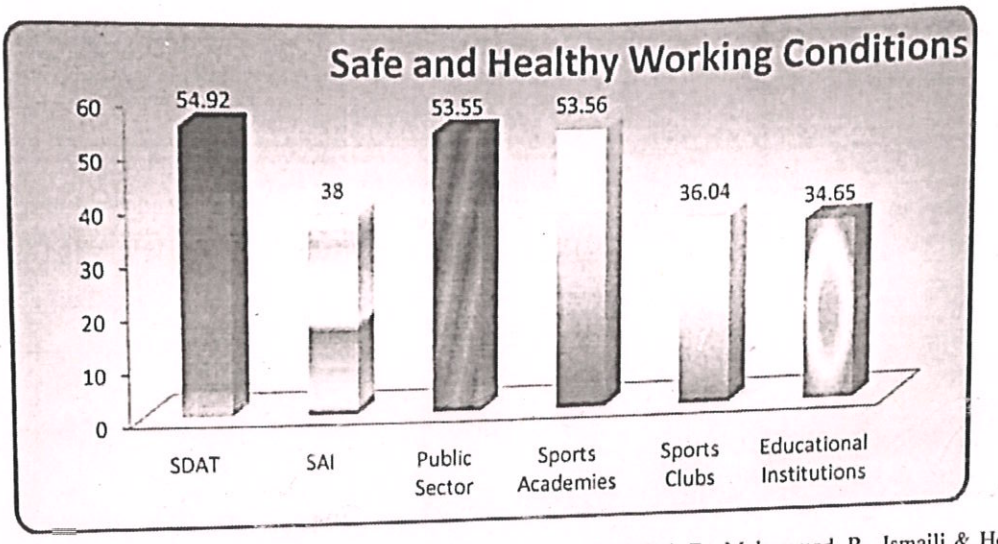
Figure II. Graphical depiction of the comparison of the means of safe and healthy working conditions of different types of coaches



Conclusion

When compared to various organization of coaches in respect to quality of work life variable adequate and fair compensation SDAT having highest quality followed by SAI, sports academies, sports club, educational institutions and public sector undertakings.

When compared to various organization of coaches in respect to quality of work life variable safe and healthy working condition SDAT having highest quality followed by SAI, sports academies, sports club, educational institutions and public sector undertakings.

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Please cite this article as: P. Rajan & Dr. S. Prem Kumar. Analysis of Selected Quality of Life Variables of Coaches from Various Organizations Working in Tamilnadu State. *International Journal of Recent Research and Applied Studies*. 2015, 2.3 (4). 12 -16.

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3.4.5 Dr. Premkumar
2014-15

E-ISSN NO : 2347-856X
ISSN NO: 2348 – 0653

International Journal of Business And Administration Research Review

Volume No-1 Issue No-6 July-Sep 2014

Impact Factor 0.314

Peer Reviewed
Listed &Indexed in International ISSN Directory, Paris

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Research Paper
Impact Factor (GIF) 0.314

E- ISSN -2347-856
ISSN -2348-963

IMPACT OF OCCUPATIONS OF CONSUMERS ON INFORMATION SEARCH: A STUDY WITH REFERENCE TO CAR

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ABSTRACT
Demography is the study of the vital and measurable statistics of a population. The demographic variables are age, gender, marital status, family size, family life cycle, income, occupation, education, religion, race, generation, nationality and social class. Demographics are used to describe a population in terms of its size, distribution and structure. Size means the number of individuals in a population while structure describes the population in terms of age, income, education and occupation. Distribution of the population describes the location of individuals in terms of geographical regions and rural, urban or suburban locations. Each of these factors influences the behaviour of the consumer and contributes to the overall demand for various products and services. This paper, with a strong backing of literature, analyses the impact of occupation of consumers on searching of information about cars.

Key words: Demographic Variables, Occupation, Consumer Purchase Decision, Information Search.

1.INTRODUCTION

The demographic variables have much significance in marketing. They are used as bases for segmenting the market and their role in consumer's buying decision is notable and vital. The important demographic variables are Age, Family size, Family life Cycle, Gender, Income, Occupation, Education, Religion, Race, Generation, Nationality, and Social class. Even when the target market is described in non-demographic terms (say, a personality type), the link back to demographic characteristics is needed in order to estimate the size of the target market and the media that should be used to reach it efficiently. So, identifying the demographic profile of the target consumers is very important for the marketers.

Demographic variables are the most popular bases for segmenting the customer groups. One reason is that consumer needs, wants, preferences and usage rates are often highly associated with demographic variables. Another is that demographic variables are easier to measure than the most of other type variables (Kotler, Philip and Gary Armstrong, 1996). Marketers are keenly interested in the size and growth rate of population in different cities, regions, nations; age distribution; educational levels; household patterns; and regional characteristics and movements (Kotler, Philip, 1997). This is because marketers have to formulate their marketing strategies in order to fulfill the needs, wants and preferences of consumers on the bases. Moreover, demographic variables make known the ongoing trends, such as shifts in age, sex and income distribution that signal new business opportunities to the marketers (Schiffman, Leon G. and Leslie Lazer Kanuk, 1991). Demographic trends are highly reliable for the short and intermediate run (Kotler, Philip, 1997).

2. CONCEPTUAL FRAMEWORK

Like psychological and social variables, demographic variables are also considered as the personal buying decision variables (Adcock, Bradfield, Halbord and Ross 1998). Barry (1986) defines demography as the study of population characteristics. These characteristics describe people – who are there, where they live, and where they are moving. Evans and Berman (1984) state demographics are easily identifiable and measurable statistics that are used to describe the population. Trends in population size indicate future potential and thus, influence market plans. The size of the population indicates the potential market demand for consumer products and services. Oldroyd (1989) notes demography is an important demand condition, helping the marketer to predict both size and change in target markets. Demographic factors have a bearing on the types of product which individuals want where they shop and how they evaluate possible purchases (Lancaster and Massingham 1998).
Marketers combine demographic, social and psychological data and study consumer decision making in order to better understand the consumers. These dimensions help to explain consumer life styles; the ways the people live.

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By understanding consumers, a firm is able to determine the most appropriate audience whom to appeal and the combination of a marketing factors that will satisfy this audience. So, it is imperative for marketers to use demographic data in conjunction with and part of social, psychological and consumer decision-making analyses. Evans and Berman (1984) claim that a person's demographic background has a strong influence in the life style or in the way of living adopted. The demographic information helps to locate a target market whose motives and behavior can then be explained and predicted using psychological or social cultural investigation. Demographic information identifies potential for sales and consumption of product although it does not identify why or by whom a particular brand is used. It is also relatively accessible and cost-effective to gather. Further, the demographic variables reveal trends relevant to marketers such as shifts in age and income distributions, etc. They can establish consumer profiles that may present attractive market opportunities. These are the causes why marketers, in growing numbers, are using demographic statistics for developing marketing strategies and programmes.

Consumer behavior is not just making a purchase decision or the act of purchasing; it includes the full range of experiences associated with using or consuming products and services. It also includes a sense of pleasure and satisfaction derived from possessing or collecting 'things'. The outputs of consumption are changes in feelings, moods, or attitudes; reinforcement in lifestyles; an enhanced sense of self; satisfaction of a consumer-related need; belonging to groups; and expressing and entertaining oneself. A consumer's decision to purchase or not to purchase a product or service is an important moment for most marketers. It can signify whether a marketing strategy has been wise, insightful, and effective, or whether it was poorly planned and missed the mark. Thus, marketers are particularly interested in the consumer's decision-making process. For a consumer to make a decision, more than one alternative must be available. In executing a purchase intention, the consumer may make up to five purchase sub decisions: a brand decision, vendor decision, quantity decision, timing decision and payment – method decision (Kotler, Philip 2003).

2.1 Information Search

After recognizing a consumption related need, a consumer may or may not search for additional information. That decision depends on the strength of the drive, prior knowledge or experience with the product and the value of more information relative to the cost of obtaining it. The consumer usually searches his or her memory before seeking external sources of information regarding a given need. Past experience is considered as an internal source of information. The greater the relevant past experience, lesser the external information the consumer is likely to need to reach a decision. Many consumer decisions are based on a combination of past experience (internal sources) and marketing and non-commercial information (external sources). Baker (2000) states that, if there is a sufficiently high level of involvement or engagement with the problem, the consumers are likely to engage in complex and extensive information search and if the involvement level is low, they are likely to use very simple or limited information search.

Kotler (2003) points out that through gathering information, the consumer learns about competing brands and their features. There may be plenty of brands (total set) available to the consumer in a product category. But, the consumer knows only some of these brands (awareness set). Among these brands, some brands will meet the consumer's initial buying criteria (consideration set). As the consumer gathers more information, only a few will remain as strong contenders (choice set). All the brands in the choice set might be acceptable. The consumer makes a final choice from this set. The marketers must identify the consumer's information sources, evaluate their relative importance and they have to evolve marketing strategies accordingly.

2.2 Occupation

Occupation may be a more meaningful criterion than income in segmenting some markets. Truck drivers and auto mechanics may earn as much as young retailing executives or college professors. But, the buying patterns of the first two are likely to be different from the second two because of attitudes and interests (Stanton, Etzel and Walker 1994). Education, occupation and income tend to be closely correlated in almost a cause-effect relationship. High-level occupations that produce high incomes usually require advanced educational training

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E- ISSN -2347-856
ISSN -2348-065

(Schiffman & Kanuk 2004). Bass, Tigert and Lonsdale (1968) conducted an extensive study and found that light and heavy users of ten product categories were different with respect to their income, educational level, marital status, occupation and number of children.

3. LITERATURE REVIEW

Bettman (1979) studied both the idiosyncratic structure of individual consumer's decision-making processes and also how their beliefs change as they learn more about the behavior concerned. Bettman's theory has clear implications for how the information strategies should be mathematically designed. Lilien, Kotler and Moorthy (1999) found that the decision to buy within a product category (need arousal) leads customers to a state of heightened awareness about products and their attributes in such a product category. If the need is particularly acute, they undertake a process of active search. Punj and Stealin (1983) conducted studies to find out the amount of search that consumer undertakes when he is in the purchase decision process. They used confirmatory factors analysis to show that high cost of searching and good brand knowledge were associated with less search activity for new automobiles. High search activity, in turn, led to large savings off the sticker price of the car.

Midgley (1983) identified five types of information seeking the symbolic product of fashion clothing: a) peer assisted, b) spouse assisted, c) extensive search, and d) minimal search (deliberate and decisive). Urbany, Dickson and Wilkie (1989) found that the amount of search is related to two dimensions of customer uncertainty: a) uncertainty about what alternatives exist and b) uncertainty about which alternative to choose. Lilien, Kotler and Moorthy (1999) make known that the consumers do not search and evaluate (consider) all the brands, which they are aware. The consideration set may be defined to be all those brands that the consumer will evaluate or search for a given purchase. Study of the composition of the consideration set is important for two reasons. First, lack of consideration may be important in its own right. Second, consideration may be important as a part of the overall study of the consumption process.

Hauser and Wernerfelt (1990) distinguished between the cost of search and the cost of evaluating between brands. They prove that low search cost brands are more likely to be considered. Lilien, Kotler and Moorthy (1999) note that research has been conducted both into whether more search should be conducted and where, as well as how the information during search should be integrated into consumers' perceptions because, information integration is very important for making a right decision. McAlister and Pessemiar (1982) distinguish between several types of behavior by individuals that relate to multiple needs, the acquisition of information and the alternating purchase of familiar products (variety seeking). They hypothesize that consumers have an ideal point of satiation level for the products attributes that leads to its decreasing utility after a period of sustained consumption. Thus, if a person drinks six colas there is a good chance that on his next consumption occasion he might wish a lemon soda just for a change, that is variety seeking.

Nedungadi (1990) notes that the information once remembered will not necessarily be recalled and he also stresses the salience of brands and stimuli. Malhotra (1982) states that the information overload also affects choice. It is necessary to know how consumers react when there is incomplete information or when there is too much information. Lamb, Hair and McDaniel (1992) indicate that the trouble and time consumers take to find data about the product are less than the cost of buying a wrong product in a complex decision making process. Johnson and Leven (1985) note that the more consumers know the more efficiently they search: that is, they search less information about inappropriate alternatives. They not only have plenty of stored information about the product and also feel self-assured about making the right decision. People lacking this confidence will continue information search even when they are extremely knowledgeable.

Klein (1998) through his study found out that there is a vast difference between men and women in terms of their response to shopping. Whereas most men do not like to shop, most women claim to like the experience of shopping; and although the majority of women found shopping to be relaxing and enjoyable, the majority of men did not have the same response. Generally, the act of shopping is an important form of external information. In addition to gender differences, the study reveals that price considerations can also play a role in determining

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extent of the search process. Beatty and Smith (1987) conducted a study for examining the external search effort associated with the purchase of different product categories and found that as the amount of total search effort increased, consumer's attitude towards shopping become more positive and more time was made available for shopping. Not surprisingly, external search effort was greatest for consumers who had the least amount of product category knowledge. Spreng, Divine and Page (2001) indicate that consumers high in subjective knowledge (a self-assessment of how much they know about the product category) rely more on their own evaluations than on dealer recommendations.

4. RESEARCH METHODOLOGY

This study is descriptive in nature. The purpose of this study is to find out whether the occupations of consumers influence their information search in the process of purchase decision. For this purpose, primary data have been collected from 405 car owners who bought their car during the year 2011-12 in Chennai city. Simple random sampling method has been adopted for identifying samples from the population. A specific questionnaire was developed for the study and the same was used to collect data from the respondents. SPSS package has been used for analyzing the data using both one way ANOVA for establishing relationship between the occupations of consumers and their information search on cars.

4.1 Ranking of the sources of information

Weighted average method is used for ranking the various sources of information from which respondents collect information about the car. By identifying the significant sources, the car marketers can give higher priority to those sources than the others in order to position their brands effectively in the minds of consumers. The weighted average score and the assigned ranks for the various sources of information are given table 4.1:

The Table 4.1 indicates the weighted average score for the various sources of information from which the respondents gather information about the car. As far as the small car is concerned, the highest weighted average score is 75.13 for self interest which is ranked first followed by friends (62.73), advertisements (62), colleagues (61.13), spouse (59.73), etc. and the least weighted average score is 51.67 for 'sales persons / dealers'. With regard to mid segment, self interest has got the highest weighted average score 28.07, and is ranked first followed by test driving the car (24.60), friends (24.0), displays (23), company's manual (22.93), etc., and the least weighted average score is 18.40 for consumer rating organisations. In the premium segment, the highest weighted average mean score is 13.73 for 'self interest' which is ranked first followed by test driving the car (13.33), children (13.33), spouse (12.93), company's manual (12.87) etc. and the least weighted average score is 10.47 for car mechanics.

Table : 4.1 Weighted Average Score for Ranking the Sources of Information

Sources	Small Segment		Mid Segment		Premium Segment	
	Weighted Average	Assigned Rank	Weighted Average	Assigned Rank	Weighted Average	Assigned Rank
Advertisement	62.00	3	21.47	10	11.47	11
Salespersons/dealers	51.67	17	19.73	15	11.60	9
Displays	57.07	9	23.00	4	12.73	6
Exhibitions	51.87	16	20.00	14	10.67	16
Spouse	59.73	5	22.47	7	12.93	4
Children	56.67	10	22.13	8	13.33	2
Friends	62.73	2	24.00	3	12.60	7
Neighbours	54.73	13	20.93	11	11.13	14
Acquaintances	54.00	15	20.73	12	11.47	11
Mass Media	54.13	14	19.67	16	11.47	11
Consumer Rating Organsiations	54.80	12	18.40	17	10.87	15

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E- ISSN -2347-4564
ISSN -2348-0823

Test Driving the Car	59.20	6	24.60	2	13.33	2
Relatives	59.20	6	22.07	9	12.47	3
Self Interest	75.13	1	28.07	1	13.73	1
Company's Manual	58.33	8	22.93	5	12.87	5
Colleagues	61.13	4	22.47	6	11.53	10
Car Mechanics	55.60	11	20.33	13	10.47	13

Source: Primary Data

4.2 The role of the occupations of the respondents in Information Search

One way analysis of variance is used to test the following the hypothesis:

Ho: There is no significant difference among the various occupations of respondents with regard to the level of information search. It is inferred from the Table 4.2 that there is a significant difference among the various occupation levels of small car owners with regard to the level of information search and Ho is rejected. Further, the mean score reveals that the small car owners who are working as non gazetted officers/non executives are found to be more inclined towards information search. There is no significant difference among the various occupations of mid-sized and premium car owners with regard to the level of information search and Ho is accepted. Hence, it is concluded that whatever may be of the occupation of these respondents, the level of information search seems to be common to all.

Table 4.2: One Way Analysis of Variance among the Various Occupations of Respondents With Regard to Information Search

S. No.	Segments	Df	SS	MS	$\bar{X}$	Statistical Inference
1	**Small Segment** Between Groups	4	1954.675	488.669	G1=57.12 G2=57.73 G3=59.39 G4=59.57 G5=48.71	F= 4.696 P < 0.01 Significant
	Within Groups	261	27160.005	104.061		
2	**Mid Segment** Between Groups	3	1382.895	460.965	G1=60.48 G2=64.85 G3=60.36 G4=39.00	F = 2.670 P > 0.05 Not Significant
	Within Groups	89	15364.911	172.693		
3	**Premium Segment** Between Groups	3	811.477	270.492	G1=70.71 G2=65.12 G3=58.85 G4=65.50	F = 2.027 P > 0.05 Not Significant
	Within Groups	42	5605.393	133.462		

G1=Business G2=Professional G3=Gazeted /Executive
G4=Non Gazeted / Non Executive G5=Retired / Others
Source: Primary Data

5. CONCLUSION

Demographics are uncontrollable variables in the external environment. Hence, studying the population in terms of its demographic structure is very significant for marketing managers in the prevailing competitive scenario. The relationship established between occupations and information search of consumers would further help the marketers understand the target group and evolve marketing strategies to make them buy their brands.

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3.4.5-J-PSY-2014-15

08th to 10th August 2014

25th Pan Asian Conference of Sports & Physical Education 2014 INDIA

ISSN 2231-3265
(Online and Print)

International Journal of Health, Physical Education & Computer Science in Sports

Volume - 15 No. 1
Quarterly
July 2014 to September 2014

IACSS

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PROCEEDING

25th Pan Asian Conference of Sports & Physical Education - 2014

at Osmania University,

Hyderabad
TELANGANA



From 8th to 10th August - 2014

Published by :
Indian Federation of Computer Science in Sports



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The result showed that the effect of visual and kinesthetic imagery with Single Limb Resistance Training significantly increased the Self-concept among intermediate male bodybuilders.
Since there was significant difference, the post hoc test was conducted. Experimental group III and the control group had significance of F at 9.48 which was greater than the Class interval of 5.92. Experimental group II and the control group had significance of F at 6.93 which was greater than the CI of 5.92. Self-concept being a holistic portrayer of the bodybuilder's abilities, characteristics, potentials, etc., imagery techniques would have contributed to the betterment through refinement and corrective approaches to specific mental representations and also through redefining attitudes towards training principles. The Single Limb Resistance Training is a novelty factor to the bodybuilder and therefore has an influence on deep muscle engagement. Combined intervention had better significance than other experimental groups and the control group.

Conclusions

Within the limitations of the study, the following conclusions were drawn: It is concluded that 'Visual and Kinesthetic Imagery with Single Limb Resistance Training' significantly improved Self-concept among intermediate level male body builders when compared to Experimental Group I (visual imagery training) and Group II (kinesthetic imagery training) .

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International Journal of Health, Physical Education and Computer Science in Sports
ISSN 2231-3265
Volume No.15, No.1.pp689-690
Journal Impact Factor 0.624

Effect of physical activity on executive functions in children with attention deficit hyperactivity disorder (adhd)

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Abstract
Physical Activity and sports are good for all of us. Not only does it add to our health and well-being, but striving to be physically fit teaches us many other skills as well. For the children with ADHD, exercise and sports can help reinforce teamwork, discipline, cooperation, and work towards a goal. Physical activity often increases self-esteem and satisfaction with life. When kids compete in sports, their own mental and emotional issues can quickly become their fiercest competition. This is especially true of children coping with Attention-Deficit Hyperactivity Disorder (ADHD). Children with attention-deficit hyperactivity disorder (ADHD) consistently perform worse on executive function (EF) tasks relative to those without ADHD. Physical activity and a sport have a small effect on cognition in children and may be particularly beneficial for children with ADHD by impacting fundamental EF deficiencies that characterize this disorder. Thus participation of children with Attention Deficit Hyperactivity Disorder in sports and physical programs promotes better EF performance.

Key words
Attention Deficit Hyperactivity Disorder, Executive functions, Physical activity

Introduction

Attention Deficit/Hyperactivity Disorder (ADHD) is a prevalent, highly impairing, neurodevelopmental disorder defined by developmentally inappropriate symptoms of inattention, impulsiveness and hyperactivity. ADHD typically emerges early in childhood and commonly persists through adolescence and into adulthood, with outcomes characterized by high rates of unstable relationships, academic/occupational failure, criminality and substance use. The inattention and hyperactivity-impulsivity that characterize children with attention-deficit hyperactivity disorder (ADHD) are associated with organisational problems, risk for achievement difficulties, and extensive negative criticism from parents and teachers (Landau, Milich, & Diener, 1998). These children experience negative outcomes in personal, educational, and social domains that might impair their functional adaptation throughout their life (Barkley, Fischer, Smallish, & Fletcher, 2006).

Executive function is a set of mental processes that helps connect past experience with present action such as planning, organizing, strategizing, paying attention to and remembering details, and managing time and space to perform activities. Due to a break down in executive function Children with ADHD have trouble listening to or following instructions, begin tasks and then easily distracted or struggle to wait their turn. Sometimes blurt things out when they know better. Chris Dendy(2002) states that executive function deficits in children with ADHD can create problems in several areas. Children with ADHD consistently perform worse on executive function task relative to those without ADHD.

Physical activity is any body movement that works your muscles and requires more energy than resting. Walking, running, dancing, swimming, yoga, and gardening are a few examples of physical activity.

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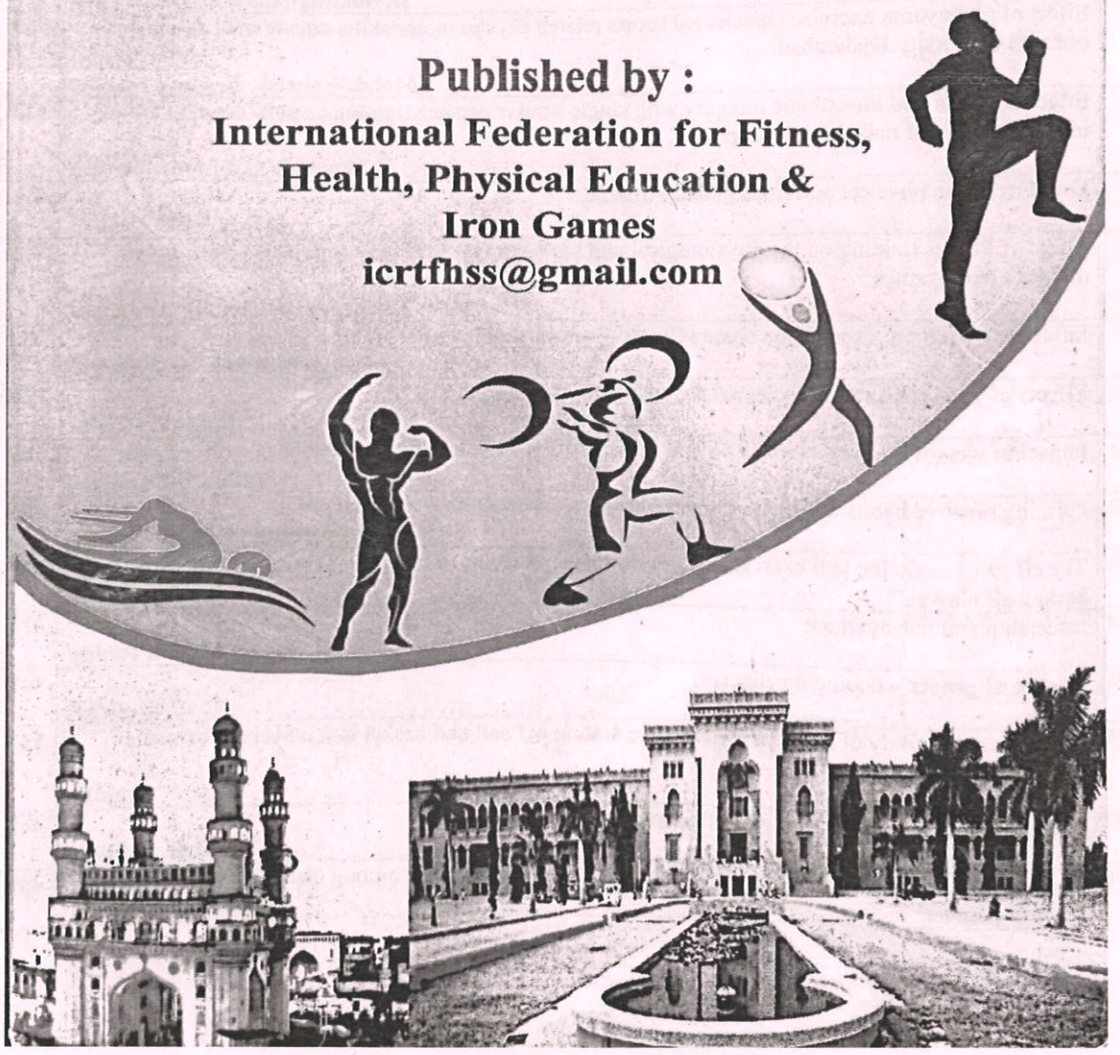
3.4.5-J-PSY-2014-15

Volume - 1 No. 1
Half yearly
July 2014 to Dec 2014
ISSN 2349 - 722X

International Journal of Fitness, Health, Physical Education & Iron Games

Published by :
International Federation for Fitness, Health, Physical Education & Iron Games
icrtfhss@gmail.com



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ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
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EFFECT OF VISUAL AND KINESTHETIC IMAGERY WITH SINGLE LIMB RESISTANCE TRAINING ON SELF- CONCEPT AMONG INTERMEDIATE LEVEL MALE BODYBUILDERS

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ABSTRACT

A study was conducted to investigate whether visual and kinesthetic imagery with single limb resistance training had benefits on self-concept among intermediate level male bodybuilders. The subjects chosen for the study were divided into four categories comprising experimental and control groups. The groups were assigned as follows: experimental group i was advised to undergo visual imagery, experimental group ii was advised to undergo kinesthetic imagery, experimental group iii was intervened with both visual and kinesthetic imagery techniques along with single limb resistance training. The control group was not given any intervention. Training on visual and kinesthetic imagery along with resistance training was given selectively to the groups over a period of time. The subjects were assessed on self- concept by Mukta Rani Rastogi . The result showed that visual and kinesthetic imagery with single limb resistance training provided significant improvement in self- concept among intermediate level male body builders.

Key words: Mental imagery, Visual imagery, Kinesthetic imagery, Self-concept.

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Sangeeth G*
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INTRODUCTION:

Mental imagery, also termed as visualization and mental rehearsal, is simply the formation of any mental picture. Imagery aids the processing of information in our mind more efficiently. Mental Imagery is of many types – most prominent being Visual imagery and Kinesthetic imagery, especially in a sporting context

Visual imagery: Imagery is made up of the dreams and daydreams; memories and reminiscence; plans, projections, and possibilities. It is the language of the emotions and most important of the deeper self. Visual imagery in muscle building is closely related to "mindfulness" for which Dr. Jon Kabat-Zinn defines it as paying attention in a particular way: on purpose, in the present moment, and non-judgmentally. Zinn stated that Meditation exercises encourage individuals to engage in non-judging awareness of their internal experience occurring at each moment, such as bodily sensations, cognition and emotions and to environmental stimuli, such as sights and sounds

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Kinesthetic imagery: It is a mental process by which an individual rehearses or simulates a given action. Both are widely used in sport training. This is a mental process by which an individual rehearses or simulates a given action. It is widely used in sport training and is also termed as 'Mental Practice of Action' and neurological rehabilitation. Studies have revealed that Kinesthetic imagery is associated with the specific activation of the neural circuits involved in the early stage of kinesthetic control.

The use of Visual and Kinesthetic imagery is a means of mental training interventions that aid in improving the performance in the field of bodybuilding. In the field of muscle building, using imagery in conjunction with some form of simulation is the key. Imagining an action strengthens pathways important to the coordination of your muscles – all by training solely with your mind *(Elnikova M.V., 2010).*

Self -Concept is the way one perceives oneself. It is derived from several factors including certain personality traits, how you look, your personal values and life goals, and your place or role in life. Self-concept in Bodybuilding: The field of bodybuilding, apart from its competitive goals promotes general physical well- being which directly impacts the self -concept of the individual.

Review of related literature:

Moore JB, Mitchell NG, Bibeau WS, Bartholomew JB (2011) studied the effects of a 12-week resistance exercise program on physical self-concept in varsity bodybuilding community. Self-esteem using the hierarchical framework of the Exercise and Self-Esteem Model (EXSEM) along with cognitive facets at the sub-domain level (e.g., competence, certainty, importance, and ideal self-discrepancy) was used. This allowed for an analysis of cognitive facets as possible contributors to changes in physical self-concept. A sample of 120 college-age bodybuilders who completed a 12-week resistance exercise program were selected. Results indicated significant improvements in self-concept constructs at all levels of the EXSEM. The hierarchical structure of the EXSEM was partially supported, as successively smaller improvements at each level of the model were observed.

Hypothesis: It was hypothesized that 'Visual and Kinesthetic Imagery with Single Limb Resistance Training' would significantly improve Self-concept among intermediate level male body builders.

It was further hypothesized that Experimental group III with combined intervention comparatively would have significant improvements in Self-concept than that of Experimental group I, II and the Control group among the intermediate male bodybuilders.

Methodology: To achieve the purpose of the study, sixty intermediate level male bodybuilders in and around the district of Calicut, Kerala were selected for the administration of specified imagery techniques. They were randomly divided in to four equal groups consisting of fifteen participants. The study was formulated as a random group design, consisting of pre and post test. The groups were assigned as follows: Experimental group I was advised to undergo visual imagery, experimental group II was advised to undergo kinesthetic imagery, experimental group III was intervened with both visual and kinesthetic imagery techniques along with Single Limb Resistance Training. The control group was not given any intervention.

A pilot study was conducted before analyzing the training program (with 5 subjects in each group) to understand the reliability of the participants and their participation in the research study.

Administration of Visual and Kinesthetic Imagery Training: The training on visual imagery and kinesthetic imagery was given for four days a week up to twelve weeks to the intermediate male body builders constituting the experimental group I and II respectively. The training was combined with Single Limb Resistance Training program for all the four days of training per week. Imagery sessions were conducted prior and post resistance training for ten to fifteen minutes.

Combined Intervention training with a combination of both visual and kinesthetic imagery was given for four days a week up to twelve weeks to the intermediate male body builders constituting the experimental group III. The training was combined with Single Limb Resistance Training program for all the four days

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
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of training per week. Imagery sessions were conducted prior and post resistance training for ten to fifteen minutes.

Single Limb Resistance training: This training was given for thirty minutes a day for four days in between the respective imagery training until twelve weeks. The training involved a unilateral methodology of executing weights throughout the range of motion. The exercise form comprises of weighted and body weight oriented executions and they also comprise of cable, machines as assistance. Selected upper and lower body exercises were chosen, to involve maximum muscle groups and their loads were fixed after testing the affordability. The repetitions were fixed at eight to twelve reps per set with standard sets of three for an exercise.

Description of tools for Self-concept assessment: Self-concept was assessed by Self-concept Scale developed by Muktha Rani Rastogi. It comprised of twenty statements (both positive and negative), and five responses are given to choose from (Strongly agree, Agree, Undecided, Disagree, Strongly disagree). The subject has to read each statement carefully and respond to it by marking a tick on any of the five responses.

Statistical Analysis The following tables illustrate the statistical result of visual and kinesthetic imagery with Single Limb Resistance Training on Self-concept among intermediate male bodybuilders. The adjusted post-test mean and difference between the means of the groups under study are given:

Computation of Analysis of Covariance of Self-concept (Table I)

Means	exp group 1	exp group 2	exp group 3	control group	SV	SS	df	MS	F	TV
Pre test	65.53	64.47	65.13	66.73	B	40.80	3.00	13.60	0.10	3.10
					W	7482.13	56.00	133.61		
Post test	70.27	72.73	75.73	67.33	B	574.85	3.00	191.62	1.87	3.10
					W	5732.13	56.00	102.36		
Adjusted	70.22	73.41	75.96	66.48	B	752.48	3.00	250.83	5.93*	3.10
					W	2328.27	55.00	42.33		

Computation of Schaffe's Post-hoc Test ordered Adjusted Final mean difference on Self-concept (Table I A)

Control group	Exp group 1	Exp group 2	Exp group 3	MD	CI
66.48	70.22	-		3.74	5.92
66.48	-	73.41		6.93*	5.92
-	70.22	73.41		3.19	5.92
		73.41	75.96	2.55	5.92
	70.22		75.96	5.74	5.92
66.48			75.96	9.48*	5.92

ISSN 2349 – 722X
International Journal of Fitness, Health, Physical Education & Iron Games
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RESULTS AND DISCUSSIONS:

Table I shows that the pre-test means of Experimental Group I, II, III, and the control group were 65.63, 64.47, 65.13 and 66.73 respectively. The obtained 'F' ratio was 0.10 which was lesser than the table 'F' ratio of 3.1. Hence pre-test was not significant at 0.05 level of confidence for degrees of freedom 3 and 56.

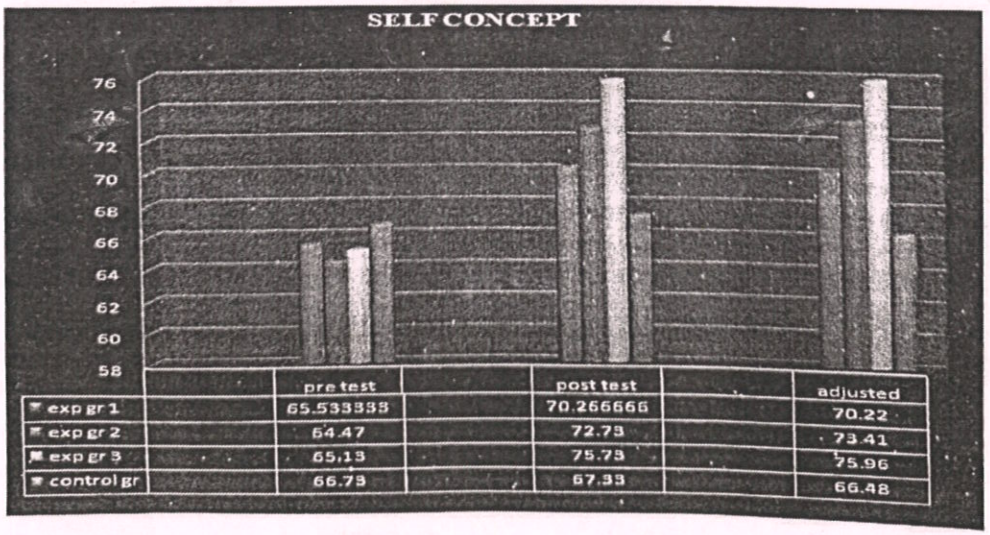
The Post-test means of Experimental Group I, II, III, and the control group were 70.27, 72.73, 75.73 and 67.33 respectively. The obtained 'F' ratio was 1.87 which was lesser than the table 'F' ratio of 3.1. Hence post-test was not significant at 0.05 level of confidence for degrees of freedom 3 and 56.

The adjusted post-test means of Experimental Group I, II, III, and the control group were 70.22, 73.41, 75.96 and 66.48 respectively. The obtained 'F' ratio was 5.93 which were greater than the table 'F' ratio of 3.1. Hence adjusted post-test was significant at 0.05 levels for degrees of freedom 3 and 55.

Table IA is Schaffe's post-hoc test ordered and final mean difference on Self-concept of different groups. In the first comparison between experimental group III and the control group, the mean difference was 9.48 which was significant in the class interval (CI) of 5.92. The second comparison was made between the control group and the experimental group I, and the mean difference of 3.74 was not significant at the CI of 5.92. The third comparison was made between the experimental group III and the experimental group I, and the mean difference of 5.74 was not significant at the CI of 5.92. The fourth comparison was made between the control group and the experimental group II, and the mean difference of 6.93 was significant at the CI of 5.92. The fifth comparison was made between the experimental group III and the experimental group II, and the mean difference of 2.55 was not significant at the CI of 5.92. The sixth comparison was made between the experimental group I and the experimental group II, and the mean difference of 3.19 was not significant at the CI of 5.92.

The pre, post and the adjusted means on self-concept were presented through bar diagram for better understanding of the study, as in the following figure:

Bar diagram of Pre, Post and Adjusted means of Self-concept



3.4.5-J-PSY-2014-1

ISSN No. 2277 – 8179
Journal DOI : 10.15373/22778179



INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

Indexed with International ISSN Directory, Paris

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Volume 3 | Issue 11
November 2014

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Research Paper

Volume : 3 | Issue : 11 | November 2014 • ISSN No 2277 - 8179

Study on Comorbid Disorders Among Children with Attention Deficit Hyperactivity Disorder (Adhd)

Psychology

KEYWORDS : Attention Deficit Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder, Conduct Disorder, Anxiety and Depression Disorder

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ABSTRACT

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common childhood neuropsychiatric disorders. The present investigation is an attempt to study about the comorbid disorders among children with Attention Deficit Hyperactivity disorder age from 7 to 10 years. The Sample consisted of 50 children diagnosed with ADHD studying in a regular school belonging to the Chennai city. They were divided into two groups with 25 in each. First group was children with both parents and second group was children with single parent. Vanderbilt ADHD diagnostic parent rating scale was administered to parent. Obtained data were subjected to t-test. Result showed that there was a significant difference between the Children with single parent and children with both parents.

INTRODUCTION

Attention-deficit/hyperactivity disorder (ADHD) is one of the most common childhood neuropsychiatric disorders, affecting 3% to 5% of school-age children. Children with ADHD often have other psychiatric disorders, with epidemiologic studies suggesting co-morbidity rates of between 50% and 90%. The core symptoms of ADHD are inattention, impulsivity, and hyperactivity.

ADHD are complex not only because of spotted cognitive functions impaired in inattention, hyperactivity and impulsivity. Very often these disorders are further complicated by comorbidities. The term comorbidities refer to other psychiatric disorders that impair an individual concurrent with his or her primary diagnosis. Many studies have found that over 50% of persons diagnosed with an attention-deficit disorder also meet the diagnostic criteria for one or more additional psychiatric disorders—for example, mood disorder, anxiety disorder, substance use disorder, learning disorder, or behaviour disorder.

Biederman et al. 1991; Jensen et al. 1997 studied that individuals with an attention-deficit disorder have a markedly increased probability of having one or more additional psychiatric disorders.

Turgay A explored that the rate of comorbidity is high, with attention-deficit hyperactivity disorder (ADHD) and oppositional defiant disorder (ODD) being the most common; comorbid anxiety and depressive disorders are also seen in children with ADHD.

Oppositional Defiant Disorder is one of the commonly diagnosed disruptive behavior disorders of a group of behavioral problems in children and adolescents. While challenging behaviors are the hallmark of all of these disorders. ODD is specifically characterized by frequent episodes of anger, deliberately irritating or hostile behavior and a pronounced intolerance for authority. In a Multimodal Treatment Study of Children with ADHD researchers found that 40 percent of children with ADHD also meet diagnostic criteria for oppositional defiant disorder.

Steiner H, Remsing L(2007) reported that Children who have both disorders tend to be more aggressive, have more persistent behavioral problems, experience more rejection from peers, and more severely underachieve academically.

Conduct Disorder is a psychological disorder diagnosed in childhood or adolescence that presents itself through a repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate norms are violated. These behaviours are often referred to as "antisocial behaviors."

Waschbusch, D.A.(2002) in a meta-analytic study, ADHD is the condition most commonly associated with conduct disorders, with approximately 25-30% of boys and 50-55% of girls with conduct disorder having a comorbid ADHD diagnosis. While it is unlikely that ADHD alone is a risk factor for developing conduct disorder, children who exhibit hyperactivity and impulsivity along with aggression is associated with the early onset of conduct problems. Moreover, children with comorbid conduct disorder and ADHD show more severe aggression.

Anxiety Disorders are a group of mental disorders characterized by feelings of anxiety and fear where anxiety is a worry about future events and fear is a reaction to current events. These feelings may cause physical symptoms, such as racing heart and shakiness

Jensen et al (2001) studied that Childhood ADHD is commonly comorbid with anxiety disorders, with estimated comorbidity rates of 20% to 40%

Souza I et al (2005) reported that, of the anxiety disorders, generalized anxiety disorder (GAD) is thought to be the most prevalent disorder, followed by social phobia and separation anxiety disorder. Some children with ADHD may present with more than one anxiety disorder.

Depression Disorder is a condition in which a person feels discouraged, sad, hopeless, unmotivated, or disinterested in life in general. When these feelings last for a short period of time, it may be a case of "the blues." But when such feelings last for more than two weeks and when the feelings interfere with daily activities such as taking care of family, spending time with friends, or going to work or school, it's likely a major depressive episode. ADHD and depression are common, disabling disorders that afflict both children and adolescents. Studies have found that between 5% and 40% of children and teens with ADHD meet criteria for Major Depression (MD).

Biederman J, Mick E, Faraone (1998) explored that as many as 40% of children with ADHD can develop MD, and MD in children with ADHD is often recurrent and quite impairing. Thus, all children with ADHD should be monitored for MD, and even more so when they reach puberty, as the prevalence of depression increases significantly around this age.

OBJECTIVE

To determine whether there is a difference between the comorbid disorders in Children (ADHD) with single parent and parents

HYPOTHESES

1. There will be no significant difference between the comorbidity among children (ADHD) with single parent and parents on their Oppositional Defiant Disorder.
2. There will be no significant difference between the comorbidity among children (ADHD) with single parent and parents on their Conduct Disorder.
3. There will be no significant difference between the comorbidity among children (ADHD) with single parent and parents on their Anxiety and Depression Disorder.

METHODOLOGY

Sample

The sample consisted of 50 parents of children with Attention Deficit Hyperactivity Disorder (ADHD), out of which 25 were children with single parent and the rest 25 were children with both parents. They are boys with age ranged between 7 and 10. belonging to the Chennai city, studying in a Regular School.

Description of the Tool

This is a 55-item rating scale that has two components: symptom assessment and impairment of performance at home, in school, and in social settings. This rating scale is widely used by healthcare professionals to screen for symptoms of ADHD, oppositional defiant disorder, conduct disorder, and anxiety and depression in children. Reliability of VADPRS showed good internal consistency in all methods and samples, with the overall Cornbach's alpha less than or equal to .90 in every case.

Administration

The subjects were seated comfortably. The VANDERBILT ADHD DIAGNOSTIC PARENT RATING SCALE (VADPRS) was administered by giving the following instructions. "This scale consists of 55-items. Think about your child in each statement then give the response by circling the appropriate number. There is no right or wrong responses. Please do not omit any statement. There is no time limit but generally this test can be completed within 30 minutes". After completion, the responses were scored and interpreted in accordance with the norms given.

Scoring

Oppositional-defiant disorder is screened by 4 of 8 behaviors, (scores of 2 or 3 are positive) (Q:19 through 26).

Conduct disorder is screened by 3 of 15 behaviors, (scores of 2 or 3 are positive) (Q:27 through 40).

Anxiety or depression are screened by behaviors Q: 41 through 47, scores of 3 of 7 are required, (scores of 2 or 3 are positive).

STATISTICAL ANALYSIS

't' value was computed in order to evaluate the difference between the comorbidity among the children(ADHD) with single parent and both parents

RESULT AND DISCUSSION

Table I shows the Mean, Standard Deviation, t value, and the level of significance between the comorbidity among the children (ADHD) with single parent and parents on their Oppositional Defiant Disorder.

Variable	Group	No of subs	Mean	S D	t-value	Level of Significance
Oppositional Defiant Disorder	Single parent	25	3.32	1.25	3.68	.0006 s< 0.05
	parents	25	2.04	1.21		

Table I

From the above values we find that there are differences between the children (ADHD) with single parent and parents on their ODD. Based on the scoring key the children do not have the co-morbid of ODD but when we compared the values between the groups, the mean value of single parent is more than that of parents. It indicates that there is a difference between the groups. Hence, the hypothesis no.1 stated that "There will be no significant difference between the comorbidity among children (ADHD) with single parent and parents on their Oppositional Defiant Disorder" is rejected.

Table II shows the Mean, Standard Deviation, t value, and the level of significance between the comorbidity among the children (ADHD) with single parent and parents on their Conduct Disorder.

Variable	Group	No of subs	Mean	S D	t-value	Level of Significance
Conduct Disorder	Single parent	25	2.36	1.29	5.42	.0001 s<0.05
	parents	25	0.760	0.723		

Table II

The mean values between single parent and parents are 2.36 and 0.760 respectively. The mean value denote that the children do not have the comorbidity of CD but there is a significant difference between the groups. Single parents are often finding difficult to manage their children when they are violating the basic issues and also hiding the information. Thus, the hypothesis no. 2 "There will be no significant difference between the comorbidity among children (ADHD) with single parent and both parents on their Conduct Disorder" is rejected

Table III shows the Mean, Standard Deviation, t value, and the level of significance between the comorbidity among the children (ADHD) with single parent and parents on their Anxiety and Depression Disorder.

Variable	Group	No of subs	Mean	S D	t-value	Level of Significance
Anxiety and Depression Disorder	Single parent	25	1.96	1.37	4.45	0.0001 s<0.05
	parents	25	0.640	0.569		

The above table shows that there is a difference between the groups on their mean, standard deviation in the dimension of ADD. But the children do not have the comorbidity of ADD. The level of significance also indicates that there is a difference. Hence, the hypothesis no.3 "There will be no significant difference between the comorbidity among children (ADHD) with single parent and parents on their Anxiety and Depression Disorder" is rejected.

CONCLUSIONS:

This study concluded that

1. There is a significant difference between the comorbidity among children (ADHD) with single parent and parents on their Oppositional Defiant Disorder.
2. There is a significant difference between the comorbidity among children (ADHD) with single parent and parents on their Conduct Disorder.
3. There is a significant difference between the comorbidity among children (ADHD) with single parent and parents on their Anxiety and Depression Disorder.

Suggestion for FUTURE RESEARCH:

1. This study can be extended to give greater consideration to

Volume : 3 | Issue : 11 | November 2014 • ISSN No 2277 - 8179

factors outside of the child.

2. This study can be extended to develop the effective parenting skills.
3. Future research should be directed at exploring parent factors further and evaluating interventions directed at reducing the comorbidity in children with ADHD.

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3.4.5-J-PSY - 2014-15

www.kheljournal.com

ISSN (Online): 2394-1693
ISSN (Print): 2394-1685

International Journal of Physical Education, Sports and Health

Volume 1 Issue 2 2014



New Delhi

Registrar
Tamilnadu Physical Education
and
Sports University
Chennai

Volume: 1, Issue: 2, Year: 2014
p-ISSN: 2394-1685; e-ISSN: 2394-1693
Online Available at www.kheljournal.com

International Journal of Physical Education, Sports and Health

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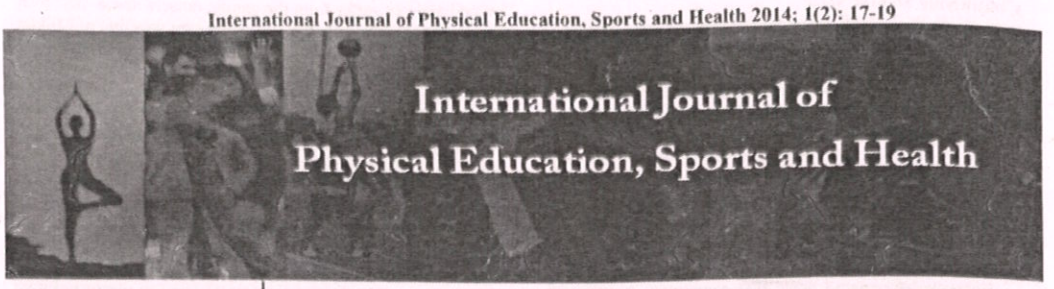

P-ISSN: 2394-1685
E-ISSN: 2394-1693
IJPESH 2014; 1(2): 17-19
© 2014 IJPESH
www.kheljournal.com
Received: 20-11-2014
Accepted: 10-12-2014

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Effect of Mental Noise on Sports Performance

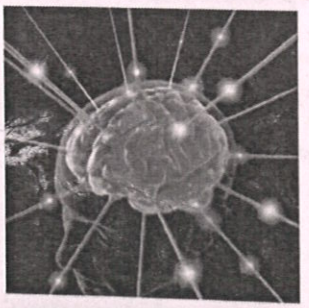
Narayanan Sridhar, Ahmed Shahin

Abstract
A noise in the audiological sense is any undesired sound or impulse. Noise can be physiological or psychological. When a noise is 'heard' it is physiological, but when one 'listens' to it the noise becomes psychological. Psychological noise, an internal noise is attributed to those factors that influence the mind's ability to interpret messages effectively or correctly. This psychological noise can also be termed as "Mental Noise". Mental Noise can have mild to devastating influence on one's personality. This paper aims to throw light on the impact of mental noise on an individual in the context of sports performance. Possible causes of mental noise and some remedies to overcome the same are also discussed.

Keywords: Mental noise, Brainwave Mapping, Flow, Mindfulness.

1. Introduction
Mental noise is the constant chatter in the mind, comprising illogical and non-sequential thoughts, anxiety, fear and several other variables. It is the constant inner dialogue that goes on almost invariably at times, and plays with our inner focus, causing disturbances to our thought patterns and resulting in distraction of our much needed attention.

On many occasions, one may be aware of this mental noise, because it has now become a deeply embedded habit, and is considered as a natural and inseparable part of one's daily life. It is a sort of inner voice that constantly analyzes everything about life, circumstances, and the people around. It is an inner voice in the head that simply keeps on chattering. The human mind also makes the event worse by repeating the same thoughts over and over again, like a scratched gramophone record. Positive thoughts are fine, but more often these are negative thoughts that intensify anxiety, stress, worry, anger or frustration. In short, these are thoughts that one absolutely does not need.



2. Clarity of thought and good decision making process
There are various processes that are involved in good decision making. Studies (by Yingxu Wang, University of Calgary, Canada) have shown that decision making is a cognitive process resulting in the selection of a suitable course of action from among several alternative possibilities. It involves thought which again is required for solving problems, analyzing, comparing, studying, planning, etc. However, on many occasions, the mind roams at will, filling up the much needed attention with trivial, unimportant matters and useless thoughts that drains one's time and energy.

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3. Identifying Mental Noise

Many individuals will experience one of the following situations in daily life. Though one may have paid very little any attention to it, it still remains very much part of one's life.

1. Incessant thoughts that keeps playing the same tune.
2. Replay of negative situations of past or reliving fears / phobias over and over again.
3. Living on the past or fearing the future which kills one's enjoyment / focus of the present.
4. Always not present in the present. Always thinking on something else.
5. Constantly analyzing self and other people's situations, reactions and behavior.
6. Constant background noise that sometimes intrudes into the foreground of everything one does.

4. Mental noise and its impact on sports performance

According to Doug Gardner (2006), in sports, 90 percent of performance is mental. Yet, the majority of our time, energy and money is spent on physical training — right from sporting gear and sports exercises to gym memberships. This leaves very little time to focus on our mental game.

Mental noise has considerable impact on the performance of the individual. Edmund T. Rolls (2010) has revealed that performance levels can drop considerably when the athlete has this problem. The mind floods itself with thoughts of previous errors and failures, or simply jumps ahead to fears of future outcomes like a missed goal or a dismal performance.

This repeating mental chatter makes one miss opportunities due to insufficient attention to what is happening around, and suddenly causes a loss in focus and ultimately a failure in performance.

According to Kristen Race (2014), when one's brains get caught up in thoughts from the past…or thoughts of the future…it creates a stress response, and one can't use the part of the brain that keeps the individual engaged in the moment. This mental chatter can make it difficult to maintain perspective and focus. If one is too stressed about performance, he can't make good decisions and solve problems or stay composed.

Not only can one's thoughts and internal dialogue create a stress response, it also impacts one's behavior. Recent studies (August 2014) by researchers at Coventry University and Staffordshire University found that increased stress and anxiety, including fear of failure, results in mental noise and impacts athletic performance in competitive situations.

Several athletes suffer from the mental noise without their own knowledge. To illustrate this, one such case was that of Milkha Singh - one of the world's greatest runners, also known as "The Flying Sikh". The race for which he is best remembered is his fourth-place finish in the 400 meters final at the 1960 Olympic Games, which he had entered as one of the favourites. He led the race till the 200m mark before suddenly easing off, allowing others to pass him. He admitted later that he suddenly lost focus as a result of mental flashes of his horrifying childhood experiences when his parents were murdered along with other relatives.

Many sportsmen suffer from mental noise arising out of grave to mild reasons, and their 'mindfulness' gets affected due to mental noise. 'Mindfulness' is simply staying connected with the present, focussing on the task on hand without allowing thoughts of the past or future harming the concentration.

5. Mental Noise Theory

According to the "Mental Noise Theory" (Vincent Covello, 2011), an individual who is anxious and experiencing stress has difficulty of hearing and processing most messages. Mental noise, in fact diminishes up to 80%, the brain's ability to capture and process communication. Consequently a coach must limit the number of messages that is told to the player, as also the length of his communication. The message can also be repeated a number of times. A classic example of how mental noise affects the players' ability to process messages is the taking of a free kick by a soccer player, close to the goal.

When the referee has told the player to wait for the whistle before taking the free kick, the player goes for the kick even before the referee moves the wall back and signals. Here it should be appreciated that the player is not being disobedient; his brain simply didn't process what the referee said because of the mental noise. When players appear to lose concentration, the referee must be able to identify the same and repeat the message a number of times, and possibly even give them some visual clues such as in this case showing and pointing to the whistle, and asking the player for a response either verbally or visually by nodding their head.

Several researches have been undertaken to study the effect of mental Noise, and they have shown that Mental Noise is associated with a variety of negative consequences, including anxiety, post-traumatic stress disorder, depression, binge-drinking and binge-eating (Robinson MD, Tamir M, 2005).

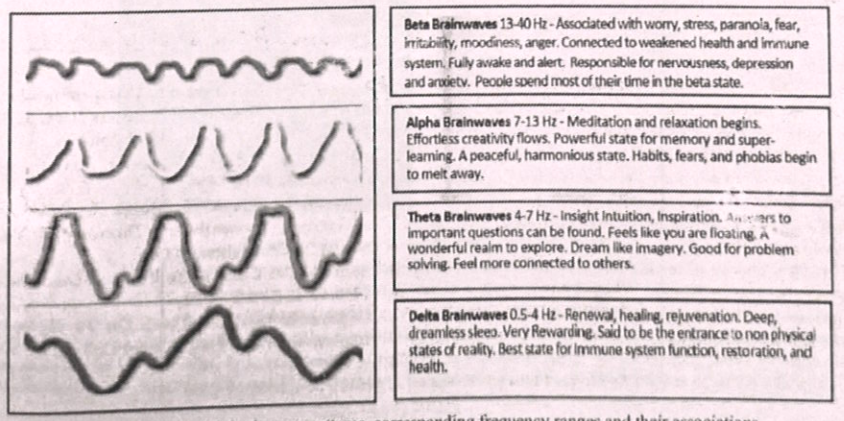

Fig 1: Normal adult brainwave patterns, corresponding frequency ranges and their associations

Brainwave Mapping
Various frequencies of the brainwaves induce various states of the mind as shown in the following figure. Mental noise can be understood in the context of this map and how to elevate the mind from Beta (or Alpha) to Delta state.

Women have noisier brain
Over the past couple of decades, some controversial research suggests that at any given moment, women have more activity in their brains than men. The *Corpus callosum* (that has a bundle of neural tissues) that connects the right and left hemispheres of the brain is larger in women, allowing for more movement across the hemispheres. This results in a frequent change in focus, finally leading to a "noisier brain". Many studies have also revealed that women in sport tend to display more anxiety levels when compared to men in the same sport.

Overcoming Mental Noise
Switching off
It has been observed that 'switching off' the mind can bring on a state of inner peace. It is a state sought by spiritual traditions and teachings, and is useful to both spiritual seekers and people who wish to improve their life. One has to just 'stop' thinking, watch the mind and notice what happens, then practice 'mental clearing' by consciously stopping one's thoughts for probably one minute. One now has to carefully pick out all the different sounds that are audible, then focus on noticing the details of a small area in front. Attention should be given to the breathing. The same routine should be followed the next day, but this time for two minutes. And gradually the time can be increased. The moment of peace should be enjoyed.

Being 'in the Flow'
Focusing on the current process and not on goals, achievement etc. That is, when one is engaged in an interesting activity for its own sake and not for any other external purpose or goal.

Practice Mindfulness
It is, simply put, a non-judgmental focus of one's attention on the present event. This can be achieved by meditational practices. It's like strengthening a muscle. The more one practices, the stronger one becomes.

Being in control
Developing a sense that one can be in control of one's actions; that is, a sense that one knows how to respond to whatever happens next.

Selective attention
It is the ability to ignore irrelevant sensory information, and to pay attention to relevant information. For highly skilled and trained athletes, the process of selective attention is very easy. For example, when skilled basketball players step up to the free throw line, they refuse to allow anyone or anything besides the actual task to distract their attention.

Mindful Breathing
For every athlete it is important to take a few minutes a day (in the morning or before engaging in an athletic event or exercise) to pay attention to his every breath, which can bring on a calm and clear state of mind.

Internal and External Messages
One has to carefully pay attention to the internal dialogue as well as the stories one tells family and friends, which can reflect — or even shape one's mental state. Sometimes, on rare occasions, one might experience a brief period of inner peace, without mental noise. This happens involuntarily, when one's attention is completely absorbed in some interesting activity or when watching a beautiful and inspiring landscape or picture. At these times one gets a short glimpse of inner peace.

Develop concentration ability
Many athletes often say that they meditate, but yet, cannot calm down their mind. Once the concentration gets stronger, one will be able to meditate without words, mental images, thoughts or any other aid. This is when the inner peace would gradually increase and deepen first while meditating, and then in one's daily life, while working, reading, talking, etc.

Pre-performance routines
This is a very useful approach to increasing focus and concentration is through the use of pre-performance routines by giving the athletes something to focus on, assisting athletes relax by providing a sense of familiarity that helps remind them this is just another shot, innings, race, etc.,

Attentional Cues and Triggers
This can be very useful in improving athletes' ability to concentrate. Task-related cues help athletes center their attention on the most appropriate focus within the task at hand. Depending on the sport, performance-relevant cues can include technique, tactics, the opponent, the score, time remaining, and many other cues.
There may be several other techniques that the coach or psychologist may be able to innovate on their own, depending on the sport as well as the athlete's mental state. Proper guidance and therapy techniques could help reduce the mental noise and considerably increase sports performance.

Conclusion
Mental Noise has been a rarely understood barrier to achievement in sports and other fields. Haunting thoughts of the past and worry about the future leaves the athlete unable to focus on the present. By proper mental training either by self or with the help of a sports psychologist, the athlete can try to overcome this problem.

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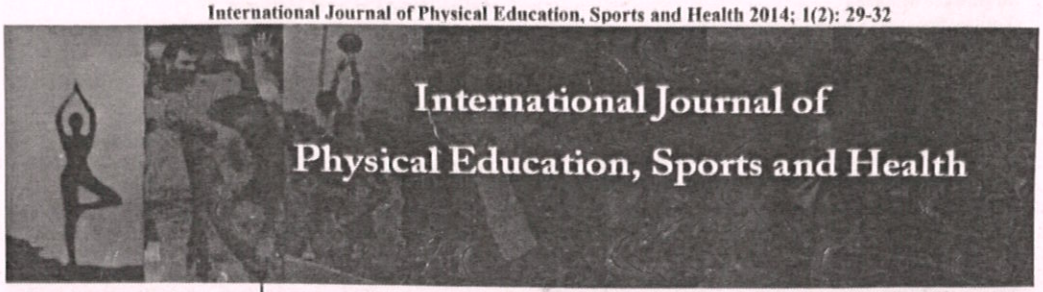
International Journal of Physical Education, Sports and Health 2014; 1(2): 29-32



P-ISSN: 2394-1685
E-ISSN: 2394-1693
IJPESH 2014; 1(2): 29-32
© 2014 IJPESH
www.kheljournal.com
Received: 18-10-2014
Accepted: 26-11-2014

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Aggression and its Influence on Sports Performance

K Krishnaveni, Ahmed Shahin

Abstract
Aggression and aggressive behavior are sometimes out of the ethical realm of sports, and sometimes very much part of sport, depending on the type of sport, the demand on the performer, and so on. Aggression includes different behaviours that serve a common end – to inflict pain or injury on the opponent. Several studies have been conducted by researchers worldwide, but there still remain gray areas that fail to pinpoint offensive or aggressive behavior in sport. This paper aims to throw light on the reasons for the existence and persistence of such behavior and possible remedies to deal with the same.

Keywords: Aggression, Assertiveness, Catharsis effect, Testosterone, Finger-digit ratio.

Objectives of the study
As one contemplates the issue of sport aggression, several questions are raised - whether aggression justified in certain sports, or does aggressive behavior in the game work as a catharsis effect or release of tension either by playing or by mere watching, or whether aggression on the other hand breed more aggression on and off the field, or if it is possible to reduce aggression. This paper addresses these issues that have been raised over and over again in the sports arena.

1. Introduction
Aggression is any interpersonal behavior intended to cause physical harm or mental distress to a person or persons. In the sports context, aggression can be defined as an unprovoked physical or verbal assault, and aggressiveness as the intent to commit such an assault. Aggression has also been defined as 'an overt verbal or physical act that can psychologically or physically injure another person or oneself'.
Aggression today is part and parcel of any contemporary sport. Over the past twenty years, most sports have been undergoing drastic changes, and several problem areas have been located and addressed that form the core of sports research. Some of them are:

1. Drug influence and the problems it poses
2. The increase of professionalism
3. Increased media attention and glorification
4. Commercialization of sports worldwide
5. Introduction of judicial norms and civil/criminal law in professional sports
6. Reduced tolerance levels in modern day athletes

2. A distinct line between Assertiveness and Aggression
Assertiveness, for a comparison, involves the use of legitimate physical or verbal force to achieve one's purpose. Here, as opposed to aggression, there is no intent to harm the opponent. Even if the opponent is harmed as a result of a tackle in Soccer, it is not necessarily aggression. It is merely assertive play, as long as it is within the spirit of the rules and the intent to harm is not present. Assertiveness requires the use of unusual effort and energy. If there is no intent to harm, then any resultant harm is only incidental to the game. The sporting community draws distinct lines between assertiveness and aggression.

3. Aggression in sports
Terry and Jackson (1985) defined aggression in sport as: 'harm-inducing behavior bearing no direct relationship to the competitive goals of sport, and relates, therefore, to incidents of uncontrolled aggression outside the rules of sport, rather than highly competitive behavior within the rule boundaries.'

Aggressive and violent actions which might be illegal outside sport, or in supposedly non-contact sports like Basketball, Football, Cricket, etc. are legal and allowed in the context of combat sports like Judo, Karate and Wrestling, or team contact sports like Rugby, American football and Ice hockey. All these sports are characterised by high levels of aggression and often violent physical contact which may be within the rules of the game and not intended to injure. The same sort of behaviour outside the sports context may however be defined as criminal. Participants in these sports have also accepted the inevitability of rough contact and possible injury in these sports.



Fig 1: Aggression is sometimes natural for the game



Fig 2: Aggression is sometimes unwarranted

A high degree of aggression that is not in line with competitive spirit is illegitimate and sometimes even illegal. In some sports, however, there appears to be a gray zone where aggression is accepted by 'victims' as a legitimate part of the game.

W. Gordon Russell (2008) provided a good understanding of the real meaning of aggression in sports. He had discussed the role of various external social influences on human aggression or the effect of provocations such as hurtful remarks, chants and songs were discussed. The most likely targets for aggression are officials, women, young entrants, and athletes who are victims of racial bias.

Katherine Simpson (2001) has found evidence about the role of testosterone and its impact on aggression. Changes in the concentration of hormones can have profound effects on mood and behaviour in humans.

Sex differences have also been considered as contributing factors to aggression. Evolutionary Psychology states that all behavior is designed to perpetuate the continuance of the gene pool and ensure the survival of the species. This evolutionary imperative contributes to gender differences in behavior.

Aggression has a new marker: the finger digit ratio, which is thought to be linked with a number of personal characteristics. According to this theory the shorter a man's index finger is when compared to the ring finger, the more aggressive he will be.

Environmental factors are also believed to have an influence on the state of mood. For example temperature, noise, drugs, alcohol, steroids, presence of weapons, have all shown to increase aggression.

3. Types of Aggression

Aggression can be of the following types

1. Direct: where the athlete can abuse face to face directly or hurt somebody by words or actions.
2. Indirect: hurting others by gossips, rumours, internal murmurings etc.
3. Instrumental: this is cognitive, where the aggression is intentional and planned, but not directly hurt someone, rather for gaining something like a reward, fame, scoring a goal, etc.
4. Emotional: also called impulsive aggression refers to aggression that occurs with only a small amount of forethought or intent.

Several theories on aggression have been proposed, but they fall into four main categories:

1. Instinct theory suggests that aggression is the result of an inherent drive like hunger, thirst etc.
2. Social learning theory suggests that aggression is a function of learning, not merely a biological drive.
3. Moral reasoning theory where the aggressor justifies his or her action as proper.
4. Frustration-aggression hypothesis states that aggression is a result of frustration.



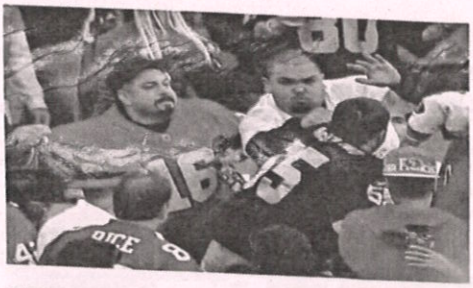
4. The Catharsis Effect

The Catharsis effect is the release of pent-up frustration that makes one feel better. It is a purging of the anger and frustration associated with not being able to accomplish a goal. Venting frustration upon a punching bag or some other inanimate object may serve as a useful catharsis. Venting frustration upon another human being, however, is unacceptable behavior that is likely to lead to more aggression.

Aggression is not cathartic i.e., it does not lead to a reduction in the desire to aggress. Aggression only leads to an increase in aggression as tempers flare and as the behavior becomes learned.

5. Fan Violence

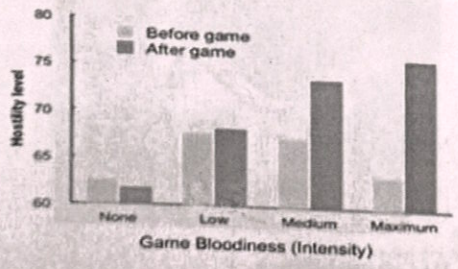
Some of the dirtiest instances of sports aggression and violence happen among the spectators. There are individuals who instigate violence. These individuals are attracted to violence tend to score high on the personality scale for anger and physical aggression.





6. Effects of Aggression on Sports Performance

It is a common knowledge that acts of aggression on the part of an athlete will constitute a distraction and result in a poor performance. These acts are likely to be distracting to the team also as a whole. Research has shown, for example, that the poorer a team is in the performance, more likelihood it will engage in aggression. As the game gets bloodier (more intense), hostility levels after the game are significantly higher.



7. Aggression due to Situational Factors

1. Temperature: Higher temperatures can lead aggressive athletes to become more aggressive.
2. Retaliation due to perception of victim's intent: Some athletes imagine that an opponent's intent is to inflict harm, so they respond with aggression against the opponent.
3. Fear of retaliation by victim: To an extent, the fear of retaliation by the victim of aggression can discourage the aggressive player from initiating that aggression.
4. Game situation: Several studies have shown that more aggressiveness occurs as there is a big difference between scores. When the scores are close, aggression is at a minimum.
5. Rivalry due to familiarity: Familiarity breeds contempt. As players become more familiar with one another due to frequency of play, rivalries also may increase, and aggression in turn becomes more frequent.
6. Reduced goal orientation: As the ego state of the athlete increases, there is general lack of respect for the game or the official. A high task goal orientation results in a higher level of sportsmanship.

8. Controlling Aggression in Sport

With the cooperation of all concerned parties, aggression in sport can be minimized. However, some most influential people sometimes actually end up promoting violence in their urge to sell tickets.

Angry feelings and angry behavior, the precursor to aggression and violence can be modified through proper anger management training and role play.

9. Controlling Aggression and Violence by Athletes

1. Athletes who are involved in aggressive acts must be severely penalized, at levels much more than any reinforcement that the game offers.
2. Young athletes must be taught to have non-aggressive, but assertive behavior.
3. Athletes should be rewarded for showing restraint and patience in emotionally charged game situations.
4. An athlete's anger, feeling can be regulated through proper role play.
5. Tolerance and patience on the part of the coach or leader will reduce violent behavior in athletes.
6. A friendly atmosphere, more in the lines of a family event should be ensured by the organizers.
7. Aggressive athletes can be provided proper counseling and rehabilitation.

10. Controlling Aggression and Violence by Fans

1. Troublemakers should be closely monitored.
2. Known offenders should be identified and denied admission.
3. Distribution of alcoholic beverages/cigarettes at sporting events should be stopped.
4. Media can help by not glamorizing the aggressive acts by players or fans.

11. Conclusion

Aggression and violence have become common in modern day sporting events, especially those that have high emotional content. Whatever the degree of aggression, it can be minimized by adopting a systematic approach at the psychological and sociological levels. Tolerance and empathy on the part of the organizers and the coach, followed by proper training to the athlete may be the solution.

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3.4.5-J-PSY-2014-15

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PHYSICAL EDUCATION

PSYCHOLOGICAL INTERVENTIONS ON MENTAL HEALTH OF ADOLESCENT BOYS

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Abstract

To achieve the purpose of the present study, thirty students from the schools of Chennai were selected as subjects at random and their age ranged between 16 and 18 years. The subjects were selected randomly and divided them into two equal groups. The groups were named as experimental (Psychological Intervention) and control group (CG). The experimental group underwent psychological intervention for six weeks which include deep breath relaxation technique, positive self-talk and Cognitive behavior therapy (CBT), whereas the control group had not exposed any experimental training. The mental health status was assessed through standardized tool prepared by Dr.Jagadish & Dr. A.K.Srivastava. The Scores range from 44 to 176. The mental health was assessed for both the groups before and after the experimental training. To find out the significant improvement paired 't' test was applied. The total score obtained by psychological intervention group was higher than the control group on mental health among adolescent boys.

Keywords: Psychological Intervention, Mental Health.

INTRODUCTION

Psychological interventions includes treatments that focus on relapse prevention, positive psychotic symptoms, negative psychotic symptoms, and associated difficulties such as anxiety, depression, and substance use. Psychological interventions should be an integral part of treatment offered to young people and their families at all phases of the recovery process. These interventions can be used in individual therapy or group settings, and can be targeted to address a wide range of issues. (McGorry, 2012)

Mental health is a level of psychological well-being, or an absence of mental illness. It is the "psychological state of someone who is functioning at a satisfactory level of emotional and behavioral adjustment". From the perspective of positive psychology or holism, mental health may include an individual's ability to enjoy life, and create a balance between life activities and efforts to achieve psychological resilience. Deep breathing is a simple, but very effective, method of relaxation. It is a core component of everything from the "take ten deep breaths" approach to calming someone down, right through to yoga relaxation and Zen meditation. It works well in conjunction with other relaxation techniques such as Progressive Muscular Relaxation, relaxation imagery and meditation to have control over various psychological factors. (www.mindtools.com)

Positive self-talk means purposely giving oneself positive reinforcement, motivation, and recognition- just as one would do for a friend. Congratulate yourself when you do well, and remind yourself of your abilities, accomplishments, strengths and skills. Keep a to-do list, check off accomplishments, and review your progress periodically. (Julie Griffin Levitt, Lauri Harwood 2009). Cognitive behavioral therapy (CBT) is a psychotherapeutic approach that addresses dysfunctional emotions, maladaptive behaviors and cognitive processes and contents through a number of goal-oriented, explicit systematic procedures. The name refers to behavior therapy, cognitive therapy, and to therapy based upon a combination of basic behavioral and cognitive principles and research. CBT is thought to be effective for the treatment of a variety of conditions, including mood, anxiety, personality, eating, substance abuse, tic, and psychotic disorders. (Lambert MJ, Bergin AE, Garfield SL 2004).

PURPOSE OF THE STUDY

The purpose of the study was to find out the effect of psychological interventions on mental health of adolescent boys.

REVIEW OF RELATED LITERATURE

Vijay Kumar, Pawan Kumar and Reena Kumari (2013) did a research on "Study of Mental Health of Pupil Teachers in Relation to their Gender and Locality". The present study was conducted to study and compare mental health of pupil teachers in relation to their gender and locality. A total sample of 160 Pupil-Teachers were taken from the selected eight B.Ed. colleges of H.P. To collect requisite data for the present study, the researcher used the mental health inventory (MHI) (Hindi Version) Constructed by Dr. Jagdish and Dr. A. K. Srivastav Deptt. of Psychology. B.H.U. Varanasi. Mental health inventory (MH1) covers six dimensions of mental health: For analysis and interpretation of data the investigator has used t'- test to find out the means difference in

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different component of mental health of Pupil-Teachers. The finding of the study revealed that pupil teachers did not differ significantly in their mental health with respect to their gender and locality.

METHOD

To achieve the purpose of the present study, thirty students from the schools of Chennai were selected as subjects at random and their age ranged between 16 to 18 years. The subjects were selected randomly and divided into two equal groups. The groups were named as experimental (Psychological Intervention) and control group (CG). The experimental group underwent Psychological Intervention training for three days a week for a period of 6 weeks in addition to their school timings. Experimental treatment was given only in the evening between 3.30.p.m. and 5.00.p.m. the regular practice, which includes deep breath relaxation technique, positive self-talk and cognitive behavioral therapy. The control group was not exposed to any experimental training. Before the training pre test was conducted to assess the mental health status prepared by Dr.Jagadish & Dr. A.K.Srivastava for both the groups. The Scores range from 44 to 176. After the experimental training period of 6 weeks, the post test was conducted. To find out the significant improvement paired t' test was applied. (Thirumalaisamy,1998).

RESULTS

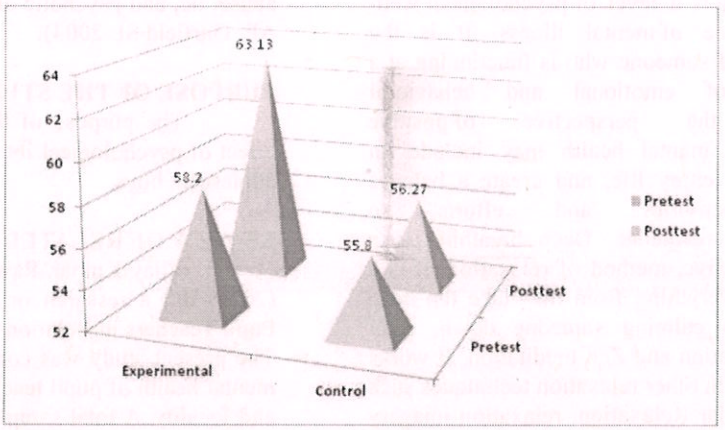
From the analysis of the data, the following results were drawn.

TABLE I
MEAN, STANDARD DEVIATION AND PAIRED T TEST OF MENTAL HEALTH AMONG ADOLESCENT BOYS

Group	Test	Mean	SD (±)	Mean Difference	t' ratio
Control	Pre	55.8	0.88	0.47	1.97
	Post	56.27			
Experimental	Pre	58.2	2.21	4.93	8.37*
	Post	63.13			

* Significant at 0.05

FIGURE 1
SHOWS THE PRE AND POST TEST DIFFERENCES ON MENTAL HEALTH OF EXPERIMENTAL AND CONTROL GROUPS AMONG ADOLESCENT BOYS



DISCUSSIONS

The result reveals that the total score obtained by psychological intervention group was higher than the control group on mental health among adolescent boys. This may be due to the regular practices of psychological interventions that include deep breath relaxation, positive self talk and counseling which helped the students to have better control over different dimensions of mental health.

CONCLUSION

The conclusion was drawn within the

limitations of the study. The psychological intervention group has shown significant improvement on mental health of adolescent boys than the control group.

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Original Article

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Effect of Transcendental Meditation on Playing Ability of Hockey Players

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Received 3rd June 2014, Accepted 25th June 2014

Abstract

The purpose of the study was to find out the effect of transcendental meditation on playing ability of hockey players. To achieve the purpose of the present study, twenty male hockey players from the affiliated colleges of Tamil Nadu Physical Education and Sports University, Chennai were selected as subjects at random and their age ranged between 18 and 25 years. The subjects were randomly divided in to two equal groups and named as experimental group and control group. The experimental group underwent transcendental for three days a week for a period of eight weeks in addition to their regular hockey practices, whereas the control group did not involve in any experimental training during the training period. Before the training pre test was conducted to assess the playing ability through subjective rating. After the training period of eight weeks, the post test was conducted. The collected data was statistically analyzed with paired 't' test to determine the significant difference between the groups. The level of confidence was fixed at $P<0.05$ levels for all the cases. The result reveals that the transcendental meditation group showed better performance on playing ability than the control group.

Keywords: Transcendental Meditation, Playing Ability, Hockey.

Introduction

The Transcendental Meditation (TM) technique is a simple, natural, effortless procedure whereby the mind easily and naturally arrives at the source of thought, the settled state of the mind Transcendental Consciousness pure consciousness, self referral consciousness, which is the source of all creative processes. Transcendental meditation is practised for 15–20 minutes in the morning and evening, while sitting comfortably with the eyes closed. During this technique, the individual's awareness settles down and experiences a unique state of restful alertness. As the body becomes deeply relaxed, the mind transcends all mental activity to experience the simplest form of awareness, Transcendental Consciousness, where consciousness is open to itself. This is the self-referral state of consciousness. The experience of Transcendental Consciousness develops the individual's latent creative potential while dissolving accumulated stress and fatigue through the deep rest gained during the practice. This experience enlivens the individual's creativity, dynamism, orderliness, and organising power, which result in increasing effectiveness and success in daily life. The Transcendental Meditation technique is scientific, requiring neither specific beliefs nor adoption of a particular lifestyle. The practice does not involve any effort or concentration. It is easy to learn and does not require any special ability. People of all ages, educational backgrounds, cultures, and religions in countries throughout the world practice the technique and enjoy its wide range of benefits (Gupta, 2007).

Field Hockey is played on a field which is 91.40m long and 55m wide. Top-level field hockey is played on synthetic surfaces, which makes the ball run faster and more smoothly, but most high school games in the United States are played on grass. The high school game consists of two 30-minute halves. Each team is permitted two time-outs per game. The game is started and re-started after every goal by a center pass. The player taking the center pass puts the ball into play in any direction using a hit, push, or selfpass. Playing ability is the performance of the players on the field during practice and during competition. When the players get mastery over the fundamental skills, may put them into a specific game. To play better, the fundamental as well as advanced skills need to be worked on and perfected. The team with high offensive and defensive skills is capable of winning high percentage of competitive matches.

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ISSN: 2349 - 489

Biomechanics is the study of the mechanics of living things. It demands knowledge of both biology and various branches of physics and engineering which comprises of mechanics. Biomechanics is a sciences that examined the internal and external forces acting on a human body and the effects produced by these forces. The push starts with an attacker standing close to the goal line with at least one foot outside the field of play. The left shoulder points in the direction of the push. The hook of the stick rests against the ball. The push-in movements involves a rapid rotation of the hip, shoulders and arms in the direction of the trapper while the body weight is being transferred from the back foot to the front foot. The ball is dragged or pushed over the playing surface by the Hockey stick for some distance and then released in the direction of the trapper. In the artificial surface dragging action is used frequently. The trap phase follows when the ball reaches top of the circles and is trapped by another attacking player just outside the circle the trapper propels the ball back into the circles for the phase three to commence, the phase three consists of a third attacker striking the moving ball towards the goal or another attacking player. Some researchers have focused on penalty corner push-in techniques in field hockey (Kerr & Ness, 2006 and Viswanath & Kalidasan 2012). Push-in part in penalty corner plays critical role in conversion of penalty corner. If push-in is with great speed, the striker has extra time before defender reach the penalty circle. However there is a paucity of research on the kinematics of the penalty corner push-in execution, for this purpose successful execution of the push-in is defined as pushing the ball accurately with in the 0.60 meters line in front of the first post and the unsuccessful execution is defined as ball which deviate beyond the 0.60 meters and limited to 2 meters is referred as a unsuccessful penalty corner push-in. The purpose of the study was to investigate the inter-relationship among the biomechanical factors in Penalty corner push- in.

Methods

The purpose of the study was to find out the effect of transcendental meditation on playing ability of hockey players. To achieve the purpose of the present study, twenty male hockey players from the affiliated colleges of Tamil Nadu Physical Education and Sports University, Chennai were selected as subjects at random and their age ranged between 18 and 25 years. The subjects were randomly divided in to two equal groups and named as experimental group and control group. The experimental group underwent transcendental for three days a week for a period of eight weeks in addition to their regular hockey practices, whereas the control group did not involve in any experimental training during the training period. Before the training pre test was conducted to assess the playing ability through subjective rating. After the training period of eight weeks, the post test was conducted. The collected data was statistically analyzed with paired 't' test to determine the significant difference between the groups. The level of confidence was fixed at $P<0.05$ levels for all the cases.

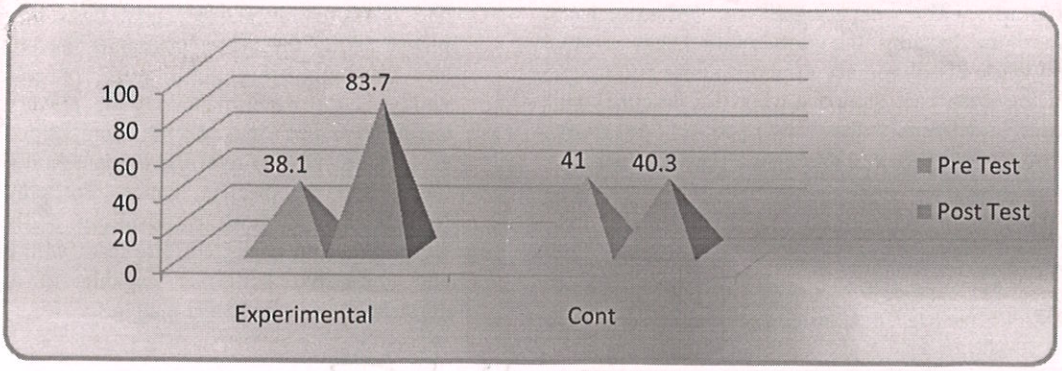
Results and Discussion

From the analysis of the data, the following results were drawn.

Table 1. Mean and Standard Deviation of Biomechanical Characteristics on University Hockey Players

S.No	Playing Ability	Pre-Test Mean	Post-Test Mean	Mean difference	Std. Dev (±)	σ DM	't' Ratio
1	Experimental	38.10	83.70	45.60	3.97	1.25	36.25*
	Control	41.00	40.30	0.70	7.76	2.45	0.28

Figure – I. Pre and Post Test Differences on Playing Ability of Experimental and Control Groups



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Kannadasan / Star International Journal, Volume 2, Issue 12(10), December (2014) *ISSN: 2321-676X*

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PHYSICAL EDUCATION

EFFECT OF RELAXATION TECHNIQUE ON MENTAL HEALTH AMONG IT PROFESSIONALS

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Abstract

To achieve the purpose of the present study, thirty male IT Professionals working in different IT industries but leaving in one apartment in Chennai were selected as subjects at random and their age ranged between 35 to 40 years. The subjects were selected randomly and divided them into two equal groups. The groups were named as experimental (Relaxation Technique) and control group (CG). The experimental group underwent Relaxation Technique for six weeks which include Deep breathing relaxation, PMR, Autogenic and Transcendental Meditation, whereas the control group had not exposed to any experimental training. The mental health status was assessed through standardized tool prepared by Dr.Jagadish & Dr. A.K.Srivastava. The mental health was assessed for both the groups before and after the experimental training. To find out the significant improvement paired 't' test was applied. The experimental group showed improvement on mental health among IT Professionals and they have adapted relaxation technique as regular practice to maintain good health.

Keywords: PMR, Autogenic, Transcendental Meditation and Mental Health.

INTRODUCTION

Relaxation training is perhaps the simplest and easiest to use of all psychological interventions, and relaxation may be the key ingredient in other types of therapeutic for managing stress (Alter, 2004). It has been observed that psycho-physical relaxation for an athlete off and on the field is necessary to produce the desired outcomes. During the actual competition and critical state physical and mental relaxation can be beneficial to the athlete. It has been seen that the athletes who learned to relax mentally and physically in a crucial moment (such as before the start of a sprint or a race) have better chances of winning where a good start is a decisive factor (Gangopadhyay, 2008). Mental health is a level of psychological well-being, or an absence of mental illness. It is the "psychological state of someone who is functioning at a satisfactory level of emotional and behavioral adjustment". From the perspective of positive psychology or holism, mental health may include an individual's ability to enjoy life, and create a balance between life activities and efforts to achieve psychological resilience.

Deep breathing is a simple, but very effective, method of relaxation. It is a core component of everything from the "take ten deep breaths" approach to calming someone down, right through to yoga relaxation and Zen meditation. It works well in conjunction with other relaxation techniques such as Progressive Muscular Relaxation, imagery and meditation. Progressive relaxation technique has been widely used in sports circles but its results are said to be mixed. Most investigators have found it to be highly useful in streamlining physiological functioning but its effects on psychological aspects of anxiety are still under review. Some psychologists have used this technique in conjunction with other techniques, for instance, visualization (Kamlesh, 2002).

The use of autogenic training as an adjunct to athletic training has tremendously increased over the years. Obviously, it does assist in achieving a relaxed state of mind under grueling competitive situation but the direct relationship between autogenic training and athletic performance is yet to be clearly established. Mastery over mind and feelings is one of the most difficult things to achieve (Kamlesh, 2002). The Transcendental Meditation technique is scientific, requiring neither specific beliefs nor adoption of a particular lifestyle. The practice does not involve any effort or concentration. It is easy to learn and does not require any special ability. People of all ages, educational backgrounds, cultures, and religions in countries throughout the world practice the technique and enjoy its wide range of benefits (Gupta, 2007).

THE PURPOSE OF THE STUDY

The purpose of the study was to find out the effect of relaxation technique on mental health among IT professionals.

REVIEW OF RELATED LITERATURE

Vijay Kumar, Pawan Kumar and Reena Kumari (2013) did a research on "Study of Mental Health of Pupil Teachers in Relation to their Gender and Locality". The present study was conducted to study and compare

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mental health of pupil teachers in relation to their gender and locality. A total sample of 160 Pupil-Teachers were taken from the selected eight B.Ed. colleges of H.P. To collect requisite data for the present study, the researcher used the mental health inventory (MHI) (Hindi Version) Constructed by Dr. Jagdish and Dr. A. K. Srivastav Deptt. of Psychology. B.H.U. Varanasi. Mental health inventory (MH1) covers six dimensions of mental health: For analysis and interpretation of data the investigator has used't'- test to find out the mean's difference in different component of mental health of Pupil-Teachers. The finding of the study revealed that pupil teachers did not differ significantly in their mental health with respect to their gender and locality.

METHOD

To achieve the purpose of the present study, thirty male IT Professionals working in different IT industries but leaving in one apartment in Chennai were selected as subjects at random and their age ranged between 35 to 40 years. The subjects were selected randomly and divided them into two equal groups. The groups were named as experimental (Relaxation Technique) and control group (CG). The experimental group practiced relaxation technique for three days a week for a period of 6 weeks in addition to their regular activities. Experimental treatment was given only in the morning between 6.15.a.m. and 7.15.a.m. and the regular practice includes deep breath relaxation technique, Deep breathing relaxation, PMR, Autogenic and Transcendental Meditation. The control group was not exposed to any experimental training. Before the training pre test was conducted to assess the mental health status prepared by Dr.Jagadish & Dr. A.K.Srivastava for both the groups. The scale consists of 44 items in which 16 are positive and 28 are negative statements and the Scores range from 44 to 176. After the experimental training period of 6 weeks, the post test was conducted. To find out the significant improvement paired't' test was applied.

RESULTS

From the analysis of the data, the following results were drawn.

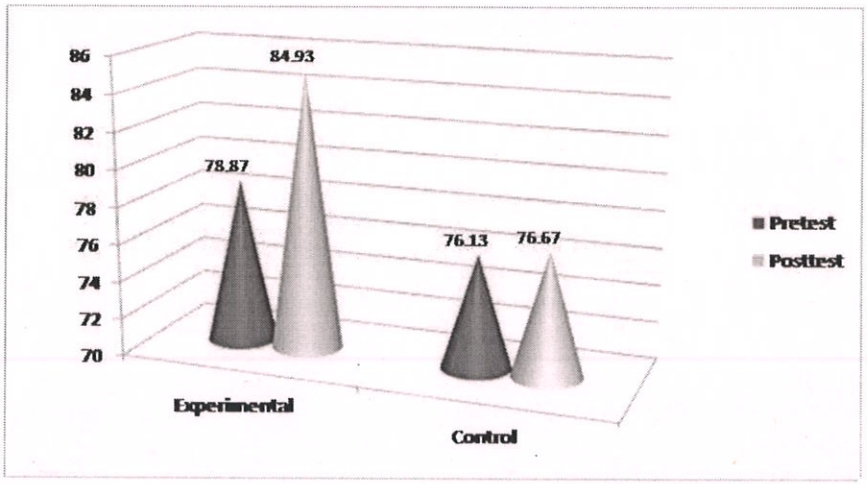
TABLE I
MEAN, STANDARD DEVIATION AND PAIRED 'T' TEST OF MENTAL HEALTH AMONG PHYSICAL EDUCATION STUDENTS

Group	Test	Mean	SD (±)	Mean Difference	t' ratio
Control	Pre	76.13	1.71	0.53	1.17
	Post	76.67			
Experimental	Pre	78.87	3.38	6.07	6.72*
	Post	84.93			

* Significant at 0.05

The mean, standard deviation and paired 't' test of mental health of both experimental and control group were numerically presented in the above table-I.

FIGURE I
SHOWS THE PRE AND POST TEST DIFFERENCES OF MENTAL HEALTH AMONG EXPERIMENTAL AND CONTROL GROUPS OF IT PROFESSIONALS



DISCUSSIONS

The result reveals that there was a significant improvement in the mental health status among IT Professionals. This may be due to the practices of relaxation techniques that include deep breathing relaxation, PMR, Autogenic and Transcendental Meditation, these techniques were helped the IT professionals to have control over their mental health.

CONCLUSION

Based on the finding of the present study, it was concluded that the mental health of the IT Professionals have improved after the implementation of relaxation technique, while relaxation behavior has been increased among them after the implementation.

The IT professionals may use different types of relaxation techniques for self care which in turn increase their familiarity with these techniques, thus contribute a lot to maintain good mental and physical health.

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3.4.5 - J - SC - 2014-15

Original Article

ISSN: 2349 - 4891

International Journal of Recent Research and Applied Studies

IJRRAS

Effect of In-Season Training on Skill Performance of Volleyball Players

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Received 30th June 2014, Accepted 30th July 2014

Abstract

It is generally accepted that the training programme are designed to develop the fitness component for the required sports during off season. The fitness level will be maintained during in-season training protocol. However the improvement in performance is possible with the help of well designed training intervention. The purpose of this study was to find out changes in skill performance after an in-season training programme in volleyball players. Higher secondary volleyball team players 14 in number were selected for this study and their age was ranging from 17 to 19 years. The study was designed to carry out resistance training and plyometric training drills apart from regular practical sessions in the competitive period for about 60 minutes in each training session. Training was given twice a week for 6 week. It was 3--4 sets of 8 – 10 repetition of resistance and plyometric exercise. The skills such as jump service and attack-hit were assessed before and after the six week of training. Jump service was improved to 9.5% and Attack-hit was increased to 18.6%. The finding suggests that the skill performance of volleyball players could be improved during the competitive season by implying a well designed training programme and in turn in may help the players for better performance.

Keywords: Resistance training, plyometric drills and In-Season training.

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Introduction

Volleyball is an Olympic sport is being played at different levels in all over the world. It becomes popular by its thrilling actions, and attracts the sports lover, spectators. To play this game one should be familiar with the explosive movements, such as jumping, hitting and blocking. Apart from these, the technical and tactical aspect of skill also plays predominant role in the successes of the Inter- national competition. It is quite natural that the coaches concerned are philosophically aspiring to enhancing the performance of their players to win medals. They tried, to prove their preeminence with this scientific approach to requirements for which they think off. The researches in this field also have shown keen interest in conceding the effective results. Due to the impact of science every angle of sports movements could be concentrated and analysised to look for better performance. I would like to concentrate on the strength factor which is very vital why because, the playing ability could be enhanced and if the individual possess the jumping ability, naturally he will try to put more effort to learn and execute the skills during practice. And I had my own doubt whether can I go for resistance and plyometric drills in the competitive seasons, yes the research review reveals that it could be.

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Review

Marques (2006) have stated that the muscular strength and explosive power are the most important factors for the successful participation during elite competition. Due to the recent trends of technical training and competition the in-season training programme concentrates on the strength factors and designed to maintain adequate level for several moths however it was un successful in competitive season the female hockey players, Who completed a maintained training programme 2 and 3 times per week. Hakkinen (1993) suggested that in order to maintain explosive strength careful attention was given during the entire course of competitive season. He found that if heavy resistance training was stopped for about five weeks and explosive strength training was performed, developments in both maximum strength and explosive strength observed, in contrast to Hakkines (1993) by his pervious research with female basketball player found an increase in vertical jump explosive type of strength training. Adans.et.al (1992) provided clear evidence that the combination of resistance training and plyometric were superior for the development of vertical jump performance compared to either training alone, most recently Marqnes et.al (2004) showed an increase in explosive power and muscular strength in a group of professional male volleyball player during in- season when using resistance and plymetric drills. These studies highlight the necessity of combining two training models when applying to improve performance in elite athletes. The ability to maintain or increase power and

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ISSN: 2349 – 4891

performance during the competitive season is an important consideration. To maintain certain level of maximum strength and explosives the, frequency the above exercise was given carful attention during the competition session. The hypothesis squabble in this article is that the mere elite volleyball players will be able to improve their strength factors in terms of jumping and hitting by doing resistance training and plyometric drills apart from regular practice sessions during competitive period.

Methodology

The purpose of the study was to find out the changes in skill performance during the in - season period among volleyball players. The subjects selected for this study was the higher secondary volleyball team players (N=14) of Sports School Coimbatore. Their age was ranging from 17 to 19 years. They are having regular practice for about 4 hours daily. This was designed and executed before their State level match. Only the selected 14 players were administered this treatment. As such it was not possible to have a control group because in practical terms to locate another equal team sample with same training and at the same performance level in team games is diffluent task. Training was given for 6 weeks and twice a week. The training protocol was divided in to two segments as three weeks each. In the First three weeks the resistance training which includes Squat, Leg press, and bench press was carried out and in the second three weeks the plyometric drills such as Depth jump, Rim jump and medicine ball throw were carried out. Given below the table, shows the detailed training programme.

Results

Table I. Resistance Training Schedule

Exercise	First week				Second week				Third week			
	Set	Rep.	% 1RM.	Rest (sec)	Set	Rep.	% 1RM.	Rest (Sec)	Set	Rep.	% 1RM	Rest (sec)
Squat	3	8	40%	60	3	8	60%	60	4	8	80%	60
Leg press	3	8	40%	60	3	8	60%	60	4	8	80%	60
Bench press	3	6	40%	60	3	8	60%	60	4	8	80%	60

Table II. Plyometric drills schedule

Exercise	Fourth week				fifth week				sixth week			
	Set	Rep.	Height cm / wt	Rest (sec)	Set	Rep.	Height cm / wt	Rest (Sec)	Set	Rep.	Height cm / wt	Rest (sec)
Depth jump	3	8	40cm	60	3	8	60cm	60	4	8	70cm	60
Rim jump	3	8	--	60	3	8	--	60	4	8	--	60
Ball throw(medicine ball)	3	6	3kg	60	3	6	3kg	60	4	8	3kg	60

Apart from the above training skills were also a part of the training which last 30 minutes and other days it was regular practice. Pre and post test were conducted to assess the Jump service and attack hit by subjective assessment with panel of expert coaches and were recorded.

Statically analysis

Collected data, were presented as mean and SD comparison between pre to post test of the selected variable were analysis using a paired simple 't' test.

ISSN: 2349 – 4891

Table III. Mean, mean difference, Standard Deviation and "t" ratio of jump service and attack-hit of Resistance training and Plyometric training among volleyball players

Group	Variables	Variance	Mean	Mean Diff.	't' Ratio
Resistance training group	Jump service	Pre-test	5.46	0.25	1.02
		Post-test	5.71		
	Attack-hit	Pre-test	5.31	0.26	1.80
		Post-test	5.57		
Plyometric training group	Jump service	Pre-test	5.70	1.39	5.63
		Post-test	7.09		
	Attack-hit	Pre-test	5.31	1.10	6.55
		Post-test	6.41		

Table III indicates that the mean differences between pre to after training on jump service and attack-hit. The plyometric training had significantly improved the skill performance variables of volleyball players better than resistance training group. And it is graphically presented in the figure.

Figure I. Bar Diagram shows the pre and post test mean of Jump service of the volleyball players

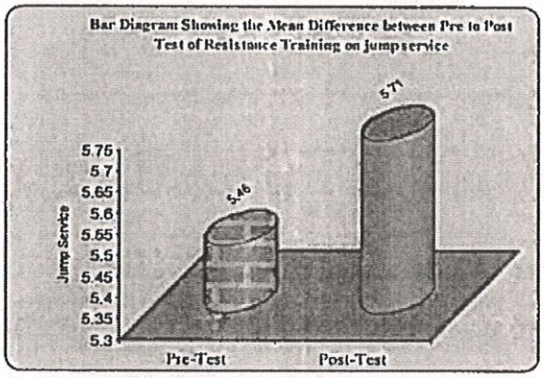
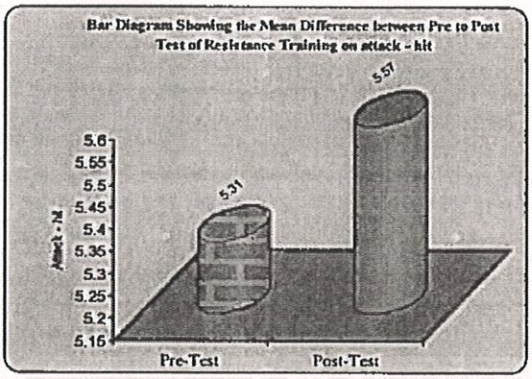


Figure II. Bar Diagram shows the pre and post test mean of attack-hit of the volleyball players



Discussions

The thought behind this study was to look at the changes in skill performance during the competitive seasons among the volleyball players whom were under regular training. To my knowledge it is risk to go for resistance and plyometric drill during the competitive period rather concentration on tactical and team training. The result shows that the changes in upper body and lower body as well as jumping and throwing are possible doing the competitive phase training combination of resistance training moderate load of plyometric drills. The improvement for upper body and lower body as 9.5%, the jumping and throwing were 18.6% respectively. So designing training programme just to maintain the strength and power during the competition seasons may have as advantages for physical

ISSN: 2349 – 4891

performance, however delicate balance must be achieved as practice and competitive demands require by the players.

Several studies were conducted extensively on the independent and combined effect of resistance training and plyometric training, the results showed that the improvement in strength and explosive power in elite players. When the resistance training is combined with plyometric .more over the subjects were under regular training, the improvement were observed after the intervention It is difficult to compare the resets are scientific literature because the studies differ in their design factors, including mode, frequency, intensity frequency of training and training history of subject. It is essential to have further research on these cases and identify other possible means responsible for the observed development after concurrent training.

Heiderscheit et.al. Compared the effect of isokinetic training with plyometric training over head medicine ball throw on shoulder strength and as expected the isokinetic group improvement in isokenitic strength. On the other plyometric training group increased softball throw for distance by five times greater than the isokinetic group, another the changes did not reach statically significant. Medicine ball throw exercise and test were included in this study to assess in explosive power and the improvement was observed after six weeks introversion

Improvement of strength during the competition session is different due to time availability and volume of work intensity for resistance training is limited. Baker reported an increase in 1RM bench press in a group of rugby players during computation session but no change in upper, lower body power of performance. Marques found significant increase in IRM bench press professional team hand ball player after six weeks of resistance training

Conclusions

To conclude plyometric increased the skill performance such as Jump service and attack-hit in volleyball better than resistance training

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3.4.5-T-SC-2014-15

Original Article

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International Journal of Recent Research and Applied Studies

Estimation of Tamil Nadu School Physical Education Programme on Selected Physical Fitness Components among Urban School Boys

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Received 1st September 2014, Accepted 29th September 2014

Abstract

The purpose of the present study was to find out the estimation of Physical Education programme on physical fitness among urban school boys. The study was conducted with 90 subjects and they were randomly selected from urban Schools from Kanchipuram district in Tamilnadu. Their age was ranging from 15 to 17 years. Based on their initial performance they were divided into four equal groups. The Experimental group 1 underwent Calisthenics exercise, Experimental group 2 underwent Yogasana practice, and group 3 control group did not undergo any specific training program. Pre and post test were conducted on selected variables. Analysis of covariance was used as statistical technique to analysis the data. The results revealed that the Yoga practices improved Physical fitness of urban school boys.

Keywords: Calisthenics exercise, Yogic practices, Speed, Agility.

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Introduction

The School Educational programmes every subject has its own way of enriching the knowledge and well being among students community. The Tamilnadu physical education school curriculum programme has been designed to develop the basic motor qualities and physiological adaptations for the well being. This programme includes the following activities such as callisthenic exercise, light apparatus activities, yoga practices, fundamental skills of some major games and track filed activities. Apart from the above programme, the Sports Development Authority of Tamilnadu a competent body which has been implementing different developmental sports schemes throughout the state, has developed a test battery named as "world beaters test" to monitor the students physical fitness. This test has been conducted periodically and reports are being submitted to concerned department for further course of action. The intention of my research was to investigate the effect of isolated yogic, callisthenic exercises as scheduled in the physical education programme and also it's combined practices on selected motor fitness components of rural high school boys.

Methodology

The subjects were selected at randomly and were divided in to three equal groups. Each group consists of 30 subjects each. The Experimental group 1 practiced Calisthenics exercises, Experimental group 2 underwent Yogasana practices, and control group did not undergo any specific training program. Set of yogic exercises and callisthenic exercises which are in the regular programme were selected as dependent variables. Set of ten yogic exercises with five repetitions were performed for the first three weeks and was increased to ten exercises with four repetitions for the next three weeks. The duration of rest was also given as 30 seconds and 45 seconds in between each repetition respectively. The same way five callisthenic exercises with five repetitions were performed in the first three weeks and were increased to ten exercises with four repetitions in the next three weeks. The training was given for six weeks for three groups namely yoga training group, Calisthenics exercise group. To measure the speed 50m run test was conducted. 4.5 m shuttle run was conducted to measure the agility the scores were recorded accordingly. Statistical tool Analysis of Covariance (ANCOVA) was used to determine the significance of the means for each variable. Post hoc analysis was made using Scheffe's test when obtained F value was significant. In all cases 0.05 level was fixed to test the hypothesis of this study.

Analysis of Speed

The results of analysis of covariance on speed from the data collected prior to and after the experimental period among the yoga group, Calisthenics group, and control group was given in table-1.

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ISSN: 2349 – 4891

Table I. Analysis of covariance on speed among yoga group, calisthenics group and control group

Test	Yoga	Calisthenics	Control Group	Sum of Variance	SS	df	MS	F
Pre test	7.24	7.25	7.23	BG	0.081	2	0.006	0.01
				WG	8.16	86	0.107	
Post test	7.21	7.16	7.23	BG	0.22	2	0.07	0.66
				WG	8.34	86	0.11	
Adjust to Post mean	7.21	7.16	7.24	BG	0.22	2	0.073	4.88*
				WG	1.127	85	0.015	

Table value for Significance at 0.05 levels is 2.72

From the table I it was observed that the pre test showed no differences in speed among the groups initially, even there was no significant difference in the post test also. However there was a significant change in speed among the groups in the adjusted post test. Further to determine which of the paired means had a significant difference scheffe's post hoc test was used.

Table II. The schefee's post hoc test for the differences between paired means on speed

Yoga Group	Calisthenics group	Control Group	M.D	C.I
7.18	7.21		0.03	0.10
7.18		7.24	0.06	0.10
	7.21	7.24	0.03	0.10

* Significant at 0.05 level of confidence

The multiple mean comparisons shown in table proved that there existed significant difference between the adjusted mean of Calisthenics' group and Yoga group. Yoga group improved better than the Calisthenics' training group in speed of the urban school boys. The mean value of yoga. Callisthenic and control group on speed were graphically represented in the figure 1.

Figure 1. Graphical representation on pretest, post test and adjust to post mean on speed of yoga, Callisthenic, and control group

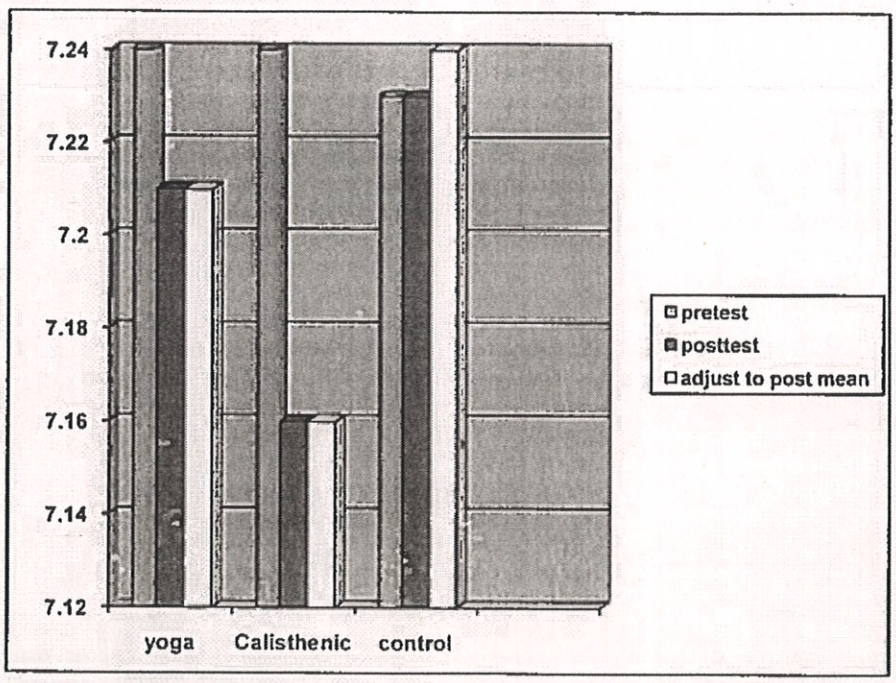

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Table III. Analysis of covariance on agility among yoga group, calisthenics group and control group

Test	Yoga	Calisthenics	Control Group	Sum of Variance	Sum of Squares	df	Mean & Square	F
Pre test	17.50	17.51	17.51	BG	0.0048	2	0.0016	0.004
				WG	33.453	86	.440	
Post test	17.46	17.26	17.51	BG	1.34	2	0.447	1.117
				WG	30.42	86	42.08	
Adjust to Post	17.37	17.27	17.51	BG	1.37	2	0.46	15.07*
				WG	2.28	85	0.030	

Table value for Significance at 0.05 levels is 2.72

From the above table it was observed that initially all the groups were equal insignificant in the pre test and the post test also indicated that there was no significant change in speed among all the groups. However in the adjusted post test there was a statistically significant change in speed among the groups, so to determine which of the paired means had a significant difference the scheffe's post hoc test was used.

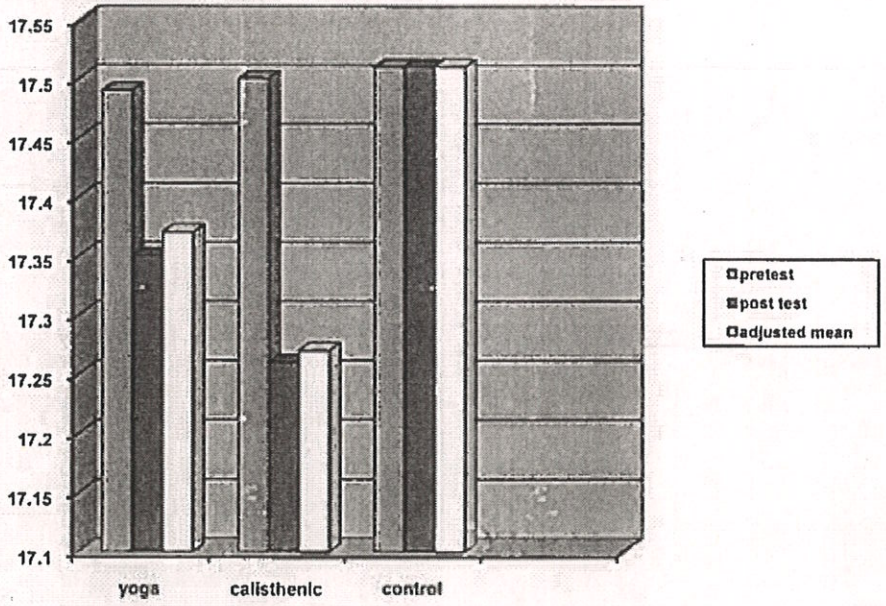
Table IV. The schefee's post hoc test for the differences between paired means on agility

Yoga Group	Calisthenics group	Control Group	M.D	C.I
17.27	17.37		0.10	0.16
17.27		17.51	0.24*	0.16
	17.37	17.51	0.14	0.16

*Significant at 0.05 level of confidence

The multiple mean comparisons shown in the table proved that there existed significant difference between yoga and control group, Calisthenics' and control group yoga and control group. The yoga group had better improvement that calisthenics group in agility of the urban school boys. The mean value of yoga, Calisthenics' and control group on agility were graphically represented in the figure II.

Figure II. Graphical representation on pretest, post test and adjust to post mean on agility of yoga, Calisthenics', and control group



Discussion and Findings

The purpose of the present study was to find out the effect of Tamil Nadu State Physical Education programme on physical fitness among urban school boys. The statistical analysis of data collected on ninety subjects indicated that there were significant improvement in selected variables of speed and agility. This study showed that 6 weeks of yoga practice, a tradition that has existed for at least 4500 years and is now becoming increasingly popular in the United States; (Hewitt; 1978, Schell et al; 1994) can have significant benefits in improving the physical fitness. Furthermore, the positive results of this study indicated that the yoga and callisthenic exercises are a form of physical activity that would meet the objectives of current recommendations to improve physical fitness and health (Surgeon; 1996). Yogasanas training programme showed significant improvement in agility level. The findings is supported by the study conducted by Galantino et al. (2004) Recommendations with Use Yoga and callisthenic exercises because of its clear and positive impact on improving the physical fitness variables.

The selected dependent variables namely speed and agility when compared to the control group and also improved better range of movements in joints and increase resistance power of the body to certain illness and awareness our cultural heritage, self discipline and concentration, knowledge of yoga exercise and understanding its influence on human body. The correct breathing habit and desirable posture the application of yoga exercises to the health needs of the individual. The results of the study indicated that the experimental group namely yoga group had significantly improved the dependent variables of speed and agility better than the other groups.

Conclusion

The results of the study indicated that the yoga and callisthenic group had significantly improved in speed and agility among the rural high school boys.

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Please cite this article as: Dr.C.Arumugam. Estimation of Tamil Nadu School Physical Education Programme on Selected Physical Fitness Components among Urban School Boys. *International Journal of Recent Research and Applied Studies*. 2014, 1, 4(23), 99 - 102.

8.4.5 - J - SC - 2014-15

Academic Sports Scholar
Vol. 3 | Issue. 11 | Nov 2014

ISSN : 2277-3665
Impact Factor : 1.3205 (UIF)

COMBINED EFFECT OF CROSS TRAINING AND INSTRUCTIONAL SKILL TRAINING ON SELECTED PHYSICAL FITNESS AND SKILL PERFORMANCE VARIABLES OF RURAL SCHOOL VOLLEYBALL PLAYERS

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Abstract:-This research aims to design a training program using cross- training and instructional skill training then to identify its effect on the selected physical abilities such as reaction speed, agility, and, flexibility among the rural volleyball players from Government Higher Secondary School Bujanganor in Tamil Nadu. The percentage of improvement for different measurements of both control and experimental groups were observed. Methods the researcher used the experimental method on a sample of 60 rural school volleyball players under 15-17 years old, four groups were used and was given 12 weeks of training except the control group. Most important tools of data collection were physical tests as pre and post measurements. Statistical work was done using arithmetic mean, standard deviation, T test, Ancova. Results training program using combined cross-training and instructional training led to development of all physical abilities such as reaction speed agility and flexibility within volleyball research sample. And clear improvement rates between experimental and control groups in all variables under consideration in favor of experimental group.

Keywords: Cross training, Instructional training, Pass, service and attack.

INTRODUCTION

Cross-training has been widely used approach for structuring a training programme to improve competitive performance in a specific sport by training in a variety of sports (Tanaka 1994). Cross training is a tool underlies strength training, which helps players to reach pinnacle of their specialty sport competition. A strategy used by coaches to organize the training program and fitness activities, which are of greatest use of diverse activities and physical challenges in order to make their players continue to acquisition and achieve the requirements and objectives of overall fitness in a satisfactory and secure manner Loy et al (1992), Yacenda(1994).

Cross training activities include both training with weights using few and large repetitions and ploy metric exercises like jump on box, which work to build body strength, development of muscle strength, legs muscles ability, and also includes activities of aerobic endurance including water running exercises and use of moving belt and fixed training cycle, as well as activities include anaerobic endurance including running exercises (Moran et al 1997).

Despite numerous anecdotal reports claiming benefits for cross-training, very few scientific studies have investigated this particular type of training. It appears that some transfer of training effects on maximum oxygen uptake (VO2max) exists from one mode to another. The nonspecific training effects seem to be more noticeable when running is performed as a cross-training mode. Swim training, however, may result in minimum transfer of training effects on VO2max. Cross-

Please cite this Article as :M.Moorthy[1] and C.Arumugam[2], "COMBINED EFFECT OF CROSS TRAINING AND INSTRUCTIONAL SKILL TRAINING ON SELECTED PHYSICAL FITNESS AND SKILL PERFORMANCE VARIABLES OF RURAL SCHOOL VOLLEYBALL PLAYERS": Academic Sports Scholar (Nov : 2014)

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training effects never exceed those induced by the sport-specific training mode. The principles of specificity of training tend to have greater significance, especially for highly trained athletes. For the general population, cross-training may be highly beneficial in terms of overall fitness. Similarly, cross-training may be an appropriate supplement during rehabilitation periods from physical injury and during periods of overtraining or psychological fatigue (Tanaka H. 1994)

Instructional skill training has been shown to improve an athlete's ability to reach their full potential, minimize injuries, and increase their ability and fitness. Many coaches believe instructional volleyball training molds the athlete by targeting areas for improvement more directly than group sessions or practices can, and is a recommended way to develop the athlete's ability and become a stronger player.(www.coachup.com/volleyball). It was hypothesizes that there would be significant improvement exists due to the experimental groups, and especially the combined training group. The instructional training improved only spike jump and speed among the Australian Junior Volleyball players whom represented the World youth volleyball Championships and also induced meaningful improvements in all measurements of skill in volleyball and greater improvements in technical skill in these athletes (Gabbett -2008).

METHODOLOGY

For the purpose of this study was to mark out the effect of chosen training programme on the physical fitness variables among rural school volleyball players. The subjects selected for this study were from Government Boys Higher Secondary School Bujanganor and were randomly selected as 60 numbers. The age group of the subjects was ranging from 14 to 16 years with standard deviation of + 0.52 and they divided into four equal groups and each group consists of twenty subjects. The physical fitness variables selected for this study was Reaction Speed, Agility and Flexibility and to assess the outcome the experiment standardized tests were used to collect the date. Cross Training and skill based training was formulated and implemented for twelve weeks.

EXPERIMENTAL DESIGN

Randomly selected rural school rural volleyball players (N=60) were assigned into four groups. As per the experimental design Group I acted as experimental group which underwent cross training (CT), group II underwent instructional skill training (IST), group III underwent combined cross training and instructional skill training (CTIST) and group IV did not participated in any special training and were strictly under control (CG). Prior to experimental treatment all the subjects were measured of their physical fitness such as reaction speed, agility and flexibility. The subjects underwent respective experimental treatments for a period of 12 weeks. After the experimental period, post measurements were taken for the selected variables. The difference between the initial and final scores was considered as the effect of respective treatments. To test the statistical significance of the data collected were subjected to statistical analysis using ANCOVA to test the significance. In all cases 0.05 level was fixed to test the hypothesis of this study. The statistical analysis comparing the initial and final means of Reaction Speed Time due to cross training, instructional skill training, combined cross training and instructional skill training and control groups of school volleyball players is presented in Table I

Table I
COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO CROSS TRAINING, INSTRUCTIONAL SKILL TRAINING AND COMBINED TRAINING ON REACTION SPEED TIME

	Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	SOV	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	0.279	0.233	0.264	0.281	B	0.030	3	0.010	1.366
Std Dev	0.055	0.056	0.057	0.050	W	0.227	56	0.003	
Post Test Mean	0.253	0.209	0.242	0.281	B	0.060	3	0.020	5.930*
Std Dev	0.046	0.046	0.057	0.050	W	0.256	56	0.003	
Adjusted Post Test Mean	0.240	0.236	0.243	0.271	B	0.015	3	0.005	4.139*
					W	0.059	55	0.001	

Required table value 0.05 level (df 3 &55) 2.77, * Significant at 0.05 level of confidence

Taking into consideration of the pre test means and post test means, adjusted post test means for analysis of covariance. The obtained F value was greater than the required value of 2.77 and hence it was accepted that there was significant differences existed in reaction speed among the rural high school volleyball players. Since significant improvements were recorded, Schaffe's post hoc test was used to find out the paired mean difference among the groups and the results were presented in Table II

Table II
Multiple Comparisons between Cross training, Instructional skill training, Combined Training and Control Groups and Scheffe's Post Hoc Analysis on Reaction Speed Time

Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	Mean difference	C.I
0.240	0.236			0.004	0.029
0.240		0.243		0.002	0.029
0.240			0.271	0.031*	0.029
	0.236	0.243		0.006	0.029
	0.236		0.271	0.035*	0.029
		0.243	0.271	0.029*	0.029

* Significant at 0.05 level.

From the above table it is clear that combined training group had significant improvement in reaction speed among the rural school volleyball players when compared to other two groups. Cross training and instructional skill training had also improved the reaction capacity among the rural volleyball players. The pre test, post test and ordered adjusted means were presented through line graph for better understanding of the results of this study in Figure 1.

Figure 1
LINE GRAPH SHOWING PRE, POST AND ADJUSTED MEANS ON REACTION SPEED

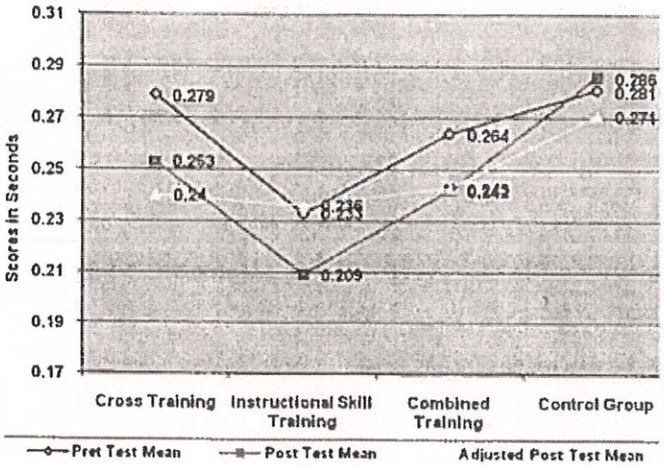


Table III
COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO CROSS TRAINING, INSTRUCTIONAL SKILL TRAINING AND COMBINED TRAINING ON FLEXIBILITY

	Cross training Group	Instructional skill training Group	Combined Group	Control Group	SOV	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	12.55	12.95	13.05	13.10	B	3.74	3	1.25	0.22
Std Dev	1.88	2.09	2.21	3.21	W	438.65	56	5.77	
Post Test Mean	13.75	14.35	14.80	13.10	B	17.44	3	5.81	1.15
Std Dev	1.68	2.06	2.21	3.21	W	384.05	56	5.05	
Adjusted Post Test Mean	14.08	14.32	14.68	13.48	B	15.13	3	5.04	14.25*
					W	26.55	55	0.35	

Required table value 0.05 level (df 3 &55) 2.77, * Significant at 0.05 level of confidence

As shown in Table III, the pre test mean on Flexibility of cross training group instructional skill training group combined group consisting of cross training and instructional skill trainings training and control group found to be insignificant. The post test means, adjusted post test means revealed that there existed significant improvement and Schaffe's post hoc test was used to find out the paired mean difference among the groups and the results were presented in Table IV

Table IV
Multiple Comparisons between and Scheffe's Post Hoc Analysis on Flexibility

Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	Mean difference	C.I
14.08	14.32			0.24	0.54
14.08		14.68		0.60*	0.54
14.08			13.48	0.60*	0.54
	14.32	14.68		0.36	0.54
	14.32		13.48	0.84*	0.54
		14.68	13.48	1.20*	0.54

* Significant at 0.05 level.

Multiple mean comparisons shows that there found to be better improvement in flexibility among the rural school volleyball players, due to combined training when compared to other two training groups, and the instructional skill training group and cross training group were also improved on Flexibility. The results were presented through line graph for better understanding of the results of this study in Figure 2.

Figure 2
LINE GRAPH SHOWING PRE, POST AND ADJUSTED MEANS ON FLEXIBILITY

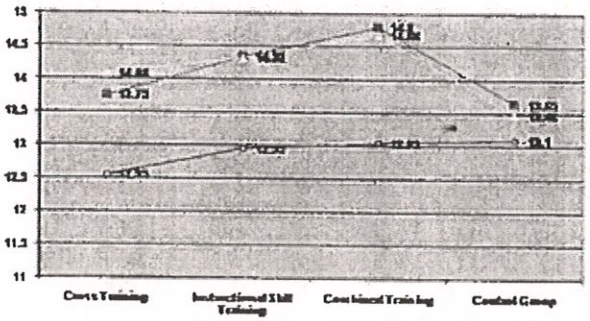


Table V
COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO CROSS TRAINING, INSTRUCTIONAL SKILL TRAINING AND COMBINED TRAINING ON AGILITY

	Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	SOV	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	17.85	17.87	17.66	17.95	B	0.90	3	0.30	1.60
Std Dev	0.44	0.46	0.39	0.45	W	14.35	56	0.19	
Post Test Mean	17.22	17.24	16.97	17.95	B	9.92	3	3.31	23.61*
Std Dev	0.30	0.46	0.39	0.45	W	10.65	56	0.14	
Adjusted Post Test Mean	17.21	17.23	17.03	17.87	B	7.73	3	2.58	23.00*
					W	8.40	55	0.11	

Taking into consideration of the pre test means and post test means, adjusted post test means for analysis of covariance. The obtained F value was greater than the required value of 2.77 and hence it was accepted that there was significant differences existed in agility among the rural high school volleyball players. Since significant improvements were recorded, Schaffe's post hoc test was used to find out the paired mean difference among the groups and the results were presented in Table IV. Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table IV

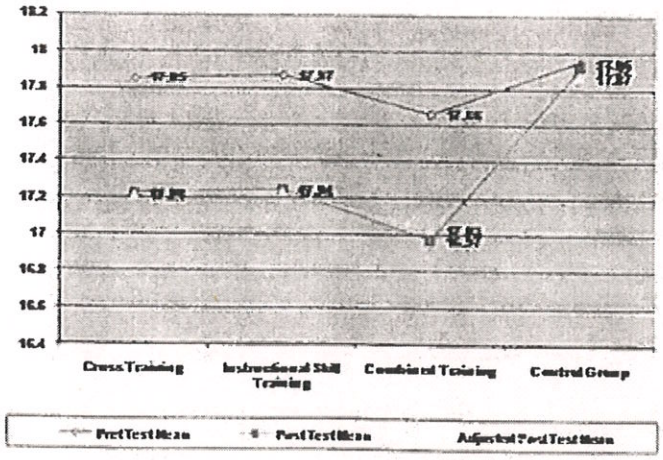
Table VI
Multiple Comparisons and Scheffe's Post Hoc Analysis on Agility

Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	Mean difference	C.I
17.21	17.23			0.01	0.30
17.21		17.03		0.18	0.30
17.21			17.87	0.65*	0.30
	17.23	17.03		0.19	0.30
	17.23		17.87	0.64*	0.30
		17.03	17.87	0.84*	0.30

* Significant at 0.05 level.

Multiple mean comparisons shows that there found to be better improvement in agility among the rural school volleyball players, due to combined training when compared to other two training groups, and the instructional skill training group and cross training group were also improved on agility. The results were presented through line graph for better understanding of the results of this study in Figure 3.

Figure 3
LINE GRAPH SHOWING PRE, POST AND ADJUSTED MEANS ON AGILITY



DISCUSSION

Instructional lessons are a great way to get an athlete ready for their school or club teams and in fighting shape for matches and scrimmages. By focusing on specific skills and techniques, instructional volleyball coaching grooms players to evolve their skills to be prepared to play at the next level. Most players are looking for a confidant in the sport to provide motivation, push them when they lose focus, and instruct training drills to help them develop more technical skills. An athlete is driven towards success when there is a person available to turn to with questions or direction with their position or game.

Experts now say that the cross training is a much better approach and all sorts of professional athletes, from ball players to golfers, tennis players to swimmers, and other sports too make cross training part of their regimes and cross training is also making its way into the average person's fitness routine, with more and more benefits. The cross training takes into consideration the fact that many muscles in different parts of the body contribute to a single activity. So to get the most out of any activity, and to do it safely, one must pay attention to all the muscles in his body that are involved, not just the ones directly related to that activity.

Researches on instructional training for improving physical fitness and skills in junior elite volleyball players found that skill-based conditioning games induced improvements in vertical jump, spike jump, speed, agility, upper-body muscular power, and estimated maximal aerobic power, whereas technical instruction improved only spike jump and speed while instructional training induced meaningful improvements in all measurements of skill, whereas improvements in technical skill after skill-based conditioning games were uncommon and typically small. Hence, the benefits of cross training, instructional training and combined effect of cross training and instructional training on physical fitness variables, reaction speed time, agility, and, flexibility were explored and hence, an attempt was made in this study. Thus, the findings of this study that the combined effect of cross training and instructional skill training significantly altered selected physical variables were in agreement with these previous studies.

CONCLUSIONS

Combined effect of cross training and instructional skill training significantly improved physical fitness variable, such as, reaction speed time, agility and explosive power of rural school volleyball players. It was also found that there was no significant difference among treatment groups on reaction speed time.

Combined effect of cross training and instructional skill training and isolated cross training and instructional skill training significantly improved skill performance variable, such as, pass, service and attack of rural school volleyball players. It was also found that there combined group was significantly better than isolated cross training groups in improving skill performance pass of the rural school volleyball players.

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3.4.5 - J - SC - 2014-15

Vol 4 Issue 3 Dec 2014

ISSN No : 2249-894X

Monthly Multidisciplinary Research Journal

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Review Of Research
Vol. 4 | Issue. 3 | Dec. 2014
Impact Factor : 2.1002 (UIF)
ISSN:-2249-894X
Available online at www.ror.isrj.org

ORIGINAL ARTICLE

COMBINED EFFECT OF CROSS TRAINING AND INSTRUCTIONAL COMBINED EFFECT OF CROSS TRAINING AND INSTRUCTIONAL SKILL TRAINING ON SELECTED SKILL PERFORMANCE VARIABLES OF RURAL SCHOOL VOLLEYBALL PLAYERS

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Abstract:

This study aims to design a training program using cross- training and skill based instructional then to identify its effect on some of the volleyball skills such as pass, service and attack among the rural volleyball players. and percentage of improvement for different measurements of both control and experimental groups. Methods: In this study the researcher used the experimental method on a sample of 60 rural school volleyball players from Government Higher Secondary School Bujanganor in Tamil Nadu under 15-17 years old, training were given as cross training and instructional skill training for twelve weeks. Most important tools of data collection were references survey, single skills tests. Statistical work was done using arithmetic mean, standard deviation, T test, Ancova. Results: Training program using combined cross-training and instructional training led to development skill performance within volleyball research sample. And clear improvement rates between experimental and control groups in all variables under consideration in favor of experimental group.

KEYWORDS:

Cross training, Instructional training, Pass, service and attack .

INTRODUCTION

The concept of cross training is a relatively recent athletic application, in which a training regime includes the use of one distinct athletic discipline to build skills or fitness in another. In the not-so-distant past, sporting success was equated to the devotion of an athlete to the discipline. For an individual pursuit such as running or cycling, devotion was translated into the athlete spending every training opportunity engaged in one aspect or another of the sport to simulate competition. In team sports, the athlete would play or practice at every available moment; where there were no formal practices or games, the striving basketball player, soccer player, or ice hockey player would find a pickup game in their sport to continue the quest for excellence. Increased popular interest in multi-sport events such as the triathlon in the 1980s, and the appreciation by the wider sport community of the training demands that such sports required, spurred a broader interest in the use of cross training. It became a fashionable approach to physical improvements in a very wide range of sports. European sports trainers had advocated variety and intensity in athletic training regimens since the 1940s, usually through the introduction of cycling or an aerobic sport like soccer into an

Title: "COMBINED EFFECT OF CROSS TRAINING AND INSTRUCTIONAL COMBINED EFFECT OF CROSS TRAINING AND INSTRUCTIONAL SKILL TRAINING ON SELECTED SKILL PERFORMANCE VARIABLES OF RURAL SCHOOL VOLLEYBALL PLAYERS" , Source: Review of Research [2249-894X] R. Moorthy[1] and C. Arumugam[2] yr:2014 | vol:4 | iss:3

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anaerobic training discipline, both for the building of strength as well as an understanding that, for the mental health of a serious athlete, "a change is often as good as a rest."

Today, the principles of effective cross training are well established. Cross training generally is accepted as building a better all-around athlete, while providing a measure of protection for injury through increased fitness, as well as reducing the mental fatigue associated with a lack of training variety. Cross training also permits an injured athlete to continue with workouts and thereby reduce the degree of fitness that might otherwise be lost to injury. The specific areas of human performance that are addressed in a typical cross-training program include: cardiovascular fitness; power, through increased muscle strength; speed; agility/reflexes; the use of all three of the body's energy systems, the aerobic system (endurance), the anaerobic lactic (intense energy demands of up to 90 seconds in duration), and the anaerobic lactic (short, very intense energy requirements); musculoskeletal flexibility; and mental acuity.

Instructional skill training has been shown to improve an athlete's ability to reach their full potential, minimize injuries, and increase their ability and fitness. Many coaches believe that the instructional volleyball training molds the players by targeting areas for improvement more directly than group sessions or practices can, and is a recommended way to develop the athlete's ability and become a stronger player.(www.coachup.com/volleyball). Talita M., a volleyball coach, believes that the instructional lessons are a great way to get an athlete ready for their school or club teams and in fighting shape for matches and scrimmages. By focusing on specific skills and techniques, instructional volleyball coaching grooms players to evolve their skills to be prepared to play at the next level. Talita noted most players are looking for a confidant in the sport to provide motivation, push them when they lose focus, and instruct training drills to help them develop more technical skills. An athlete is driven towards success when there is a person available to turn to with questions or direction with their position or game. (www.coachup.com/volleyball)

The Olympic sport Volleyball has developed into a highly competitive sport and no doubt which requires a high demand in terms of physical capacities and skill performance. The game at a high level of competition requires quicker sudden movements and fast reaction. Volleyball matches have no time limit and matches can last for several hours, if the teams are evenly matched. So one has to master over the skills and should attain the required fitness. Research reveals that skill-based conditioning games offer a specific training stimulus to simulate the physiological demands of competition and the improvements in physical fitness after training were greater with skill-based conditioning games (Gabbett 2008) Cross training represents a modern trend in training and is regarded as organizational form, which includes the use of different activities, sports as well as training means and methods and what suit it from facilities available, which can be utilized during the training in accordance with players capabilities, cross-training contributes in development of physical abilities represented in aerobic, anaerobic work, muscular endurance, force, power, agility and f flexibility, it is also working on development of physiological aspects related to sports performance in addition to the development of psychological aspect of an athlete (Mohammed 2002).

METHODS:

To achieve the purpose of this study, 60 rural school volleyball players were randomly selected. The subjects were in the age group of 14 to 16 years with standard deviation of + 0.52. The skill performance pass, service and attack were selected as variables for this study. The selected subjects were equally divided into four groups and each group consists of twenty subjects. Group I acted as experimental group which underwent cross training (CT), group II underwent instructional skill training (IST), group III underwent combined cross training and instructional skill training (CTIST) and group IV did not participated in any special training and were strictly under control (CG). Pre measurement was taken and recorded for the chosen variables. Cross training and instructional skill training was formulated and implemented accordingly for twelve weeks. After the treatment period the post measurements was taken and recorded. The collected data were analysised using ANCOVA to find out the effect of training on the selected variables. The results are presented below.

Table I
COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO CROSS TRAINING, INSTRUCTIONAL SKILL TRAINING AND COMBINED TRAINING ON PASS

	Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	SOV	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	32.00	32.80	32.40	33.35	B	19.94	3	6.65	0.78
Std Dev	2.34	2.86	2.95	3.41	W	644.56	56	8.48	
Post Test Mean	33.70	34.90	35.10	33.35	B	30.64	3	10.21	1.42
Std Dev	2.36	2.75	2.95	3.41	W	548.36	56	7.22	
Adjusted Post Test Mean	34.27	34.76	35.31	33.22	B	46.91	3	15.64	28.61*
					W	41.00	56	0.55	

* Significant at 0.05 level of confidence

In the table I, it is observed that the pre test found to be insignificant and the post test means, adjusted post test means were statistically significant and there was an improvement in passing ability among the rural school boys and to find out which group had significant improvement Schefee's post hoc test was used to determine the paired mean difference and the results were presented in Table II.

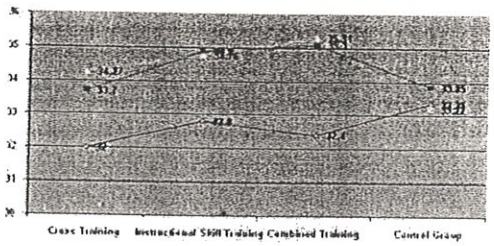
Table II
Scheffe's Post Hoc Analysis on Pass

Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	Mean deference	C.I
34.27	34.76			0.49	0.67
34.27		35.31		1.05*	0.67
34.27			33.22	1.05*	0.67
	34.76	35.31		0.55	0.67
	34.76		33.22	1.54*	0.67
		35.31	33.22	2.09*	0.67

* Significant at 0.05 level.

The multiple mean comparisons shows in the above table proved that there existed significant difference between the experiential groups and the combined training group had better improvement than the cross training and instructional skill training group in improving passing ability among the rural school volleyball players. The pre test, post test and ordered adjusted means were presented through line graph for better understanding of the results of this study in Figure 1

Figure 1
LINE GRAPH SHOWING PRE, POST AND ADJUSTED MEANS ON PASS



B.4.6-J-ST- 2014-15

International Journal of Engineering and Technology Innovation, vol. 4, no. 1, 2014, pp. 59-67

Manufacturing, Testing of Polymer Nanocomposite and Analysis of Tennis Racket Frame

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Received 23 October 2013; received in revised form 26 November 2013; accepted 10 December 2013

Abstract

The modern days, the game of tennis expects high levels of performance from every international tennis players. The performance of every tennis player based on the tennis racket and playing conditions. The evolution of the tennis racket, with respect to both design and materials (tennis racket strings and grips) developed lots of new tennis racket frames. The tennis racket required to change in recent years as a result of lightweight, stiffer rackets for better performance. The paper discusses the manufacturing, testing, structural and modal analysis of four ratios of Nylon6,6/MWNT new polymer nanocomposite material replacing excising composite materials to a tennis racket frame for better mechanical properties to enhanced performance of the tennis racket. Using universal testing machine test and calculate the various mechanical properties strength, modulus, impact, hardness, stiffness, toughness of the polymer nanocomposite. In the design, the tennis racket frame was designed of the shape, dimensions. After design part created the 3D model using by PRO/ENGINEER software. The 3D racket model can be export to ANSYS analysis software and incorporated with new polymer nanocomposite properties. The structural and model analysis was done.

Keywords: MWNT, nylon 6,6, tennis racket frame, PRO/ENGINEER, ANSYS

1. Introduction

When tennis was first invented, wooden rackets had always been used. The usage of wood rackets lasted for decades, until the 1970s. Thereafter metal tennis racket frames were introduced for the first time. These metal frames quickly replaced the old wooden frames, as many advantages could be spotted with such a change. Late 80's as manufacturers experimented with mixing different types and proportions of metals together to construct the frames, the racket frames became stronger, but also lighter. Most racket manufacturers mix graphite with another metal, such as titanium, to form composite metals.

Many of the racket frame made of Carbon fiber composite materials are stiffer and lighter in weight than most of the updated rackets. Increased stiffness reduces energy absorbed by the frame on ball contact and so increases applied ball velocity. New materials and technologies have been widely used. Today's tennis rackets are a showcase of high tech materials and engineering [1]. These arguments allow us to consider this field as the science of tennis racket. Nowadays tennis players are use the latest rackets of advance engineering materials for enhanced mechanical properties and lighter in aspect ratio of nanocomposite materials. At present various nanocomposite materials are in research work for replacement of existing material.

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Matthew Vokoun described in his work, the design aspects of tennis rackets the two main design aspects of tennis rackets, which are classified in external and internal design aspects. The external design aspects consist in strings, head size, and beam size. The internal design aspects are material type, weight, and balance [2, 3]. The strings characteristics such as elongation, tension, and pattern density are of great importance in stroke production. The head size provides the desired power: a larger head provides more power (longer head) or a better control (wider head). The beam size (racket's cross section) influences the racket's stiffness and power. Most modern racket frames are made from light-weight polymer nanocomposite allowing good frame flexibility, more power or more control, depending on the shots. Other important aspect refers to how racket's weight and its distribution affect balance and control. New racket models are designed using computer-aided design which allows precise calculation of material rigidity and center of gravity. The trend today is toward lighter, bigger rackets, and these are viable because of advanced materials engineering [2]. Today's racket designs rely heavily on the engineering and scientific fields. For those who are interested in tennis, it is important to understand the modern design aspects of tennis rackets. This knowledge can be used by a tennis player to choose the best racket for him and to improve the tennis techniques. Understanding these design aspects is also important to anyone with an interest in modern technology [2, 3].

The Carbon nanotubes were first discovered by Iijima in 1991 [4, 5]. Carbon nanotubes are among the most amazing materials discovered in the 20th century and probably the most highly cited name in scientific literature over the past two decades. Carbon Nanotubes are typically considered as molecular scale tubes of graphite carbon. Depending on numbers of carbon layers, they are categorized as single-walled and multi walled nanotubes. Rolling single layer of graphite is SWNT. Rolling two and more than two layers of graphite is called MWNT. Carbon Nanotubes show unique combinations of mechanical properties like stiffness, toughness, strength, thermal, physical & very high electrical conductivity. MWNTs with tensile strength up to 63 MPa, and with a high aspect ratio of 1,000 or higher are available [6-10] .Thermoplastic materials are those which get softened on the application of heat with or without pressure but they require cooling to set them to shape. Nylon 6,6 is one of the very important thermoplastic materials. It is made of hexamethylene diamine and adipic acid, which give nylon 6,6 a total of 12 carbon atoms. It is very tough, strong and rigid [11, 12].

Polymer/carbon nanotube composites have the potential to offer a vast improvement over current materials available today. Research scientists believe that the excellent physical, thermal and electrical properties of the carbon nanotubes (CNTs) can be realized at the macroscale by incorporating them into polymer matrices. Successful fabrication of such nanocomposites will lead to stronger and more conductive materials for advanced application (such as military and space). Examples include intelligent sensory materials in fabrics and films and strong, tough fibers for impact resistance. A polymer nanocomposite (PNC) is a two-phase material where one of the phases has at least one dimension in the nanometer range. PNCs can have enhanced mechanical and electrical properties in terms of their strength, weight, flame retardancy and electrical conductivity due to the very high surface/volume ratio of its reinforcements. The interfacial properties and the interfacial area have a crucial role to obtain good final properties in composites due to the nanosize of the fillers which provide them those above mentioned advance properties.

Today in sports equipment/automotive, aeronautics industry most, most common applied polymer nanocomposites are carbon nanotubes and nanoclay incorporated polymers. They are preferred due to their enhanced physical properties example. Light weight ratio, noise dampening, high impact strength, high strength to weight ratio, dimensional stability, long term durability, directional strength and etc., in addition to main constituents of composites, resins and reinforcements, use of additional fillers has become very common both for composites and nanocomposites. Fillers not only improve the mechanical properties and CNTs filler dispersion as well as interfacial interactions to be crucial for both incorporating CNTs into the resin and reaching enhanced mechanical properties in PNCs.

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In this research, synthesizing various ratios of MWNTs with Nylon 6,6 and the study of improvements in mechanical properties of the polymer nanocomposites were attempted. Attempts were being made to use this material for making tennis racket frame. The tennis racket frame requires high stiffness, high impact strength, high tensile, flexural modulus, stiffness and less in weight. The racket 3D modeling was performed by using PRO/ENGINEER software. The 3D racket model can be export to ANSYS analysis software and structural analysis of the racket, especially the impact of tennis ball with string bed of the racket frame was performed.

2. Experimental

2.1. Materials and blend preparation

The Nylon 6,6 used in this study was obtained from DuPont India Pvt Ltd., under the trade name of Zytel 101L™. Nylon 6,6 has a melt flow index value of 11 g/10 min (275°C@ 0.325 kg) and melts at a temperature range between 260°C to 270°C. The Multiwall Carbon Nanotubes (MWNTs) were obtained from Sunnano, China with the purity of >95%, residue (after calculated) <5%, diameter of the MWNT being 10-30 nm. Prior to blending, Nylon 6,6 and Multiwall Carbon Nanotubes were dried at 80°C in an oven for 12 hrs. Four ratios of polymer nanocomposites 0.15 wt% MWNT, 0.30 wt% MWNT, 0.45 wt% MWNT, and 0.60 wt% MWNT with Nylon 6,6, polymer nanocomposites were prepared by using Twin Screw Extruder Bersforft, FRG (L/D= 30, L=1 m) in the temperature range of 250-285°C and at a screw speed of 150 rpm.

2.2. Manufacturing of nanocomposite and preparation of sample

After preparation of blend materials with various four ratios of polymer nanocomposite, was ready for synthesizing. Using Twin Screw Extruder starts the synthesis of each composition. Five heaters will set temperatures between 220°C and 285°C while constant temperature is maintained during the melting. Through the nozzle, the wire was drawn via water pool so that wire loses it is heat and starts cooling and the wire was cut into small granules. Using Injection moulding machine ,WINDSOR 130 Ton, India specimens of Virgin nylon 6,6 and Nylon 6,6/MWNT are prepared with of Tensile strength (ASTM D638), Flexural strength (ASTM D790), Impact strength (ASTM D256) and Hardness strength (ASTM D2240) as per ASTM standards.

2.3. Mechanical testing

Specimens of Virgin nylon 6,6 and Nylon 6,6/MWNT were subjected to tensile test carried out as per ASTM D638 using Universal testing machine (UTM) Shimadzu Autograph (model AG 50kN ISD MS), Japan. A cross head speed of 50 mm/min and gauge length of 50 mm was used for carrying out the test. Specimens of virgin nylon 6,6 and Nylon 6,6/ MWNT were taken for flexural test under three points bending using the same universal testing machine (UTM) with ASTM D790 at a cross head speed of 1.3 mm/min and a span length of 50 mm. The Izod impact strength was determined with Tinius Olsen impact testing machine with specimen using notch cutter, cutting the specimen into 2.54 mm notch length, 45° notch angle at centre as per ASTM D 256. Hardness testing with the help of Duro hardness (Shore-D) with standard specimen ASTM D2240 was done. The test results were obtained by taking the average of five readings for each composition. For analyzing the mechanical properties test specimens were initially conditioned at 23+1°C and 55+2% RH. Five replicate specimens were used for each test and the data reported were the average of five tests. Corresponding standard deviations along with measurement uncertainty values for the experimental data showing the maximum standard deviation were also included.

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3. Results and Discussion

3.1. Measurement and mechanical characterization

The Nylon 6,6 and Nylon 6,6/ MWNT nanocomposite with various ratios of MWNT like 0.15 wt%, 0.3 wt%, 0.45 wt% and 0.6 wt% were prepared. The Tensile strength, Flexural strength, Tensile strength and Flexural modulus of the nanocomposite increased with compared Virgin nylon 6,6. In that nanocomposite up to 0.6wt% multiwall carbon nanotube significant improvement of mechanical properties occurs. Fig. 1 (a), (b), (c) shows the values. The tensile modulus of the nanocomposite increases the value up to 0.45 wt% MWNT and then starts to reduce [13-16]. The average tensile strength, flexural strength and flexural modulus for 0.6 wt% structures are approximately 51%, 40%, and 69% respectively and are those of greater than virgin nylon 6,6. Peak value of tensile strength is 149.4 MPa, with flexural strength being 195.4 MPa and flexural modulus being 9951MPa. The average tensile modulus for 0.45 wt% structures is approximately 74% greater than virgin nylon 6,6. Peak value of tensile modulus is 11952 MPa .Impact strength and hardness 0.3 wt% structures are approximately 25% & 4% respectively and are greater than virgin nylon 6,6. The average stiffness value increases up to 3 times greater than the virgin nylon 6,6 and the peak value is 3582 N/mm. The average toughness optimized peak value is 17200 J/m^2. A slow decrease occurs with 0.6w% of tensile modulus dropping to 11233 MPa and 11258 MPa. But tensile strength, flexural strength and flexural modulus keep increasing MWNTs up to 0.6 wt% [17, 18].

3.2. Essential mechanical properties of tennis racket frame

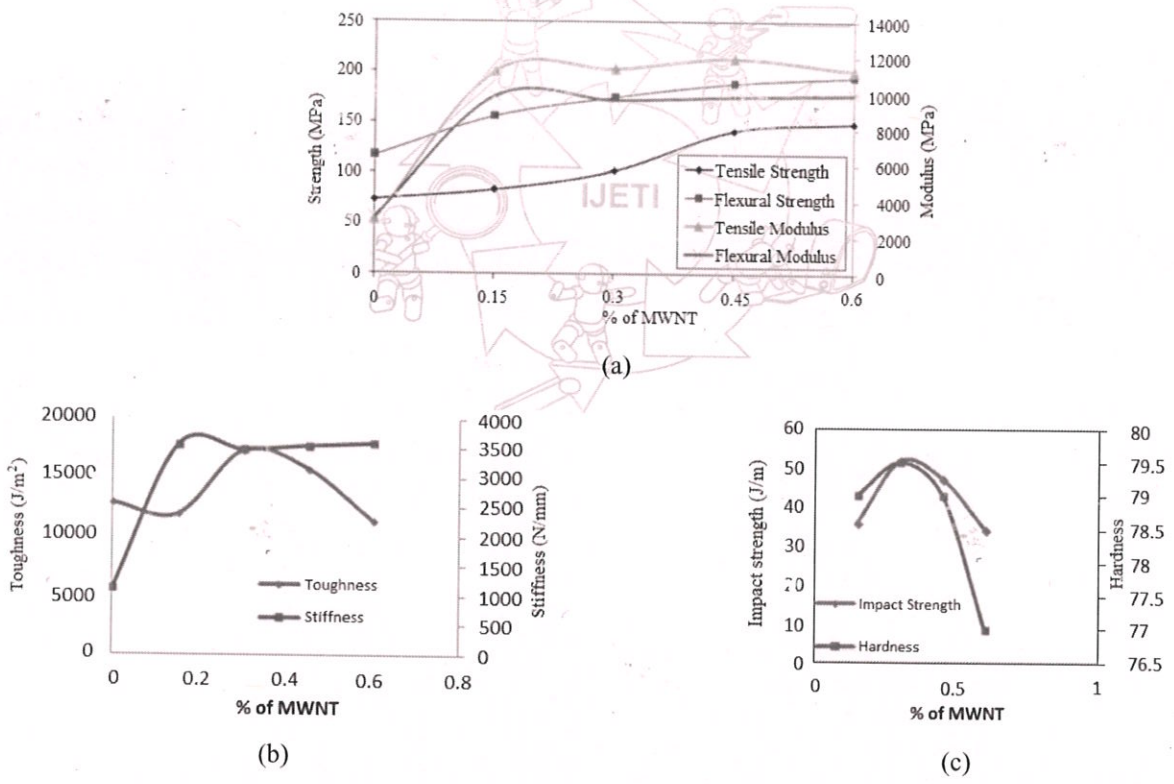

Fig. 1 (a) Strength & modulus (b) Impact & hardness (c) Stiffness Vs toughness Vs% of MWNT

In the mechanical testing, tested and calculated the mechanical tensile strength, tensile modulus, flexural strength, flexural modulus, impact strength, Hardness, stiffness and toughness. All the properties are important but stiffness and impact strength is very important for functional tennis racket frame. When the ball hits on the tennis racket and returns the ball from the tennis racket, it required stiffness and impact strength. So the work involves the improvement of these properties at the same time rest of the properties optimized.

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4. Design of the Tennis Racket

Specification: Head Ti 4700 Tennis racket. A racket design tries to find an ideal balance of playing characteristics. When a tennis racket is designed, some compromises must be accepted: power vs. control, comfort vs. feel, light weight/maneuverability vs. solid shot response and stability [1, 19]. Design of the tennis racket was focused on many items, such as: racket size (dimensions– length, width, and thickness), size and shape of the racket head, size and shape of the racket handle, frame and string materials, weight, centre of mass and inertial characteristics, etc. The racket design is performed using PRO/ENGINEER software suite multiplatform, one of the most used integrated CAD/CAM/CAE systems. PRO/ENGINEER offers one of the world's leading parametric solid modeling packages. Tennis racket designed was thought to be composed of two main components: racket frame and strings. All parts go through the same stages of design. Design stages used commands. As the first result, a sketch of the racket frame was obtained, using the Extrude-Swept Blend-Curve-Sweep. Next were realized holes into the racket frame for string fixing. There were used Hole command for the first hole and Pattern command to multiply the created hole. Racket frame is ellipse section. The holes made in the racket frame have diameter of 2 mm, string diameter is 1.3 mm and they are arranged on the racket frame periphery at 19 mm distance vertically and 16 mm horizontally. Using the software facilities, the mass centre was determined [20]. The figure 2 shows 3D model of the tennis racket.

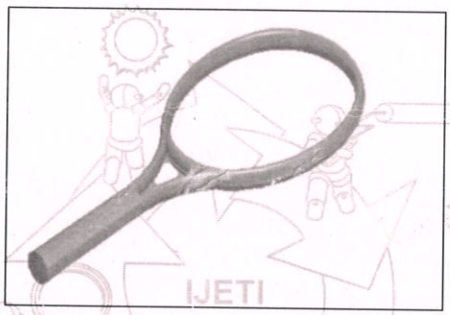

Fig. 2 3D model of the tennis racket

5. Analysis of Tennis Racket

The racket model can be imported in finite element analysis software ANSYS 10.0 in order to simulate and analyze the mechanical characteristic of the racket, especially the impact between tennis ball and string bed of the racket and modal analyses were performed with the flexible racket models under different boundary conditions. Newer polymer nanocomposites material properties were taken for analyzing the tennis frame [21, 22].

6. Finite Element Analysis of Tennis Racket

6.1. Structural analysis

Using SOLID186 is a higher order 3-D 20-node solid element of meshing the tennis racket 3D model for structural analysis. It is well suited to modeling irregular meshes (such as those produced by various CAD/CAM systems). The model will be constrained at the handle location in all DOFs. A pressure distribution of -1MPa along the inside edge of the ellipsoidal face will be applied to simulate the racket strings 32 forces of magnitude (32x 15.625 N –z direction) will be distributed over the head of the racket frame to represent the string-distributed forces on the racket frame as impact force 500 N (distributes 32 forces= 500/32=15.625 N). The first load case with only pressure distribution applied and Simulate. Second load case with both pressure and force applied and simulate. Both the cases, pressure distribution and pressure distribution with load applied plot analysis results of 0.45 wt% MWNT and 0.6 wt% MWNT. Actual volume of the tennis racket 668.228 mm^3 and mass of the nylon 6,6 racket frame is 715 grams and mass of the nanocomposite tennis racket frame 742 grams.

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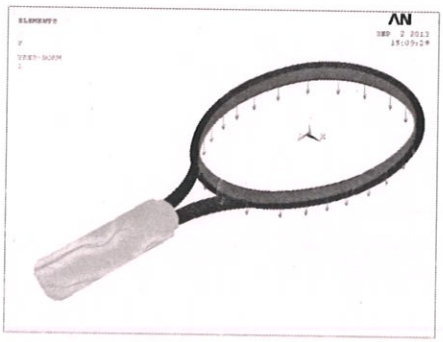
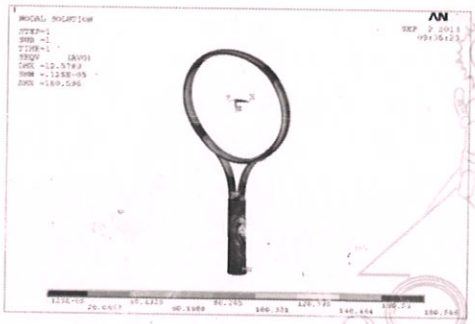
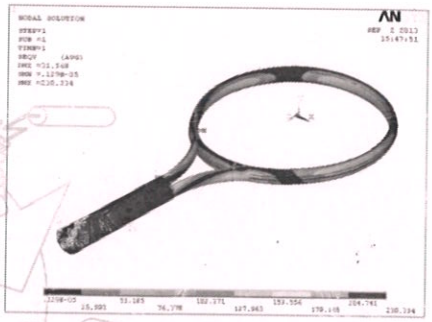
The details report of the stress analysis of the tennis racket frame structural. In the finite element analysis given the load and pressure distribution on the racket frames and plots the graphs and recorded the stress values. Nanocomposite 0.45 wt% MWNT tennis racket frame having betterment stress value is 230 MPa and moderate deflection value. The 0.45 wt% MWNT having better strength, modulus, and impact and moderate stress value suits for making a wide range tennis racket frame and also use other sport equipments golf bat, ho-ckey stick etc., Fig. 3 (a) - (e) show the stress and deflection of nanocomposite.



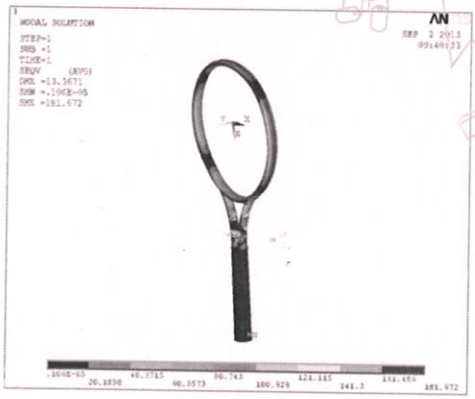
(a) Boundary conditions 32x15.625N–z direction



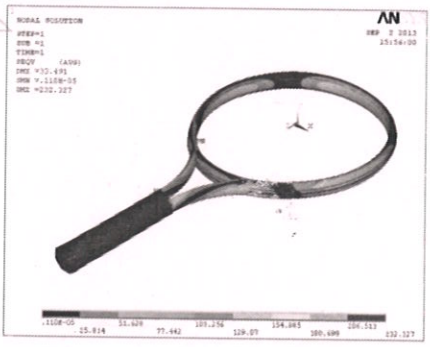
(b) 0.45 wt% MWNT force-stress



(c) 0.45 wt% MWNT Pressure & force-stress



(d) 0.6 wt% MWNT pressure-stress



(e) 0.6 wt% MWNT pressure & force-stress

Fig. 3 boundary conditions & stress values of nanocomposites

6.2. *Modal analysis*

The vibration characteristics (natural frequencies and mode shapes) of a tennis racket structure was analysis used the modal analysis. Modal analysis in the ANSYS, Inc. family of products is a linear analysis, any nonlinearity, such as plasticity and contact (gap) elements, are ignored even if they are defined. The natural frequencies and mode shapes are important parameters in the design of a structure for dynamic loading conditions. It can also serve as a starting point for another, more detailed, dynamic analysis, such as a transient dynamic analysis, a harmonic response analysis, or a spectrum analysis.

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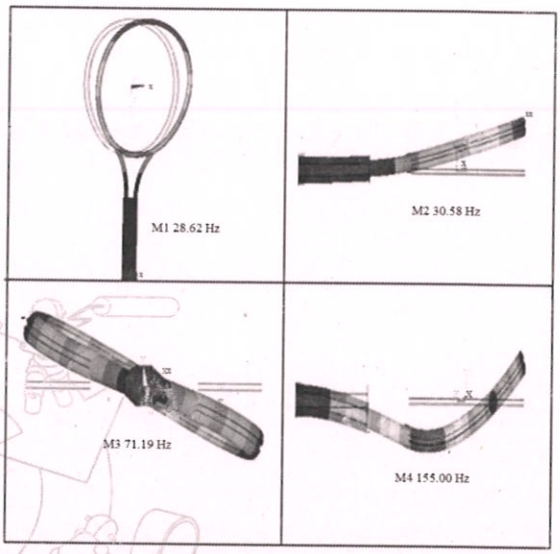
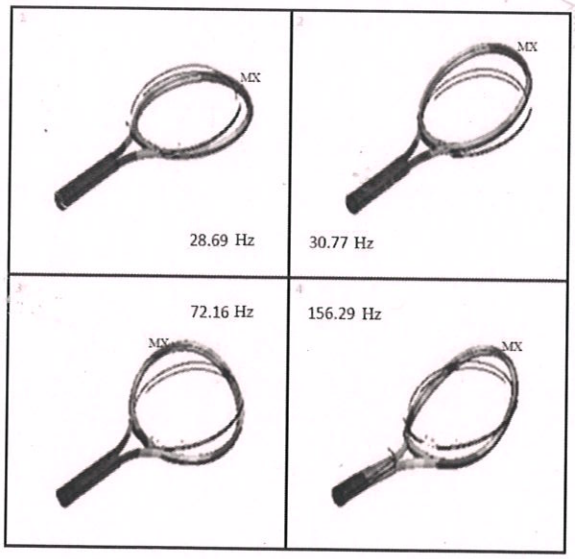
(a)



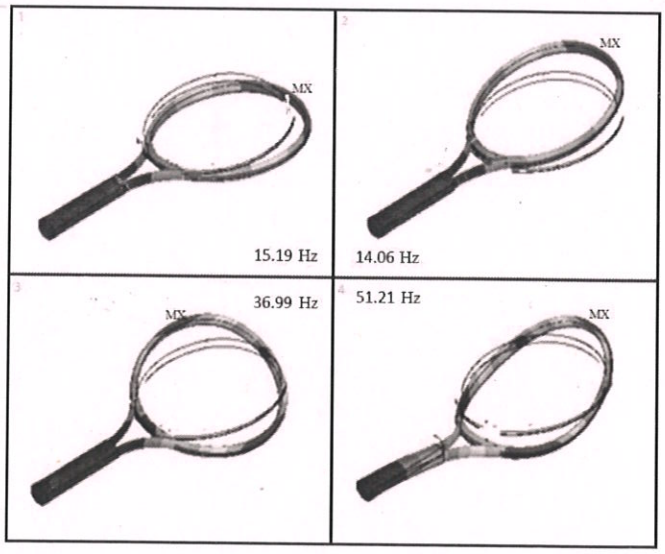
(b)



(c)



(d)



(e)

Fig. 4 Four modes (a) 0.6 wt% MWNT (b) 0.45 wt% MWNT (c) 0.15 wt% MWNT (d) 0.3 wt% MWNT (e) Nylon 6,6

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The analysis type and options apply loads, specify load step options, and begin the finite element solution for the natural frequencies, select from among several mode-extraction methods: Block Lanczos, Supernode, PCG Lanczos, reduced, unsymmetrical, damped, and QR damped. The damped and QR damped methods allow you to include damping in the structure. The QR damped method also allows for unsymmetrical damping and stiffness matrices.

Build the model for a modal analysis was chosen 3-D Structural Solid-Solid 45 element used and meshed after that applied Loads, Obtained the Solution and applied boundary conditions and solved. Vibration analysis was done for four ratios of the polymer nanocomposites. Among 0.45 wt% MWNT and 0.6 w% MWNT polymer nanocomposite show the optimize natural frequency with other mechanical properties. The figure 4(a), (b) show four various modes of 0.45 wt% MWNT and 0.6 wt% MWNT polymer nanocomposite. The natural frequency in Hz listed of the various four modes of four ratio's of nanocomposites in the table 1.

Table 1 Natural frequency of various modes of nanocomposite

Modes/Polymer Nanocomposite	1 in Hz	2 in Hz	3 in Hz	4 in Hz
Nylon 6,6	15.19	16.06	39.99	51.21
0.15 wt% MWNT	28.623	30.576	71.193	155.00
0.30 wt% MWNT	28.690	30.774	72.157	156.29
0.45 wt% MWNT	29.381	31.574	74.300	160.50
0.60 wt% MWNT	28.498	30.651	72.263	155.88

0.45 wt% MWNT polymer nanocomposites show optimize natural frequency fourth mode 160.50 Hz for tennis racket frame and of various playing conditions, it was absorbed and reduced the vibration transverse to the through player hands through tennis racket handle [23].

7. Conclusions

The new polymer nanocomposite four ratio's of nylon 6,6/MWNT was manufactured and tested properties. 0.45 wt% MWNT polymer nanocomposite produced the best optimized results. It shown optimized strength, modulus both (tensile and flexural). The stiffness, impact value was increased, so the 0.45 wt% MWNT nanocomposite improved properties than existing composite materials. The tennis racket 3D model incorporated 0.45 wt% MWNT polymer nanocomposite properties and structural, modal analysis was done. It was shown the best stress value and it was improved better performance of the tennis racket. The natural frequency in Hz of the tennis racket of various four modes was done and shown best natural frequency. The polymer nanocomposite improved stiffness, less in weight and stored vibration & shock. Less amount shock transverse to the racket handle, so it was replaced existing composite materials to tennis racket frame.

Acknowledgements

The author thanks the Central Institute of Plastics Engineering and Technology, Chennai division, India, for helping in synthesizing the polymer nanocomposites and the Centre for Nano Science and Nanotechnology, University of Madras, Chennai for morphology testing. The author also thanks the Department of Sports Technology, Tamil Nadu Physical Education and Sports University, Chennai. , given the various technological input about tennis racket.

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3.4.5-J- EPN – 2014-15

Vol 5 Issue 5 June 2015

ISSN No : 2230-7850

International Multidisciplinary Research Journal

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Indian Streams Research Journal
ISSN 2230-7850 Impact Factor : 3.1560(UIF)
Volume - 5 | Issue - 5 | June - 2015 Available online at www.isrj.org

COMPARATIVE EFFECT OF AEROBICS AND RESISTANCE EXERCISES ON SELECTED PHYSIOLOGICAL VARIABLES AMONG OBESE CHILDREN



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ABSTRACT:

The aim of this study was to find out the comparative effects of aerobics and resistance exercises on selected physiological variables among obese children. To achieve the purpose, 60 Obese children, whose BMI was greater than 30 kg/m2 were randomly selected and assigned into three groups, aerobics exercises group (AEG), resistance training group (RTG) and Control group (CG) consisting of 20 in each. After assessing physiological variables, forced vital capacity and resting heart rate initially, the experimental groups underwent respective treatments for 12 weeks. After the completion of 12 weeks experimental period, all the subjects were measured of their selected variables. The results proved that aerobic exercise improved forced vital capacity of obese children 470.00 ml, resistance training improved 260.00 and control group 75.00, comparing to initial and final scores; aerobic exercises stabilized resting heart rate 6.2 and resistance training stabilized 3.15 beats per minutes and the control group, there was a slight increase of 0.30. The differences were found significant $P < 0.05$. The comparisons proved that aerobic exercise was significantly better than resistance exercise group in improving forced vital capacity and resistance training failed to stabilize resting heart rate significantly. Thus, it was concluded that obese children may use aerobic exercises than resistance training to

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improve their physiological levels, forced vital capacity and resting heart rate.

KEYWORDS

Aerobic Exercise, Resistance Training, Forced Vital Capacity, Resting Pulse Rate

INTRODUCTION :

Childhood inactivity is linked to obesity with more children being overweight at younger ages. Physical inactivity of children has been shown to be a serious cause for child obesity, and children who fail to engage in regular physical activity are at greater risk of obesity. Researchers studied the physical activity of 133 children over a three-week period using an accelerometer to measure each child's level of physical activity. They discovered the obese children were 35% less active on school days and 65% less active on weekends compared to non-obese children. Physical inactivity as a child could result in physical inactivity as an adult. In a fitness survey of 6,000 adults, researchers discovered that 25% of those who were considered active at ages 14 to 19 were also active adults, compared to 2% of those who were inactive at ages 14 to 19, who were now said to be active adults. (Ortega FB et.al. 2007) Staying physically inactive leaves unused energy in the body, most of which is stored as fat. Researchers studied 16 men over a 14 day period and fed them 50% more of their energy required every day through fats and carbohydrates. They discovered that carbohydrate overfeeding produced 75–85% excess energy being stored as body fat and fat overfeeding produced 90–95% storage of excess energy as body fat (Horton TJ, et.al, 1995). In a 2009 preschool study 89% of a preschoolers' day was found to be sedentary while the same study also found that even when outside, 56 percent of activities were still sedentary.

The Centers for Disease Control and Prevention (2011) reported that obese children and adolescents are more likely to become obese as adults. For example, one study found that approximately 80% of children who were overweight at aged 10–15 years were obese adults at age 25 years. It was also found that 25% of obese adults were overweight as children. They also found that if overweight begins before 8 years of age, obesity in adulthood is likely to be more severe.

In India despite there being more undernourished children than in any other country, we also have millions of obese and overweight urban schoolchildren. And experts say these obese children will one day face severe medical consequences. Compared to children of normal weight, obese ones face several times the risk for developing high blood pressure, respiratory complications, Type-2 diabetes, cardiovascular disease and much reduced life-spans. Thus, child obesity has become one of the most serious public health challenges of the 21st century. Researches conducted at 11 affluent urban schools from five zones across India found 18.2 percent of all kids aged two to 17 to be overweight or obese as per international standards. "During the past three decades, obesity rates have doubled for preschool-age children and adolescents and tripled for school-going children aged 6 to 11 years," maintains Dr Rekha Harish, professor and head of pediatrics at Government Medical College, Jammu, who is also national convener of the Indian Academy of Paediatrics' task force for the prevention of childhood obesity. "Overweight children have a 70 percent chance of being an overweight or obese adult, by which time it may be too late to intervene. Childhood obesity's enormously-growing rate needs urgent attention if its potential toll on morbidity, mortality, and the economy is to be avoided."(Sivani Maharishi, 2014)

One of the strongest is the link with type 2 diabetes. Excess body fat underlies 64% of cases of diabetes in men and 77% of cases in women. Thus, researches have proved that life style modification consisting of exercise and diet restrictions could contribute for managing childhood obesity. Faria AG et al. (2014) investigated the pulmonary response to exercise of non-morbidly obese adolescents considering the gender. The results presented proved that blood pressure and heart rate were higher in obese individuals during the exercise test ($p = 0.0001$). Obese males had higher levels of maximum inspiratory and expiratory pressures ($p = 0.0002$) Obese males showed lower values of maximum voluntary ventilation, forced vital capacity, and forced expiratory volume in the first second when compared to eutrophic males, before and after exercise ($p = 0.0005$). Obese females had greater inspiratory capacity compared to eutrophic females ($p = 0.0001$). Expiratory reserve volume was lower in obese subjects when compared to controls ($p \leq 0,05$). Obese adolescents presented changes in pulmonary function at rest and these changes remained present during exercise. The spirometric and cardiorespiratory values were different in the four study groups. The present data demonstrated that, in spite of differences in lung growth, the model of fat distribution alters pulmonary function differently in obese female and male adolescents. Alberga AS et al. (2013) assessed the effects of resistance exercise training on body composition and muscular strength in obese prepubertal children and found Resistance training increases leg lean mass and leg strength in obese prepubertal youth and may have a positive effect on overall physical activity and health. There are number of similar studies that prescribe suitable exercise modulations for different groups of people, such as adult men, women, players, professionals etcetera there are dearth of studies to high light how different types of exercises, namely, aerobic and resistance exercises contribute for selected physiological variables, vital capacity and resting heart rate, which are considered as important variables for cardiorespiratory fitness of obese children. Hence, this research was undertaken.

METHODOLOGY

Sixty obese children were selected from different schools in Chennai. They were in the age group of 12 – 15 years. For the purpose of this study, children with 30kg/m2 and above of Body Mass Index is considered as obese men. The study was formulated as a true random group design consisting of a pre-test and post test. The subjects (N=60) were randomly assigned to three equal groups of twenty children each. The groups were assigned as experimental group I – (aerobic exercises), Experimental Group II (resistance training) and control group respectively. Pre tests were conducted for all the 60 subjects on selected physiological variables forced vital capacity and resting heart rate. The subjects were provided with 10 aerobic exercises with progressive intensities for aerobic exercise group and 8 types of resistance exercises with progressive intensities for resistance training group. After the experimental period of twelve weeks post test were conducted and the scores were recorded. The differences between the initial and final scores were considered as the effect of respective training on selected variables. The obtained data were statistically analysed using ANCOVA.

RESULTS

Tab I: Effects of Aerobics and Resistance Exercises on Selected Physiological Variables among Obese Children

FORCED VITAL CAPACITY (Scores in ml)								
	AEG	R T G	CG	S V	SS	df	MS	Obtained F
Pre Test Mean	2337.50	2355.00	2435.00	Between	108083.33	2	54041.67	
				Within	8629375.00	57	151392.54	0.36
Post Test Mean	2807.50	2615.00	2510.00	Between	910583.33	2	455291.67	
				Within	7324875.00	57	128506.58	3.54*
Adjusted Post Test Mean	2839.09	2632.17	2461.24	Between	1417066.51	2	708533.26	
				Within	1465291.51	56	26165.92	27.08*
Mean Diff	470.00	260.00	75.00					
RESTING HEART RATE (Scores in beats per minute)								
Pre Test Mean	71.00	70.60	69.45	Between	25.90	2	12.95	
				Within	2301.75	57	40.38	0.32
Post Test Mean	64.80	67.45	69.75	Between	245.43	2	122.72	
				Within	1551.90	57	27.23	4.51*
Adjusted Post Test Mean	64.43	67.31	70.26	Between	336.54	2	168.27	
				Within	807.65	56	14.42	11.67*
Mean Diff	-6.20	-3.15	0.30					

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56(df) =3.16 .

The results presented in Table I proved that there was a significant difference due to aerobic exercises and resistance training on forced vital capacity and resting heart rate as the obtained F values 27.08 and 11.67 as the obtained F values were greater than the required F value of 3.16 to be significant at 0.05 level. Since significant results were obtained multiple comparisons of adjusted means on Forced Vital Capacity and Resting Heart Rate comparing the effects of aerobic exercises and resistance training were presented in Table II.

Tab II : Multiple Comparison of Paired Adjusted Means of Selected Physiological Variables due to Aerobic exercises and Resistance Training

FORCED VITAL CAPACITY				
ADJUSTED MEANS			Mean Difference	Required . C I
Aerobic Exercises Group	Resistance Training Group	Control Group		
2839.09	2632.17		206.92*	128.60
2839.09		2461.24	377.84*	128.60
	2632.17	2461.24	170.92*	128.60
RESTING HEART RATE				
64.43	67.31		2.88	3.02
64.43		70.26	5.83*	3.02
	67.31	70.26	2.95	3.02

* Significant at 0.05 level.

DISCUSSIONS

The results presented in Table I proved that while aerobic exercise improved vital capacity of obese children 470.00 ml, resistance training improved 260.00 and control group 75.00, comparing to initial and final scores. The ANCOVA results proved that these differences were significant at 0.05 level. The comparison of effects of aerobic exercises and resistance training (Table II) proved that while both the experimental protocols significantly improved forced vital capacity of the obese children, it was found that aerobic exercises was significantly better than resistance training. Similarly aerobic exercises stabilized resting heart rate 6.2 and resistance training stabilized 3.15 beats per minutes and the control group, there was a slight increase of 0.30. These differences were found to be significant at 0.05 level. The comparison of effects of aerobic exercises and resistance training among obese children proved that aerobic exercises significantly reduced resting heart rate. Though there was improvement due to resistance training, this was not significant at 0.05 level. The comparisons proved that to improve selected physiological variables, forced vital capacity and resting heart rate, aerobic exercises was significantly better than resistance training. The findings of this study are in agreement with the findings of Faria AG et al. (2014) who found the pulmonary response proved that blood pressure and heart rate were higher in obese individuals during the exercise test (p = 0.0001). Obese adolescents

presented changes in pulmonary function at rest and these changes remained present during exercise and demonstrated that, in spite of differences in lung growth, the model of fat distribution alters pulmonary function differently in obese female and male adolescents.

CONCLUSIONS

It was concluded that obese children may use aerobic exercises than resistance training to improve their physiological levels, forced vital capacity and resting heart rate.

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3.4.5- J- EPN- 2014-15 Original Article

ISSN: 2349 - 4891

International
Journal of Recent Research and Applied Studies
(Multidisciplinary Open Access Refereed e-journal)

Effect of Suryanamaskar Practices Compared with Physical Exercises on Selected Biochemical Parameters of College Women

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Received 29th November 2014, Accepted 1st February 2015

Abstract

To attain healthy population, college campuses serve as crucial settings to overcome perceived barriers to healthy diet and exercise habits, and implement effective interventions. The aim of this study was to find out the effect of suryanamaskar practices and physical exercises on selected biochemical parameters of college women. 60 college women studying in Arul Anandar College in Madurai District were selected randomly and divided into three groups consisting of 20 in each. Group I underwent physical exercises (PEG), group II underwent suryanamaskar practices (SNG) and group III was kept as control group. The physical exercises (PEG) group was provided with different types of physical exercises, consisting of walking, jogging, floor aerobic exercises and step aerobic exercises for 12 weeks and suryanamaskar practices (SNG) group underwent, slow, medium and fast variations of suryanamaskar. Venous blood samples (10 ml) were collected from the forearm vein after overnight fasting both prior to and immediately after the experimental treatments from all the three groups' subjects. From the blood samples biochemical variables, fasting blood sugar and total cholesterol were obtained. The results of this study proved that both the experimental protocols significantly contributed for fasting blood sugar and total cholesterol of the college women. Even though it was found that suryanamaskar practices (SNG) group was found to be better than physical exercises (PEG), the difference between the experimental groups was not significant at 0.05 level. It was concluded that the findings of this study can be used by future researchers as status reporting on selected biochemical parameters among college women and the beneficial effects of physical exercise and suryanamsakar for the all round development of their health.

Keywords: Physical Exercise, Surya Namaskar, Fasting Blood Sugar, Total Cholesterol.

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Introduction

The adage of healthy body, healthy mind is especially relevant to college students. Getting good grades, focusing in class and balancing a busy schedule may be easier if they maintain a healthy lifestyle. By making small changes in the diet and activity level, they can reap big benefits in their overall health. Most college students may not achieve the nutrition and exercise guidelines designed to reduce the risk of chronic disease, typically consuming diets high in fat, sodium, and sugar and low in fruits and vegetables which resulted in imbalance in their biochemical parameters. Therefore, to attain healthy population, college campuses serve as crucial settings to overcome perceived barriers to healthy diet and exercise habits, and implement effective interventions. Ideally, if college students make positive changes in exercise and dietary habits, these changes could persist into adult years. The health benefits of exercise are well documented. Working out on a regular basis is not just a great way to stay in shape, it also enables the body to produce natural chemicals called endorphins that help feel happier, and may also make it easier to focus on the studies. However, making the commitment to go to the gym on a regular basis can be a struggle. Fitness scientists, physical educationists, administrators are giving more concentration to evolve suitable solutions and make the students, especially the college women students to undergo regular physical exercises and asanas as they are simple in nature. To high light the advantages of physical exercises and Suryanamaskar on their biochemical parameters this study was undertaken.Asanas have evolved over the centuries so as to exercise every muscle, nerve and gland in the body. Asanas balance the respiratory, circulatory, nervous, hormonal, digestive excretory and reproductive systems perfectly. The equilibrium in the body then bring mental peace and enhances intellectual clarity (Iyengar, 2001). Asana are one of the major tools of Yoga. Asana brings steadiness, health and lightness of limb. A steady and pleasant posture produces mental equilibrium and prevents fickleness of mind. Asanas are not merely gymnastic exercises, they are postures. The limbs of the body provide the necessary weights and counter–weights. By practicing them one develops agility,

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ISSN: 2349 – 4891

balance, endurance, co-ordination and great vitality. It secures a fine physical structure, which is strong and flexible without being muscle-bound and helps to keep the body free from diseases. Asanas reduce fatigue and soothe the nerves, boosts metabolism, lymphatic circulation, hormonal secretion, and bring about chemical balance in the body (Iyengar, 2001). There are three stages to each asana, viz. coming into the pose, holding it, and coming out of the pose and those steps should be performed as one continuous movement upto the final position (Rabinovitch et.al., 1983) .

Surya Namaskara or Sun Salutation is a common sequence of Hatha yoga asanas. This sequence of movements and poses can be practised on varying levels of awareness, ranging from that of physical exercise in various styles, to a complete sadhan, which incorporates asana, pranayama, mantra and chakra meditation. The physical base of the practice links together twelve asanas in a dynamically performed series. These asanas are ordered so that they alternately stretch the spine backwards and forwards (Iyengar, 2001). When performed in the usual way, each asana is moved into with alternate inhalation and exhalation (except for the sixth asana where the breath is held in external suspension). A full round of Surya namaskara is considered to be two sets of the twelve poses with a change in the second set to moving the opposite leg first through the series. Proponents of the use of Surya namaskara as pa t of the modern yoga tradition prefer to perform it at sunrise, which the orthodox consider to be the most 'spiritually favourable' time of the day. Surya Namaskar provides all of the key health benefits of yoga in a very succinct package. It is a holistic exercise that provides physical health benefits, but also mental or emotional as well as spiritual benefits. The obvious advantage of Surya Namaskar is the workout it provides for the muscles, but it also benefits joints, ligaments and the skeletal system by improving posture, flexibility and balance. In addition to these physical benefits, Surya Namaskar practice stimulates and conditions virtually every system in the body. It is good for the heart and stimulates the cardiovascular system. It oxygenates the blood and helps strengthen the heart. Surya Namaskar is good for the digestive system and the nervous system. It stimulates the lymphatic system and supports respiratory system health, as well (Rabinovitch et al., 1983).

Physical exercises improves intake of oxygen. Oxygen is transported to muscles primarily by haemoglobin (Suhr, Porten, and Hertrich, et al. (2009) . During aerobic exercise, the demand for oxygen increases at the working muscle; so an optimum level of hemoglobin is required to perform at the highest level with high intensity. Urea and uric acid accumulation is most frequently used as a measure of protein catabolism and degradation of adenonucleotides (Heitkamp, Wegler and Brehme, et al (2008) . Lipids have important beneficial biological functions. These include usage of triglycerides for energy production, fat storage in adipose tissues, and usage of cholesterol as a component in phospholipids of cellular membranes or in the synthesis of steroid hormones (Kelley and Kelley, 2009). Elevated plasma cholesterol concentrations have been implicated in the development of coronary artery disease (CAD) (Halverstadt, Phares and Wilund, et al. (2007). Regular monitoring of these biochemical variables of college women can provide valuable information about their health, metabolic and cardiovascular status. In this study, the investigator selected two biochemical variables, namely, blood cholesterol and blood sugar (fasting) to find out the effect of physical exercises on them.

Kim, (2014) investigated the effects of yogic exercises on life stress and blood glucose levels in nursing students on twenty-seven undergraduate nursing students and gave yogic exercises intervention was undertaken for 60 minutes one day a week for 12 weeks. It consisted of physical exercise (surya namaskara) combined with relaxation and meditation (shavasana and yoga nidra). It was found yogic exercise group measurements were significantly decreased in both life stress and postprandial blood glucose levels compared with the control group. McDermott, et al. (2014) found significant reductions in systolic and diastolic blood pressure, total cholesterol among diabetes due to yogic practices while there were no significant differences in fasting blood glucose. Thus, the theoretical foundations laid proved that there were number of studies to find out the effect of yogic practices on biochemical variables, blood sugar and blood cholesterol and there were contradictory findings whether suryanamaskar can be practiced for improving selected biochemical variables among college women. Hence this study was undertaken to find out whether physical exercises or suryanamsakar could significantly contribute for beneficially altering fasting blood sugar and blood cholesterol.

Methodology

For the purpose of the study 60 college women studying in Arul Anandar College in Madurai District were selected randomly. They were divided into three groups consisting of 20 in each. Group I underwent physical exercises (PEG), group II underwent suryanamaskar practices (SNG) and group III was kept as control group. The physical exercises (PEG) group was provided with different types of physical exercises, consisting of walking, jogging, floor aerobic exercises and step aerobic exercises for 12 weeks and suryanamaskar practices (SNG) group underwent, slow, medium and fast variations of suryanamaskar. The base level biochemical variables selected, namely, fasting blood sugar and blood cholesterol were measured prior to experimental treatments. After experimental treatments to physical exercises (PEG) and suryanamaskar practices (SNG) groups for 12 weeks, post test scores were collected. Venous blood samples (10 ml) were collected from the forearm vein after overnight fasting. Samples were centrifuged to separate serum at 3000 *g* for 15 min, and serum samples were stored at −80°C until blood biochemistry analysis. The obtained data were subjected to statistical analysis using

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ANCOVA to test the significance. In all cases 0.05 level was fixed to test the hypothesis.

Analysis of Data

Analysis of covariance was applied to determine whether the training programmes produced significant changes in Fasting Blood Sugar and Total Cholesterol among Physical Exercises Group, Suryanamaskar Group and control group. The analysis is presented in the following tables.

Results

Table I. Influence on Fasting Blood Sugar due to Physical Exercises and Suryanamaskar

	PEG	SNG	CG	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	76.55	77.30	78.35	Between	32.7	2	16.35	1.88
				Within	495.7	57	8.69	
Post Test Mean	70.70	72.75	77.90	Between	550.43	2	275.22	28.64*
				Within	547.75	57	9.61	
Adjusted Post Test Mean	71.42	72.83	77.09	Between	327.18	2	163.59	48.82*
				Within	187.64	56	3.35	
Mean Diff	5.85	4.55	0.45					

PEG: Physical Exercise Group; SNG: Suryanamaskar Group; CG: Control Group
Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.
*Significant

Table II. Multiple Comparisons of Adjusted Means on Fasting Blood Sugar

PEG	SNG	CG	Mean Difference	Reqd. C.I
71.42	72.84	-	1.41	1.47
71.42	-	77.09	5.67*	1.47
	72.84	77.09	4.26*	1.47

* Significant at 0.05 level.

Table III. Influence on Total Cholesterol due to Physical Exercises and Suryanamaskar

	PEG	SNG	CG	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	173.45	168.2	171.25	Between	278.03	2	139.02	1.25
				Within	6333.9	57	111.12	
Post Test Mean	166.80	161.80	170.9	Between	830.8	2	415.4	3.53*
				Within	6710.2	57	117.72	
Adjusted Post Test Mean	164.54	164.32	170.64	Between	514.94	2	257.47	9.79*
				Within	1471.92	56	26.28	
Mean Diff	6.65	6.4	0.35					

PEG: Physical Exercise Group; SNG: Suryanamaskar Group; CG: Control Group
Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.
*Significant

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Table IV. Multiple Comparisons of Adjusted Means on Total Cholesterol

PEG	SNG	CG	Mean Difference	Reqd. C.I
164.54	164.32	-	0.23	4.12
164.54	-	170.64	6.10*	4.12
	164.32	170.64	6.33*	4.12

* Significant at 0.05 level.

Discussions on Results

Physical Exercise is considered an acceptable method for improving and maintaining health related fitness. A growing body of evidence supports the belief that yoga benefits physical and mental health. (Ross and, Thomas, 2010) With the recent rise in awareness and the increased understanding of the importance of physical activity in promoting overall health, greater emphasis has been placed on improving physical fitness to enhance quality of life. Surya Namaskar, a component of Hatha Yoga, has been practiced by Indians for hundreds of years and is often used in place of a typical fitness program. It consists of a series of postures (asanas) that are repeated 12 times per round. (Bhavesh, Surendra Mody, 2011). The results of this study proved that both the experimental protocols, namely, physical exercises and suryanamaskar practices significantly contributed for beneficially altering biochemical variables, total cholesterol and fasting blood sugar of the college women. Even though it was found that suryanamaskar practices (SNG) group was found to be better than physical exercises (PEG) on blood sugar, the difference between the experimental groups was not significant at 0.05 level (Table 2). The results presented in Table 3 proved that there was significant effect on biochemical variable, total cholesterol too among the college women as the obtained F value was greater than the required F value to be significant at 0.05 level. The multiple paired adjusted mean comparisons presented in Table 4 proved that both the experimental groups were able to significantly reduce total cholesterol of the college women. The mean differences between the treatment groups showed that suryanamaskar practices (SNG) was better than physical exercises (PEG). However, this difference was also not significant at 0.05 level. The findings of this study are in agreement with the findings of Kim, (2014) who found yogic exercise (consisting of suryanamaskar) group significantly decreased blood glucose levels compared with the control group and McDermott, et al. (2014) findings that significant reductions in total cholesterol.

Conclusions

It was concluded that the findings of this study can be used by future researchers as status reporting on selected biochemical parameters among college women and the beneficial effects of physical exercise and suryanamsakar for the all round development of their health.

Acknowledgements

Authors would like to thank Arul Anandar College, Madurai District, for providing assistance in collecting the relevant information for undertaking quality research. In addition I am very thankful to my guide the Dr.P.K.Senthilkumar, TNPESU, Chennai for such a great idea of research. I acknowledge the participants to maintain the regularity and punctuality in my study, without them this study was not possible.

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EFFECT OF MULTIGYM TRAINING ON SELECTED HEALTH RELATED FITNESS COMPONENTS AMONG ADULT MEN

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Abstract

The purpose of the study was to determine the effect of multigym training on selected health related fitness components among adult men. To achieve the purpose of the study, thirty adult men were selected from Chennai. The selected subject's age groups were ranging from 25 and 35 years. The subjects were randomly divided into two groups and each group consists of fifteen subjects. Group one acted as experimental group I and Group two acted as control group. The experimental group underwent their respective training programme namely multigym training for three days per week for a period of 6 weeks and control group underwent their routine work. The dependent variables were cardiorespiratory endurance, muscular strength, flexibility and body composition. The obtained pre and post data were statistically analyzed using ANCOVA. In all cases the level of significance fixed was 0.05. The results proved that there was a significant improvement due to 6 weeks multigym training on cardiorespiratory endurance, muscular strength, flexibility and body composition among adult men.

Key words: *Cardiorespiratory Endurance, Muscular Strength, Flexibility, Body Composition and Adult men.*

Introduction

Resistance training offers greater development of muscular strength, endurance, and mass. It also assists in the maintenance of basal metabolic rate promotes independence, and helps to prevent falls in the elderly **(Pratley, 1994)**. Resistance training is particularly beneficial for improving the function of most cardiac, frail, and elderly patients, who benefit substantially from both upper- and lower-body exercise **(Pollock, 1996)**. Resistance training can be beneficial in the prevention and management of other chronic conditions, eg, low back pain, osteoporosis, obesity and weight control, sarcopenia, diabetes mellitus, susceptibility to falls, and impaired physical function in frail and elderly persons, as well as in the prevention of and rehabilitation from orthopaedic injuries **(Lippincott Williams & Wilkins, 2000).** Resistance training can be accomplished with traditional free weights and dumbbells, weight machines, body weight, elastic tubing, medicine balls, or even common household products like milk jugs filled with sand or soup cans. The choice to incorporate a certain type of resistance depends on level of physical fitness, how familiar a person is with specific exercise movements, and individual goals **(Michael R. Esco, 2013).** In this regard, the purpose of this study was to investigate the effect of multigym training on selected health related fitness among adult men.

Methodology

To achieve the purpose of the study thirty adult men were randomly selected from Chennai district. The subject's age were ranged between 25-35 years. They were divided into two equal groups and each group contains fifteen subjects. Group one acted as

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experimental group and they underwent multigym training for a period of 6 weeks for three days per week and group two acted as control group. The dependent variables selected for this study were such as cardiorespiratory endurance, muscular strength, flexibility and body composition. The above selected variables were tested through cooper's 12 minutes run/walk test, push-ups, sit and reach test and skinfold caliper. Data were collected prior and immediately after experimental treatment. The collected data were statistically analyzed with analysis of covariance (ANCOVA). The level of confidence was fixed at 0.05 levels for all cases.

Training Programme

The exercise intervention was structured and supervised by the study investigators and certified experienced fitness trainers at "7 Fitness" centre, Chennai. Each of these sessions commenced and concluded with an 10-min warm-up or cool down and stretching period. Multigym training was perform with sensible resistance exercise for (Upper body: biceps curl, bench press, one arm bent row, pull over, shoulder press, incline press; Lower body: squat, step-up, lunges) major body muscles were conducted. During the first week, the exercises were performed with 50% of one repetition maximum (1RM) in 3 sets with 12-15 repetitions and a recovery period of 1-2 min. The intensity of the workout increased to 75% of 1RM in 3 sets with 8-10 repetitions during the six week. A work load chart as shown was prepared for each subject to monitor the multigym training program for six weeks experimental period.

TABLE I
MULTIGYM TRAINING SCHEDULE

S. No	Multigym Training	Week	I to II	III to IV	V to VI
		Intensity	50%	65%	75%
1	Dumb bell Squats	Sets	3	3	3
		Rep	12-15	12-15	8-10
2	Dumbbell Bench press	Sets	2	2	3
		Rep	12-15	12-15	8-10
3	Dumbbell One arm row	Sets	2	2	3
		Rep	12-15	12-15	8-10
4	Dumbbell Step-up	Sets	2	2	3
		Rep	12-15	12-15	8-10
5	Dumbbell Incline press	Sets	2	2	3
		Rep	12-15	12-15	8-10
6	Dumbbell Pull over	Sets	2	2	3
		Rep	12-15	12-15	8-10
7	Dumbbell Lunges	Sets	2	2	3
		Rep	12-15	12-15	8-10
8	Dumbbell Shoulder press	Sets	2	2	3
		Rep	12-15	12-15	8-10
9	Dumbbell Biceps Curl	Sets	2	2	3
		Rep	12-15	12-15	8-10
10	Abdominal crunch	Sets	2	2	3
		Rep	12-15	12-15	8-10

Results and Discussion

The analysis of covariance on selected health related fitness variables such as cardiorespiratory endurance, muscular strength, flexibility and body composition of multigym training group and control group have been analyzed separately and presented in Table I.

Table II
Computation of Analysis of Covariance on Selected Health Related Fitness Components

Variable	Means	Exp. Gr	Con. Gr	SV	SS	df	MS	F
Cardio respiratory Endurance	Pre test	1800.33	1866.67	B	33000.83	1	33000.833	1.83
				W	503956.67	28	17998.45	
	Post test	2303.67	1885.00	B	1314613.33	1	1314613.33	**83.35***
				W	441623.33	28	15772.26	
	Adjusted	2310.97	1877.70	B	1321400.55	1	1321400.55	**85.52***
				W	417193.89	27	15451.63	
Muscular strength	Pre test	20.33	19.27	B	8.53	1	8.533	1.66
				W	144.27	28	5.15	
	Post test	24.13	18.93	B	202.80	1	202.80	**34.48***
				W	164.67	28	5.88	
	Adjusted	23.64	19.43	B	125.20	1	125.20	**86.49***
				W	39.09	27	1.45	
Flexibility	Pre test	23.80	22.87	B	6.53	1	6.533	1.13
				W	162.13	28	5.79	
	Post test	26.60	23.67	B	64.53	1	64.53	**8.99***
				W	200.93	28	7.18	
	Adjusted	26.23	24.04	B	34.76	1	34.76	**9.42***
				W	99.67	27	3.69	
Body Composition	Pre test	29.01	30.43	B	15.12	1	15.123	1.91
				W	221.85	28	7.92	
	Post test	25.09	31.01	B	262.85	1	262.85	**43.60***
				W	168.79	28	6.03	
	Adjusted	25.58	30.53	B	171.65	1	171.65	**72.35***
				W	64.06	27	2.37	

*Significant at 0.05 level of confidence for the degree of freedom 1 and 28 is 4.20 and df 1 and 27 is 4.21

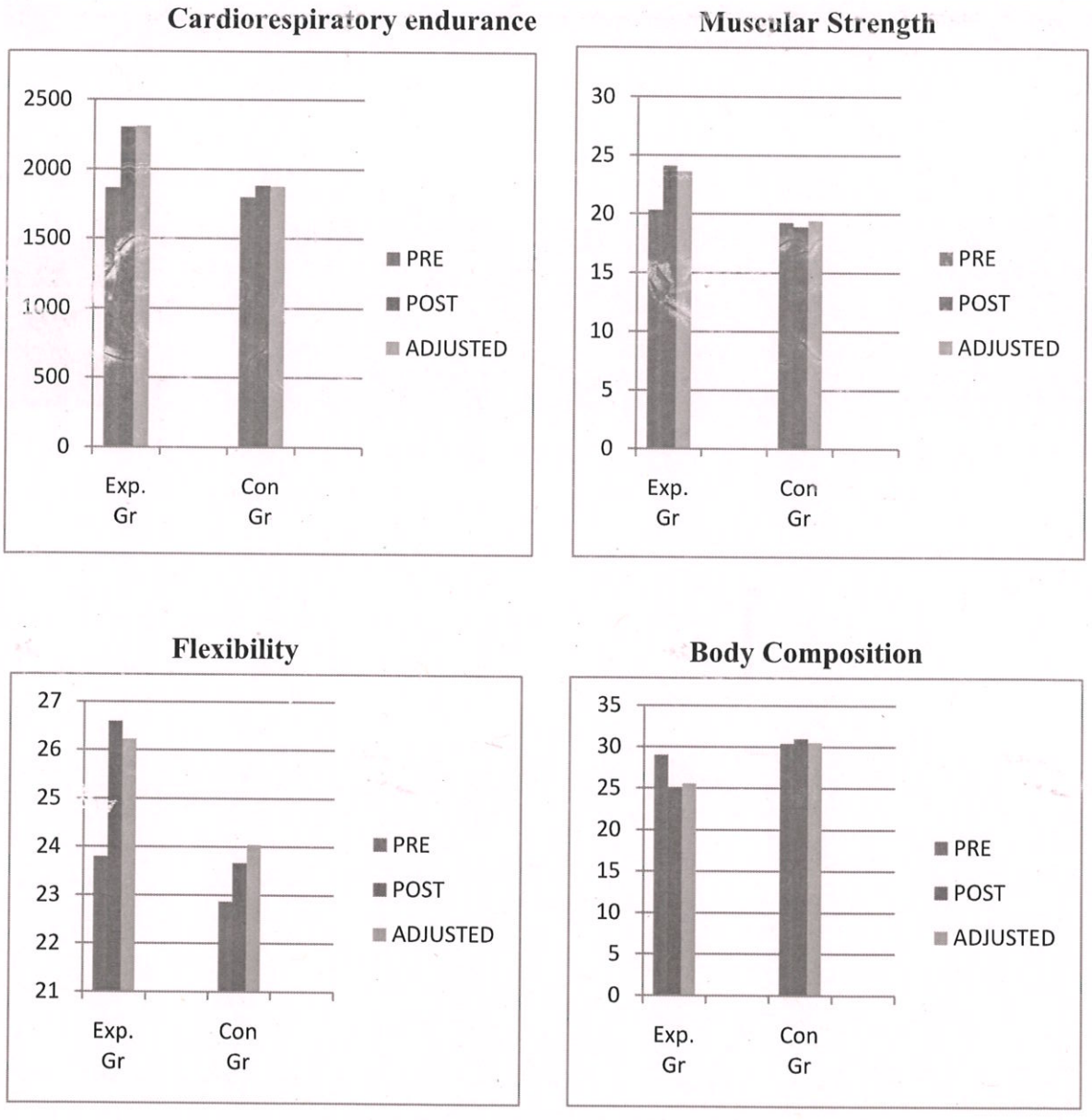
The results presented in above table II shows the obtained F values on the scores of pre test means of cardiorespiratory endurance, muscular strength, flexibility and body composition were 1.86, 1.66, 1.13 and 1.91 which were lesser than the required F value 4.20, which proved that the random assignment of the subjects in multigym training group

and control group were successful and before the training were equal.

The obtained F values on the post test means of cardiorespiratory endurance, muscular strength, flexibility and body composition 83.35, 34.48, 8.99, and 43.60 respectively were higher than the required F value 4.20, which revealed that there was a significant difference at 0.05 level.

The obtained F values on the adjusted post test means of cardiorespiratory endurance, muscular strength, flexibility and body composition of 85.52, 86.49, 9.42 and 72.35 respectively were higher than the required F value 4.21, which revealed that there was a significant difference among multigym training group and control group. It clearly indicated that there was a significant difference among the groups on cardiorespiratory endurance, muscular strength, flexibility and body composition.

Figure – 1
Bar Diagram on Pre Test, Post Test and Ordered Adjusted Means of Cardiorespiratory Endurance, Muscular Strength, Flexibility and Body Composition



Discussion on Findings

Resistance training as an exercise programme where free or stationary weights are used for the purpose of increasing muscular strength, muscular endurance and power and body composition through which skills can be improved **Moran and McGlynn (1990)**. In general, exercise is beneficial for health and physical fitness, while a sedentary lifestyle has a negative effect on a person's well-being. The present study was investigated the effect of multigym training on selected health related fitness among adult men. The result proved that multigym training significantly improved cardiorespiratory endurance, muscular strength, flexibility and significantly decreased body composition among adult men.

Conclusion

The result of the study was concluded that multi gym training could produce favourable changes in selected health related fitness such as cardiorespiratory endurance, muscular strength, flexibility and body composition in adult men.

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JOURNAL OF PHYSICAL EDUCATION SPORTS AND ALLIED DISCIPLINES

PEER REVIEWED
Vol. 5 No. 1 & 2 Jan - July 2014 ISSN : 0974-343X
JPESAD



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Influence of Yogasana and Pranayama on Selected Psychological Parameters in Post Graduate Students

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Abstract

The role of yoga in sports is becoming increasingly popular to reduce anxiety and aggression and also to unfold the potentialities hidden in every sportsman. The purpose of this study was to examine the influence of Yogasana and Pranayama on Selected Psychological parameters in Post Graduate Students. This study comprised a twelve week randomized controlled trial. A total of 40 physical education students participated in this study voluntarily. They were randomly divided into two groups: those undertaking a Yogasana and Pranayama (n=20) and a control group (n=20). Their age ranged between 23 and 27 years. The subjects took part in a Yogasana and Pranayama for one hour per day, three days a week for twelve weeks. The Taylor's manifest anxiety scale was used to assess anxiety of subjects and aggression was assessed by using Pati's aggression scale before and after the completion of the Yogasana and Pranayama. Data were analyzed by applying ANCOVA statistical technique. Significance level was set at $P < 0.05$. After the twelve weeks of the Yogasana and Pranayama, significant differences were found in the anxiety and aggression in the experimental group ($p<0.05$). There were no significant differences in the control group after the experiment in terms of the same measures ($P>0.05$). The Yogasana and Pranayama proved to be a useful exercise modality for reduced anxiety and aggression in Post Graduate Physical Education Students.

Key words: Yogasana and Pranayama, anxiety and aggression.

Introduction

Yoga is an ancient discipline designed to bring balance and health to the physical, mental, emotional, and spiritual dimensions of the individual. It is long popular practice in India that has become increasingly more common in Western society. "Yoga" means union of our individual consciousness with the Universal Divine Consciousness in a super-conscious state known as Samadhi (Vivekananda, 2007). A sound mind grows only with a sound body and the growth of one is complementary to that of the other. This is indicated during the period of illness, when ailing body effects the usually attitude of mind. Mental discontent is caused by physical disequilibrium.

Man is endowed with mind, intellect and ego collectively known as consciousness, which is a source of thinking, understanding and acting. As the wheel of life turns, consciousness experiences the fine miseries of ignorance, selfishness, attachment, aversion and love of life. Asanas and pranayama bring the wavering mind to a state of stability.

Review of Related Literature

Gupta et al., (2006) examined the short-term impact of a comprehensive, yet brief, lifestyle intervention based on yoga in diseased and normal individuals. The research subjects had a history of hypertension, coronary artery disease,

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diabetes mellitus, obesity, psychiatric disorders and thyroid disorders. The intervention consisted of asanas, pranayanama, relaxation techniques, group support, individualized advice, lectures and films on philosophy of yoga, and the place of yoga meditation in daily life, meditation, and stress management. Outcome measures were anxiety scores taken on the first and last days of the course. Among diseased individuals, improvement was seen in anxiety levels. Short educational program for stress management and lifestyle modification based on yoga leads to reduction in anxiety.

Stueck et al., (2005) determined whether yoga can assist in reducing stress responses in preteens. Forty-eight 11-12-year olds with abnormal exam anxiety participated in the study with 21 students assigned to the experimental group to participate in a 15-session program of relaxation, yoga, and other meditation and social interaction exercises. Each session lasted one hour. A questionnaire with stress-related items was given to students before the sessions began, immediately after the 15-week program, and three months after the program ended. Students involved in the program showed improvement in several stress measures. Significant effects were seen in a comparison immediately after the training: decreased aggression, decreased helplessness in school, decreased physical complaints, and improved stress coping abilities. In a comparison 3-month later, the following effects were seen: improvements in emotional balance, decreased anxiety, decreased shyness in social contacts, and decreased impulsiveness. In the first post-test measurement, parents also reported their students as being calmer and more balanced (71.4%), less impulsive, aggressive and hot-tempered (38.1%), more concentrated (38.1%), and having fewer complaints (38.1%). Comparisons to the control group were not statistically measured.

Methodology

The purpose of the study was to examine the influence of yogasanas and pranayama on selected psychological parameters in Post Graduate students. The subjects were selected from Rajivi Gandhi Post Graduate College, Rajahmundry, Andhra Pradesh, conducted a yoga camp for post graduate students for 3 months. Sixty students attended this camp, out of which forty subjects were selected at random by lot procedure. Their age ranged from 23 to 27 years. They were asked to undergo medical checkup and were found to be normal, healthy and fit enough to undergo experimentation. Random group design was used for this experimental study. Before the administration of tests and yogasanas and pranayama practices, the purpose of the study was explained in details to the subjects to ensure proper understanding and effective co-operation. The method of doing each yogasanas, pranayama was explained to the subjects before the experiment. The investigator himself demonstrated each item of the yogasanas, pranayama. The model performance by some of the subjects was also done to make the subjects clearly understand all the techniques. The following Yogasana and Pranayama were Practices: Standing Postures: Natarajasana, Trikonasana, Padhastasana. Sitting Postures: Paschimottanasana, Vajrasana, Ushtrasana, Shashankasana, and Padmasana. Prone Postures:

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Yogasana and Pranayama

Makarasana, Bhujangasana, Dhanurasana Supine Postures. Matsyasana, Halasana and Chakrasana. Relaxation Posture: Shavasana. Pranayama Anuloma-Viloma, shitali, Sitkari and Ujjayi. Asanas, Pranayama were practiced for 45 minutes in this order. The subjects were tested on the selected psychological parameters at the beginning (pre-test) and at the end of the experimental period(post-test). The data collected from the two groups on the selected psychological parameters were used for the statistical treatment to find out whether there was any significant difference between the adjusted means by analysis of covariance method. The level of significance was fixed at .05 level. The analysis of data was done in SPSS/PC+ computer system using standard statistical package.

Results

Analysis of Anxiety

The data of anxiety before (pre-test) and after the yogasanas and pranayama (post-test) of control group, experimental group were analyzed and presented in Table I. The pre and post-test mean of two groups have been presented in Fig.1.

Table-I

Computation of Analysis of Covariance on Anxiety

Test	Con. Group	Exp Group	SV	SS	df	MS	F
Pre Test	25.10	25.20	B	1000	1	.1000	.0084
			W	455.00	38	11.97	
Post Test	24.25	20.20	B	164.03	1	164.03	16.36*
			W	380.95	38	10.02	
Adjusted Mean	24.26	20.18	B	166.04	1	166.04	17.45*
			W	352.04	37	9.51	

*Significant at 0.05 level of confidence for the degree of freedom 1 and 38 is 4.09 and df 1 and 37 is 4.106

The result presented in Table I indicated that the pre-test mean of the control group was 25.10 and experimental group was 25.20. The obtained F-ration of .0084 was lesser than the required table value of 4.096. It indicated that, no significant difference existed between the pre-test mean of the two groups.

The post-test mean of the control group was 24.25 and the experimental group was 20.20. The obtained F-ratio for the post-test mean 16.36 was found to be higher than the table value of 4.096 required for significant 1 and 38 degrees of freedom.

The adjusted post-test mean of the control group and experimental group were 24.26 and 20.18 respectively. The obtained F-ration was 17.45 was greater than the tabulated F-ration for degrees of Freedom 1and 37 was 4.106. Hence the obtained F-ration was significant at .05 level of confidence. The results of

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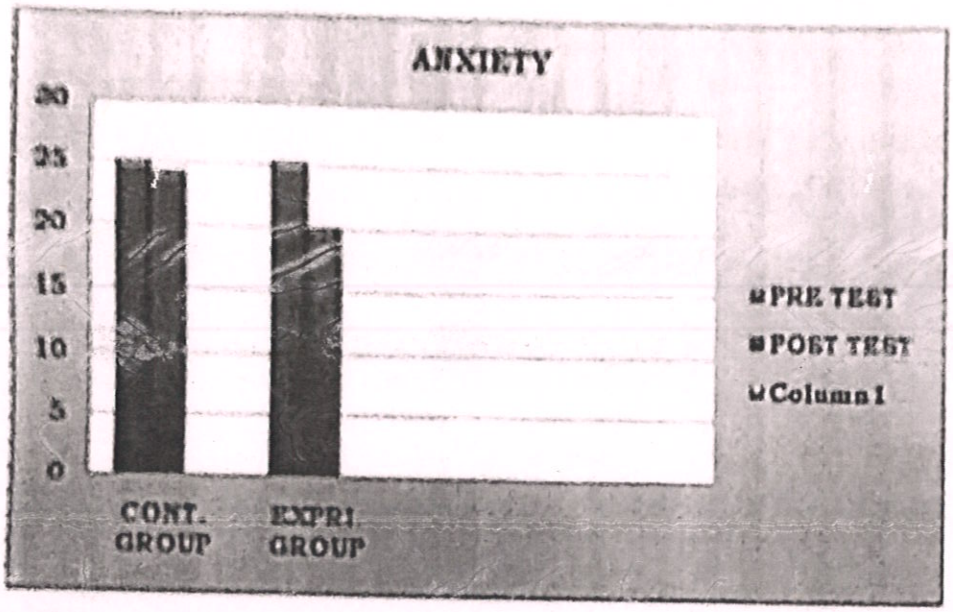
the study revealed that there was a significant reduction in anxiety as a result of the practice of yogasanas and pranayama.

Figure-1

Bar Diagram on Pre and Post Test Means of Anxiety



Analysis of Aggression

The data of aggression before (pre-test) and after the yogasanas and pranayama (post-test) of control group, experimental group were analysed and presented in Table II. The pre and post test mean of two groups have been presented in Fig. 2.

Table-II

Computation of Analysis of Covariance on Aggression

Test	Con. Group	Exp Group	SV	SS	df	MS	F
Pre Test	510.50	530.90	B	4161.60	1	4161.60	1.72
			W	92116.80	38	2424.13	
Post Test	512.95	463.35	B	24601.60	1	24601.60	11.80*
			W	79201.50	38	2084.25	
Adjusted Mean	519.23	457.07	B	36963.81	1	36963.81	30.87*
			W	44304.80	37	1197.43	

*Significant at 0.05 level of confidence for the degree of freedom 1 and 38 is 4.09 and df 1 and 37 is 4.106

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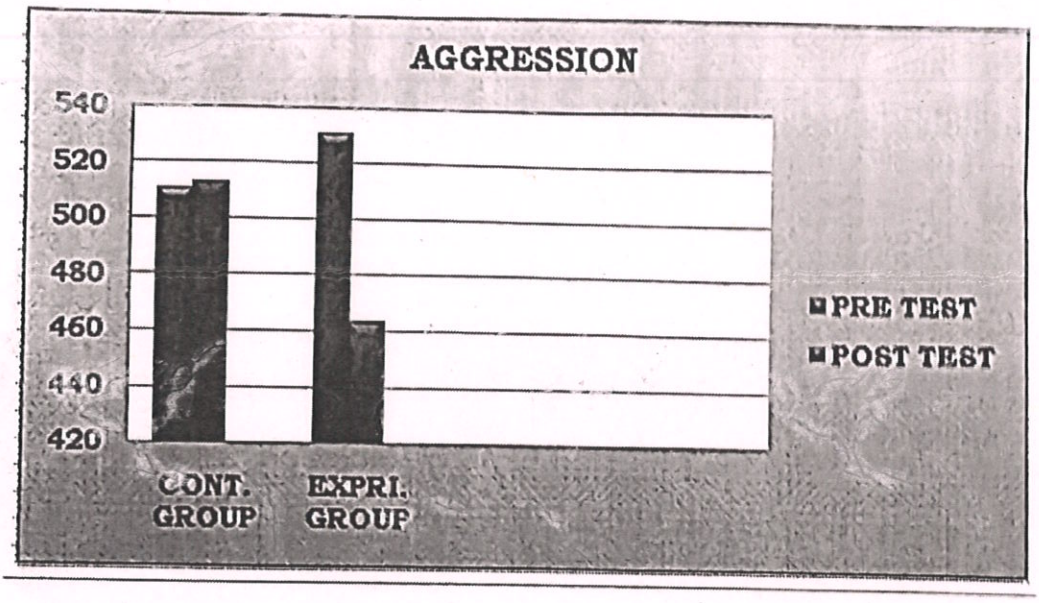
Table II indicated that the pre-test mean of the control group was 510.50 and experimental group was 530.90. The obtained F-ratio of 1.72 was lesser than the required table value of 4.096. It proved that, no significant difference existed between the pre-test mean of the two groups.

The post-test mean of the control group was 512.95 and the experimental group was 463.35. The obtained F-ratio for the post-test mean, 11.80 was found to be higher than the table value of 4.096 required for significant 1 and 38 degrees of freedom.

Figure-2

Bar Diagram on Pre and Post Test Means of Aggression



The adjusted post-test mean of the control group and experimental group were 519.23 and 457.07 respectively. The obtained F-ratio 30.87 was greater than the required tabulated F-ratio of 4,106. Hence the obtained F-ratio was significant at. 05 level of confidence. The results of the study revealed that there was a significant reduction in aggression as a result of the practice of yogasanas and pranayama.

Discussion and Findings

The results of the study revealed that there was significant reduction in anxiety as a result of practice of yogasanas and pranayama. It was hypothesisted that yogasanas and pranayama practices would decrease anxiety, and the same was accepted. The findings of the study indicated that aggression of subjects had decreased significantly due to practice of yogasanas and pranayama. It was hypothesized that yogasanas and pranayama, practices would decrease aggression, thus the hypothesis was accepted. It was observed from the (Stueck and Gloeckner, 2005 & Deshpande Nagendra and Raghuram, 2008) review

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that studies on anxiety and aggression have been undertaken extensively and their results showed decrease in aggression.

Conclusions

In the light of the study undertaken with certain limitations imposed by the experimental conditions, the following conclusions were drawn.

1. Yogasanas and pranayama reduces the level of anxiety.
2. Yogasanas and Pranayama reduced aggression.

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3.4.5.-J. EPN- 2014-15

Academic Sports Scholar
ISSN : 2277-3665
Impact Factor : 2.1052(UIF)
Vol. 4 | Issue. 1 | Jan 2015
Available online at www.lsrj.in

INFLUENCE OF PHYSICAL EXERCISES AND SURYA NAMASKAR PRACTICES ON SELECTED HEALTH RELATED PHYSICAL FITNESS COMPONENTS OF COLLEGE WOMEN

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Abstract:- The aim of this study was to find out the influence of physical exercises and surya namaskar practices on selected health related physical fitness components of college women. 60 college women studying in Arul Anandar colleges in Madurai District were selected randomly and divided into three groups consisting of 20 in each. Group I underwent physical exercises (PEG), group II under went suryanamaskar training (SNG) and group III was acted as control group. The PEG group was provided with different types of physical exercises, consisting of walking, jogging, floor aerobic exercises and step aerobic exercises for 12 weeks and SNG group underwent, slow, medium and fast variations of suryanamaskar. Health related physical fitness variables, cardio respiratory endurance and muscular strength were measured prior to and after experiments. The results of this study proved that both the experimental protocols significantly contributed for improving cardio respiratory endurance and muscular strength of the college women. Even though it was found that SNG group was found to be better than PEG, the difference between the experimental groups was not significant at 0.05 level. It was concluded that the findings of this study can be used in improving cardio respiratory endurance and muscular strength among women.

Keywords: Physical Exercise, Surya Namaskar, Cardiorespiratory Endurance, Muscular Strength.

INTRODUCTION

Asanas have evolved over the centuries so as to exercise every muscle, nerve and gland in the body. Asanas balance the respiratory, circulatory, nervous, hormonal, digestive excretory and reproductive systems perfectly. The equilibrium in the body then brings mental peace and enhances intellectual clarity (Iyengar, 2001). Asana are one of the major tools of Yoga. Asana brings steadiness, health and lightness of limb. A steady and pleasant posture produces mental equilibrium and prevents fickleness of mind. Asanas are not merely gymnastic exercises, they are postures. The limbs of the body provide the necessary weights and counter–weights. By practicing them one develops agility, balance, endurance, co-ordination and great vitality. It secures a fine physical structure, which is strong and flexible without being muscle-bound and helps to keep the body free from diseases. Asanas reduce fatigue and soothe the nerves, boosts metabolism, lymphatic circulation, hormonal secretion, and bring about chemical balance in the body. (Iyengar, 2001) There are three stages to each asana, viz. coming into the pose, holding it, and coming out of the pose and those steps should be performed as one continuous movement up to the final position (Rabinovitch et.al., 1983).

Surya Namaskara or Sun Salutation is a common sequence of Hatha yoga asanas. This sequence of movements and poses can be practiced on varying levels of awareness, ranging from that of physical exercise in various styles, to a complete sadhan a which incorporates asana, pranayama, mantra and chakra meditation. The physical base of the practice links together twelve asanas in a dynamically performed series. These asanas are ordered so that they alternately stretch the spine backwards and forwards. (Iyengar, 2001) When performed in the

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usual way, each asana is moved into with alternate inhalation and exhalation (except for the sixth asana where the breath is held in external suspension). A full round of Surya namaskara is considered to be two sets of the twelve poses with a change in the second set to moving the opposite leg first through the series. Proponents of the use of Surya namaskara as part of the modern yoga tradition prefer to perform it at sunrise, which the orthodox consider to be the most 'spiritually favourable' time of the day. Surya Namaskar provides all of the key health benefits of yoga in a very succinct package. It is a holistic exercise that provides physical health benefits, but also mental or emotional as well as spiritual benefits. The obvious advantage of Surya Namaskar is the workout it provides for the muscles, but it also benefits joints, ligaments and the skeletal system by improving posture, flexibility and balance. In addition to these physical benefits, Surya Namaskar practice stimulates and conditions virtually every system in the body. It is good for the heart and stimulates the cardiovascular system. It oxygenates the blood and helps strengthen the heart. Surya Namaskar is good for the digestive system and the nervous system. It stimulates the lymphatic system and supports respiratory system health, as well (Rabinovitch et.al, 1983).

The adage of healthy body, healthy mind is especially relevant to college students. Getting good grades, focusing in class and balancing a busy schedule may be easier if they maintain a healthy lifestyle. By making small changes in the diet and activity level, they can reap big benefits in their overall health. Most college students may not achieve the nutrition and exercise guidelines designed to reduce the risk of chronic disease, typically consuming diets high in fat, sodium, and sugar and low in fruits and vegetables. Therefore, college campuses serve as crucial settings to overcome perceived barriers to healthy diet and exercise habits, and implement effective interventions. Ideally, if college students make positive changes in exercise and dietary habits, these changes could persist into adult years. The health benefits of exercise are well documented. Working out on a regular basis is not just a great way to stay in shape, it also enables the body to produce natural chemicals called endorphins that help feel happier, and may also make it easier to focus on the studies. However, making the commitment to go to the gym on a regular basis can be a struggle. Fitness scientists, physical educationists, administrators are giving more concentration to evolve suitable solutions and make the students, especially the college women students to undergo regular physical exercises and asanas as they are simple in nature. To high light the advantages of physical exercises and Suryanamaskar on their health related physical fitness components this study was undertaken.

Bhavanani, et al. (2013) found performance of Suryanamaskar (SN) produced immediate decrease in both visual reaction time and auditory reaction time (ART) ($P < 0.001$). This was significant when compared to self-control period ($P < 0.001$) and compared to external-control group, it decreased significantly in ART ($p = 0.02$) and suggested SN may be used as an effective training means to improve neuro-muscular abilities. Bhavanani, et.al. (2011) determined the differential effect of 6 months training in the fast and slow versions of suryanamaskar. Training in SSN produced a significant decrease in diastolic pressure. In contrast, training in FSN produced a significant increase in systolic pressure. Although there was a highly significant increase in isometric hand grip (IHG) strength and hand grip endurance (HGE) in both the groups, the increase in HGE in FSN group was significantly more than in SSN group. Nagarathna, and Nagendra (1985) found significantly greater improvement in the group who practiced yoga consisting of suryanamaskar in the weekly number of attacks of asthma, scores for drug treatment, and peak flow rate and showed the efficacy of yoga in the long term management of bronchial asthma, but the physiological basis for this beneficial effect needs to be examined in more detail. Thus, the theoretical foundations laid proved that suryanamaskar can be practiced for improving health fitness among different groups of people and there was further scope for research to find out the effect of physical exercises and suryanamaskar on selected health related physical fitness components among college women, hence this study was undertaken.

METHODOLOGY

For the purpose of the study 60 college women studying in Arul Anandar colleges in Madurai District were selected randomly. They were divided into three groups consisting of 20 in each. Group I underwent physical exercises (PEG), group II under went suryanamaskar training (SNG) and group III was acted as control group. The PEG group was provided with different types of physical exercises, consisting of walking, jogging, floor aerobic exercises and step aerobic exercises for 12 weeks and SNG group underwent, slow, medium and fast variations of suryanamaskar. Prior to and after the training all the subjects were measured of their health related physical fitness variables, cardiorespiratory endurance and muscular strength. Physical Efficiency Index followed by Harvard Step Test was used for this purpose. The score after calculating the recovery pulse rate was recorded. The formula used for calculating PEI is as follows:

$$PEI = \frac{\text{Duration of Exercise in Seconds x 100`}}{\text{2 x Sum of pulse counts in recovery}}$$

Muscular strength of the subjects was determined through pull ups test. The obtained data were subjected to

statistical analysis using ANCOVA to test the significance. In all cases 0.05 level was fixed to test the hypothesis.

RESULTS

Table I: Influence on Cardiorespiratory Endurance due to Physical Exercises and Suryanamaskar

	PEG	SNG	CG	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	71.87	73.15	75.29	Between	119.61	2	59.80	0.72
				Within	4740.91	57	83.17	
Post Test Mean	78.69	82.92	75.04	Between	621.34	2	310.67	4.92*
				Within	3599.87	57	63.16	
Adjusted Post Test Mean	79.64	83.09	73.92	Between	848.21	2	424.10	12.82*
				Within	1852.51	56	33.08	
Mean Diff	6.82	9.77	-0.24					

PEG: Physical Exercise Group; SNG : Suryanamaskar Group; CG: Control Group
Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.
*Significant

Table II: Multiple Comparisons of Adjusted Means on Cardio respiratory Endurance

PEG	SNG	CGI	MEAN DIFFERENCE	Reqd. C.I
79.64	83.09		3.45	4.57
79.64		73.92	5.72*	4.57
	83.09	73.92	9.18*	4.57

* Significant at 0.05 level.

Table III: Influence on Muscular Strength due to Physical Exercises and Suryanamaskar

	PEG	SNG	CG	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	12.55	11.75	12.25	Between	6.53	2	3.27	0.66
				Within	282.45	57	4.96	
Post Test Mean	14.80	14.45	13.20	Between	28.30	2	14.15	2.75
				Within	293.35	57	5.15	
Adjusted Post Test Mean	14.50	14.81	13.14	Between	31.24	2	15.62	8.86*
				Within	98.74	56	1.76	
Mean Diff	2.25	2.70	0.95					

PEG: Physical Exercise Group; SNG : Suryanamaskar Group; CG: Control Group
Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.
*Significant

Table 4: Multiple Comparisons of Adjusted Means on Muscular Strength

PEG	SNG	CGI	MEAN DIFFERENCE	Reqd. C.I
14.50	14.81		0.31	1.06
14.50		13.14	1.35*	1.06
	14.81	13.14	1.67*	1.06

* Significant at 0.05 level.

DISCUSSIONS ON RESULTS

Exercise is considered an acceptable method for improving and maintaining physical and emotional health. A growing body of evidence supports the belief that yoga benefits physical and mental health. (Ross and, Thomas, 2010) With the recent rise in awareness and the increased understanding of the importance of physical activity in promoting overall health, greater emphasis has been placed on improving physical fitness to enhance quality of life. Surya Namaskar, a component of Hatha Yoga, has been practiced by Indians for hundreds of years and is often used in place of a typical fitness program. It consists of a series of postures (asanas) that are repeated 12 times per round. (Bhavesh Surendra Mody, 2011) , The results of this study (Table I) proved that both the experimental protocols, namely, physical exercises and suryanamaskar practices significantly contributed for improving cardiorespiratory endurance of the college women. Even though it was found that SNG group was found to be better than PEG, the difference between the experimental groups was not significant at 0.05 level (Table II). The results presented in Table III proved that there was significant improvement on muscular strength of the college women as the obtained F value was greater than the required F value to be significant at 0.05 level. The post hoc analysis results presented in Table IV proved that both the experimental groups were able to significantly improve muscular strength of the college women. The mean differences between the treatment groups showed that SNG was better than PEG. However, this difference was also not significant at 0.05 level. Ni M et al. (2014) indicated that different yogic poses can produce specific muscle activation patterns. Sinha and Sinha (2014) documented that surya namaskar (SN), a popular traditional Indian yogic practice, includes practicing 12 physical postures with alternate forward and backward bending movement of the body along with deep breathing maneuvers and indicated that yogic training caused conditioning of cardiorespiratory parameters. The results of this study that PEG and SNG improved health related physical fitness variables cardiorespiratory endurance and muscular strength among college women were in agreement with these previous researches.

CONCLUSIONS

It was concluded that the findings of this study can be used in improving cardiorespiratory endurance and muscular strength among women.

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3.4.5 - 2014-15

Academic Sports Scholar
ISSN : 2277-3665
Impact Factor : 2.1052(UIF)
Vol. 4 | Issue. 2 | Feb 2015
Available online at www.lsrj.in

EFFECT OF ISOLATED AND PARALLEL CORE STRENGTH AND MOBILITY TRAINING ON SELECTED BIO MOTOR VARIABLES AMONG CRICKET PLAYERS

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Abstract:- The aim of this study is to find out the effect of isolated and parallel core strength and mobility training on selected bio motor variables among cricket players. 60 male school level cricket players from Tamil Nadu were selected randomly as the subjects and their age ranged between 14 to 16 years. The selected subjects were divided into four groups, namely, isolated core strength training group (ICST), isolated mobility training group (IMT), parallel training (combination of both core strength and mobility training) group (PTG) and control group consisting of 15 cricket players in each group. The experimental period was 12 weeks. The experimental groups were given the respective treatments. The results indicated that there was a significant improvement in bio motor variables, abdominal strength after isolated and parallel core strength and mobility training among school level cricket players. And the results further proved that there was significant difference between the treatment groups, in favour of PTG than IMT on abdominal strength. The bio motor variable agility was significantly improved due to all the three treatment groups and comparisons between the treatment groups it was found that there was no significant dif¬ference after training on bio motor variable agility. It was concluded that core strength and mobility training may be extensively practiced by school cricket players as they improve bio motor abilities abdominal strength and agility.

Keywords: Isolated, Parallel, Core Strength, Mobility Training, Abdominal Strength, Agility.

INTRODUCTION

Noakes, and Durandt, (2000) reported that the demands of cricket may not be underestimated citing a study of the 1999 South African world cup players, a number of physiological tests for explosive power and aerobic endurance capacity showed they were as 'fit' as the South African national rugby players. Strength training and conditioning plays an important role in chronic and acute injury prevention, particularly in asymmetrical sports such as cricket (i.e. batting, bowling and throwing are performed with a dominant arm or stance). Conditioning for cricket should not only be sport specific but also position specific. Fast bowlers require different preparation from spin bowlers for example. Of course, there are many aspects of cricket training applicable to all players as each individual will be required to bat and field during a game.

In the development of fitness, coaches and athletes have understood the value of core strength training for many years. The core region consists of far more than just the abdominal muscles. In fact core strength training aims to target all the muscles groups that stabilize the spine and pelvis. It's these muscle groups that are critical for the transfer of energy from large to small body parts during many sporting activities. Because of these facts every cricket player is interested to improve their core strength.

In core strength training the muscles of the trunk and torso act to stabilize the spine, pelvis and shoulder girdle. From this solid, balanced base the limbs can be moved powerfully and under control. In fact before rapid movements of the extremities can take place, the central nervous system stabilizes the spine in anticipation (Hodges and Richardson, 1997) . The rate at which the core muscles stabilize the spine may have a direct effect on the power of limb movement (Hodges and Richardson,1997b). As cricket involve forceful, strenuous activity, and mobility

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exercises and mobility drills stimulate nervous system, muscles, tendons, and joints in a very dynamic manner in which one not only moving around at all but are simply elongating a particular muscle or group of muscles.

As the overhead sports like cricket, characterized by predominant movements of the hands above the head, are associated with very dynamic, often acyclic movements and require strong muscles of humero-scapular regions with high mobility of the shoulder joint as well as flexibility and ability to relax these muscles. Kacanski, et.al. 2011) selected 100 "overhead" sports male athletes, who were randomly divided into the experimental and control group, aged 14 to 18 years. The range of motion was measured in degrees by goniometer to analyse the shoulder mobility on overhead sports before and after experimental treatment and found statistically significant difference inflexion, extension, abduction, adduction, external and internal rotation at the final measure in favor of the experimental group at the level of significance $p<0.001$. Prieske, et.al. (2015) found trunk muscle strength, sprint, and kicking performance improved following core strength training performed on unstable (CSTU) compared with stable surfaces (CSTS) in youth soccer players. Sandrey and Mitzel, (2013) determined the effects of a 6-week core-stabilization-training program for high school track and field athletes on dynamic balance and core endurance and found significant improvement in dynamic balance and core endurance among high school student athletes. Stuber, et al. (2014) after making a systematic review of literature concluded that quantity and quality of literature on the use of core stability exercises in athletes is low. The existing evidence has been conducted on small and heterogeneous study populations using interventions that vary drastically with only mixed results and short-term follow-up. This precludes the formulation of strong conclusions, and additional high quality research is clearly needed. Thus, the theoretical foundations laid so far proved that there was further scope for research to find out the effect of isolated and parallel core strength and mobility training on selected bio motor variables, abdominal strength and agility among cricket players.

METHODOLOGY

To achieve the purpose of this study, 60 male school level cricket players from the area of Annamalai University, Tamil Nadu were selected randomly as the subjects and their age ranged between 14 to 16 years. The selected subjects were divided into four groups, namely, isolated core strength training group (ICST), isolated mobility training group (IMT), parallel training (combination of both core strength and mobility training) group (PTG) and control group consisting of 15 cricket players in each group. The experimental period was 12 weeks. The experimental groups were give the respective treatments. The control group was not exposed to any treatments and was strictly under control. The selected biomotor variable abdominal strength was measured through sit ups test and agility was measured through shuttle run test. The difference between the initial and final means on selected variables was the effect of respective experimental treatment of the groups concerned. The obtained data were subjected to statistical treatment using ANCOVA. In all cases 0.05 level was fixed to test the hypothesis of this study.

RESULTS

The descriptive statistics showing mean and standard deviation of data obtained are presented in Table I.

Tab 1: Descriptive Statistics on Abdominal Strength and Speed due to Isolated and Parallel Core Strength Training and Mobility Training among Cricket Players

ABDOMINAL STRENGTH				
Tests	ICST	IMT	PTG	Control Group
Pre Test Mean	31.27	31.40	32.00	32.3
Std Dev	+ 6.06	+ 5.51	+ 4.11	+ 4.51
Post Test Mean	33.93	33.73	36.60	31.7
Std Dev	+ 5.09	+ 4.74	+ 4.39	+ 4.61
Adjusted Post Test Mean	34.32	34.01	36.38	31.3
Mean Difference	2.67	2.33	4.60	-0.53

AGILITY				
Tests	ICST	IMT	PTG	Control Group
Pre Test Mean	11.14	11.03	10.58	10.9
Std Dev	+ 0.52	+ 0.54	+ 0.33	+ 0.44
Post Test Mean	10.25	10.32	10.07	10.9
Std Dev	+ 0.17	+ 0.56	+ 0.30	+ 0.39
Adjusted Post Test Mean	10.16	10.27	10.20	10.9
Mean Difference	-0.89	-0.70	-0.51	0.00

ICST : Isolated Core Strength Training; IMT : Isolated Mobility Training PTG: Parallel Training Group

The results presented in Table I proved that there existed differences and the calculation of ANCOVA is presented in Table II.

Tab II: Effect of Isolated and Parallel Core Strength Training and Mobility Training on Bio Motor Variables, Abdominal Strength and Agility among Cricket Players

Test	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
ABDOMINAL STRENGTH					
Pre Test Mean	Between	10.27	3	3.42	
	Within	1461.47	56	26.10	0.13
Post Test Mean	Between	179.60	3	59.87	
	Within	1244.40	56	22.22	2.69
Adjusted Mean	Between	196.61	3	65.54	
	Within	217.72	55	3.96	16.56*
AGILITY					
Pre Test Mean	Between	2.65	3	0.88	
	Within	12.03	56	0.21	4.12*
Post Test Mean	Between	5.26	3	1.75	
	Within	8.26	56	0.15	11.89*
Adjusted Mean	Between	5.16	3	1.72	
	Within	6.29	55	0.11	15.04*

Required F¬(0.05), (df 3,76) =2.77
* Significant at 0.05 level of confidence

Since significant F values were obtained, the scores were further subjected to post hoc analysis using Scheffe's post hoc analysis and the results are presented in Table III.

Tab III: Multiple Comparisons of Paired Adjusted Means of the Experimental and Control Group on Abdominal Strength and Speed

ICST	IMT	PTG	Control Group	MEAN DIFF	Required C.I.
ABDOMINAL STRENGTH					
34.32	34.01			0.31	2.09
34.32		36.38		2.05	2.09
34.32			31.29	3.04*	2.09
	34.01	36.38		2.36*	2.09
	34.01		31.29	2.73*	2.09
		36.38	31.29	5.09*	2.09
AGILITY					
10.16	10.27			0.12	0.36
10.16		10.20		0.04	0.36
10.16			10.88	0.72*	0.36
	10.27	10.20		0.08	0.36
	10.27		10.88	0.60*	0.36
		10.20	10.88	0.68*	0.36

* Significant

DISCUSSIONS

The results indicated that there was a significant improvement in bio motor variables, abdominal strength after isolated and parallel core strength and mobility training among school level cricket players. And the results further proved that there was significant difference between the treatment groups, in favour of PTG than IMT on abdominal strength. The bio motor variable agility was significantly improved due to all the three treatment groups and comparisons between the treatments groups it was found that there was no significant dif¬ference after training on bio motor variable agility. Cricket is one associated with very dynamic, often acyclic movements with high mobility of the shoulder joint as well as flexibility and ability to relax these muscles. Kacanski, et.al. (2011) found the statistically significant difference inflexion, extension, abduction, adduction, external and internal rotation. Prieske, et.al. (2015) found trunk muscle strength, sprint, and kicking performance improved following core strength training performed on unstable (CSTU) compared with stable surfaces (CSTS) in youth soccer players. Sandrey and Mitzel, (2013) found the effects of a 6-week core-stabilization-training program for high school track and field athletes on dynamic balance and core endurance and found significant improvement in dynamic balance and core endurance among high school student athletes. These reviews proved that mobility training and core strength training contributed for core strength, core endurance, muscle strength and range of motion. In this study comparative effect of isolated and parallel core strength training and mobility training were tested among school level cricket players and noted significant improvement due to selected experimental treatments. Thus, the findings of this study were in agreement with the previous researches cite.

CONCLUSIONS

It was concluded that core strength and mobility training may be extensively practiced by school cricket players as they improve bio motor abilities abdominal strength and agility.

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ISSN 2231-5063
Impact Factor 2.2052 (UIF)
DOI 10.9780/22315063

Editor-in-Chief
T.N. Shinde

Golden Research Thoughts

International Recognition Multidisciplinary Research Journal



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ISSN NO:-2231-5063 VOL.III, ISSUE.XII/June - 2014

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Golden Research Thoughts
ISSN 2231-5063
Impact Factor : 2.2052(UIF)
Volume-3 | Issue-12 | June-2014
Available online at www.aygrt.isrj.net

INFLUENCE OF COMBINED AND ISOLATED YOGIC PRACTICES AND YOGIC DIET ON MAXIMAL OXYGEN UPTAKE AND VITAL CAPACITY OF OBESE ENGINEERING COLLEGE WOMEN

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Abstract:-The aim of this study was to find out the combined and isolated effects of yogic practices and yogic dieting on maximal oxygen uptake and vital capacity of obese engineering college women students. 80 obese engineering college women whose BMI was above 30 kg/m^2 were randomly selected. The subjects were assigned to four equal groups of twenty in each. The groups were assigned as Experimental Groups I (Yogic practices), II (yogic diet), III (combined) and control group respectively. Pre tests and post test scores were collected The results proved that The results presented in this study proved that there was significant influence on maximal oxygen consumption and vital capacity due to combined and isolated effects of yogic practice and yogic diet ($P<0.05$) The post hoc analysis revealed that combined group experimented with yogic practices and yogic diet was significantly better than isolated groups yogic practices; yogic diet group and control group in improving maximal oxygen consumption. The post hoc analysis further proved that isolated yogic practices group and combined group significantly improved vital capacity than control group. It was concluded that combined group was significantly better than isolated groups in influencing maximal oxygen uptake and vital capacity of the obese engineering college students.

Keywords: Yogic Practices, Yogic Diet, Combined Training, Maximal Oxygen Uptake, Vital Capacity

INTRODUCTION :-

VO_2 max known as maximal oxygen consumption is the maximum rate of oxygen consumption. Maximal oxygen consumption reflects the aerobic physical fitness of the individual, and is an important determinant of their endurance capacity during prolonged, sub-maximal exercise.(Clements et al. 2009). "Maximal oxygen uptake (VO_2 max) is widely accepted as the single best measure of cardiovascular fitness and maximal aerobic power. (Thomas et al. 2007) Absolute values of VO_2 max are typically 40-60% higher in men than in women. The factors affecting VO_2 are often divided into supply and demand.[19] Supply is the transport of oxygen from the lungs to the mitochondria (including lung diffusion, stroke volume, blood volume, and capillary density of the skeletal muscle) while demand is the rate at which the mitochondria can reduce oxygen in the process of oxidative phosphorylation. Of these, the supply factor is often considered to be the limiting one However, it has also been argued that while trained subjects probably are supply limited, untrained subjects can indeed have a demand limitation.(Wagner, P.D. (2000) Tim Noakes, a professor of exercise and sports science at the University of Cape Town, describes a number of factors that may affect VO_2 max: age, sex, fitness and training, changes in altitude, and action of the ventilatory muscles. Noakes also asserts that VO_2 max is a relatively poor predictor of performance in runners due to variations in running economy and fatigue resistance during prolonged exercise.(Noakes, Tim. 2001)

BMI is a global measure of body mass that includes both fat and lean mass and takes no account of differences in fat distribution. If the reduction of lung volumes in obesity is due to a direct mechanical effect on lung volumes, then the distribution of body fat should modify the relationship between BMI and lung volumes. Abdominal and thoracic fat are likely to have direct effects on the downward movement of the diaphragm and on chest wall properties, while fat on the hips and

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thighs would be unlikely to have any direct mechanical effect on the lungs. The most consistently reported effect of obesit lung function is a reduction in the functional residual capacity (FRC). This effect reflects a shift in the balance of inflatio and deflationary pressures on the lung due to the mass load of adipose tissue around the rib cage and abdomen and in visceral cavity. There is an exponential relationship between BMI and FRC, with a reduction in FRC detectable eve overweight individuals. In obesity, the reduction in FRC may become so marked that the FRC approaches residual volu (RV). (Jones RL, and Nzekwu MMU (2006)

Yoga practice has been effectively prescribed in conjunction with other medical and yogic procedures in management of severe psychosomatic diseases, including cancer, bronchial asthma, colitis, peptic and ulcer. It impro strength and flexibility, and may help control physiological variables such as blood pressure, lipids, respiration, heart rate, metabolic rate to improve overall exercise capacity and evaluate the effects of Yogic Practice on anxiety/depression associa with obesity and found supports yoga as an effective tool with no diet restriction to improve anxiety and depression sympto as well as obesity in obese subjects. Dhananjai S et al. (2013)

Balaji PA, Varne SR, Ali SS (2012) Studied the Physiological effects of yogic practices and transcender meditation in health and disease. Medline search was done to review relevant articles in English literature on evaluation physiological effects of yogic practices and TM. Data were constructed; issues were reviewed and found that there w considerable health benefits, including improved cognition, respiration, reduced cardiovascular risk, body mass index, blo pressure, and diabetes. Yoga also influenced immunity and ameliorated joint disorders.

Ross A, et.al. (2012) studied the frequency of yoga practice predicts health: results of a national survey of yo practitioners. Yoga shows promise as a therapeutic intervention, but relationships between yoga practice and health are und explored. Frequency of home practice favorably predicted ($P < .001$): mindfulness, subjective well-being, BMI, fruit a vegetable consumption, vegetarian status, sleep, and fatigue. Each component of yoga practice (different categories physical poses, breath work, meditation, philosophy study) predicted at least 1 health outcome ($P < .05$).Home practice of yo predicted health better than years of practice or class frequency. Different physical poses and yoga techniques may have uniqu health benefits.

The theoretical foundations laid proved that obesity plays vital role in influencing maximal oxygen uptake and vit capacity. It was also laid that yogic practices were beneficial for healthful living including managing obesity. However, it w found that there was further scope for research to find out the combined and isolated effects of yogic practices and yogic dietin on maximal oxygen uptake and vital capacity of obese engineering college women students. Hence, this study was undertaken

METHODOLOGY

To achieve the purpose of the study, 80 obese engineering college women whose BMI was above 30 kg/m2 wer randomly selected. The subjects were assigned to four equal groups of twenty in each. The groups were assigned a Experimental Groups I (Yogic practices), II (yogic diet), III (combined) and control group respectively. Pre tests were conducted for all the subjects on maximal oxygen uptake and vital capacity through Cooper's 12 Min run walk test and Spirometer. The experimental groups participated in combined and isolated treatments for twelve weeks. After the experimental period, post test scores were obtained. The differences between the initial and final scores were considered as the influence of respective treatments. To determine statistical significance, the pre and post test scores were statistically analysed using ANCOVA.

RESULTS

The descriptive statistics showing mean and standard deviation of data obtained are presented in Table I.

Tab 1: Descriptive Statistics on Maximal Oxygen Uptake and Vital Capacity of the Combined and Isolated Yogic Practices and Yoga Diet groups among obese Engineering College women students

MAXIMAL OXYGEN UPTAKE (VO_2 max)				
Tests	Yoga Group	Yogic Diet	Combined Group	Control Group
Pre Test Mean	25.34	25.12	24.14	26.2
Std Dev	±1.61	±1.94	±2.44	±3.95
Post Test Mean	26.98	26.39	28.74	26.8
Std Dev	±1.82	±2.35	±3.21	±3.54
Adjusted Post Test Mean	26.85	26.46	29.72	25.9
Mean Difference	1.64	1.27	4.60	0.60
VITAL CAPACITY				
Tests	Yoga Group	Yogic Diet	Combined Group	Control Group
Pre Test Mean	2242.50	2065.00	2157.50	2057.5
Std Dev	460.06	438.03	367.88	455.46
Post Test Mean	2431.25	2186.25	2367.50	2127.5
Std Dev	451.01	466.12	399.10	381.99
Adjusted Post Test Mean	2327.41	2247.16	2342.56	2195.4
Mean Difference	188.75	121.25	210.00	70.00

The results presented in Table I proved that there existed differences and the calculation of ANCOVA is presented in Table II.

Tab II: Influence of Combined and Isolated Yogic Practices and Yogic Diet on Maximal Oxygen Uptake and Vital Capacity of Obese Engineering College women students

Test	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
MAXIMAL OXYGEN UPTAKE					
Pre Test Mean	Between	42.40	3	14.13	2.03
	Within	530.10	76	6.98	
Post Test Mean	Between	65.21	3	21.74	2.74*
	Within	602.24	76	7.92	
Adjusted Mean	Between	164.34	3	54.78	27.39*
	Within	150.00	75	2.00	
VITAL CAPACITY					
Pre Test Mean	Between	457844	3	152615	0.82
	Within	14179625	76	186574	
Post Test Mean	Between	1251281	3	417094	2.30
	Within	13791688	76	181470	
Adjusted Mean	Between	281334	3	93778	4.46*
	Within	1576485	75	21020	

Required F(0.05), (df 3,76) =2.72
* Significant at 0.05 level of confidence

Since significant F values were obtained, the scores were further subjected to post hoc analysis using Scheffe's post hoc analysis and the results are presented in Table III.

Tab III: Multiple Comparisons of Paired Adjusted Means of Yogic Practices, Yogic Diet, Combined and Control Groups on Maximal Oxygen Uptake and Vital Capacity

Yoga Group	Yoga Diet Group	Combined Group	Control Group	MEAN DIFF	Required C.I.
MAXIMAL OXYGEN UPTAKE					
26.85	26.46			0.38	1.28
26.85		29.72		2.87*	1.28
26.85			25.87	0.97	1.28
	26.46	29.72		3.25*	1.28
	26.46		25.87	0.59	1.28
		29.72	25.87	3.84*	1.28
VITAL CAPACITY					
2327.41	2247.16			80.25	130.97
2327.41		2342.56		15.14	130.97
2327.41			2195.37	132.04*	130.97
	2247.16	2342.56		95.40	130.97
	2247.16		2195.37	51.79	130.97
		2342.56	2195.37	147.19*	130.97

* Significant

DISCUSSIONS

The results presented in this study proved that there was significant influence on maximal oxygen consumption and vital capacity due to combined and isolated effects of yogic practice and yogic diet as the obtained F values on adjusted means 27.39 and 4.46 respectively. The post hoc analysis revealed that combined group experimented with yogic practices and yogic diet was significantly better than isolated groups yogic practices; yogic diet group and control group in improving maximal oxygen consumption. The post hoc analysis further proved that isolated yogic practices group and combined group significantly improved vital capacity than control group. Mandanmohan, et al. (2003) found effect of yoga training on handgrip, respiratory pressures and pulmonary function, i.e. maximum expiratory pressure (MEP), maximum inspiratory pressure (MIP), forced expiratory volume (FEV), forced expiratory volume in first second (FEV1) and peak expiratory flow rate (PEFR) and found improves lung function, strength of inspiratory and expiratory muscles as well as skeletal muscle strength and endurance. Ross A, et.al. (2012) found yoga and fruit and vegetable consumption better health. The experimental treatments in the form of combined training consisting of yogic practices and yogic diet improved inspiratory, expiratory muscules as well as skeletal muscle strength and endurance, which improved maximal oxygen uptake and improved vital capacity of the obese engineering women students and the findings of this study are in agreement with the findings of Madanmohan (2003) and Ross et al. (2012). Conclusions: It was concluded that combined group was significantly better than isolated groups in influencing maximal oxygen uptake and vital capacity of the obese engineering college students.

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ISSN 2277-3665 Vol : III Issue : IX Sept.-2014 Impact Factor 1.3205 (UIF)

Physical Education & Sports Research Journal

International Recognition Physical Education & Sports Research Jou

Speed and Agility as Determinants of Long Jump Performance



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ISSN NO:-2277-3665 Vol: III, Issue : IX, Sept - 2014

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Academic Sports Scholar
Vol. 3 | Issue. 9 | Sept 2014

ISSN : 2277-3665
Impact Factor : 1.3205 (UIF)

ORIGINAL ARTICLE

SPEED AND AGILITY AS DETERMINANTS OF LONG JUMP PERFORMANCE

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Abstract:

The aim of this study was to find out how far speed and agility serves as determinants of long jump performance. To achieve the purpose of the study, the investigator randomly selected 40 long jumpers who participated at inter collegiate level athletic meets, representing different colleges. The selected subjects were measured of their speed using 50 M sprint test, agility using 4 x 10 shuttle run and long jump performance following the standard procedure. The collected data on speed, agility were correlated with long jump performance to find out the association between speed and agility with long jump performance. The obtained data were further subjected to statistical analysis using Multiple regression analysis to find out whether speed and agility combined together contributes for the long jump performance of these athletes. The Correlation co-efficient results proved that there was significant relationship ($P<0.05$) between speed and long jump performance while there was no significant relationship between agility and long jump performance. The multiple regression analysis results proved that long jump performance can be determined based on speed and agility and based on the results suitable formulae were determined. It was concluded the formulae suggested in this study, can be used to determine the long jump performance of long jumpers.

KEY WORDS:

Speed, Agility, Determinants of Long Jump Performance.

INTRODUCTION

Athletic performance is the sum total of numerous facts on which, it will be varying from individual to individual, even if they ultimately achieve similar results in competition. A few centimeters or fraction of seconds decide record performance, victory or defeat in competition. (Swaddling, Judith (2004) It is very important to mobilise the potential of each individual. Athletics is an individual sports event of a person in sports field. This sports event varies according to their performance and physical fitness of the body. In the games and sports field, physical fitness components is very essential to achieve the peak performance of an individual. To achieve the goal exactly, the athletes must have dedication of right practices. Hence, physical fitness plays a vital role for each and every synchronized movements of the body.(Tricard, Louise Mead (1996). A jump is a motion which carries the body through the air from the take-off. In a jump the propulsive force may be exerted either by foot or by both feet. In long jump, the run preceding the jump gives the forward movements and vertical determined by the strength which are involved in these movements. There is an old adage that an athlete will go as long as his legs will carry him.(Stephen G. Miller 2004)

Please cite this Article as : Hari Om Sharma[1] and R. Subramanian[2], "SPEED AND AGILITY AS DETERMINANTS OF LONG JUMP PERFORMANCE" : Academic Sports Scholar (Sept ; 2014)

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Lockie RG et al. (2014) investigated relationships between the lower-body focused screens a overall performance and multidirectional speed and jumping capabilities. And found the deep squat (D did moderately correlate with between-leg difference (r = -0.423), and bilateral vertical jump (VJ) (r = 0.428) and Standing broad jump (SBJ) (r = -0.457). When stratified into groups according to DS score, hi performers had a 13% greater SLJ when compared to intermediate performers, which was the o significant result. The functional movement screen (FMS) appears to have minimal capabilities identifying movement deficiencies that could affect multidirectional speed and jumping in male athlet Stodden DF et al. (2014) examined associations among motor skill competence (MSC) and health-rela fitness (HRF) in youth and found that development of object control skills in childhood may be import for the development and maintenance of HRF across childhood and into adolescence. Marcovic G. (20(examined the relationship between the leg extensor strength and power and agility performance. T correlations between strength and power, and each agility performance were generally low. As consequence, the multiple correlation coefficients between strength and power predictors and agility, alb significant (P<0.01), were also rather low (r=0.33, 0.44, and 0.35 for the lateral stepping, 20-yard shut run, and slalom run, respectively). The highest relationship with each of the agility tests was revealed by one-leg rising test (r within -0.3 and -0.44; P<0.02). The results of the present study suggest that most of multijoint leg extensor strength and power measures are poor predictors of agility in physically active m Thus, the effects of interventions aimed towards the improvement of functional movement performar may not require evaluation by means of the common tests of muscular strength and power. A more speci approach including both the functional strength tests and functional movement performance tests could recommended instead. Sheppard JM, et.al. (2008) examined the potential strength, power, a anthropometric contributors to vertical jump performances that are considered specific to volleyb success: the spike jump (SPJ) and counter-movement vertical jump (CMVJ) The results of this stu clearly demonstrate that in an elite population of volleyball players, stretch-shortening cycle performar and the ability to tolerate high stretch loads, as in the depth jump, is critical to performance in the jun associated with volleyball performance. The theoretical foundations laid based on previous researcl proved that there were few attempts made to find out the determinants for jumping performances different sports and games among different groups of people. And it was found that there was further sc for research to find out whether long jump performance is determined by speed and agility of collegi level athletes.

METHODOLOGY

To achieve the purpose of the study, the investigator randomly selected 40 long jumpers w participated at inter collegiate level athletic meets, representing different colleges. The selected subje were measured of their speed using 50 M sprint test, agility using 4 x 10 shuttle run and long ju performance following the standard procedure. The collected data on speed, agility were correlated w long jump performance to find out the association between speed and agility with long jump performan The obtained data were further subjected to statistical analysis using Multiple regression analysis to f out whether speed and agility combined together contributes for the long jump performance of th athletes.

RESULTS

Tab 1: Showing Descriptive Statistics, Number of Subjects, Means and Standard Deviation o Speed, Agility and Long Jump Performance of the Subjects

S.No	Variables	No. of Subjects	Mean	Standard Deviation
1	Speed	40	7.00	0.22
2	Agility	40	10.65	0.48
3	Long Jump Performance	40	5.36	0.36

The descriptive statistics showed that the average speed of the subjects were 7.00 seconds to spr 50 M run with standard deviation of + 0.22. The average agility scores of the subjects were 10.65 secor with standard deviation of + 0.48. The long jump performance average score was 5.36 Meters w

standard deviation of 0.36. The obtained data were statistically analysed to find out whether speed and agility have any significant relationship with long jump performance.

Tab 2: Showing Pearson Coefficient Correlation Between Criterion and Independent Variables

S.No	Variables LONG JUMP PERFORMANCE Vs	No. of Subjects	Obtained 'r'	Required 'r'
1	Speed	40	0.34*	0.304
2	Agility	40	0.24	0.304

* Significant at 0.05 level.

The results proved that there was significant relationship between speed of the subjects and their long jump performance ($P<0.05$) and there was no significant relationship between agility and long jump performance of the subjects.

In order to determine whether speed and agility serve as determinant of long jump performance, the obtained data were further subjected to statistical analysis using Multiple Regression analysis and the results are presented below.

Tab 3: Showing Multiple Regression Analysis on Speed and Agility and Long Jump performance

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.450	0.202	0.159	0.325

a Predictors: (Constant), AGILITY, SPEED

Tab 4: Showing Analysis of Variance between Regression and Residual between Long Jump Performance and Speed and Agility

	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.993	2	0.496	4.692	.015
Residual	3.914	37	0.106		
Total	4.906	39			

Required table value (df 2,37) at 0.05 level = 3.25
* Significant at 0.05 level.
Predictors: (Constant), AGILITY, SPEED
Dependent Variable: Long Jump Performance

Tab 5: Showing Beta Unstandardised Co-Efficients, Constant Value And Significance of Selected Variables

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	11.923	2.143		5.565	.000
SPEED	-0.604	.237	-0.378	-2.554	.015
AGILITY	-0.219	.110	-0.294	-1.990	.054

a Dependent Variable: Performance

DISCUSSION ON RESULTS

The results presented in Table 2 proved that there was significant relationship between sp long jump performance of the subjects. The multiple regression analysis results to determine sp agility combined together on long performance proved that 45% of long jump performance is con by speed and agility (Table 3) and ANOVA calculations between regressed and residual being signi 0.05 level the results proved that speed and agility combined together contributes for the lon performance (Table 4). Based on the results presented in Table 5 the long jump performance of the s can be determined through the following formulae.

Y (Long Jump Performance) = X_1 (Speed) + X_2 (Agility) + C (constant)
Therefore the long jump performance is determined by speed and agility based on the formulae Lor Performance = -0.604 (Speed) -0.219 (Agility) + 11.923.

CONCLUSIONS

It was concluded the formulae suggested in this study, can be used to determine the lor performance of long jumpers.

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Effect of SAQ and Swiss Ball Training on Lunge and Fleche Performance among State Level Women Fencers

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Abstract

The purpose of the study was to find out the effect of SAQ and Swiss ball training on lunge and fleche performance among state level women fencers. For this purpose, thirty fencers were selected at random from the SDAT, Chennai. Their age ranged between 16 and 21 years. The selected thirty fencers were randomly assigned into three groups namely; SAQ training group, Swiss ball training group and control group each consisting of ten subjects. The subjects were given SAQ and Swiss ball training for a period of ten weeks. The subjects were tested lunge and fleche performance. After the experimental period, the collected data was analysed by using analysis of covariance. The level of significance was fixed at 0.05 level. The results showed that the ten weeks of SAQ training had a significant improvement on the lunge and fleche performance. This restrictive concept is applied to SAQ training, as opposed to the fencer then takes a large step forward with the front foot, landing the foot flat on the floor.

Key words: SAQ and Swiss ball Training, Lunge and Fleche

Introduction

Fencing sport is required of skill, speed, and power. Skill is improved by long years of practice and experience under the guidance of expert coaching. Traditionally, Fencers need specific parts of all the physical qualities to succeed in competition and to prevent them from getting injured. With greater levels of strength and agility fencers find 'explosive' lunge movements and getting around the piste easier, All the training is designed to progress individuals so the type and intensity of fitness training done with our fencers is dependent on the individual level and age of the fencers involved in the sessions. As such training might be introductory, general, and (relatively) easy for the novice fencers, or they might be designed to be very tough and very fencing specific for elite fencers (with everything in-between) **(Rippetoe, 2000)**.

The lunge plays an important role as a major skill in fencing where it forms the basis of one of the most definitive attacking moves. It is initiated by the extension of the elbow and shoulder of the sword arm. This initial movement is followed almost immediately by extension of the front knee. Only when these extensions have been initiated does the whole body then move forward driven by a vigorous extension of the back leg.

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JOURNAL OF PHYSICAL EDUCATION SPORTS AND ALLIED DISCIPLINES

PEER REVIEWED

Vol. 6 No. 1 January 2015 ISSN : 0974-343X

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The purpose of this study was to determine which kinematic variables within the performance of the fencing lunge have the greatest effect on the overall speed. The independent variable was therefore the time taken from the initiation of the first movement to the impact of the tip of the blade on the target. The six dependent variables were the maximum angular velocities of the elbow of the sword-arm, and the right and left knees, and the time taken to achieve maximum angular velocity from rest. Using a lunge technique, fencers attempt to score points by touching their opponent with the point of their sword. A lunge begins with the fencer extending his sword arm with the point threatening a targeted area of the opponent's body. The fencer then takes a large step forward with the front foot, landing the foot flat on the floor. Once the sword touches the opponent, the fencer slightly lifts his hand to bend the sword upward and confirm the touch. The rear foot provides the leverage and thrust for the lunge, with the fencer pushing off and propelling himself forward into striking distance. Thus, the aim of the present study was to compare the effects of Swiss ball training and SAQ training on Lunge and Fleche performance of state level women fencers.

Methods and Materials

For this purpose, thirty fencers were selected at random from the SDAT, Chennai. Their age ranged between 16 and 21 years. The selected thirty fencers were randomly assigned into three groups namely; SAQ training group, Swiss ball training group and control group each consisting of ten subjects. The subjects were given SAQ and Swiss ball training for a period of ten weeks. The subjects were tested lunge and fleche performance. After the experimental period, the collected data was analysed by using analysis of covariance. The level of significance was fixed at 0.05 level.

Training Programme for SAQ (Speed, Agility and Quickness) and Swiss Ball

The SAQ training method more frequently uses the programmed than random type conditioning after the SAQ continuum. One SAQ session is composed of 7 components, where the main part of the session, explosion and expression of potential, are combinations of programmed and random conditioning. Integral planning and programming is required to progress from fundamental movement patterns to highly positional specific movements.

Swiss ball exercises were conducted 3 days (Monday- Wednesday-Friday) per week. Each fencer was given a Swiss ball in accordance to their height. The size of the Swiss balls were conducive to accomplishing >90° angle at both the hip and knee while sitting on the Swiss ball. The stability balls were either 55 or 65 cm in height. The volume of the exercise program gradually increased by increasing the repetitions and increasing the duration. Before each session, participants performed a 5-10 minute warm-up, and then stretching. The rest interval between the sets and circuits was

approximately 30 seconds. Exercise session lasted 30 minutes for week 1 and gradually increased up to 50 minutes in progress of the time. Before the week 1, ball familiarization movement was conducted for 2 weeks. All of the sessions were instructed and supervised by the same trainer. In each session and movement, participants were reminded to focus on the specific muscles which were activated while performing movement (for example quadriceps muscles during squat). The control group was told not to join any exercise program and to continue their routine daily activities.

Results on Lung and Fleche

The results presented in the table I shows that the pre and post test scores of SAQ Training group, Swiss ball training group and control group on lunge and fleche performance. The obtained pre test F value of 1.60 and 0.57 respectively was lesser than the required table value of 3.35. The obtained post test F value of 25.21 and 30.30 respectively was greater than the required table value of 3.35. Hence, it was proved that there was significant improvement in lunge and Fleche performance among women state level fencers due to SAQ Training and Swiss ball training.

Table I

Computation of Analysis of Covariance on Lunge and Fleche

(Scores in meters)

variables	Test	SAQ Group	Swiss Ball Group	Cont. Group	SV	SS	df	MS	F
Lung	Pre Test	1.41	1.42	1.40	B	0.00	2	0.00	1.60
					W	0.02	27	0.00	
	Post Test	1.52	1.51	1.40	B	0.09	2	0.05	**25.21***
					W	0.05	27	0.00	
	Adjusted	1.52	1.50	1.41	B	0.06	2	0.03	**28.54***
					W	0.03	26	0.00	
Fleche	Pre Test	2.70	2.72	2.71	B	0.00	2	0.00	0.57
					W	0.04	27	0.00	
	Post Test	2.84	2.84	2.72	B	0.09	2	0.05	**30.30***
					W	0.04	27	0.00	
	Adjusted	2.85	2.83	2.72	B	0.09	2	0.05	**41.28***
					W	0.03	26	0.00	

*Significant at 0.05 level of confidence for 2 and 27 (df) = 3.35, 2 and 26 (df) = 3.37

The statistical analysis on adjusted mean values using ANCOVA revealed that there was significant difference existed among SAQ Training group, Swiss ball Training group and control group on lunge, since the obtained adjusted mean F value 28.54 and 41.28 respectively was greater than the table value of 3.37 at 0.05 level.

Since the F value was significant, the results were subjected to post hoc analysis using Scheffe's confidence interval test. The results were presented in Table II.

Table II

Scheffe's Confidence Interval Test Score on Lunge and Fleche

(Scores in Meters)

variables	Cont. Group	SAQ Group	Swiss Ball Group	Mean Difference	CI
Lunge	1.41	1.52		**0.11***	0.03
	1.41		1.50	**0.09***	0.03
		1.52	1.50	0.02	0.03
Fleche	1.36	1.45		**0.09***	0.02
	1.36		1.43	**0.07***	0.02
		1.45	1.43	0.01	0.02

*Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between SAQ Training group and control group. Further, there was significant difference between Swiss ball Training group and control group. There was no significant difference between treatment groups, namely SAQ Training group and Swiss ball training group.

The pre test, post test and ordered adjusted means are presented through bar diagram for better understanding of the result of this study in figures.

Figure – 1

Bar Diagram on Adjusted Means of Lunge

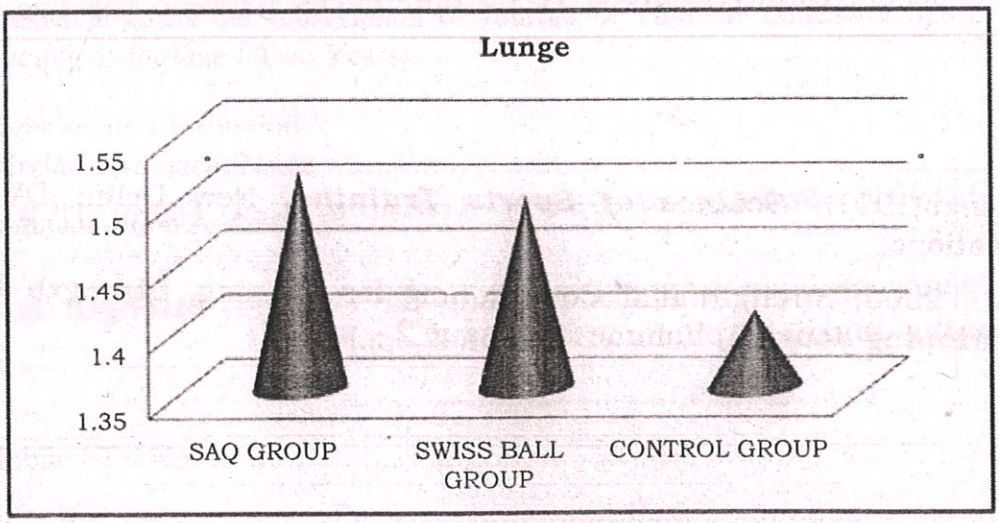
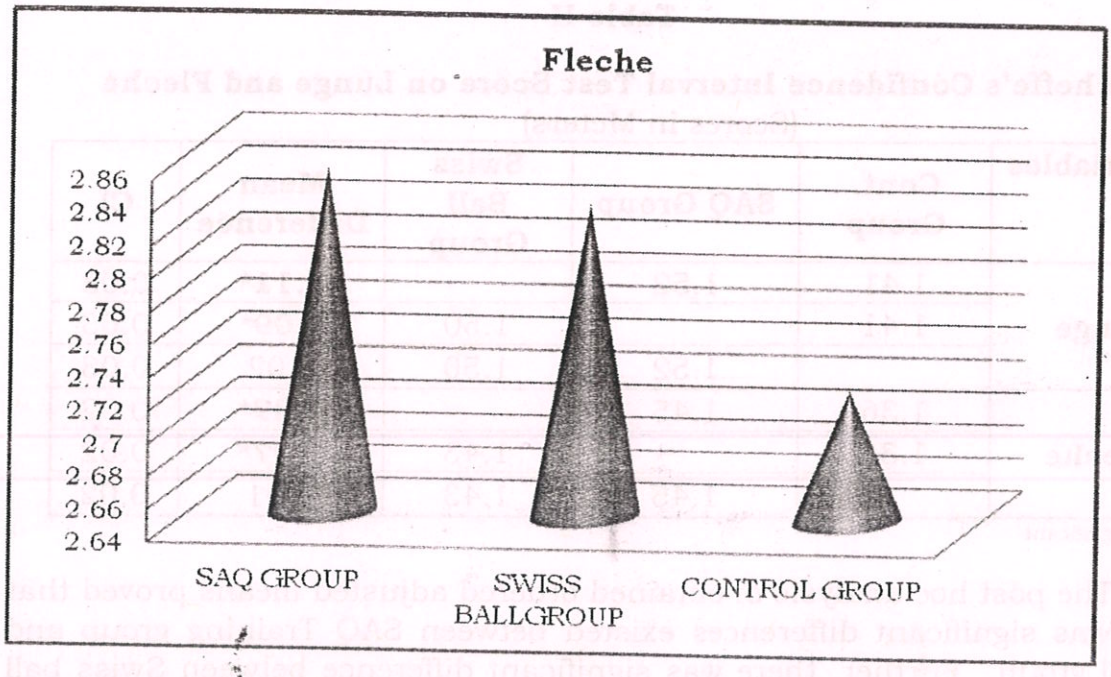


Figure – 2

Bar Diagram on Adjusted Means of Fleche



Discussion and Conclusion

Sports training are the process of sports protection based on scientific and educational principles aimed at top-level performance in one of sports events **(Hardayal Singh, 1991)**. Training means a systematic program of conditioning exercise and physical activates designed to improve the physical fitness and skill of the players.

The results proved that the SAQ (Speed, Agility and Quickness) and Swiss Ball exercise improved indices of body composition and performance of lunge and Fleche. However, there were no differences between the two groups.

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Vol-IV Issue-IV Oct 2014



GOLDEN RESEARCH THOUGHTS

International Recognition Multidisciplinary Research Journal

ISSN 2231-5063 Impact Factor 2.2052(UIF) DOI Prefix : 978-22315063

Relationship Between Leg Power, Reaction Time and Long Jump Performance



Research by



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Abstract:

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Golden Research Thoughts
ISSN 2231-5063
Impact Factor : 2.2052(UIF)
Volume-4 | Issue-4 | Oct-2014
Available online at www.aygrt.isrj.net

RELATIONSHIP BETWEEN LEG POWER, REACTION TIME AND LONG JUMP PERFORMANCE

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Abstract:-The aim of this study was to find out the relationship between leg power and reaction time with long jump performance. To achieve the purpose of the study, the investigator randomly selected 30 long jumpers who participated at inter collegiate level athletic meet, representing different colleges. The selected subjects were measured of their leg power through standing broad jump test and reaction time through reaction time tester and long jump performance following the standard procedure. The collected data on leg power, reaction time were correlated with long jump performance to find out the relationship. The obtained data were further subjected to statistical analysis using Pearson Correlation Coefficient analysis to find out whether leg power and reaction time were significantly related to long jump performance of these athletes. The Correlation co-efficient results proved that there was significant relationship ($P<0.05$) between leg power and long jump performance while there was no significant relationship between reaction time and long jump performance. It was concluded that leg power has significant relationship with long jump performance and more researches are required to establish relationship with long jump and reaction time.

Keywords: Leg Power, Reaction Time, Standing Broad Jump, Reaction Time Tester, Long Jump Performance.

INTRODUCTION

Leg strength plays a vital role in the daily activities of man. It is an essential factor for indulging in almost all games and sports. There is an old adage that an athlete will go on only as long as his leg could carry him. Vertical jump is used to measure the explosive power and strength of legs. Jumping ability depends on strength muscles and tendons and flexibility of ankles, knee and hip joints. (Larsen, 1971) In vertical jumping exercise, the forces are directed upward and projection takes place with the center of gravity directly over the base of support. Power is a composite of a number of different factors operating together to produce an explosive effort to get away to a first start, to accelerate the shot, to get maximum life when jumping all these require the explosive power. A jump is a motion which carries the body through the air from the take-off. In a jump the propulsive force may be exerted either by foot or by both feet. In long jump, the run preceding the jump gives the forward movements and vertical determined by the strength which are involved in these movements. Long jump requires lot of speed, strength and agility. So one can attain success in these events of jumping with proper training which are suitable to develop those qualities. A good technique is very

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essential in the field of athletics especially for long jumpers. But the first and foremost quality f long jumper is leg strength and muscular power so that the jumper can develop so much of speed go up in the air with maximum effort to gain distance.

Human Psychomotor skills are organised patterns of muscular activities guided changing signals from the environment. The genetic factors, growth and developm considerations and prior environmental experiences provide learners to come to a learning situat with dissimilar probabilities for success. In researches concerning psychomotor skills particu attention is given to the learning to co-ordinated activity of the arms, hands, fingers and feet. If assume the uniqueness of the skill to be learned and a relative homogentiy of the would be learner relevant variables.(Oxendline, J.B. (1975)

Reaction time is one of the factors of great significance in competition. Different forms reaction time may dominate one's ability to perform according to situation demanding qu response and immediate action. Reaction time is considered as the time that elapses from occurrence of the stimulus till we set act or the time from the occurrence of the stimulus to completion of a simple muscular contraction.(John,D.Lawther. (1960) Reaction time impro upto the age of 25-30 after that it gradually declines. Men generally respond and react slightly fas than women. Studies have recalled that gymnasts and wrestlers react more slowly than the te game athletes" (Lawther, 1960).

Coward SR and Halsey LG (2014) analysed video recorded data on horizontal jumping a found the calf muscle is likely used more, and the thigh muscles less, to take-off from a fi springboard during 1.8 m jumps, which may result in the power required to take-off being produc less efficiently. And the angle of take-off is closer to the optimal for energetic efficiency, possible d to the impulse provided by the surface as it returns stored energy during the final stages of the tak off. López-Segovia M et al. (2014) examined the relationship between lower body power a repeated as well as single sprint performance in soccer players and found repeated and single sprin are associated with relatively lower body power in soccer players. Lockie RG et al. (201 examined lower-body focused tests, hurdle step, in-line lunge that could assist in identifyi movement deficiencies affecting multidirectional sprinting and jumping, which are importa qualities for team sports and found functional movement screen (FMS) have minimal capabilities f identifying movement deficiencies that could affect multidirectional speed and jumping in ma team sport athletes. Theodorou A et al. (2013) investigated the occurrence of stride regulation at th approach phase of thelong jump in athletes with normal vision and visually deprived and four reduced vision does not prevent athletes from applying a regulatory mechanism similar to th observed in sighted athletes. Panteli FN et al. (2014) examined the presence of visually regulate control in young, novice long jumpers as they approach the takeoff board and found that youn novice participants adjust the length of the final steps of their approach run, suggesting the presenc of visual control. Chatzopoulos D et al. (2014) compared the acute effects of three differe stretching protocols on balance, agility, reaction time and movement time of the upper limbs an revealed significant main effects for all variables except reaction time. Ricotti L et al. (2013) foun visual and acoustic reaction times do not discriminate among players or control subjects (nor athletes). Nuri L et al. (2013) investigated whether a difference exists in sensory-cognitive skill between two different sport domains (volleyball players and sprinters) and found athletes hav greater sensory-cognitive skills related to their specific sport domain either open or closed. Th theoretical foundations laid proved that there were some attempts made to identifying variables fo long jump performances and some other researches were attempted to find out the influence o reaction time among different athletes. These findings proved that there is further scope for researc to find out the relationship between leg power and reaction time on long jump performances amon collegiate level long jumpers.

METHDOLOGY

To achieve the purpose of the study, the investigator randomly selected 30 long jumper who participated at inter collegiate level athletic meets, representing different colleges. The selecte subjects were measured of their leg power through standing broad jump test, simple reaction tim

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using reaction timer and long jump performance following the standard procedure. The collected data on leg power and reaction time were correlated with long jump performance to find out the relationship between leg power and reaction tome with long jump performance. Statistical tool Pearson Coefficient of Correlation was used to find out the relationship between criterion variable, long jump ability and independent variables, leg power and reaction time. In all cases 0.05 level was fixed to test the significance of the study.

RESULTS

Tab 1: Showing Descriptive Statistics, Number of Subjects, Means and Standard Deviation on Leg Power, Reaction Time and Long Jump Performance of the Subjects

S.No	Variables	No, of Subjects	Mean	Standard Deviation	Range	
					Min	Max
1	Leg Power	30	2.04	0.14	1.74	2.28
2	Reaction time	30	0.467	0.051	0.374	0.558
3	Long Jump Performance	30	5.42	0.363	4.87	6.05

The descriptive statistics showed that the average leg power of the subjects were 2.04 meters to standing broad jump run with standard deviation of + 0.14. The average reaction time scores of the subjects were 0.467 seconds with standard deviation of + 0.051. The long jump performance average score was 5.42 Meters with standard deviation of 0.363. The obtained data were statistically analysed to find out whether leg power and reaction time have any significant relationship with long jump performance.

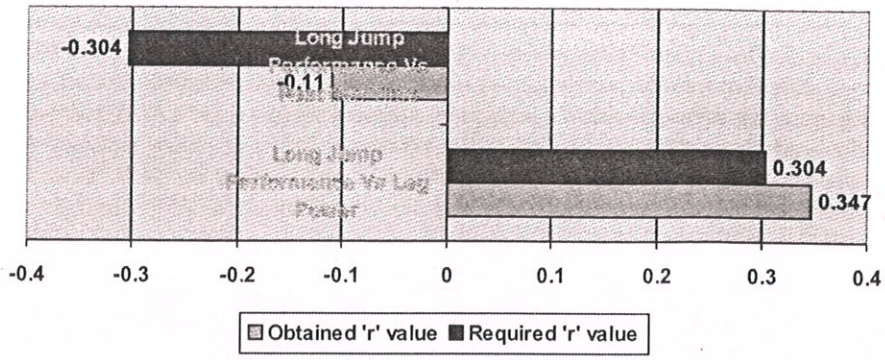
Tab 2: Showing Pearson Coefficient Correlation Between Criterion and Independent Variables

S.No	Variables LONG JUMP PERFORMANCE Vs	No. of Subjects	Obtained 'r'	Required 'r'
1	Leg Power	30	0.347*	0.304
2	Reaction time	30	-0.110	0.304

* Significant at 0.05 level.

The results proved that there was significant relationship between leg power of the subjects and their long jump performance ($P<0.05$) and there was no significant relationship between reaction time and long jump performance of the subjects.

Fig 1: The obtained & Required 'r' values.



DISCUSSION ON RESULTS

The results presented in Table 2 proved that there was significant relationship between leg power and long jump performance of the subjects. The reaction time of the subjects were not significantly related to long jump performance as the obtained 'r' value of -0.11 was less than the required 'r' value of 0.304 to be significant at 0.05 level. Coward SR and Halsey LG (2014) found the calf muscle is likely used more, and the thigh muscles less, to take-off from a firm springboard during 1.8 m jumps, which may result in the power required to take-off being produced less efficiently. López-Segovia M et al. (2014) examined the relationship between lower body power as well as single sprint performance in soccer players and found repeated and single sprints are associated with relatively lower body power in soccer players. These findings revealed that long jump performance are associated with leg power and the findings of this study are in agreement with these previous researches. Chatzopoulos D et al. (2014) compared the acute effects of three different stretching protocols on balance, agility, reaction time and movement time of the upper limbs and revealed significant main effects for all variables except reaction time. The findings of this study proved that there was insignificant relationship between reaction time and different protocols including long jump and the findings of this study that there is no significant relationship between long jump and reaction time was in agreement with this previous study.

CONCLUSION

It was concluded that leg power has significant relationship with long jump performance and more researches are required to establish relationship with long jump and reaction time.

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PHYSICAL EDUCATION

Star. Phy. Edn 4 (2015)

ASSOCIATION OF SHOOTING ACCURACY IN HOCKEY ON SPEED AND AGILITY

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Abstract

The purpose of the study was to find out the correlation of shooting accuracy in hockey in speed and agility. To achieve this purpose (N=20) twenty subjects were selected from field hockey players from Tamilnadu physical education and sports university. The subjects' age ranged from 21 to 27 years. The selected independent variables namely agility and speed was tested through Illinois agility test and 50 yards test respectively and dependent variable shooting accuracy was tested through Harbinder Singh shooting accuracy test. The Pearson's product moment correlation was used as a statistical technique to analyze the collected data. The level of significance was fixed at 0.05 levels. The results of the study proved that there was no significant relationship between shooting accuracy and the selected skill related fitness variables namely speed and agility among college field hockey players.

INTRODUCTION

Field hockey is a sport with a long history that has undergone quite rapid and radical change within the past decade. The advent of the synthetic playing surface has changed the technical, tactical and physiological requirements of the game at all levels, but in particular at the elite level (Borrie, 1992). Skill related fitness factors play an important role in the best performance. In all the sports for achieving high level performance, it requires skill related fitness to execute the skills in the competitive situation. Nowadays the fitness level of players is the major contributor for a term's success.

Field Hockey is a vigorous team game in India and the game is played by all who love vigorous game. Apart from the game skills, the game requires optimum level of skill related fitness. Thus, field hockey players from different skill related fitness of India possess different level of body structure which might affect their playing skills and skill related fitness. To be a good dribbler one needs control, confidence and aggression. Learning to control the ball, improving stick work, can easily be done at home using stationary objects. Developing confidence and drive to beat a man requires opponents with and urge to take the ball away from a player (Thani, 1995).

Agility is the ability to turn the body into different directions quickly. Speed is the ability to cover the given distance in a shortest possible time. Shooting accuracy is the ability of the player to shoot the ball accurately into the hockey goal in an acute angle.

Dodging is the ability to beat the opponent while regaining possession of the ball or to gain ground, territory or a position of advantage and beat the opponent (Glencross, 1985). Russell, Benton and Kingsley (2011) examined the effects of exercise-induced fatigue on soccer skills performed throughout simulated match play. The findings revealed that soccer-specific exercise influenced the quality of performance in gross motor skills, such as passing and shooting. Russell, Benton and Kingsley (2010) examined the reliability and construct validity of new soccer skills tests. Test-retest reliability statistics were as follows: ball speed passing, shooting, dribbling. Professional players performed better than recreational players in at least one outcome measure for all skills. These findings demonstrate the reliability and validity of new soccer skill protocols.

Mwisukha and Andaje (2012) involved in an analysis of the effectiveness of Kenya's top men's field hockey teams in using offensive tactics of passing and shooting with the drive, push, flick and scoop, corners and penalty corners in competition. From the study, it is recommended that Kenya's top men's hockey teams should boost their chances of winning league matches by polishing more on their passes using the drive, push, flick and scoop and shots with the drive, push and flick. Konarski et al. (2012) suggested that a separate training must be recommended to improve the specific functional capacities (speed, aerobic endurance, and speed-endurance) of individual athletes in addition to technical and tactical skills. Shooting must be

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PHYSICAL EDUCATION

Star. Phy. Edn 12 *(2014)*

RELATIONSHIP BETWEEN SPIKING AND VERTICAL JUMPING ABILITY AMONG VOLLEYBALL PLAYERS

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Abstract

The purpose of this study was to find out the relationship between Spiking and vertical jumping ability among volleyball players. Fifteen men volleyball players were selected at random from various colleges in, Chennai. Each subject was measured their ability in spiking. In addition Vertical jumping ability was measured using Sargent Vertical Jump Test. The Spearman Rank Order correlation method was used to find out the relationship between spiking ability and vertical jumping ability. It was concluded that spiking ability of volleyball players were significantly related to vertical jumping ability of the volleyball players.

Introduction

Volleyball has developed into a highly competitive sport which requires a high level of physical, physiological and psychological fitness. The game at a high level of competition, requires quicker sudden movements and fast reaction. Volleyball matches have no time limit and matches can last for several hours, if the teams are evenly matched.

Successful play in volleyball is not the outcome of power alone but it is the product of the combined display of power and tactical abilities. Modern game of volleyball is characterized by accuracy, concentration and cleverness (Sharma et al, 1986).

Volleyball has changed beyond recognition in the past three decades from an unorganized sport into a highly competitive, requiring a high level of physical fitness, mental alertness and mastery over techniques.

"Volleyball has a great need for volitional qualities, with equal technical and tactical mastery the team whose players show the greatest desire for victory will win (Dewaram, 1982).

Volleyball is characterized mainly by its dynamic work of broken intensity. There are periods of significant muscular activity in alteration with periods of relative relaxation intensity of work. During the time of play, the intensity of play oscillates from moderate to maximum. The time playing approaches three hours during which intensity increases to a points where, pulse rate reaches 200 beats / min and weight loss goes upto 2.5 to 3 Kgs (Kteshcer, 1986).

In every tactical move in volleyball, one depends on team work and the individual skills, good passing, setting, spiking, jumping, controlling the ball, participation and speed to the ball and keeping the eyes on the ball. Tactics will succeed only through individual fundamental skills and with players thinking as a team.

Every player must know the requirements of his position and skills and he fits in with other members of the team, especially with those most closely connected with him. So player must possess the skills of the game and is physically fit to execute the same. If any of the above is lacking he is not a complete player.

Blazevich AJ, et. al. (2003) conveyed Significant muscle size and architectural adaptations can occur in concurrently training athletes in response to a 5-wk training program. These adaptations were possibly associated with the force and velocity characteristics of the training exercises but not the movement patterns. Factors other than, or in addition to, muscle architecture must mediate changes in strength, sprint, and jump performance.

Dowson MN, et.al.(1998) suggest that the relationship between isokinetic muscle strength and sprint performance over 0-15 m (during the acceleration phase) is improved by taking limb length and body mass into account.

Sleivert G, and Taingahue M.(2004) concluded that the traditional squat peak power was maximal between 50% and 70% of 1RM. Concentric force development is critical to sprint start performance and accordingly maximal concentric jump power is related to sprint acceleration.

Oxyzoglou et.al. (2008) revealed that the goalkeepers have a highly developed level of pelvis

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Star. Phy. Edn 11 (2014)

RELATIONSHIP OF CARDIO PULMONARY ENDURANCE AND FLEXIBILITY WITH MOVING ABILITY IN HOCKEY

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Abstract

The purpose of the study was to find out the relationship of cardio pulmonary endurance and flexibility with moving ability in hockey. To achieve this purpose (N=20) twenty subjects were selected from field hockey players from Tamilnadu physical education and sports university. The subjects' age ranged from 21 to 27 years. The selected independent variables namely cardio-pulmonary endurance and flexibility were tested through beep test and sit and reach test respectively and dependent variable moving tested was through SAI Hockey skill test. To achieve this purpose, Pearson's product moment correlation was used as a statistical technique. The level of significance was fixed at 0.05 levels. The result proved that there was a significant relationship between moving skill and the selected skill related fitness variables namely cardio pulmonary endurance and flexibility among college field hockey players.

INTRODUCTION

Field hockey is a sport with a long history that has undergone quite rapid and radical change within the past decade. The advent of the synthetic playing surface has changed the technical, tactical and physiological requirements of the game at all levels, but in particular at the elite level (Borrie, 1992). Skill related fitness factors play an important role in the best performance. In all the sports for achieving high level performance, it requires skill related fitness to execute the skills in the competitive situation. Nowadays the fitness level of players is the major contributor for a term's success.

Field Hockey is a vigorous team game in India and the game is played by all who love vigorous game. Apart from the game skills, the game requires optimum level of skill related fitness. Thus, field hockey players from different skill related fitness of India possess different level of body structure which might affect their playing skills and skill related fitness. To be a good dribbler one needs control, confidence and aggression. Learning to control the ball, improving stick work, can easily be done at home using stationary objects. Developing confidence and drive to beat a man requires opponents with and urge to take the ball away from a player (Thani, 1995).

Cardio pulmonary endurance is the ability of the players to sustain the aerobic activity in the game situation for a longer duration. Flexibility is the range of motion in a joint.

Moving is the ability to the ball controlling the hockey player when moving with the ball (Kansal, 2008).

Dodging is the ability to beat the opponent while regaining possession of the ball or to gain ground, territory or a position of advantage and beat the opponent (Glencross, 1985).

The position of the hands and use of the wrists are very important in the drive. The hands in the drive should be close together and the player must grip the handle firmly (Thani, 1995).

Russell, Benton and Kingsley (2011) examined the effects of exercise-induced fatigue on soccer skills performed throughout simulated match play. The findings revealed that soccer-specific exercise influenced the quality of performance in gross motor skills, such as passing and shooting.

Russell, Benton and Kingsley (2010) examined the reliability and construct validity of new soccer skills tests. Test-retest reliability statistics were as follows: ball speed passing, shooting, dribbling. Professional players performed better than recreational players in at least one outcome measure for all skills. These findings demonstrate the reliability and validity of new soccer skill protocols.

Mwisukha and Andaje (2012) involved in an analysis of the effectiveness of Kenya's top men's field hockey teams in using offensive tactics of passing and shooting with the drive, push, flick and scoop, corners and penalty corners in competition. From the study, it is recommended that Kenya's top men's hockey

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PHYSICAL EDUCATION

Star. Phy. Edn 8 *(2014)*

PSYCHOLOGICAL CORRELATES OF PLAYING ABILITY AMONG SOCCER PLAYERS AS A FUNCTION OF GENDER

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Abstract

The purpose of the study was to find out psychological correlates of playing ability among football players as a function of gender. To achieve the purpose of this study the investigator selected 100 football players consisting of 50 men and women. The subjects were randomly selected from players who competed at intercollegiate level competitions held at Chennai. The selected subjects age group were ranging from 19 to 25 years. Selected psychological Variable Team Cohesion was measured through Group Environment Questionnaire, Mental Toughness was measured through Sports Mental Toughness Questionnaire (SMTQ) and Subjects playing ability in football was assessed subjectively through three experts in football in a playing situation. To examine the relationship between playing ability in football and psychological variables, mental toughness and team cohesion simple correlation using Pearson Coefficient of Correlation was used. It was concluded that psychological variable, team cohesion and mental toughness was positively correlated with men and women soccer players.

INTRODUCTION

Soccer is a game of physical and mental challenges. One must execute skilled movements under generalized conditions of restricted space, limited time, physical and mental fatigue, and opposing players. The player must be able to run several miles during a game, mostly at sprint like speed and respond quickly to a variety of rapidly changing situations during play. Finally, the player need a thorough understanding of individual, group, and team tactics. The player" s ability to meet challenges determines how well he performs on the football field. It is a game which calls for strenuous continuous thrilling action and therefore, appeals to the youth the world over. The skills involved in the game are simple, natural and satisfying to any one who participate in the game.

Mental toughness is a contested term, in that many people use the term liberally to refer to any set of positive attributes that helps a person to cope with difficult situations. Coaches and sport commentators freely use the term mental toughness to describe the mental state of athletes who persevere through difficult sport circumstances to succeed. Hardiness has been suggested as a similar construct to mental toughness. Hardiness has typically been constructed as a personality trait, which is generally seen as stable throughout the lifetime. This differs from the conceptions of mental toughness offered by both Jones et al. and Gucciardi et al. These authors both conceive of mental toughness as unstable, arising in development, fluctuating over time, and varying for an individual performer between different sport and life scenarios.

Cohesion has been defined in many ways. In the sporting world, one definition is most widely used and accepted, and it is the one we will use. Cohesion is the total field of forces which act on members to remain in a particular group (Festinger, Schacter, & Back, 1950). People will usually refer to their team as cohesive if the members get along, are loyal and are united in the pursuit of its goals. Merely being together at workouts and games doesn" t necessarily guarantee a team will be cohesive and successful, it simply means that they are occupying the same space at the same time. A cohesive team can be distinguished from a noncohesive team by many characteristics. A cohesive team has well-defined roles and group norms, common goals, a positive team identity, a good working relationship, shared responsibility, respect, positive energy, trust, a willingness to cooperate, unity, good communication, pride in membership, and synergy. Another indicator of the amount of cohesiveness in a team is the frequency of statements of we and our, in contrast to statements of I, me and mine. The we is just as important as the me. Developing cohesion is something that takes time and effort, but it is well worth the investment.

Coulter, Mallett, and Gucciardi (2010) explored mental toughness in soccer using a triangulation of data capture involving players (n =6), coaches (n = 4), and parents (n = 5). Semi-structured interviews, based on a personal construct psychology (Kelly, 1955/1991) framework, were conducted to elicit participants' perspectives on the key characteristics and their contrasts, situations demanding mental toughness, and the behaviours displayed and cognitions employed by mentally tough soccer players. The results from the research provided further evidence that mental toughness is conceptually distinct from other psychological constructs such as hardiness. The findings also supported Gucciardi, Gordon, and Dimmock's (2009) process model of mental toughness. A winning mentality and desire was identified as a key

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RELATIONSHIP BETWEEN DRIBBLING DODGING DRIVE WITH CARDIO PULMONARY ENDURANCE AND FLEXIBILITY AMONG HOCKEY PLAYERS

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Abstract

The purpose of the study was to find out the relationship between dribbling dodging drive with cardio pulmonary endurance and flexibility among hockey players. To achieve this purpose, (N=20) twenty subjects were selected from field hockey players from Tamilnadu physical education and sports university. The subjects' age ranged from 21 to 27 years. Selected independent variables namely cardio-pulmonary endurance and flexibility were tested through beep test and sit and reach test respectively and dependent variables dribbling, dodging and drive tested through Schmithal's French field hockey skill test. To achieve this purpose Pearson's product moment correlation was used as a statistical technique. The level of significance was fixed at 0.05 levels. Results proved that there was a significant negative relationship between dribbling, dodging and drive skill and the selected skill related fitness variables namely cardio pulmonary endurance and flexibility among hockey players.

INTRODUCTION

Field hockey is a sport with a long history that has undergone quite rapid and radical change within the past decade. The advent of the synthetic playing surface has changed the technical, tactical and physiological requirements of the game at all levels, but in particular at the elite level (Borrie, 1992). Skill related fitness factors play an important role in the best performance. In all the sports for achieving high level performance, it requires skill related fitness to execute the skills in the competitive situation. Nowadays the fitness level of players is the major contributor for a term's success.

Field Hockey is a vigorous team game in India and the game is played by all who love vigorous game. Apart from the game skills, the game requires optimum level of skill related fitness. Thus, field hockey players from different skill related fitness of India possess different level of body structure which might affect their playing skills and skill related fitness. To be a good dribbler one needs control, confidence and aggression. Learning to control the ball, improving stick work, can easily be done at home using stationary objects. Developing confidence and drive to beat a man requires opponents with and urge to take the ball away from a player (Thani, 1995).

Cardio pulmonary endurance is the ability of the players to sustain the aerobic activity in the game situation for a longer duration. Flexibility is the range of motion in a joint.

Dodging is the ability to beat the opponent while regaining possession of the ball or to gain ground, territory or a position of advantage and beat the opponent (Glencross, 1985).

The position of the hands and use of the wrists are very important in the drive. The hands in the drive should be close together and the player must grip the handle firmly (Thani, 1995).

Russell, Benton and Kingsley (2011) examined the effects of exercise-induced fatigue on soccer skills performed throughout simulated match play. The findings revealed that soccer-specific exercise influenced the quality of performance in gross motor skills, such as passing and shooting.

Russell, Benton and Kingsley (2010) examined the reliability and construct validity of new soccer skills tests. Test-retest reliability statistics were as follows: ball speed passing, shooting, dribbling. Professional players performed better than recreational players in at least one outcome measure for all skills. These findings demonstrate the reliability and validity of new soccer skill protocols.

Mwisukha and Andaje (2012) involved in an analysis of the effectiveness of Kenya's top men's field hockey teams in using offensive tactics of passing and shooting with the drive, push, flick and scoop, corners and penalty corners in competition. From the study, it is recommended that Kenya's top men's hockey teams should boost their chances of winning league matches by polishing more on their

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Available online at www.starresearchjournal.com (Star International Journal)
PHYSICAL EDUCATION
Star. Phy. Edn 7 (2014)

EFFECT OF CYCLING AND SWIMMING ON THE PHYSICAL AND PHYSIOLOGICAL VARIABLES AMONG LONG DISTANCE RUNNERS

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Abstract

The purpose of the study was to find out whether there would be any significant improvement on selected variables as a result of cycling and swimming training on selected physical fitness and physiological variables among long distance runners. , forty five long distance runners from different colleges were selected within Chennai. Randomly selected (N=45) long distance runners were divided into three groups and assigned as cycling group, swimming training group and control group. Pre test scores were collected on selected criterion variables, namely, muscular endurance of upper body assed by sit ups, cardio respiratory endurance assed by cooper test and resting pulse rate assed by palpation method. After six weeks experimental treatments to the experimental groups, scores on selected criterion variables were obtained. The differences between the initial and final scores were the effect of respective experimental treatments. To test the statistical significance, the scores were subjected to ANCOVA. Comparing between the treatments groups cycling group was better than swimming group in improving Muscular Endurance of and also found that there was no significant difference between cycling group and swimming group among long distance runners on Resting pulse rate. It was further found that cycling group was better than swimming group in improving Cardiorespiratory Endurance of long distance runners.

Keywords: *Cycling, Swimming, Long distance runners.*

Introduction

Long distance runners require long term endurance to excel in long distance running. There are different training methods being following by these athletes to improve their long term endurance. However, the effect of swimming and cycling in improving the long term endurance of long distance runners were not researched fully. Hence, the investigator selected this research topic. To test how far the long distance runners improved their physical fitness and physiological variables, the investigator selected physical fitness variable, Muscular endurance and physiological variable, Pulse rate and cardio respiratory endurance.

Methodology

The purpose of the study was to find out whether there would be any significant improvement on selected variables as a result of cycling and swimming training on selected physical fitness and physiological variables among long distance runners. To achieve the purpose of the study, forty five long distance runners from different colleges

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PHYSICAL EDUCATION

Star. Phy. Edn 8 (2014)

CORRELATION OF MOVING ABILITY ON SPEED AND AGILITY AMONG HOCKEY PLAYERS

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Abstract

The purpose of the study was to find out the correlation of moving ability on speed and agility among hockey players. To achieve this purpose, (N=20) twenty subjects were selected from field hockey players from Tamilnadu physical education and sports university. The subjects' age ranged from 21 to 27 years. The selected independent variables namely speed and agility were tested through 50 yards test and Illinois test respectively and dependent variable moving ability was tested through SAI Hockey skill test. To achieve this purpose, Pearson's product moment correlation was used as a statistical technique. The level of significance was fixed at 0.05 levels. Results proved that there was a significant relationship between moving skill and the selected skill related fitness variables namely speed and agility among hockey players.

INTRODUCTION

Field hockey is a sport with a long history that has undergone quite rapid and radical change within the past decade. The advent of the synthetic playing surface has changed the technical, tactical and physiological requirements of the game at all levels, but in particular at the elite level (Borrie, 1992). Skill related fitness factors play an important role in the best performance. In all the sports for achieving high level performance, it requires skill related fitness to execute the skills in the competitive situation. Nowadays the fitness level of players is the major contributor for a term's success.

Field Hockey is a vigorous team game in India and the game is played by all who love vigorous game. Apart from the game skills, the game requires optimum level of skill related fitness. Thus, field hockey players from different skill related fitness of India possess different level of body structure which might affect their playing skills and skill related fitness. To be a good dribbler one needs control, confidence and aggression. Learning to control the ball, improving stick work, can easily be done at home using stationary objects. Developing confidence and drive to beat a man requires opponents with and urge to take the ball away from a player (Thani, 1995).

Agility is the ability to turn the body into different directions in a quick manner. Speed the is ability to run a given distance in a shortest possible time.

Dodging is the ability to beat the opponent while regaining possession of the ball or to gain ground, territory or a position of advantage and beat the opponent (Glencross, 1985).

The position of the hands and use of the wrists are very important in the drive. The hands in the drive should be close together and the player must grip the handle firmly (Thani, 1995).

Russell, Benton and Kingsley (2011) examined the effects of exercise-induced fatigue on soccer skills performed throughout simulated match play. The findings revealed that soccer-specific exercise influenced the quality of performance in gross motor skills, such as passing and shooting.

Russell, Benton and Kingsley (2010) examined the reliability and construct validity of new soccer skills tests. Test-retest reliability statistics were as follows: ball speed passing, shooting, dribbling. Professional players performed better than recreational players in at least one outcome measure for all skills. These findings demonstrate the reliability and validity of new soccer skill protocols.

Mwisukha and Andaje (2012) involved in an analysis of the effectiveness of Kenya's top men's field hockey teams in using offensive tactics of passing and shooting with the drive, push, flick and scoop, corners and penalty corners in competition. From the study, it is recommended that Kenya's top men's hockey teams should boost their chances of winning league matches by polishing more on their passes using the drive, push, flick and scoop and shots with the drive, push and flick.

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PHYSICAL EDUCATION

Star. Phy. Edn 1 (2014)

BIOMECHANICAL ANALYSIS OF SET SHOT IN BASKETBALL

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ABSTRACT :

The aim of this study was to analyse the selected biomechanical factors of set shot in basketball. Men (n=21) Basketball players represented university were purposively selected from Tamil Nadu state, India for this study, the age of the subjects ranged from 18 to 28 years. The subjects had past playing experience of at least four years in basketball. Written informed consent was obtained from players. The high definition camera (Sony 10) was used to record the performances that were approximately transverse to the trajectory of the plane of motion. Video footage was digitized using Kinovea software for data analysis of speed of release, relative height, angle of release, apex of the ball and accuracy. The collected data was statistically analysed by using descriptive statistics and pearson's correlation coefficients. The finding reveals that the accuracy has significant relationship with speed of release, relative height and angle of release. Among the selected variables accuracy and speed of release having highest relationship.

KEYWORDS: *Biomechanics, Kinovea, Basketball, set shot*

INTRODUCTION

Basketball is one of the most popular and widely viewed sports in the world. Points are scored by throwing (shooting) the ball through the basket from above, the team with more points at the end of the game wins. The ball can be advanced on the court by bouncing it (dribbling) or passing it between teammates. Disruptive physical contact (foul) is penalized and there are restrictions on how the ball can be handled (violations). Through time, basketball has developed to involve common techniques of shooting, passing and dribbling, as well as player's positions and offensive and defensive structures. Typically, the tallest members of a team will play center or one of two forward positions, while shorter players or those who possess the best ball handling skills and speed, play the guard positions. While competitive basketball is carefully regulated, numerous variations of basketball have developed for casual play. In some countries, basketball is also a popular spectator sport. Shooting is the act of attempting to score points by throwing the ball through the basket. While methods can vary with players and situations, the most common technique is outlined as follows: The player faces the basket with feet about shoulder-width apart, knees slightly bent, and back straight. The player allows the ball to rest on the fingertips of the dominant hand (the shooting arm) slightly above the head, with the other hand supporting the side of the ball. To aim the ball, the player's elbow should be aligned vertically, with the forearm facing in the direction of the basket. The ball is shot by extending the bended knees and straightening the shooting arm; the ball rolls off the finger tips while the wrist completes a full downward flex motion. The shooting arm, fully extended with the wrist fully bent, and the fingers pointing downward, is held stationary for a moment following the release of the ball, this is known as a follow-through, which when properly done, enhances the accuracy of the shot. Generally, the non-shooting arm is used only to guide the shot, not to power it. Players often try to put a steady backspin on the ball to

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2014-15
2015-16

STAR
Research Journal

Available online at www.starresearchjournal.com (Star International Journal)
PHYSICAL EDUCATION
Star. Phy. Edn 2 (2014)

Biomechanical Analysis of Penalty Corner Drag Flick in Field Hockey

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Abstract

The purpose of the study was to analyze the selected biomechanical variables of drag flick in field hockey. Five male hockey players were randomly selected from Tamil Nadu state, India for this study. The subjects were experienced in penalty corner drag flick technique. The age of the subjects ranged from 18 to 30 years. The Pylon Basler Gige and Canon EOS 5D Mark II cameras were used to capture the movement of the penalty corner drag flick.. The first camera was mounted at the height of one meter, at 90 degree and 21 meters away perpendicular to the movement of the drag flick in sagittal plane. The second camera was mounted at the height of one meter, at 90 degree and 8 meters away from the stationary ball in a field setting or in front of the goal post to record frontal plane movement. The shutter speed was fixed (1/2000), with a frame rate of 100 frames per second. The video footage was digitized using Kinovea Software for the data analysis of the selected biomechanical variables namely distance of right foot from the ball, time of left foot contact with ground, distance of left foot from the ball, time of ball release after left foot contact with ground, drag length, drag velocity, stance width, stick velocity, total time of drag flick and ball velocity of drag flick technique. The collected data was statistically analyzed by using descriptive statistics and person's correlation coefficients. The finding reveals that the drag length, drag velocity, stance width, time of left foot with ground, time of ball release after left foot contact with ground, had significant relationship with the ball velocity of drag flick.

Keywords: *Penalty Corner, Drag Flick, Biomechanics, Field Hockey, Ball Velocity.*

Introduction

The Field Hockey is one of the most popular games in India. It was introduced in India by the British (Hendricks, 1988). It is a game in which players attempt to score goal by hitting, pushing or flicking the ball with hockey sticks into the opposing team's goal (Miroy, 1986). The performance of Indian men's hockey team has been highly depended on the success of its penalty corners. The penalty corner was introduced in 1908 for offence against defenders in the 'D' circle and the rules have been amended from time to time. The penalty corner is one of the most important game situations in field hockey, with one third of the goals resulting from this tactical situation (Laird and Sutherland, 2003; Pineiro, 2008). In recent years, the penalty corner, particularly with the advent and popularization of the drag flick, has gained vital importance in the game as a goal scoring opportunity.

The drag flick was introduced in the penalty corner by Dutch International, Van den Honert in 1992, after a change in which the penalty corner rules permitted shots higher than 45cm. The drag flick is capable of producing goals which if executed well by the attacking team is possibly even more efficient than a hit. In the most simple terms, a player pushes the ball from the baseline to another player standing at the top of the circle who stops it. A third player waiting behind the 'stopper' then hits to the goal (Glencross, 1985; McLaughlin, 1997). The innovation of drag flick becomes a vital part of a team's attacking arsenal. It is impressive technique that makes the game more spectators orientated. (Lees, 2002).

The drag flick is a technical learning process. It requires co-ordination, power and timing and takes years to master it. The training is physically changing (Meulnan et al., 2012). The average success rate for teams converting penalty corners to goals at the 1994 World Cup in Sydney was 15.2% with the most successful team's conversion rate being 32%. In the same competition, there were fewer drag flicks taken at goals than direct hits (22% compared to 30%). The drag flick was 1.4 times more successful than the direct hit (Yusoff, 2008). In the FIH Challenge Champion Trophy –I for men 2011, the average 60.15% of goals were scored through field goals, 36.09% of goals scored in penalty corner (30% of the goals were converted by drag flick technique (Franklin and Rajinikumar, 2014). In the Commonwealth Games 2014 at Glasgow, Australia scored 33 goals but Chris Cirielllo, the drag flicker of Australia converted 9 goals out of 33 goals from the penalty corner drag flick. Ashley Jackson, the drag

Registrar
Tamilnadu Physical Education
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2014-15

ISSN : 2319-2437

EDUCATION FOR ALL

A Peer Reviewed Journal

An International Journal of Education & Humanities

Vol. III, Number - 1 January - December, 2014

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A.P.H. Publishing Corporation
4435-36/7, Ansari Road, Darya Ganj,
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Psycho Social Issues and Challenges in Higher Education

Dr. P. Gopinathan*

It is really a great experience to witness the fast development of the higher education system in India. Education plays a special role in the history of human societies. Modern education is rooted through the ancient forms of Gurukula education system. There is a rich history in our education system. Education is to provide an all-round development of the individual which is essential for the quality education in competing with the global market. But our education system fails to achieve quality products. The political and social transformation revealed many changes in our education. Besides the enormous progress in education system, we are facing many issues and challenges. It is our bounden duty to chart out the issues to have a global competitive education. Father of the Nation, Mahatma Gandhi once said, "By education I mean all round drawing out of the best in child and man body, mind and spirit". Our national poet, great philosopher and follower of naturalistic approach of education somewhere wrote that, the highest education is that which does not merely give us information but makes our life in harmony with all existence". From these quotes we can say that Quality education should provide all round development and harmonious life of the students.

ISSUES ON QUALITY EDUCATION

Ensuring quality higher education is one of the most important things we can do for future generations. In the present scenario every country of the world are striving hard to impart quality education to all its citizens. With this aim innovative curriculum, rules and regulations in the higher educational institutions are framed and implemented time to time. The word education in the ordinary sense means literacy, formal education, getting through examinations and acquisition of knowledge. Knowledge however does not mean bookish knowledge, but one studied with noble feelings and values of life such as power and virtue. The concept and process of education facilitate the physical, mental, social, emotional and spiritual development of the students. These developments can be achieved with the quality education. Our education reached an enormous growth but it is not competitive enough to reach the global market. None of our Indian Universities found place in the top 200 world class universities. It has indicated that we are lacking in some aspect. The quality education provides necessary training for individuals wishing to enter professional careers. By acquainting students with complex ideas in an intellectually and psychologically stimulating environment, colleges and universities are to provide unique opportunities for personal enrichment while also preparing students for future careers.

There are various reasons for poor quality education and few are listed below:

- Poor quality of graduates – lack of skills for communication, employability
- Very narrow range of course options are offered and poor curriculum design
- Improper evaluation system and Examination malpractice
- Number of Ph.D.s produced each year is very low and most of the Ph.D studies are cut and paste method, which do not contribute much
- Many institutions are appointing inexperienced, unqualified and academically weak graduates to teach, which leads to poor quality of classroom instruction

Registrar
Tamilnadu Physical Educat and
Sports University
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2014-15

(6)

Rs. 25.00
ISSN-0566-2257

University News

A Weekly Journal of Higher Education

Association of Indian Universities

Vol. 52 No. 31 • August 04-10, 2014

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Quality Assurance: A Benchmark in Higher Education

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[illegible] higher education in India today is at the [illegible] in India although has given [illegible] has not been [illegible] to be made to [illegible] and [illegible] quality in higher education in India. We have [illegible] number of [illegible] universities which is one of the [illegible] and it is [illegible] has to provide the [illegible] quality. Quality assurance is [illegible] the aim is [illegible] will [illegible] the [illegible] higher education institutions in the [illegible] which [illegible] [illegible] to [illegible] the [illegible] of the [illegible] [illegible] [illegible]

2014-15

Indian Streams Research Journal
ISSN 2230-7850
Impact Factor : 2.1502(UIF)
Volume-4 | Issue-10 | Nov-2014
Available online at www.isrj.org

EFFECTS OF YOGIC PRACTICES ON PHYSICAL, PHYSIOLOGICAL AND PSYCHOLOGICAL VARIABLES AMONG SCHOOL STUDENTS

Abhilash Solomon and P Gopinathan

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Abstract – The purpose of the present study was to find out the effects of Yoga practices on Physical, physiological and Psychological variables of school students. For this purpose 32 subjects from the residential school studying higher secondary class were selected as subjects and they were divided in to two equal groups each as experimental and control group. Both the group undergone usual physical training in the morning from five monitors periods. Classes and evening one and half an hour as their choice in playing different games and sport. For the experimental group, undertaken selected yogasana practice daily morning 6.0 minute on Initial 15 minutes of warm up and the control group not given any special training. The training period for this study was 8 weeks in a schedule of 5 days in a week. The pre and post test were conducted prior and after the training programme on the selected physical fitness variables of 50 meter dash, standing broad jump, sit ups and sit and reach, physiological variables of vital capacity, resting heart rate, breath holding time, respiratory rate, systolic pressure and diastolic pressure and psychological variables of mental health, self confidence and anxiety. The means, standard deviation and t-value were assessed both experimental and control group separately and thereby significant level were analyzed. The significant level was fixed at 0.05 levels. The result of the study revealed that the experimental group shown the significant improvements in all the selected variables when as in control only 50 m dash and vital capacity having significant improvement and all the remaining variables are not having any significant improvement. The results revealed the effectiveness of yogasanas in physical fitness, physiological systems and psychological efficiency of school students.

Keywords: Yoga, Mental Health, Anxiety, Self-Confidence and Vital Capacity

INTRODUCTION

The word yoga comes from the Sanskrit language and means "to integrate". Yoga promotes a harmonious working together of the body's components leading to both physical and mental training. Yoga is a scientific system which brings harmony in body and mind. Asanas play significant role in toning up the neuro-muscular glandular systems of the body to maintain the vitality of healthy organs. Yoga provides the path to achieve greater perfection of the body, life and mind. Yoga, an ancient Indian concept, represents the way of life which endows perfect health comprising physical, mental, ethical and spiritual development. Yoga physically creates a sound, flexible, and strong body

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2014-15

2319-5274

JOURNAL OF PHYSICAL EDUCATION SPORTS AND ALLIED DISCIPLINES

PEER REVIEWED
ISSN : 0974-343X
Vol 6 No 1 & 2 Jan - July 2014

JPESAD



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TAMIL NADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY, CHENNAI

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Effect of Circuit Training on Speed Agility and Explosive Power among Volleyball Players

Abhilash Solomon, Ph.D. Scholar, Department of Physical Education, and

P.Gopinathan, Assistant Professor, Department of Sports Psychology and Sociology, Tamil Nadu Physical Education and Sports University

Abstract

The purpose of the present study was to find out the effect of circuit training on speed, agility and explosive power among volleyball players. To achieve the purpose of the study thirty college volleyball players from [illegible] were selected as subjects. All the subjects were played volleyball in inter collegiate level. The selected subjects were divided in to two equal groups i.e. fifteen players each as experimental group and control group. Both the group underwent their routine volleyball training and in addition to the above training the experimental group underwent specified circuit training starting one hour before starting the their routine volleyball training in a schedule of weekly three days in alternative days for all the eight weeks. The collected data were statistically analyzed by using ANCOVA to find out the significant difference between the groups if any. It was concluded from the result of the study that the experimental group significantly shown better performance in the speed, agility and explosive power.

Key words: Physical fitness, Speed, Agility, Explosive Power

Introduction

The circuit training was developed by R.E. Morgan and G.T. Anderson in 1953 at the University of Leeds in England. Circuit training is a workout routine that combines cardiovascular fitness and resistance training. It was first proposed in the late 1950s as a method to develop general fitness. The main routines were arranged in a circle, alternating between different muscle groups. By allowing only a short rest interval of 30-90 seconds between stations, cardiovascular fitness is gained along with the benefits of resistance training. The different exercises in different stations are fixed depends on the trainees training state, age and demand to improve physical fitness and physiological qualities. 'Circuit training is a method of fitness training that is designed to develop general, all-round physical and cardiovascular fitness' (Sandler, 1990). It is an excellent training program for improving different type of physical fitness abilities based on the program in different stations.

In sports training the coaches are applying various means and methods to make their players to improve various physical fitness qualities to achieve higher sports performance. Present study is undertaken to find out the effect of specified circuit training on speed, agility and explosive power. Circuit training has gained popularity as a training strategy due to its improvement in different physical fitness qualities. Sudhakarbabu and Paul Kumar (2013) conducted a study on the effect of selected circuit training on Sprinters of High school girls. They have found out that the experimental group improved the physical fitness qualities as well as sprinting performance. Mazidur W. Mazu and Sarvesh Kumar Yadav (2011) conducted a study on the effects of circuit training for the development of

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Effect of Complex Training on Agility Explosive Power and Speed among Handball Players

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Abstract

The purpose of the present study was to find out the effect of complex training on selected physical fitness variables of agility, explosive power and speed among handball players. To achieve the purpose of the study, [illegible] participated the summer handball coaching [illegible] science college as subjects. [illegible] groups of fifteen [illegible] group underwent handball training [illegible] hours in a schedule of weeks [illegible] the above training the experimental group underwent complex training [illegible] hour before starting the handball training in a schedule of weeks [illegible] alternative days for all the six weeks. [illegible] training.

Key words: Complex Training, Agility, Explosive power and Speed

Introduction

Handball is a game of applied athletics. Due to the nature of the game the players should have athletics qualities of strength, speed, endurance, explosive power etc. Sports performance is the product of many ingredients, which includes scientific training, anthropometric characteristics, physiological efficiency of various organs and psychic power. High level achievement is becoming more and more demanding. In sports training the coaches are applying [illegible] and methods to make their athletes run faster, jump higher and more quicker than ever before to achieve higher performance. Present study is undertaken to find out the effect of complex training on physical fitness variables of agility, explosive power and speed. Complex training has gained popularity as a training strategy combining weight training and plyometric training.

The combination of plyometric training and weight training are thought to be useful for developing athletic power. Complex training is one of the most advanced forms of sports training, integrates strength training, plyometrics, and sport-specific movement. It consists of an intense strength exercise followed by a plyometric exercise. Complex training describes a power-developing workout that combines weights and plyometric exercises. Bauchin and Harb (2000) defined 'complex training is a combination of high intensity resistance training followed by plyometrics'. Complex training is a workout comprising of a resistance exercise followed by a plyometric exercise like squats followed by squat jumps or bench press followed by plyometric press up. Complex training has been proposed

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345-J-Y 2015-16

Original Article

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International Journal of Recent Research and Applied Studies

Effect of Yogic Practice on Selected Physiological Variables among Stressed Men Police Constable

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Received 21st August 2015, Accepted 12th November 2015

Abstract

The purpose of the study was to investigate the effect of yogic practice on selected Physiological and Psychological variables among stressed men police constable. To facilitate the study 30 stressed men police constable were selected from Tirunelveli District, as subjects between the age group of 25-35 years. In this study yogic practice were given to experimental group and control group was not given any type of training. The pre tests were taken for all the subjects before administering the training. Then subjects were given respective training for a period of six weeks. And at the end of the sixth week, post tests were taken. Before and after the experimental period of six weeks pre and post test scores were obtained from all the two groups. The scores on physiological variables were considered as the effect of yogic practice among stressed men police constable. The mean differences were tested for significance using analysis of co variance (ANCOVA). The Pulse rate has significantly reduced due to influence of six week training of yogic practice compared to control group. There was a significant result in the level of Vital Capacity due to influence of six week training of yogic practice pared to control group.

Keywords: Yogic Practice, Physiological Variables, Police Constable.

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Introduction

Yoga is usually defined as union: union between the limited self (jiva) and the cosmic self (atman). Without trying to confuse things any further, we would like to point out that there is an anomaly in this definition. For there to be an aim or goal of union there must first be a state of separation. And in fact this separation does not exist. At this very moment you are united with the cosmic consciousness. Even this statement is not true, for you actually are the cosmic consciousness. So the aim of yoga is not really to unite you with greater self, to make you are already united. It is to make you realize your identity with the greater self, to make you know and tune in with your existing inner nature (Swami Satyananda Saraswati, 1981). Yoga is an ancient philosophy of life as well as a system of exercises that encourages the union of mind, body, and spirit. In fact, the word yoga is derived from the Sanskrit word meaning "yoke" or "union." The ultimate goal of yoga is to achieve a state of balance and harmony between mind and body.

Stress plays a part in the lives of everyone. Some stress is not only inevitable, it can be good. For example, the physical stress of "working out" improves your cardiovascular system, and feeling pressure that causes you to study harder for an exam can improve your score. Police stress, however, refers to the negative pressures related to police work. Police officers are not super humans. According to Gail Goolkasian and others, research shows that they are affected by their daily exposure to human indecency and pain; that dealing with a suspicious and sometimes hostile public takes its toll on them; and that the shift changes, the long periods of boredom, and the ever-present danger that are part of police work do cause serious job stress (Selye, 1920). The very nature of a police officer's job is to become deeply involved in the lives of those who have either committed a crime or been the victim of a crime. On both ends of this spectrum it is likely that the individuals involved are suffering in one way or another. Spending most of the day working with people who are experiencing high levels of distress is bound to affect one's own emotional state. The unfortunate fact is that police officers spend an above average amount of time around pain, suffering and sadness.

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Methodology

The purpose of the study was to investigate the effect of yogic practice on selected Physiological and Psychological variables among stressed men police constable. To facilitate the study 30 stressed men police constable were selected from Tirunelveli District, as subjects between the age group of 25-35 years. In this study yogic practice were given to experimental group

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345-J-Y-2015-16

Asian Journal of Multidisciplinary Research (AJMR) 2015

E-ISSN: 2395-1702 P-ISSN: 2395-0382
Volume 01- Issue 05-, pp-33-38
www.yadavapublication.com

Research Paper

INFLUENCE OF VARIED YOGIC PRACTICES ON SELECTED CLINICAL VARIABLES AMONG INFORMATION TECHNOLOGY PROFESSIONALS WITH LOW BACK PAIN

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Abstract

The purpose of the study was to investigate the influence of varied yogic practices on selected clinical variables among information technology professionals with low back pain. To facilitate the study, 45 information technology professionals suffering from low back pain between the age group of 25 to 30 were selected randomly from O_2 health studio Chennai. In the study, the total numbers of subjects were divided into three groups' viz., Experimental group-I, Experimental group-II and the Control group. The group I underwent six weeks B.K.S Iyengar School of yoga and group II under gone Vivekananda School of yoga practices and the control group was not exposed to any treatments. Before administering the training a pretest were taken for pain and range of motion for all the 45 subjects and at the end of sixth week a post test was also taken. The pre test and post test scores of all the three groups on pain and range of motion were collected. Analysis of Covariance (ANCOVA) was applied to determine the significant difference resulting from the training programme on information technology professionals with low back pain. Results revealed that there was significant mean difference in the clinical variables in information technology professionals with low back pain.

Key words – B.K.S Iyengar School of yoga, Vivekananda School of yoga, pain, range of motion.

Introduction

Information Technology (IT) is the branch of engineering that deals with the use of computers and telecommunications to store, retrieve and transmit information. The acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a microelectronics-based combination of computing and telecommunications are its main fields. The term in its modern sense first appeared in a 1958 article published in the Harvard Business Review, in which authors Leavitt and Whisler commented that "the new technology does not yet have a single established name.

10 Major Health Concerns for IT Professionals

Night owls doing those graveyard shifts are being haunted by health problems. IT and IT-enabled services are the worst affected, reports CNBC-TV18.About 40% cannot

Tamilnadu Physical Education and Sports University Chennai

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3.4.5-J-Y-2015-16

Selvalakshmi / Star. Phy. Edn Vol.3 Issue 10(4), October (2015)

ISSN: 2321-676X

STAR Research Journal

Available online at www.starresearchjournal.com (Star International Journal)

PHYSICAL EDUCATION

Star. Phy. Edn 4 (2015)

THE EFFECTS OF YOGIC PRACTICES ON PHYSIOLOGICAL VARIABLES AMONG MIGRAINE WOMEN

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Abstract

The purpose of the study was to investigate the effects of yogic practices on physiological variables among Migraine Women. To facilitate the study, 30 Migraine Women were selected from various place of Chennai city subjects only at random In this study yogic practices were given to experimental group for the period of six weeks. The pre test was taken from the subjects before administering the training. The subjects were involved with their training for a period of six weeks. The subjects were monitored throughout the sessions. At the end of the six weeks training post test with respect to Systolic and Diastolic Blood Pressure, were measured by using the standardized tests and methods. The significant difference between the means of the experimental group and control group for the pre test and post test scores were determined by 't' test. The level of significance was fixed at 0.05 level of confidence. The result of this study proved that significant differences were recorded due to six weeks of yogic therapy for Migraine Women.

Keywaord: *Yoga, physiology, Migraine*

Introduction

Migraine is a neurological disorder that is quit ordinarily seen in people around the world. Migraine usually occurs on one side of head and rarely on both sides. Migraine is a vascular headache caused by the inflammation and irritatior of the nerve endings resulting from the expansion of the blood vessels of the surface of the brain. Migraine investigations have revealed that they are not normal headache woman sufferance from migraine more than men but unlike usual headaches it requires specialized treatment and care. The migraine pain makes the body incapable of doing any work. Mordern life style is responsible for migraine. stressful work followed by sudden rest disturbes the centred nervous system . Migraine is no longer restricted to certain age group earlier it was evident in the age group of 35 above nowadays it occurs envet to school going kids . Migraine most commonly start between 15 and 24 years of age and occur most frequently in those 35 to 45 years of age. Yoga, which has been practiced for some 5,000 years, involves mind and body control through a series of movements, breathing techniques, meditations and postures. It is based on ancient Indian principles and philosophies that centers on discipline and spiritual enlightenment through uniting the mind and body

Yoga's relaxation techniques are thought to calm the body's nervous system. This action on the nervous system is believed to reduce the activities in the brain that lead to migraines. Yoga also has a positive impact on certain chemicals in the body and in the brain, which may also help migraine sufferers. Researchers also believe yoga increases the chemical serotonin, which relays signals from one area of the brain to another. Serotonin also eases the tightening of the brain's blood vessels, so migraines and serotonin levels are believed to be closely related

Methodology

The purpose of the study was to investigate the effects of yogic practices on physiological variables among Migraine Women To facilitate the study, 30 Migraine Women were selected from various place of Chennai city subjects only at random In this study yogic practices were given to experimental group for the period of six weeks. The pre test was taken from the subjects before administering the training. The subjects were involved with their training for a period of six weeks. The subjects were monitored throughout the sessions. At the end of the six weeks training post test with respect toSystolic and Diastolic Blood Pressure, were measured by using the standardized tests and methods. The significant difference between the means of the experimental group and

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345-J-Y 2015-16

STAR Research Journal
Available online at www.starresearchjournal.com (Star International Journal)
PHYSICAL EDUCATION
Star. Phy. Edn 3 (2015)

THE EFFECT OF YOGIC PRACTICES ON SELECTED PHYSIOLOGICAL VARIABLES AMONG CERVICAL SPONDYLITIS PEOPLE

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Abstract

The purpose of the study was to find out the effect of yogic practices on selected physiological variables among people affected by cervical spondylitis. For the present investigation forty (40) persons with cervical spondylitis were selected randomly from various hospitals in chennai. Nine weeks training were given of yogic practices . All the subjects were assigned to one experimental group and one control group each group consisting of 20 subjects. Yoga training was given to experimental group (Yogic practices). No training was provided to Control group. The subjects selected for this study were grouped in two groups based on their level of pain. Equated groups design was used with twenty subjects in each group, namely control group, experimental group respectively. The post tests were conducted on the above said dependent variables after a period of nine weeks.

Keyword: Yoga, Physiology, Cervical Spondylitis

Introduction

Cervical spondylosis is usually an age-related condition that affects the joints in your neck. It develops as a result of the wear and tear of the cartilage and bones are of the cervical spine. While it is largely due to age, it can be caused by other factors as well.To an extent, we all develop some degeneration in the vertebrae and discs as we become older. It tends to start sometime after the age of about 30. One feature of the degeneration is that the edges of the vertebrae often develop small, rough areas of bone called osteophytes. Also, over many years, the discs become thinner. This degeneration is a normal ageing process which can be likened to having 'wrinkles in the spine'. In many people, the degeneration does not cause any symptoms. For example, routine X-rays of the neck will show these features (osteophytes and disc thinning) in many people who do not have any symptoms. However, in some people, the nearby muscles, ligaments, or nerves may become irritated or 'pressed on' by the degenerative changes. So, cervical spondylosis often causes no problems but can be a cause of neck pain, particularly in older people.

One of the yoga practices, Hatha Yoga, is based on the knowledge, development, and balance of psychophysical energies in the body and can, therefore, be referred to as the "psychophysical yoga." The three main elements used in Hatha Yoga to attain its purposes are the body, the physical part of man; the mind, the subtle part; and the element that relates the body with the mind in a special way, the breath. Hatha Yoga offers special techniques for each one of these elements. For the physi-cal part, or body, it offers the asanas ("postures"), techniques for physical conditioning, called kriyas ("actions"), mudras ("seals"), bandhas ("locks"), as well as techniques for total and conscious physical relaxation. Although a small part of the practice of yoga, the capacity of kriyas, mudras, and bandhas to deepen awareness and consciousness should not be overlooked.

A kriya is an action or effort to direct movement of energy up and down the spine, transforming the meditator's state of being until spiritual realization occurs; a mudra is a gesture or a seal, a body movement to hold energy, or concentrate awareness; and a bandha is an energy lock, using muscular constriction to focus awareness. Each of these techniques are considered separately because of their discrete benefits. For the mental or subtle part, Hatha Yoga offers concentration in specific parts of the body, or in subtle forms or abstract ideas. Finally, for that link between the body and the mind, which is breathing, Hatha Yoga has developed a lot of specific techniques, called pranayamas. (Pranayama in a physiological sense involves breath control [inhalation, exhalation, and suspension] that strengthens the respiratory muscles and improves ventilation.) These are the techniques for activation of prana ("energy") that is contained in the breathing. In the practice of yoga, the whole life-energy of the universe is

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345-J-Y-2015-2016

STAR Research Journal

Available online at www.starresearchjournal.com (Star International Journal)

PHYSICAL EDUCATION

Star. Phy. Edn 1 (2015)

EFFECT OF YOGA THERAPY ON SELECTED BIO-CHEMICAL VARIABLES AMONG DIABETIC MELLITUS MIDDLE AGED MEN

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Abstract

The purpose of the study was to find out the efficacy of yoga therapy on selected bio-chemical variables among diabetic mellitus middle aged men. To facilitate the study, 30 subjects were selected at random from Villupuram district only. Their age were ranged between 40-60 years old. They were assigned into two groups as yoga therapy group and control group. All the subjects were tested prior to and immediately after the 8 weeks treatment in progression to bio-chemical variables such as blood glucose, high density lipoprotein (HDL) and low density lipoprotein (LDL). The initial and final scores in selected bio-chemical variables were put in-to statistical treatment using Analysis of Covariance (ANCOVA) to find out the significant mean differences. Results revealed that yoga therapy helped in increasing the level of HDL and decreasing the blood glucose and LDL level in blood and systematic eight weeks of yoga therapy reduced the blood glucose, LDL and increased the HDL more than the control group.

Keyword: *Yoga, Diabetic mellitus, biochemical*

Introduction

Yoga is usually defined as union: union between the limited self (jiva) and the cosmic self (atman). Without trying to confuse things any further, we would like to point out that there is an anomaly in this definition. For there to be an aim or goal of union there must first be a state of separation. And in fact this separation does not exist. At this very moment you are united with the cosmic consciousness. Even this statement is not true, for you actually are the cosmic consciousness. So the aim of yoga is not really to unite you with greater self, to make you are already united. It is to make you realize your identity with the greater self, to make you know and tune in with your existing inner nature **(Swami Satyananda Saraswati, 1981).**

Yoga is an ancient philosophy of life as well as a system of exercises that encourages the union of mind, body, and spirit. In fact, the word yoga is derived from the Sanskrit word meaning "yoke" or "union." The ultimate goal of yoga is to achieve a state of balance and harmony between mind and body.

Yoga therapy a form of physical activity is rapidly gaining in popularity and has many health benefits. Yet healthcare providers have been slow to recognize yoga therapy for its ability to improve health conditions, and few interventions have been developed that take full advantage of its benefits. Yogis observe the mind and the body as one and that if one is provided with the right yoga kit and tools and taken to the correct atmosphere; it can discover harmony and men itself. Yoga so is regarded as therapeutic. Ancient Theories, explanations and ideas about the mind and body connection is now being established by modern drug. Extensive research has been performed to look at the health advantages of yoga India- from the yoga asanas, yoga pranayama and meditation and diet. The information on yoga poses and advantages are grouped into 3 groups physiological, biochemical effects. In addition, scientists have set these outcomes against the advantages of usual exercise. Psychological advantages of yoga therapy: increases the mood improves and subjective well-being, self-acceptance and self-actualization, social adjustment, self-actualization, social skills, self-acceptance, well-being, somatic and kinesthetic awareness, improves the concentration, memory, attention, learning efficiency, mood, attention, learning efficiency, symbol coding, depth perception, flicker fusion frequency, decreases the anxiety, depression and hostility.

Methodology

The purpose of the study was to find out the efficacy of yoga therapy on selected bio-chemical variables among diabetic mellitus middle aged men. To facilitate the study, 30 subjects were selected at random from Villupuram district only. Their age were ranged between 40-60 years old. They were assigned into two groups as yoga therapy group and control group. All the subjects were tested prior to and immediately after the 8 weeks treatment in progression to bio-chemical variables such as blood glucose, high density

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Indian Journal of Science and Technology, Vol 9(S1), DOI: 10.17485/ijst/2016/v9iS1/107616, December 2016
ISSN (Print) : 0974-6846
ISSN (Online) : 0974-5645

Tribological and Mechanical Characterization of Aluminum Metal Matrix Composites

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Abstract

Many researchers analyzed the wear characteristics and mechanical properties of Aluminium metal Metal Matrix Composites (AMMC) with Silicon Carbide (SiC) reinforcement however not abundant work has been reported on analyzing the wear characteristics of AMMC with pigment (TiO_2) reinforcement material. A try is created to fabricate Metal Matrix Composite with metallic element as matrix material and TiO_2 as reinforcement through stir casting methodology and to investigate the wear and tear and mechanical characteristics. Aluminium 6061 and variable weight fractions as 0.5, 1 and 1.5% of nanoTiO_2 was fancied through the technique of Stir followed by Die Casting. Subsequent analysis on wear characteristics exploitation Pin on Disc and mechanical characteristics viz. Vickers micro hardness, tensile, compressive and surface roughness tests were carried out. The results showed improved wear and mechanical characteristics for 1% reinforcement material.

Keywords: Aluminium Metal Matrix Composites, Stir Casting, Titanium Dioxide, Mechanical characteristics, Wear

1. Introduction

Composite material may be a material suspended with two or additional divergent parts (matrix phase and reinforcing phase) and having bulk properties significantly numerous from those of any of the constituents. The new material may be chosen for several reasons: frequent examples embody materials are stronger, lighter or cheap once compared to standard materials. Numerous regular materials like metals, alloys and polymers assorted with additives as well have a little quantity of discrete phase in their structure, nevertheless they are not considered as composite materials in view of the fact that their properties are alike to those of their base constituents.[1] Encouraging properties of composites materials are high stiffness and high strength, low density, high temperature constancy, high electrical and thermal conductivity, corrosion resistance, improved wear resistance etc. Metal Matrix composites are composed of a tinny matrix and a distributed ceramic or tinny part. Metal matrix composites, presently though generating associate degree in depth notice in analysis fraternity, are not as extensively in use as their plastic counterparts. High strength, fracture toughness and stiffness are offered by metal matrices than those gettable by their chemical compound counterparts.

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345-J-Y-2015-H

Original Article

IJRRAS

Journal of Recent Research and Applied Studies
An Open Access Refereed Journal

Effects of Yogic Practices on Physiological and Haematological Variables among Peptic Ulcer Diseased Persons

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Received 15th August 2015, Accepted 21st October 2015

Abstract

The purpose of this study was to investigate the effects of yogic practices on physiological and haematological variables among peptic ulcer diseased persons. To facilitate the study 30 peptic ulcer diseased persons, were selected from various hospitals, Chennai as subjects between the age group 30-40 years. In this study yogic practices were given to experimental group and control group was not given any type of training. The subjects were given respective training for the period of six weeks. The pre test was taken from the persons before administering the training. The subjects were involved with their training for a period of six weeks. The subjects were monitored throughout the sessions. At the end of the six weeks training post test with respect to pulse rate and Hemoglobin were measured using the standardized tests and methods. The significant difference between the means of the experimental group and control group for the pre test and post test scores were determined by 't' test. The level of significance was fixed at 0.05 level of confidence. The result of this study proved that significant differences were recorded due to six weeks of yogic therapy for peptic ulcer diseased persons. Experimental group namely yogic practice group have achieved significant improvement as compared to control group towards improving the selected criterion variable such as pulse rate and hemoglobin.

Keywords: Yogic Practice, Peptic Ulcer, Haematological Variables.

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Introduction

Peptic ulcer is the type of ulcer that is diagnosed in the stomach or gastrointestinal tract and cause serious health problems and even life threats in many cases. Though in the initial stage the ulcer can be non-symptomatic and without much painful manifestation of syndromes, in the long run it can cause serious health trouble by doing damage to the digestive tract and stomach. Sedentary lifestyle aspects, especially those related with irregular and unhealthy dietary habit have a lot of detrimental effect that are responsible for peptic ulcer. As the people in all the big cities are more vulnerable to chronic digestive problems leading to serious problems like peptic ulcer, the metropolitan city of Delhi is no exception. In presenting here the organic and natural remedies for Peptic ulcer treatment in Delhi we must address these contributing factors. In Mata Jaagi Ayurveda and Yoga Research Institute organic healing experts consider it more important to restore the digestive health in the person rather than just providing medication for eradication of the ulcer.

Yoga is a practical aid, not a religion. Yoga is an ancient art of science based on a harmonizing system of development for the body, mind, and spirit. The continued practice of yoga will lead you to a sense of peace and well-being, and also a feeling of being at one with their environment. This is a simple definition. The practice of yoga makes the body strong and flexible, it also improves the functioning of the respiratory, circulatory, digestive, and hormonal systems. Yoga brings about emotional stability and clarity of mind. Yoga is a science, a method. It is not a religion, rather – it is a system that is designed to show the aspirant that everything needed for enlightenment lies within an individual. It is commonly believed that Yoga is Hinduism, but the methodology of Yoga predates Hinduism. Multiple philosophical schools have been influenced by the ideas of Yoga.

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Methodology

The purpose of this study was to investigate the effects of yogic practices on physiological and haematological variables among peptic ulcer diseased persons. To facilitate the study 30 peptic ulcer diseased persons, were selected from various hospitals, Chennai as subjects between the age group 30-40 years. In this study yogic practices were given to experimental group and control group was not given any type of training. The subjects were given respective training for the period of six weeks. The pre test was taken from the persons before administering the training. The subjects were involved with their training for a period of six weeks. The subjects were monitored throughout the

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3.4.5-J-Y-2015-16

IJRRAS

International Journal of Recent Research and Applied Studies
(An International Open Access Refereed Journal)

Efficacy of Yoga Therapy on Selected Bio-Chemical Variables among Middle Aged Diabetic Women

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Received 19th June 2015, Accepted 26th August 2015

Abstract

The purpose of the study was to find out the efficacy of yoga therapy on selected bio-chemical variables among middle aged diabetic women. To facilitate the study, 30 subjects were selected at random from Chennai city only. Their age were ranged between 30-45 years old. They were assigned into two groups as yoga therapy group and control group. All the subjects were tested prior to and immediately after the 6 weeks treatment in progression to bio-chemical variables such as Fasting Blood Sugar and Post Prandial Blood Sugar. The initial and final scores in selected bio-chemical variables were put in-to statistical treatment using Analysis of Covariance (ANCOVA) to find out the significant mean differences. Systematic six weeks of yoga therapy reduced the Fasting Blood Sugar and Post Prandial Blood Sugar more than the control group.

Keywords: Yoga, Bio-chemical, Diabetic Women.

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Introduction

Yoga meaning is union in Sanskrit, is a family of ancient spiritual practices, and also a school of spiritual through that originated in India, where it remained a vibrant living tradition and was seen as a means to enlightenment. People believed the origin of yoga was in Ancient India. Between 4000 B.C, and 2000 B.C, artifacts of Indus Valley Civilization showed figures in seated, cross-legged poses, and symbols later associated with yoga (Jones, 2000; Beck, 1996). Yoga, a Vedic science has been applied in the field of therapeutics in modern times. Yoga has given patients to reduce medication besides slowing the progression of the disease. Yoga employs stable postures or asanas and breath control or pranayama. Yoga is a practical aid, not a religion. Yoga is an ancient art of science based on a harmonizing system of development for the body, mind, and spirit. The continued practice of yoga will lead you to a sense of peace and well-being, and also a feeling of being at one with their environment. This is a simple definition. The practice of yoga makes the body strong and flexible, it also improves the functioning of the respiratory, circulatory, digestive, and hormonal systems. Yoga brings about emotional stability and clarity of mind.

Yoga has a diverse range of things that it can offer. It could be said that a primary goal of yoga is to gain balance and control in one's life. To free one from confusion and distress. To provide a sense of calm that comes from the practice of yogic exercises and the practice of breath control. The practice of yoga exercises aims at overcoming the limitations of the body. Other forms of exercises are good but good is not enough, they strain the muscles, joints, the entire skeletal system and cause free radical damage at a cellular level.Yoga however realigns and rejuvenates the body inside and out, yoga frees the mind from the negative feelings caused by the fast pace of modern life.The practice of yoga installs optimism within you. It helps you to focus better and overcome any obstacles in your way while on your road to perfect health, spiritual contentment, and total well being.Yoga will teach you that the goal of every individual's life should be to take the inner journey inside one's self. When there is perfect harmony between mind and body, we achieve total balance and control.

Diabetes Mellitus (DM) is the most common and possibly one of the oldest metabolic disorders in the world. Diabetes is a life style related condition due to an imbalance in handling a glucose level. The word "diabetes" is borrowed from the Greek word meaning "a siphon." The 2nd-century A.D.Greek Physician, Aretus the Cappadocian, named the condition "diabetes." He explained that patients with it had polyuria and "passed water like a siphon". When "diabetes" is used alone, it refers to diabetes mellitus. The two main types of diabetes mellitus Type I diabetes (insulin requiring) and Type II diabetes (adult-onset) are distinct and different diseases in themselves.

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Methodology

The purpose of the study was to find out the

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3.4.5-J-Y-2015-16

Original Article

IJRRAS

International Journal of Recent Research and Applied Studies

Efficacy of Yoga Therapy on Selected Bio-Chemical Variables among Middle Aged Hypertensive Women

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Received 13th July 2015. Accepted 18th September 2015

Abstract

The purpose of the study was to find out the efficacy of yoga therapy on selected bio-chemical variables among middle aged hypertensive women. To facilitate the study, 30 subjects were selected at random from Chennai city only. Their age were ranged between 30-45 years old. They were assigned into two groups as yoga therapy group and control group. All the subjects were tested prior to and immediately after the 6 weeks treatment in progression to bio-chemical variables such as low density lipoprotein (LDL) and cholesterol. The initial and final scores in selected bio-chemical variables were put in-to statistical treatment using Analysis of Covariance (ANCOVA) to find out the significant mean differences. Systematic six weeks of yoga therapy reduced the LDL and cholesterol more than the control group.

Keywords: Yoga Theraphy, LDL, Cholesterol, Hypertension.

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Introduction

Yoga is an ancient philosophy of life as well as a system of exercises that encourages the union of mind, body, and spirit. In fact, the word yoga is derived from the Sanskrit word meaning "yoke" or "union." The ultimate goal of yoga is to achieve a state of balance and harmony between mind and body. There is evidence that yoga was practiced as early as 5,000 years ago, although the first written description is found in the Yoga Sutras, a book from the second century B.C. that is partially attributed to the Indian physician and Sanskrit scholar Patanjali. The Yoga Sutras describe a multi-fold path to spiritual enlightenment that includes Hatha yoga, the system of physical exercises, breathing techniques, and meditation that is most often followed by Western yoga practitioners today. (Other forms of yoga include Bhakti, Jnana, Karma, Laya, and Raja.) All types of yoga subscribe to the belief that the body and mind are seamlessly connected, and that, for optimal health, they must be in a state of balance.

The Yoga for health aims at the maintenance of highest physical efficiency, purification and relaxation of all organs, removal of diseases, longevity, moral and mental perfection. Yoga, a Vedic science has been applied in the field of therapeutics in modern times. Yoga has given patients to reduce medication besides slowing the progression of the disease. Yoga employs stable postures or asanas and breath control or pranayama.

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Therapeutic yoga is basically a system of self-treatment. According to yogic view diseases, disorders and aliments are the result of faulty ways of living, bad habits, lack of proper knowledge of things related to individula's life and improper food. There are certain diseases .Which are incurable by medical science but can be cured through yoga. Over 90 percent of the causes of hypertension remain unknown. Certain drugs are known to elevate blood pressure, including most arthritis medications (except acetaminophen and aspirin), many cold remedies, nose sprays, weight-reducing pills, and alcohol. Increased heart rate, anemia, excessive thyroid hormone, or stiff (nondistendible) arteries can increase systolic blood pressure. Blocked arteries to the kidney, kidney failure, and decreased production of thyroid hormone are common causes of hypertension. Other rare causes include tumors of the adrenal gland (Lawrence & Morehouse, 1967).

Methodology

The purpose of the study was to find out the efficacy of yoga therapy on selected bio-chemical variables among middle aged hypertensive women. To facilitate the study, 30 subjects were selected at random from Chennai city only. Their age were ranged between 30-45 years old. They were assigned into two groups as yoga therapy group and control group. All the subjects were tested prior to and immediately after the 6 weeks treatment in progression to bio-chemical variables such as low density lipoprotein (LDL) and cholesterol. The initial and final scores in selected bio-chemical variables were put in-to statistical treatment using Analysis of Covariance (ANCOVA) to find out the significant mean differences.

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B.A.S. J- Y- 2015-16

Asian Journal of Multidisciplinary Research (AJMR) August 2015

E-ISSN: 2395-1702 P-ISSN: 2395-0382
Volume 01- Issue 06-, pp-15-19
www.yadavapublication.com

Research Paper

EFFECT OF SECTIONAL BREATHING AND PRANAYAMA PRACTICE ON SELECTED PHYSIOLOGICAL VARIABLES AMONG HEARING IMPAIRED BOYS

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Abstract

The purpose of the study was to investigate the effect of sectional breathing and pranayama practice on selected physiological variables among hearing impaired boys. To facilitate the study, 45 hearing impaired boys between the age group of 10 to 15 were selected randomly from Chennai city. In the study, the total numbers of subjects were divided into three groups' viz., Experimental group-I, Experimental group-II and the Control group. The group one under gone six weeks pranayama practice programme and group two under gone sectional breathing and the control group was not exposed to any treatments. Before administering the training a pretest were taken from all the 45 subjects and at the end of six week a post test was also taken. The pre test and post test scores of all the three groups on pules rate and cardio respiratory endurance were collected. Analysis of Covariance (ANCOVA) was applied to determine the significant difference resulting from the training programme on hearing impaired boys. Results revealed that there was significant mean difference in the physiological variables in hearing impaired boys.

Key words – pranayama practices, sectional breathing, pules rate, cardio respiratory endurance.

INTRODUCTION:

Hearing Impairment

Disability, according to the World Health Organization, is "...an umbrella term, covering impairments, activity limitations, and participation restrictions. Impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations. Thus disability is a complex phenomenon, reflecting an interaction between features of a person's body and features of the society in which he or she lives." An individual may also qualify as disabled if he/she has had an impairment in the past or is seen as disabled based on a personal or group standard or norm. Such impairments may include physical, sensory, and cognitive or developmental disabilities. Mental disorders (also known as psychiatric or psychosocial

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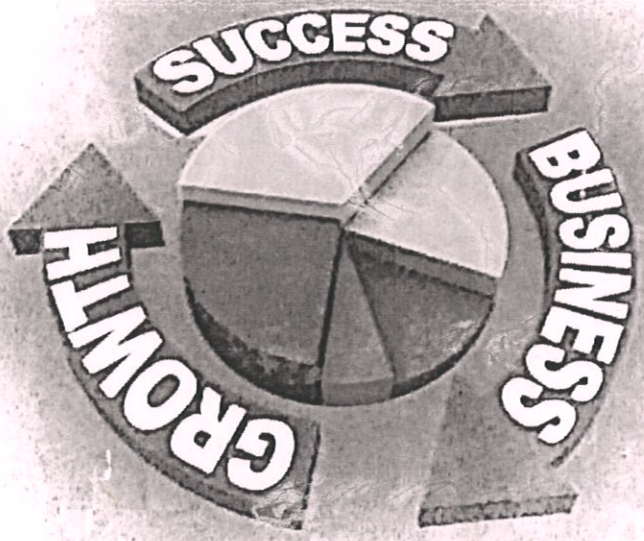
363

3.4.5 - Dr. Preemkumar 2015-16

L-ISSN NO : 2347-856X
ISSN NO: 2348 – 0653

International Journal of Business and Administration Research Review

Volume No-2 Issue No-11 July - Sep 2015
Impact Factor 3.072
Listed & Indexed in International ISSN Directory, Paris
Peer Reviewed Quarterly Journal



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Research Paper
Impact Factor: 5.072
Peer Reviewed Journal & Indexed

E- ISSN -2347-856X
ISSN -2348-0653

INFLUENCE OF SAFE AND HEALTHY WORKING CONDITIONS ON SPORTS COACHES WORKING AT PRIVATE SECTOR ORGANISATIONS IN TAMIL NADU

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Abstract

Quality of life is the general well being of individuals and societies. Quality of life has a wide range of contexts, including the fields of international development, healthcare, and politics. Quality of life should not be confused with the concept of standard of living, which is based primarily on income. Societal considerations of the quality of life include not only wealth and employment, but also the built environment, physical and mental health, education, recreation and leisure time and social belonging. In sports, a coach is an individual involved in the direction, instruction and training of the operations of a sports team or of individual sports persons. A coach participates in a major operation, as traditionally aided in his efforts by one or more assistant coaches. This paper, with a strong backing of literature, explains the influence of safe and health working conditions which is one of the important dimensions of Quality of work life on sports coaches working at private sector organisations in Tamil Nadu.

Keywords: Quality of Work Life, Safe and Healthy Working Conditions, Sports Coaches

1. INTRODUCTION

The quality of life is an important concept in many developed countries; however, this has also found its own place in developing countries. Assessing the quality of life is effective to identify social needs in order to enhance mental health services, obtain necessary funds and programs, and improve the quality of life. The concept of quality of work life is associated with an organizational philosophy aiming to enhance the dignity of employees. In some organizations, the QWL programs seek to increase the trust, involvement and problem solving ability among employees, and consequently to improve the satisfaction and organizational effectiveness. The valuable system of life quality focuses on investing on individuals as the most important variable for the strategic management equation; it means that to meet staffs' needs will lead to long-term results for optimization and effectiveness of organizations (Khodifazl Dehnavi, 2013).

Within a global context, sports plays a significant role in the generation of economic activity and in the provision of services to spectators, participants, communities, athletes, coaches, administrators and the corporate sector. Sports is an organized, competitive, entertaining and skillful activity requiring commitment, strategy, and fair play, in which a winner can be defined by objective means. It is governed by a set of rules or customs. Activities such as card games and board games are classified as "mind sports" and some are recognized as Olympic sports, requiring primarily mental skills and mental physical involvement. Non competitive activities, for example as jogging or playing are usually classified as forms of recreation.

2. CONCEPTUAL FRAMEWORK

Quality of Work Life refers to "the favorableness or unfavorableness of a job environment for people" (Keith, 1989). QWL means the sum total of values, both material and nonmaterial, attained by a worker throughout his career life. QWL include aspects of work-related life such as wages and hours, work environment, benefits and services, career prospects and human relations, which is possibly relevant to worker satisfaction and motivation. QWL encompasses every aspect of a person's work which includes working condition, job security, pay and allowances, recognition, appreciation, development interpersonal relation, etc. and its effect on his life outside work. Therefore, it can be concluded that QWL is concerned with improving life not only at work but also life outside work.

2.1 Safe and Healthy Working Conditions

Orpen (1981) strongly argues that employees should not be exposed to working conditions that can adversely affect the physical and mental health. Many of the researchers in the domain of quality of work life believe that safe and healthy work conditions have significant impact on QWL. The trouble with both compensation and working conditions is that, while in themselves they are very capable of removing feelings of job dissatisfaction, they are seldom able to arouse strong feelings of satisfaction (Orpen, 1981). For most of the employees in the developed economies of the western countries, fair compensation and good working conditions function mainly as hygiene factors and not as motivators. But in India, they are hygiene factors because employees in India have not yet crossed the first two levels of needs as depicted in the need hierarchy theory of Maslow (1954).

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3. LITERATURE REVIEW

Chan et al. (2011) assessed the relative impact of social influences initiated by coaches, parents, and peers on children and adolescent athletes' motivational patterns, involving self-rated effort, enjoyment, competence, and competitive trait-anxiety. Questionnaire data were collected from 408 youth swimmers (aged 9-18 years). Results of multi-group structural equation modeling analyses generally showed that compared with athletes in the adolescent age-group, the social influence from mother was stronger in childhood, and that from peers was greater in adolescence. The coach was more influential for athletes' effort and enjoyment in childhood, and competence in adolescence. Age appeared to moderate the impact of social influence from significant others on young athletes' sport experiences. **Chandranshu (2012)** explored the factors of quality of working-life experiences in organizations. The study focused on 100 employees holding middle managerial positions in various organizations. The Cronbach's alpha of the questionnaire was found to be 0.862& Pearson correlation was 0.924 ($p<0.001$). The factor analysis of the component 'quality of working-life experiences' led to the extraction of 3 factors from various organizations. The three emerging factors were "relationship-sustenance orientation", "futuristic and professional orientation" and "self-deterministic and systemic orientation". The results indicate that these factors have substantial roles to play in satiating the needs of the employees and how at middle managerial level different aspects are valued and employed for developing a unique and inimitable quality of working life within their socio-technical systems for eliciting favorable job-related responses. **Mozafar et al. (2012)** investigate the relationship between religious attitudes and organizational justice of professional sports coaches in Iran. 293 of Iran's professional sports coaches were totally selected as the sample. The research method was correlational and to measure religious attitudes and organizational justice, organizational justice questionnaire and researcher made questionnaire (Rego and Cunha, 2006) were used respectively. Alpha Cronbach of the made questionnaire in a manual study was 0.91; to check for normal distribution of the data, Kolmogorov Smirnov test and to analyze the data statistical methods of Pierson correlation coefficient and multiple correlation were used. Results indicated that religious attitude and its components have a significant and positive correlation with each of the components of organizational justice. Mode of the relationship between religious attitudes and organizational justice components which is obtained as the result of this study can have a significant role in the cognition and knowledge of the managers in order to take measures to improve the religious attitudes and perceptions of organizational justice in the coaches.

4. RESEARCH METHODOLOGY

This study is descriptive in nature. The purpose of this study is to find out whether safe and healthy working conditions which is one of the dimensions of Quality of work life make an impact on sports coaches working at private sector organisations in Tamil Nadu. For this purpose, primary data have been collected from 119 eligible sports coaches (those who have already completed their one year Diploma in Coaching from National Institute of Sports) presently working at private sector organisations such as sports academies, sports clubs and educational Institutions across Tamil Nadu during the year 2013-14. Convenience sampling method has been adopted for identifying samples from the population. A specific questionnaire was developed for the study and the same was used to collect data from the respondents. SPSS package has been used for analyzing the data using both one way ANOVA and Scheffe's Post Hoc Test for establishing relationship between the variables.

4.1 Influence of Adequate and Fair Compensation on Sports Coaches working at Private Sector Organisations in Tamil Nadu.

One way analysis of variance is used to test the following the hypothesis:

Ho: There is no significant difference among the Sports Coaches working at different private sector organizations in Tamil Nadu with regard to the level of safe and healthy working conditions.

Table 1: One Way Analysis of Variance among Coaches working at Private Sector Organizations with regard to Safe and Healthy Working Conditions

S.No.	Groups	Df	SS	MS	$\bar{X}$	Statistical Inference
1.	Between Groups	2	8341.21	4170.60	G1=8.93 G2=6.97 G3=6.97	F=64.61* P<0.05 Significant
2.	Within Groups	116	7487.89	64.55		

*p < 0.05 Table F, df (2, 116) at (0.05) = 3.07.

G1= Sports Academies G2= Sports Clubs G3= Educational Institution

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It is found from the table 1 that there is a significant difference among the coaches working in private sector organizations with regard to safe and healthy working conditions and therefore H is accepted. Further the mean score values of the coaches working at Sports Academies are found to be more inclined towards adequate and fair compensation. Since the F value was significant, the Scheffe's Post Host test was computed further in order to find out the difference between the groups of Coaches with regard to safe and healthy working conditions. The test results are shown in the table 2.

Table 2: Scheffe's Post Hoc Test of Significance and Difference among the Means of Opinion of Coaches working in Private Sector Organizations on Safe and Healthy Working Conditions

Sports Academies	Sports Clubs	Educational Institutions	Mean Difference	C.I
53.55	36.04	---	17.51*	5.48
53.55	---	34.65	18.90*	5.48
---	36.04	34.65	1.39	5.48

From the table 2, it is inferred that the mean difference values between the group of Coaches from Sports Academies and Educational Institutions is 18.90 and Sports Academies and Sports Clubsis 17.51 which are greater than the confidence interval value (5.48), which shows that coaches working at these organizations have highest satisfaction level with regard tosafe and healthy working conditions. It is also observed that the mean difference values between the other groups are lesser than the confidence interval value (5.48), which shows that coaches working at these organizations have low satisfaction level with regard tosafe and healthy working conditions.

5. CONCLUSION

A happy and healthy employee will give better turnover, make good decisions and positively contribute to the organizational goal. An assured good quality of work life will not only attract young and new talent but also retain the existing experienced talent. This study will help the organizations to find out the existing quality of work life of coaches in their respective work places. This would help them to understand in what areas they have to concentrate more on improving the level of the work life of the coaches which will in turn make the coaches happy and motivated. Because motivated and committed coaches can make the trainees to achieve their objectives.

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3.4.5 - Dr. Premkumar - 2015-16

PRINT ISSN : 2349 - 0187 ONLINE ISSN : 2347 - 9671

InnoSpace. (SJIF) Impact Factor: 4.618 (Morocco)
ISI Impact Factor: 1.259 (Dubai, UAE)

EPRA INTERNATIONAL JOURNAL OF ECONOMIC AND BUSINESS REVIEW

Monthly Peer Reviewed, Refereed & Indexed International Journal

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Printed by Joy Printers, Trichy

Published by EPRA Journals, Trichy

Scanned by CamScanner

e-ISSN : 2347 - 9671, p- ISSN : 2349 - 0187
EPRA International Journal of Economic and Business Review | Vol - 3, Issue- 10, October 2015
Inno Space (SJIF) Impact Factor : 4.618(Morocco) ISI Impact Factor : 1.259 (Dubai, UAE)

IMPACT OF ADEQUATE AND FAIR COMPENSATION ON SPORTS COACHES WORKING AT PRIVATE SECTOR ORGANISATIONS IN TAMIL NADU

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ABSTRACT

Quality of life is the general well being of individuals and societies. Quality of life has a wide range of contexts, including the fields of international development, healthcare, and politics. Quality of life should not be confused with the concept of standard of living, which is based primarily on income. Instead, standard indicators of the quality of life include not only wealth and employment but also the built environment, physical and mental health, education, recreation and leisure time and social belonging. In sports, a coach is an individual involved in the direction, instruction and training of the operations of a sports team or of individual sports persons. A coach, particularly in a major operation, is traditionally aided in his efforts by one or more assistant coaches. This paper, with a strong backing of literature, explains the impact of adequate and fair compensation which is one of the important dimensions of Quality of work life on sports coaches working at private sector organisations in Tamil Nadu.

KEYWORDS: *Quality of Work Life, Adequate and Fair Compensation, Sports Coaches.*

1.0 INTRODUCTION

The quality of life is an important concept in many developed countries; however, this has also found its own place in developing countries. Assessing the quality of life is effective to identify social needs in order to enhance mental health services, obtain necessary funds and programs, and improve the quality of life. The concept of quality of work life is associated with an organizational philosophy aiming to enhance the dignity of employees. In some organizations, the QWL programs seek to increase the trust, involvement and problem solving ability among employees, and consequently to improve the satisfaction and organizational effectiveness. The valuable system of life quality focuses on investing on individuals as the most important variable for the strategic management equation;it means that to meet staffs' needs will lead to long-term results for optimization and effectiveness of organizations (Aboulfazl Dehnavi, 2013).

Within a global context, sports plays a significant role in the generation of economic activity and in the provision of services to spectators, participants, communities, athletes, coaches, administrators and the corporate sector. Sports is an organized, competitive, entertaining and skillful activity requiring commitment, strategy, and fair play, in which a winner can be defined by objective means. It is governed by a set of rules or customs. Activities such as card games and board games are classified as "mind sports" and some are recognized as Olympic sports, requiring primarily mental skills and mental physical involvement. Non competitive activities, for example as jogging or playing are usually classified as forms of recreation.

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2.0 CONCEPTUAL FRAMEWORK

Quality of Work Life refers to "the favorableness or unfavorableness of a job environment for people" (Keith, 1989). QWL means the sum total of values, both material and nonmaterial, attained by a worker throughout his career life. QWL includes aspects of work-related life such as wages and hours, work environment, benefits and services, career prospects and human relations, which is possibly relevant to worker satisfaction and motivation. QWL encompasses every aspect of a person's work which includes working condition, job security, pay and allowances, recognition, appreciation, development, interpersonal relation, etc. and its effect on his life outside work. Therefore, it can be concluded that QWL is concerned with improving life not only at work but also life outside work.

2.1 Adequate and Fair Compensation:-

The fundamental driving force behind work is to earn a living. Walton (1975), appeals to consider adequate and fair compensation as a major component when QWL programs are implemented. What constitutes adequate compensation is difficult to define and assess. This difficulty stems from the relativity of the concept in that the work situation and the particular employee concerned largely influence its operational definition. Fairness can be determined through job evaluation measures such as job ranking, job classification and by factor comparison. Also various techniques are available to determine the supply and demand for particular skills and competencies, and for establishing average levels of compensation for these various categories, thus enabling the implementation of fair compensation levels. Furthermore, benchmarks can be used to determine what proportions of profits should be distributed to employees in different occupations and across different categories within these occupations (Walton, 1975). Pay is identified as being one of five important components of QWL, although its categorical classification is somewhat different to Walton.

3.0 LITERATURE REVIEW

Chan et al. (2011) assessed the relative impact of social influences initiated by coaches, parents, and peers on children and adolescent athletes' motivational patterns, involving self-rated effort, enjoyment, competence, and competitive trait-anxiety. Questionnaire data were collected from 408 youth swimmers (aged 9-18 years). Results of multi-group structural equation modeling analyses generally showed that compared with athletes in the adolescent age-group, the social influence from mother was stronger in childhood, and that from peers was greater in adolescence. The coach was more influential for athletes' effort and enjoyment in childhood, and competence in adolescence. Age appeared to moderate the impact of social influence from significant others on young athletes' sport experiences. Chandranshu (2012) explored the factors of quality of working-life experiences in organizations. The study focused on 100 employees holding middle managerial positions in various organizations. The Cronbach's alpha of the questionnaire was found to be 0.862& Pearson correlation was 0.924 ($p<0.001$). The factor analysis of the component 'quality of working-life experiences' led to the extraction of 3 factors from various organizations. The three emerging factors were "relationship-sustenance orientation", "futuristic and professional orientation" and "self-deterministic and systemic orientation". The results indicate that these factors have substantial roles to play in satiating the needs of the employees and how at middle managerial level different aspects are valued and employed for developing a unique and inimitable quality of working life within their socio-technical systems for eliciting favorable job-related responses. Mozafar et al. (2012) investigate the relationship between religious attitudes and organizational justice of professional sports coaches in Iran. 293 of Iran's professional sports coaches were totally selected as the sample. The research method was correlational and to measure religious attitudes and organizational justice, organizational justice questionnaire and researcher made questionnaire (Rego and Cunha, 2006) were used respectively. Alpha Cronbach of the made questionnaire in a manual study was 0.91; to check for normal distribution of the data, Kolmogorov Smirnov test and to analyze the data statistical methods of Pierson correlation coefficient and multiple correlation were used. Results indicated that religious attitude and its components have a significant and positive correlation with each of the components of organizational justice. Mode of the relationship between religious attitudes and organizational justice components which is obtained as the result of this study can have a significant role in the cognition and knowledge of the managers in order to take measures to improve the religious attitudes and perceptions of organizational justice in the coaches.

4.0 RESEARCH METHODOLOGY

This study is descriptive in nature. The purpose of this study is to find out whether adequate and fair compensation which is one of the dimensions of Quality of work life make an impact on sports coaches working at private sector organisations in Tamil Nadu. For this purpose, primary data have been collected from 119

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eligible sports coaches (those who have already completed their one year Diploma in Coaching from National Institute of Sports) presently working at private sector organisations such as sports academies, sports clubs and educational Institutions across Tamil Nadu during the year 2013-14. Convenience sampling method has been adopted for identifying samples from the population. A specific questionnaire was developed for the study and the same was used to collect data from the respondents. SPSS package has been used for analyzing the data using both one way ANOVA and Scheffe's Post Hoc Test for establishing relationship between the variables.

4.1 Impact of Adequate and Fair Compensation on Sports Coaches working at Private Sector Organisations in Tamil Nadu:-

One way analysis of variance is used to test the following the hypothesis:

Ho: There is no significant difference among the Sports Coaches working at different private sector organizations in Tamil Nadu with regard to the level of adequate and fair compensation

Table 1: One Way Analysis of Variance among Coaches working at Private Sector Organizations with regard to Adequate and Fair Compensation

S.No.	Groups	Df	SS	MS	$\bar{X}$	Statistical Inference
1.	Between Groups	2	151.20	75.60	G1=4.84 G2=4.81 G3=4.55	F=3.36* P<0.05 Significant
2.	Within Groups	116	2603.58	22.44		

*$p < 0.05$ Table F, df (2, 116) at (0.05) = 3.07

G1= Sports AcademiesG2= Sports ClubsG3= Educational Institution

It is clear from the table 1 that there is a significant difference among coaches working at private sector organizations with regard to adequate and fair compensation and therefore H_1 is accepted. Further, it is also observed that the mean score reveals that the coaches working at sports academies are found to be more inclined towards adequate and fair compensation. Since, the 'F' value was significant, the Scheffe's Post Host test was computed further in order to find out the difference between the groups of the Coaches with regard to adequate and fair compensation. The test results are shown in the table 2.

Table 2: Scheffe's Post Hoc Test of Significance and Difference among the Means of Opinion of Coaches working at Private Sector Organizations on Adequate and Fair Compensation

Sports Academies	Sports Clubs	Educational Institutions	Mean Difference	CI
24.50	21.74	---	2.76*	2.58
24.50	---	23.30	1.20	2.58
---	21.74	23.30	1.56	2.58

From the table 2, it is inferred that the mean difference values between the groups of Coaches from Sports Academies and Sports Clubs is 2.76 which are greater than confidence interval value (8.05), which shows that coaches are working at these organizations have high satisfaction level with regard to adequate and fair compensation. It is also observed that the mean difference values between the other groups of Coaches are lesser than the confidence interval value (2.58), which shows that these organizations have low satisfaction level with regard to adequate and fair compensation.

5.0 CONCLUSION

A happy and healthy employee will give better turnover, make good decisions and positively contribute to the organizational goal. An assured good quality of work life will not only attract young and new talent but also retain the existing experienced talent. This study will help the organizations to find out the existing quality of work life of coaches in their respective work places. This would help them to understand in what areas they have to concentrate more on improving the level of the work life of the coaches which will in turn make the coaches happy and motivated. Because motivated and committed coaches can make the trainees to achieve their objectives.

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3.4.5 – Dr. Premkumar 2015-16

Indian Journal of Education and Information Management, Vol 5(1), January 2016

ISSN (Online) : 2277-5374
ISSN (Print) : 2277-5366

A study on factors affecting need recognition for life insurance policies in Chennai

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Abstract

Background/Objectives: This study examines the factors influencing need recognition of Life Insurance Policies on purchase of different types of plan and role of family life cycle in purchase decision of insurance policies.
Methods/Statistical analysis: The 500 life insurance policy holders of Life Insurance Corporation (LIC) are chosen as test sample through multi stage random sampling technique. The frequency and percentage analysis are carried out to understand the demographic profile. The exploratory factor analysis, ANOVA (Analysis of Variance) and the multiple regression analysis are done to examine the influence of factors affecting need recognition for life insurance policies on purchase of types of plan.
Findings: The study reveals that majority of life insurance policy holders are males and most of life insurance policy holders belong to the family life cycle of Bachelor Type. Most of life insurance policy holders are graduates and majority of life insurance policy holders are employed in private sector. Most of life insurance policy holders belong to the monthly income group of Rs. 20001 – 30000 and majority of life insurance policy holders are married.

The exploratory factor analysis shows that social security, peer influence, prosperity and safety are the factors affecting need recognition for life insurance policies. There is significant difference between demographic profile of life insurance policy holders and factors affecting need recognition for life insurance policies except gender and factors affecting need recognition for life insurance policies. The regression analysis indicates that social security, prosperity and safety are positively and significantly influencing the purchase of type of plan.
Application/Improvements: The insurance products of LIC should be designed and promoted as per the needs of the valuable policy holders. Since the family life cycle is the most important factor deciding the purchasing of life insurance policies, LIC should develop and market separate insurance policies for different stages of life cycle of policy holders.

Keywords: Life Insurance Policies, Need Recognition, Type of Plan, Demographic Profile, Family Life Cycle.

1. Introduction

The importance of life insurance increases drastically in last three decades, due to social and economical conditions, health issues, reduction of life expectancy and improvement of financial education among people. All this contribute to an increase of dependency costs and provide a reason for covering it through insurance. Also, the limits of social security schemes and tax benefits are broadly seen as inducers for purchasing of life insurance products and services as the public organizations will envelop increasingly less of the financial needs of the population [1-4]. Furthermore, development of financial savings for retirement age is seen as a factor that strongly sustained the demand for life insurance.

Life Insurance is considered to be an important part of an individual's investment portfolio, not necessarily to accumulate wealth, but to feel financially secure. Other then this, when an individual opts for a life insurance policy, he enjoys other benefits also, like tax-deduction options, and in some cases long term capital gains. Life Insurance is primarily made keeping family and those who are dependent on him in mind.

Important factors that an individual needs to understand prior to opting for life insurance policies are requirements, term (duration) and premium to be paid, nature and benefits of the policy in the longer run and coverage of the policy. The need and income of an individual helps him decide the amount of life insurance premium. The insured should also think about the benefits that he and / or his nominee will receive before deciding to go for a

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ISSN (Online) : 2277-5374
ISSN (Print) : 2277-5366

particular policy. Therefore, the present research is made to study the factors affecting need recognition for life insurance policies in Chennai.

According to [5], educational level, financial status and income of the policy holders are the major factors that influence the decision of taking the policy. Agents are the main people who provide information about various plans and schemes of LIC to the policyholders. Policyholders take policies for purposes, like education of children, safety, marriage, tax benefits, etc.

[6] In his research on the preferences of customers revealed that they do not prefer private sector rather they mainly opt for public sector. Protection is the major reason for which people buy insurance.

[7]Analyzed on socio-economic factors which are responsible for taking life insurance policies and examined the policy holders preference towards various type of policies of LIC. It was interpreted that factors such as age, educational level and sex are insignificant while deciding on an insurance policy.

Study conducted [8], researched on evaluating the existing performance of insurance products. The insurance coverage for agricultural labor is very low. The children money back policy is good but the performance of other children-related policies like Jeevan Kishore, Jeevan Balya, etc. is very poor.

[9] Undertook research on customer's awareness towards new insurance companies. It was found that majority of the customers belonged to the age group of 30. They also observed that huge percentage of the policy holders is married. It was also found that they had taken the policy to cover the risk. The study revealed that to design appropriate products insurance companies should understand the customers and determine correct price

2. Methodology

Chennai city has been purposively selected for the present study. Among various life insurance companies, the Life Insurance Corporation (LIC) of India has again purposively selected. The 500 life insurance policy holders of Life Insurance Corporation (LIC) are chosen through multi stage random sampling technique for this study and the data related to the year 2013-2014. The frequency and percentage analysis are carried out to understand the demographic profile of life insurance policy holders. The exploratory factor analysis is used to identify the factors affecting need recognition for life insurance policies. In order to know the difference between demographic profile of life insurance policy holders and factors affecting need recognition for life insurance policies, the ANOVA (Analysis of Variance) has been applied. The multiple regression analysis is done to examine the influence of factors affecting need recognition for life insurance policies on purchase of types of plan.

3. Results and discussion

3.1. Demographic profile of life insurance policy holders

The demographic profile of life insurance policy holders was analyzed and the results are presented in Table-1. The results show that about 65.20 per cent of life insurance policy holders are males and the rest of 34.80 per cent of life insurance policy holders are females. It is clear that about 35.00 per cent of life insurance policy holders belong to the family life cycle of Bachelor Type followed by Full Nest I(32.00 per cent), Newly Married Couple(13.80 per cent), Full Nest II(5.20 per cent), Full Nest III(3.60 per cent), Empty Nest I(3.40 per cent), Empty Nest II(3.00 per cent), Solitary Survivor(2.40 per cent) and Solitary Survivor(Retired)(1.60 per cent).

The results indicate that that about 40.80 per cent of life insurance policy holders are educated up to graduation followed by professionals (23.40 per cent), post graduation (17.80 per cent), up to secondary (9.80 per cent) and higher secondary (8.20 per cent). It is seen that about 53.80 per cent of life insurance policy holders are working in private sector followed by Government sector(23.20 per cent), own business(12.80 per cent), self employed(6.20 per cent) and retired(4.00 per cent).

The results reveal that about 31.40 per cent of life insurance policy holders belong to the monthly income group of Rs. 20001 – 30000 followed by Rs. 10001 – 20000(21.40 per cent), Rs. 30001 – 40000(15.00 per cent), above Rs. 50000(12.80 per cent), Rs. 40001 – 50000(10.80 per cent) and up to Rs. 10000(8.60 per cent). It is apparent that about 61.00 per cent of life insurance policy holders are married followed by unmarried (35.00 per cent) and widower/divorcer (4.00 per cent).

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ISSN (Online) : 2277-5374
ISSN (Print) : 2277-5366

Table 1. Demographic Profile of Life Insurance Policy Holders

Particulars	Frequency	Percentage
Gender		
Male	326	65.20
Female	174	34.80
Family Life Cycle		
Bachelor Type	175	35.00
Newly Married Couple	69	13.80
Full Nest I	160	32.00
Full Nest II	26	5.20
Full Nest III	18	3.60
Empty Nest I	17	3.40
Empty Nest II	15	3.00
Solitary Survivor	12	2.40
Solitary Survivor(Retired)	8	1.60
Educational Qualification		
Up to Secondary	49	9.80
Higher Secondary	41	8.20
Graduation	204	40.80
Post Graduation	89	17.80
Professionals	117	23.40
Occupation		
Own Business	64	12.80
Government Sector	116	23.20
Private Sector	269	53.80
Self Employed	31	6.20
Retired	20	4.00
Monthly Income(Rs.)		
Up to 10000	43	8.60
10001 – 20000	107	21.40
20001 – 30000	157	31.40
30001 – 40000	75	15.00
40001 – 50000	54	10.80
Above 50000	64	12.80
Marital Status		
Married	305	61.00
Unmarried	175	35.00
Widower/Divorcer	20	4.00

3.2. Factors affecting need recognition for life insurance policies

To identify the factors affecting need recognition for life insurance policies, the exploratory factor analysis is applied and the results obtained through rotated component matrix are presented in Table-2.

Table 2. Factors Affecting Need Recognition for Life Insurance Policies

Particulars	Rotated Factors Loadings on			
	Factor-I	Factor-II	Factor-III	Factor-IV
Family Security	.64			
Saving			.88	
Retirement Planning	.56			
Child's Future Planning	.58			
Protection against the Financial Loss				.59
Medical Benefit	.86			
Social Status	.80			
Family Necessity		.72		
Awareness about Life Insurance				.72
Motivation of Friends		.63		
Compulsion of Spouse		.77		
Wealth Creation			.79	
Eigen Value	3.87	1.53	1.34	1.05
% of Variance	22.06	16.59	13.32	12.90
Cumulative % of Variance	22.06	38.65	51.97	64.87
Cronbach's Alpha			0.81	

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There are four independent factors which are extracted accounting for a total of 64.87 per cent of variations on 12 variables. The each of the four factors contributes to 22.06 per cent, 16.59 per cent, 13.32 per cent and 12.90 per cent respectively.

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 10 iterations.

Factor-I: This factor includes:

- Family Security (0.64)
- Retirement Planning (0.56)
- Child's Future Planning (0.58)
- Medical Benefit (0.86)
- Social Status (0.80)

This factor is named as **"SOCIAL SECURITY"**

Factor-II: is formed with:

- Family Necessity (0.72)
- Motivation of Friends (0.63)
- Compulsion of Spouse (0.77)

This factor is named as **"PEER INFLUENCE"**

Factor-III: This factor consists:

- Saving (0.88)
- Wealth Creation (0.79)

This factor is named as **"PROSPERITY"**

Factor-IV: This factor is formed with:

- Protection against the Financial Loss (0.59)
- Awareness about Life Insurance (0.72)

This factor is named as **"SAFETYNESS"**

The Cronbach's alpha value is 0.81 and it is showing that all measures exhibit acceptable internal consistency. It is revealed that social security, peer influence, prosperity and safetyness are the factors affecting need recognition for life insurance policies.

3.3. Demographic profile of life insurance policy holders and factors affecting need recognition for life insurance policies

In order to examine the difference between demographic profile of life insurance policy holders and factors affecting need recognition for life insurance policies, the ANOVA (Analysis of Variance) has been applied and the results are presented in Table-3.

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ISSN (Online) : 2277-5374
ISSN (Print) : 2277-5366

Table 3. Difference between Demographic Profile of Life Insurance Policy Holders and Factors Affecting Need Recognition for Life Insurance Policies

Particulars	F-Value	Sig
Gender and Factors Affecting Need Recognition for Life Insurance Policies	1.306	0.254
Family Life Cycle and Factors Affecting Need Recognition for Life Insurance Policies	2.312*	0.019
Educational Qualification and Factors Affecting Need Recognition for Life Insurance Policies	16.943**	0.000
Occupation and Factors Affecting Need Recognition for Life Insurance Policies	15.709**	0.000
Monthly Income and Factors Affecting Need Recognition for Life Insurance Policies	11.433**	0.000
Marital Status and Factors Affecting Need Recognition for Life Insurance Policies	7.221**	0.001

** indicates significant at one per cent level
* indicates significant at five per cent level

The results indicate that the F-values are significant indicating that there is significant difference between demographic profile of life insurance policy holders and factors affecting need recognition for life insurance policies except gender and factors affecting need recognition for life insurance policies. Hence, the null hypothesis of there is no significant difference between demographic profile of life insurance policy holders and factors affecting need recognition for life insurance policies is rejected.

3.4. Influence of factors affecting need recognition for life insurance policies on purchase of types of plan

To examine the influence of factors affecting need recognition for life insurance policies on purchase of types of plan, the multiple linear regression is done and the results are presented in Table-4.

The coefficient of multiple determination (R^2) is 0.57 and adjusted R^2 is 0.55 showing the regression model is moderately fit. It means that about 55.00 per cent of variation in dependent variable is explained by the independent variables taken into this regression model. The F-value is 4.791, which is significant at one per cent level implies that this regression model is significant.

Table 4. Influence of Factors Affecting Need Recognition for Life Insurance Policies on Purchase of Types of Plan

Factors Affecting Need Recognition for Life Insurance Policies	Regression Coefficients	t-value	Sig
Intercept	1.770**	7.056	0.000
Social Security(X_1)	.153**	3.600	0.001
Peer Influence (X_2)	.005	1.110	0.912
Prosperity (X_3)	.185**	3.781	0.001
Safetyness(X_4)	.115*	2.396	0.017
R^2	0.57		
Adjusted R^2	0.55		
F	4.791		0.001
N	500		

Dependent Variable=Purchase of Types of Plan
** *Significance at one per cent level*
* *Significance at five per cent level*

The results reveal that social security and prosperity are positively and significantly influencing the purchase of types of plan at one per cent level, whereas, safetyness is also positively and significantly influencing the purchase of types of plan at five per cent level. Hence, the null hypothesis that there is no significant influence of factors affecting need recognition for life insurance policies on purchase of types of plan is rejected.

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ISSN (Online) : 2277-537
ISSN (Print) : 2277-536

4. Conclusion

The study reveals that majority of life insurance policy holders are males and most of life insurance policy holder, belong to the family life cycle of Bachelor Type. Most of life insurance policy holders are graduates and majority of life insurance policy holders are employed in private sector. Most of life insurance policy holders belong to the monthly income group of Rs. 20001 – 30000 and majority of life insurance policy holders are married.

The exploratory factor analysis shows that social security, peer influence, prosperity and safetyness are the factors affecting need recognition for life insurance policies. There is significant difference between demographic profile of life insurance policy holders and factors affecting need recognition for life insurance policies except gender and factors affecting need recognition for life insurance policies. The regression analysis indicates that social security, prosperity and safetyness are positively and significantly influencing the purchase of type of plan. Therefore, the insurance products of LIC should be designed and promoted as per the needs of the valuable policy holders. Since the family life cycle is the most important factor deciding the purchasing of life insurance policies, LIC should develop and market separate insurance polices for different stages of life cycle of policy holders.

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The Publication fee is defrayed by Indian Society for Education and Environment (iSee). www.iseeadyar.org
Cite this article as

U. Manikumar, S.Premkumar. A study on factors affecting need recognition for life insurance policies in Chennai. Indian Journal of Education and Information Management. Vol 5 (1), January 2016.

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3.4.5 - J - PSY - 2015-16

Original Article

IJRRAS

International
Journal of Recent Research and Applied Studies
(Multidisciplinary Open Access Refereed e-journal)

Relationship of Sports Achievement Motivation, Locus of Control and Team Relationship with Performance of First Division Cricket Players in Chennai

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Received 29th November 2015, Accepted 1st January 2016

Abstract

To achieve the purpose of the present study, thirty five male first division cricket players from Chennai were selected as subjects and their age ranged between 21 and 31 years. The standardized psychological tool devised by Kamlesh M.L. was used to quantify the sports achievement motivation of players. J.B. Rotter's Internal External Locus of control scale is a measure of personal belief and this tool was used to assess the Locus of control of the cricket players. Sports team relationship was measured using sports relationship scale devised by Shahin Ahmed and Swaminathan V.D. The performance was determined by subjective rating of the players by three experts and used as the criterion variable. To find out the relationship between Sports achievement motivation, Locus of control and Team Relationship with performance of first division cricket players descriptive statistics and Pearson's product moment correlation at 0.05 level of significance was used. The results of the study showed that there is a significant relationship between Sports Achievement Motivation and performance, Locus of control and performance & Team Relationship and performance of first division cricket players.

Keywords: Sports achievement motivation, Locus of control, Team relationship, Performance.

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Introduction

Sports psychology is an applied psychology principles of education and psychology are applied in sporting situations. In sports, general principles from several branches of psychology help study the behavior of an athlete. The European Federation of sport psychology (FEPSAC) (1996) defined sport psychology as the study of psychological bases, processes and effects of sport. It includes any physical activity for the purpose of competition, recreation, education or health. Achievement motivation may be characterized as the tendency to maintain and increase individual proficiency in all areas in which a standard or quality is taken as binding (Desai,1970). "Achievement motivation refers to success in competition with some definite standard of excellence" (Mc Clelland 1964)

Locus of control has much significance to sports personnel, in the sense that, it helps to guage how will a sports person adjusts with event: be it positive or negative in his/her social environment. Psychologists have become increasingly interested in how individuals adjust to sudden unexpected and or negative events in their environment. It has also been argued by psychologists and philosophers that man behavior is determined and controlled by the features in his social environment. It is believed that he is the prisoner of social forces which he cannot resist. These forces would render his responses quite predictable without regard to his characteristics and disposition of a unique individual. Rotter's I-E control concept has an inner outer metaphor. This concept refers to a person's belief's regarding his own skill in getting what he wants. The "what" that is wanted may be defined by :

.Internal Directions from within (inner directions)
.The current whims of peers from outside (outer directions)
.The "How" means the self analysed organism.

It should be noted that I-E dimension represents one of the many meditational processes which might moderate subjective distress and efficient performance, which it may be tempting to classify individuals as "internal" and "external", we must keep in mind that the pervasiveness of internal or external belief pattern may be a function of consistency in situational and experimental factors. In Rotter's theory a person's actions are predicted on the basis of his values, his expectations and the situation in which the concept of locus of control comes, suggests that a person enters a situation with expectancies concerning the probable outcomes of his possible behavior. Four basic concepts are utilized in the prediction of behavior are

. Behavioral potential
. Expectancy
. Reinforcement value (Rotter, chance and Phares1972)
. Psychological situation

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ISSN: 2349 – 4891

There are many group dynamics that take place within a sporting team. One of the most important is cohesion one is always hearing about how important it is for a team to "gel or bond " or " have good chemistry" . Cohesive team can achieve dramatic and awesome things. The way players interact has a tremendous impact on the way a team performs. As Hall (1960) put it "the fittest to survive and succeed are those able to find their strength in cooperation, able to build team based upon mutual helpfulness and responsibility for one's fellow team mates. A cohesive team has well defined roles and group norms, common goals, a positive team identity, a good working relationship shared responsibility, respect, positive energy, trust, a willingness to cooperate, unity, good communication, pride in membership and synergy. Another indicator of the amount of cohesiveness in a team is the frequency of statements of we and our, in contrast to statements of I, me and mine. The 'we' is just as important as the 'me'. Developing cohesion is something that takes time and effort, but it is well worth the investment

The Cricketers' performance normally, can be judged by runs in case of a batsman, wickets in case of a bowler and catches / run outs / stumping / ground fielding in case of a fielder. Coordination by interaction with team members, Fair play, that is the adherence to rules and regulations of the game. But all can be judged by an individual's playing ability. Due to non-availability of standardized skill tests in Cricket, subjective rating of Cricket playing ability was selected as performance variables. Keeping in mind the opinion of the experts, availability of requirements, acceptability of the subjects and the time to be devoted, the above mentioned variables were selected as variables, as they may have direct relation to the performance of Cricket players in competitive situations. The purpose of the study was to find out the relationship of Sports achievement motivation, Locus of control and Team relationship with performance of first division cricket players in Chennai.

Method

To achieve the purpose of the present study, thirty five male first division cricket players from Chennai were selected as subjects and their age ranged between 21 and 31 years. The standardized psychological tool devised by Kamlesh M.L. was used to quantify the sports achievement motivation of players. J.B. Rotter's Internal External Locus of control scale is a measure of personal belief and this tool was used to assess the Locus of control of the cricket players. Sports team relationship was measured using sports relationship scale devised by Shahin Ahmed and Swaminathan V.D. The performance was determined by subjective rating of the players by three experts and used as the criterion variable. The data collected was interpreted and analyzed through the descriptive statistics and Pearson's Product moment correlation. The results were tested at 0.05 level of significance.

Results

From the analysis of data the following results were drawn. The result of the descriptive statistics consisting of mean, standard deviation and range of Sports achievement motivation, Locus of control and Team relationship with performance of first division cricket players at Chennai are presented in table I.

Table I. Descriptive statistics of Sports Achievement Motivation, Locus of Control, Team Relationship with performance of First Division Cricket Players

S.NO.	VARIABLES	MEAN(M)	STANDARD DEVIATION (SD)	RANGE
1	Performance	75.40	5.08	68 - 86
2	Sports Achievement Motivation	28.34	3.90	22 - 36
3	Locus Of Control	15.66	5.05	6 - 22
4	Team Relationship	56.77	4.75	46-65

Table II. Zero Order correlation between selected Sports Achievement Motivation, Locus of Control, Team Relationship with performance of First Division Cricket Players

S. No.	VARIABLES Vs PERFORMANCE	CORRELATION COEFFICIENT	REQUIRED "r'
1	Sports Achievement Motivation	0.79*	0.325
2	Locus of Control	0.64*	
3	Team Relationship	0.92*	

*Significant at 0.05

From Table II it is proved that the selected psychological variables namely sports achievement motivation, Locus of Control and team relationship has significant correlation with the criterion variable performance, as the obtained r value were 0.79, 0.64 and 0.92 respectively were greater than the required 'r' value of .325 at 0.05 level.

ISSN: 2349 – 4891

Discussion

The results reveal that the psychological variables namely sports achievement motivation, locus of control and team relationship has greater influence with performance and proved to have significant relationship. The result of the study is in line with the study conducted by Rajesh Boor (2015), Satish Kanauji, OmPrakash & Vishal Choudhary (2012).

Conclusion

1. It was concluded that there was significant relationship between sports achievement motivation and performance of first division cricket players.
2. It was concluded that there was significant relationship between locus of control and performance of first division cricket players.
3. It was concluded that there was significant relationship between team relationship and performance of first division cricket players.

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Please cite this article as: K. Kannadasan & Sudha, P. (2016). Relationship of Sports Achievement Motivation, Locus of Control and Team Relationship with Performance of First Division Cricket Players in Chennai. *International Journal of Recent Research and Applied Studies*, 3, 1(3), 9 - 11.

3.4.5-J-SC-2015-16

Original Article

ISSN: 2349 - 4891

International
Journal of Recent Research and Applied Studies
(Multidisciplinary Open Access Refereed e-Journal)

Effect of Varied Intensities of Strength Training on Selected Physical Fitness Variables among State Level Men Fencers

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Received 7th February 2016. Accepted 16th March 2016

Abstract

Fencing is a sport requiring hand-eye coordination, explosiveness, and pinpoint accuracy. The aim of this study was to find out the effect of varied intensities of strength training, on selected physical fitness variables, explosive strength and speed. Randomly selected 60 men state level fencers were divided into 4 groups consisting of 15 subjects in each. Low intensity strength training (LIST) group I underwent 40 to 50% of 1 RM of selected 8 strength training exercises. Group II underwent medium intensity of strength training (MIST) 50 to 60% of 1 RM and group III underwent high intensity of strength training (HIST) 60 to 70% of 1 RM. The control group did not undergo any special training or coaching programmed apart from their regular routine. Pre and post tests scores were analysed using ANCOVA. The results proved that MIST and HIST groups significantly improved speed and lower explosive strength (P<0.05), and LIST, MIST and HIST groups significantly improved upper explosive strength. It was concluded that High intensity training group significantly improved explosive strength and speed better than medium intensity group.

Keywords: Strength training, Explosive strength, Speed, Fencing.

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Introduction

Fencing is a sport requiring hand-eye coordination, explosiveness, and pinpoint accuracy. Whatever type of blade a fencer uses, the individual must be faster and more accurate than the opponent.(Harmer (2008)). Fencing sports requires strength, speed and timing, as well as specific skill. To improve on many of these aspects, a routine based around explosive training can help to lunge faster and give the extra inch needed to score the winning point. Much of the explosiveness of the technique comes from the lower body, and strong legs are critical to drive down the strip. The barbell squat and the lunge should be considered foundational exercises, and be the focus of many workouts. Much of the upper body control of the weapon comes from the shoulders, and the military press is the best exercise to strengthen them. Work out for the latissimus dorsi, the widest muscles of the back, is crucial as much of the power will come from the back. Chin-ups and rowing movements are essential rotator cuff exercises, such as external rotations, will help improve shoulder stability and lower the risk for injury. External rotations can be performed by standing next to a cable stack with arm across the body and pulling the arm away against the resistance of the weight. (Bompa & Haff, 2009)

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Strength training is the use of resistance to muscular contraction to build the strength, anaerobic endurance and size of skeletal muscles. There are many different methods of strength training, the most common being the use of gravity or elastic/hydraulic forces to oppose muscle contraction. When properly performed, strength training can provide significant functional benefits and improvement in overall health and well-being, including increased bone, muscle, tendon and ligament strength and toughness, improved joint function, reduced potential for injury, increased bone density, a temporary increase in metabolism, improved cardiac function, and elevated HDL cholesterol. (Newton and Dugan, 2002)

Different strength training activities can be carried out with different intensities which may have different effect in organism. Exercise intensity should be checked frequently during and beginning of exercise programme. The intensity and length of the work interval should be based upon the primary energy system being used in the activity. Sprinters should have short high intensity intervals whereas marathons may run intervals of 3 miles at race pace or slower. It should be pointed out that the rest interval is really not a time to stop all activity but only a jog or walk period which allows the body to recover somewhat before the next interval begin. (Turner 2009)

Fencing produces typical functional asymmetries that emphasize the very high level of specific function, strength and control required in this

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sport. Fencers need to anticipate the opponent and to mask their true intentions with a game of feints and counter-feints As in every other sport, the prevention of accidents must be accomplished at various levels and above all must involve the institutions that are responsible for safety in sports (Roi and Bianchedi. 2008). The maximal isometric force (MIF) of a muscle is directly related to its cross-sectional area (CSA). Strength training produces an increase in muscular force while muscular hypertrophy becomes appreciable at a later time; in asymmetric sports, training causes significant increases in force and muscular mass of the dominant limb of the athlete (Margonato et al. (1994). Drop jump and thigh cross-sectional area were best predictors of lunge time and distance of squat jump on the shuttle test (Tsolakis et al. (2010). Fencing is an explosive sport requiring energy production predominately from anaerobic sources. Lunging and change of direction speed seem vital to performance, and strength and power qualities underpin this. In the elimination rounds, fencers are likely to accumulate high levels of blood lactate, and so high-intensity interval training is recommended to reduce the intolerance to and the accumulation of hydrogen ions (Turner et al. (2014) . Redondo et al. (2014) showed that the treatment group participated in a 12-week strength training program divided into 2 parts: maximal strength training, including weightlifting exercises and demonstrated significant increases ($p \leq 0.05$) in maximal strength and jumping ability after 6 weeks of training and after 12 weeks. These improvements remained unaltered during the 4-week detraining period. It may be concluded that a 12-weekstrength training program can improve maximal and explosive strength, and these increases can be transferred to movement time performance. Thus, the theoretical foundations laid proved that only very few attempts were made to find out the effect of strength training on selected physical fitness variables of fencers and further scope for research to find out the varied strength training on selected physical fitness variables, lower strength, upper strength and speed.

Methodology

Randomly selected 60 state level men fencers from the state level selection trials and competitions were selected for this study. The selected subjects were divided into four groups, three experimental groups and one control group consisting of 15 in each. Selected subjects were tested of their lower explosive strength and speed prior to experimental treatment. Group I underwent low intensity strength training of 40 to 50% of 1 RM of selected 8 strength training exercises. Group II underwent medium intensity of strength training 50 to 60% of 1 RM and group III underwent high intensity of strength training 60 to 70% of 1 RM. The control group did not undergo any special training or coaching programmed apart from their regular routine. The experimental period was for 12 weeks. After the experimental period all the subjects' explosive strength and speed was assessed. The difference between the pre and post test scores were considered as the effect of varied intensities of strength training on selected physical fitness variables among the subjects. The obtained data were statistically analysed to test the significance of difference. In all cases 0.05 levels was fixed to test the significance of the study.

Results

Table I. Analysis of covariance on speed, lower explosive strength and upper explosive strength among low, medium, high intensities of strength training group and control group

SPEED									
Test	LIST GROUP	MIST GROUP	HIST GROUP	Control	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	7.18	7.18	7.09	7.09	Between	0.11	3	0.04	1.31
Std Dev	0.19	0.17	0.17	0.13	Within	1.60	56	0.03	
Post Test Mean	7.03	6.97	6.85	7.13	Between	0.63	3	0.21	7.66*
Std Dev	0.16	0.19	0.17	0.14	Within	1.54	56	0.03	
Adjusted Post Test Mean	7.01	6.96	6.86	7.15	Between	0.64	3	0.21	8.54*
					Within	1.37	55	0.02	
Mean Diff	-0.15	-0.20	-0.25	0.04					
LOWER EXPLOSIVE STRENGTH									
Pre Test Mean	55.07	55.93	53.73	55.1	Between	37.12	3	12.37	0.21
Std Dev	7.95	7.56	7.22	7.95	Within	3299.73	56	58.92	
Post Test Mean	62.07	63.47	65.80	56.6	Between	686.32	3	228.77	4.54*
Std Dev	5.60	8.19	7.02	7.35	Within	2824.67	56	50.44	
Adjusted Post Test Mean	62.01	62.95	66.43	56.5	Between	754.17	3	251.39	7.17*
					Within	1927.07	55	35.04	
Mean Diff	7.00	7.53	12.07	1.53					

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UPPER EXPLOSIVE STRENGTH									
Pre Test Mean	11.60	11.80	12.47	12.0	Between	6.20	3	2.07	0.41
Std Dev	3.16	2.04	1.41	1.96	Within	279.73	56	5.00	
Post Test Mean	13.27	13.67	14.60	11.9	Between	55.13	3	18.38	5.45*
Std Dev	2.58	1.63	0.99	1.79	Within	188.80	56	3.37	
Adjusted Post Test Mean	13.55	13.79	14.22	11.9	Between	46.01	3	15.34	30.64*
					Within	27.53	55	0.50	
Mean Diff	1.67	1.87	2.13	-0.07					

LIST : Low Intensity Strength Training; MIST : Medium Intensity Strength Training; HIST : High Intensity Strength Training
* Significant at 0.05 level

Since significant f values were obtained the data were subjected to Scheffe's post hoc test to find out the paired mean difference and the results presented in table II.

Table II. Scheffe's post hoc analysis on speed and explosive strength

SPEED					
MEANS					Required C.I.
Low intensity Group	Medium Intensity Group	High Intensity Group	Control Group	MEAN DIFF	
7.01	6.96			0.05	0.17
7.01		6.86		0.15	0.17
7.01			7.15	0.13	0.17
	6.96	6.86		0.10	0.17
	6.96		7.15	0.19*	0.17
		6.86	7.15	0.29*	0.17
LOWER EXPLOSIVE STRENGTH					
62.01	62.95			0.95	6.23
62.01		66.43		4.43	6.23
62.01			56.54	5.47	6.23
	62.95	66.43		3.48	6.23
	62.95		56.54	6.41*	6.23
		66.43	56.54	9.90*	6.23
UPPER EXPLOSIVE STRENGTH					
13.55	13.79			0.25	0.74
13.55		14.22		0.68	0.74
13.55			11.91	1.64*	0.74
	13.79	14.22		0.43	0.74
	13.79		11.91	1.89*	0.74
		14.22	11.91	2.31*	0.74

ISSN: 2349 – 4891

* Significant at 0.05 level.

The obtained mean values on the experimental and control groups were presented in the following figures.

Figure I. Bar diagram showing pre, post and adjusted means on speed

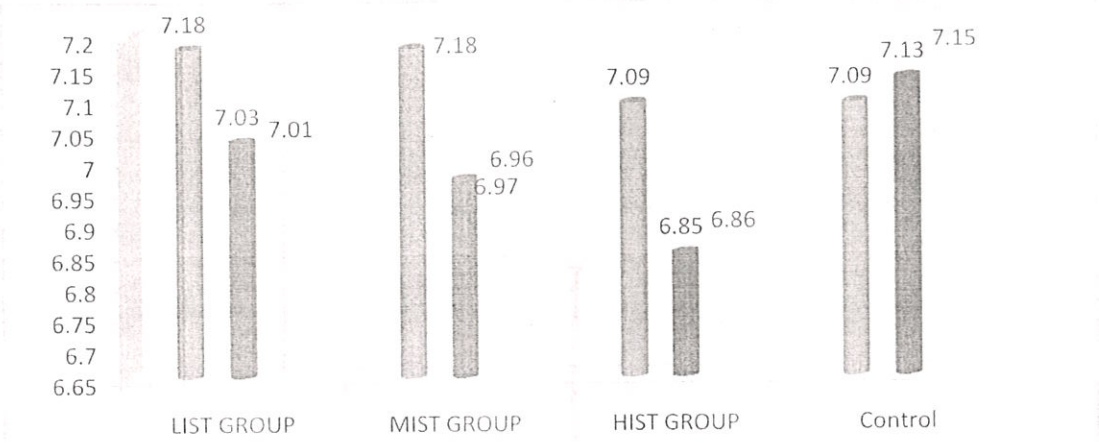

Figure II. Bar diagram showing pre, post and adjusted means on lower explosive strength

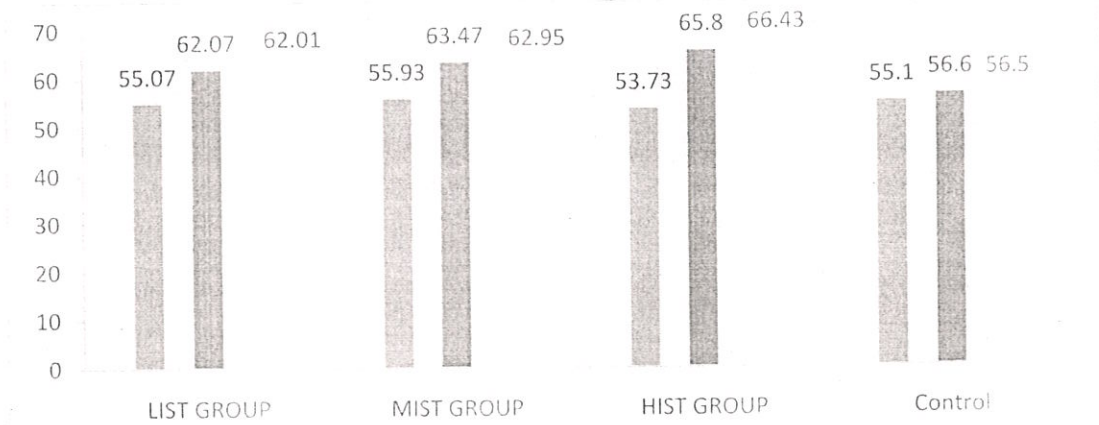

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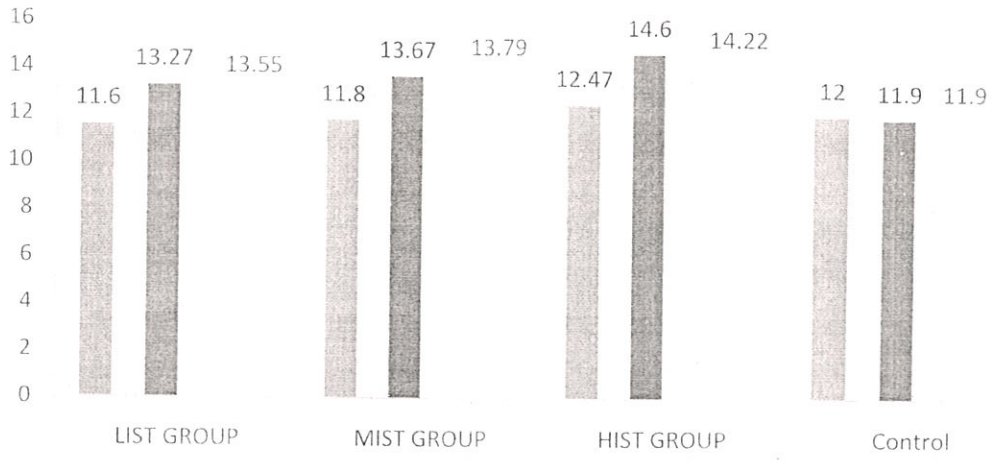
Figure III. Bar diagram showing pre, post and adjusted means on upper explosive strength



This bar diagram is presented for easy understanding of the facts.

Discussions

Physical demands of fencing competitions are high, involving the aerobic and anaerobic alactic and lactic metabolisms. Fencing is an explosive sport requiring energy production predominately from anaerobic sources. Lunging and change of direction speed seem vital to performance, and strength and power qualities underpin this. In the elimination rounds, fencers are likely to accumulate high levels of blood lactate, and so high-intensity interval training is recommended to reduce the intolerance to and the accumulation of hydrogen ions (Turner et al. (2014). This study aims at finding out the effect of varied intensities of strength training, namely, low, medium and high intensity strength training on selected physical fitness variables, lower explosive strength, upper explosive strength and speed, among state level men fencers. The results presented in Table I proved that varied intensities of strength training significantly improved lower explosive strength, upper explosive strength and speed among men fencers. Table II the post hoc analysis proved that comparing to control group, varied intensities, low, medium and high intensity strength training significantly improved upper explosive strength. The results also proved that there were no significant differences among treatment groups. The maximal strength training, including weightlifting exercises and demonstrated significant increases ($p \leq 0.05$) in maximal strength and jumping ability and concluded that a 12-week strength training program can improve maximal and explosive strength, and these increases can be transferred to movement time performance (Redondo et al. 2014). The results of this study that varied intensities of strength training increased physical fitness variables, lower explosive strength, upper explosive strength and speed of state level men fencers is in agreement with the findings of Turner et al. (2014) and Redondo et al. (2014).

Conclusions

1. It was concluded that the high intensity had significant improvement in the chosen variable such as lower explosive strength, upper explosive strength and speed among the state level fencers.
2. It was also concluded that the medium intensity training group improved in the selected variables better than the low intensity training group.
3. It was concluded that the low intensity training group did not improve the selected variables of the state level fencers.

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ISSN: 2349 – 4891

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8.4.5-J-SC-2015-16

Original Article

ISSN: 2349 - 4891

International Journal of Recent Research and Applied Studies
(Multidisciplinary Open Access Refereed e-Journal)

IJRRAS

Effect of Varied Intensities of Strength Training on Aerobic Capacity and Anaerobic Power of State Level Men Fencers

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Received 20th February 2016. Accepted 10th April 2016

Abstract

The sport fencing requires optimum level of aerobic capacity and anaerobic power. The purpose of this study was to find out the effect of varied intensities of strength training on aerobic capacity and anaerobic power of state level men fencers. Randomly selected 60 state level men fencers were assigned to four equal groups of fifteen state level men fencers in each group, namely, experimental groups I, II, III and control group respectively. Their age was ranging from 18 to 25 years. Experimental group I underwent low intensity strength training (LIST), experimental group II underwent medium intensity strength training (MIST) and experimental group III underwent high intensity strength training (HIST) and the fourth group, namely, control group did not undergo any special training or coaching programmed apart from their regular routine. Pre and post test scores of the fencers proved improvement on aerobic capacity and anaerobic power. LIST was significantly improved in aerobic capacity better than MIST, HIST and control group, and HIST was significantly in anaerobic power better than LIST and MIST groups. It was concluded that high intensity and low intensity had significant improvement in aerobic and anaerobic power among the state level men fencers.

Keywords: Strength Training, Aerobic Capacity, Anaerobic Power, Fencing.

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Introduction

Strength training is a type of physical exercise specializing in the use of resistance to induce muscular contraction which builds the strength, anaerobic endurance, and size of skeletal muscles. When properly performed, strength training can provide significant functional benefits and improvement in overall health and well-being, including increased bone, muscle, tendon and ligament strength and toughness, improved joint function, reduced potential for injury, increased bone density, increased metabolism, improved cardiac function, and elevated HDL cholesterol. Strength training commonly uses the technique of progressively increasing the force output of the muscle through incremental weight increases and uses a variety of exercises and types of equipment to target specific muscle groups. Strength training is primarily an anaerobic activity, although some proponents have adapted it to provide the benefits of aerobic exercise through circuit training. (De Mello Meirelles, Gomes 2004).

In one common method, strength training uses the principle of progressive overload, in which the muscles are overloaded by attempting to lift at least as much weight as they are capable. They respond by growing larger and stronger. This procedure is repeated with progressively heavier weights as the practitioner gains strength and endurance. (Brooks, Fahey, & White 1996) Weight training can be a very effective form of strength training because exercises can be chosen, and weights precisely adjusted, to safely exhaust each individual muscle group after the specific numbers of sets and repetitions that have been found to be the most effective for the individual.

Sports where strength training is central are bodybuilding, weightlifting, power lifting, strongman, Highland games, shot put, discus throw, and javelin throw. Many other sports use strength training as part of their training regimen, notably football, wrestling, track and field, rowing, lacrosse, basketball, pole dancing (or pole fitness),and hockey . Strength training for other sports and physical activities is becoming increasingly popular. In this study, the researcher was interested to find out the effect of varied intensities of strength training on aerobic capacity and anaerobic power of the state level men fencers, as there was dearth of studies in this area. According to Roi and Bianchedi (2008) the demands of fencing competitions are high, involving the aerobic and anaerobic alactic and lactic metabolisms, and are also affected by age, sex, level of training and technical and tactical models utilized in relation to the adversary. Further stated that it is difficult to identify a significant relationship between any one physiological

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ISSN: 2349 – 4891

characteristic and performance, and performance is more likely to be influenced by perceptual and neuro-physiological characteristics of fencers. And further reported that although the aerobic capacity of fencers (52.9 mL/kg per minute) is greater than that of the sedentary population (approximately 42 mL/kg per minute), it is clearly lower than that of aerobic endurance–based athletes and may be suggestive of the relatively small role a high [Combining Dot Above] VO_2max has to fencing. The energy system requirements of each sword of fencers will inevitably differ, it is in their opinion none will significantly tax the aerobic system to the extent that training need directly target its development through the traditional methods of long slow distance (LSD) running (Ratmess 2008)

The predominant anaerobic system, originates from reports quantifying the blood lactate concentrations of fencing bouts. In men's foil, for example, blood lactate concentrations (measured 5 minutes after bout) averaged 2.5 mmol/L during the preliminary pools and then were consistently above 4 mmol/L (and as high as 15.3 mmol/L in the winner) during the elimination bouts (Cerizza, Roi 1994).

The foil fencing is undoubtedly an anaerobic-type sport. The theoretical foundations proved that the sport, fencing requires aerobic capacity and anaerobic power and there was lack of research to find out the effect of varied intensities of strength training on these variables among state fencers. Hence, the investigator made an attempt to this effect (Turner, Anthony 2013)

Methodology

Sixty state level men fencers were selected randomly as subjects for this study. The age group of the subjects was between 18 to 25 years. The subjects were selected during state level selection trails and competition held at Chennai under the sponsorship of Sports Development Authority of Tamil nadu with prior permission from the authorities. The study was formulated as a true random group design, consisting of a pre test and post test. The subjects (n=60) were randomly assigned to four equal groups of fifteen state level men fencers in each group. The groups were assigned as experimental groups I, II, III and control group respectively. Experimental group I was assigned as low intensity strength training (LIST), experimental group II was assigned as medium intensity strength training (MIST) and experimental group III was assigned as high intensity strength training (HIST) and control group. The control group was not given any special treatment except of their routine. Pre tests were conducted for all the subjects on selected criterion variables. The experimental groups participated in their respective training protocols for a period of twelve weeks. The post tests were conducted on the above said dependent variables after the experimental period of twelve weeks for all the four groups. Aerobic capacity was measured through Queen College Test and scores recorded in maximal oxygen consumption in ml/kg/min. Anaerobic Power measured through Margaria Kalaman Anaerobic Test and scores recorded in seconds and converted into watts. The differences between the initial and final means on selected variables were considered. The obtained data were subjected to statistical treatment using ANCOVA. In all cases 0.05 levels was fixed to test the hypothesis set for this study.

Results

Table I. Analysis of covariance on aerobic capacity and anaerobic power among low, medium, high intensities of strength training group and control group

AEROBIC CAPACITY									
Test	LIST	MIST	HIST	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	f-ratio
Pre Test Mean	40.32	41.47	42.10	41.84	Between	27.80	3	9.27	0.42
					Within	1233.68	56	22.03	
Post Test Mean	46.41	43.98	45.47	41.61	Between	197.34	3	65.78	3.77*
					Within	977.17	56	17.45	
Adjusted Post Test Mean	47.29	43.95	44.95	41.28	Between	275.59	3	91.86	24.78*
					Within	203.86	55	3.71	
ANAEROBIC POWER									
Test	LIST	MIST	HIST	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	f-ratio
Pre Test	63.57	64.12	63.22	66.76	Between	115.84	3	38.61	

ISSN 2349 – 4891

Mean					Within	4333.09	56	77.38	0.50
Post Test Mean	67.61	68.64	72.70	66.81	Between	308.35	3	102.78	1.93
					Within	2976.17	56	53.15	
Adjusted Post Test Mean	68.24	68.86	73.60	65.05	Between	549.39	3	183.13	18.42*
					Within	546.78	55	9.94	

* Significant at 0.05 level and required $F_{(0.05),(df\ 3,45)} = 2.77$

The results of comparing the adjusted post-test mean among low intensity strength training group, medium intensity strength training group, high intensity strength training group and control group, it was observed that the mean difference among these groups on aerobic capacity and anaerobic power was statistically significant Further to determine which of the paired had a significant difference the Scheffe's test was used as post-hoc test and the results are presented in the table II

Table II. Scheffe's post hoc analysis on aerobic capacity and anaerobic power of state level men fencers

MEANS					Required C.I.
Low intensity Group	Medium Intensity Group	High Intensity Group	Control Group	MEAN DIFF	
AEROBIC CAPACITY					
47.29	43.95			3.34*	2.03
47.29		44.95		2.34*	2.03
47.29			41.28	6.01*	2.03
	43.95	44.95		1.00	2.03
	43.95		41.28	.66	2.03
		44.95	41.28	3.67	2.03
ANAEROBIC POWER					
68.24	68.86			0.62	3.32
68.24		73.60		5.36*	3.32
68.24			65.05	3.19	3.32
	68.86	73.60		4.73*	3.32
	68.86		65.05	3.81*	3.32
		73.60	65.05	8.54*	3.32

* Significant at 0.05 level

The multiple mean comparisons reveal that there existed statistically significant improvement in aerobic capacity among LITG and HITG groups. The medium intensity training group had not shown improvement in aerobic capacity, however there significant differences between the groups existed. High intensity training group had better improvement than the low intensity training group in the aerobic capacity. In the anaerobic power high intensity training group had better improvement than the other two group namely low and medium intensity. Medium intensity training group had better improvement than the low intensity training group in anaerobic power. The obtained mean values on the experimental and control groups were presented in figure I and II.

ISSN: 2349 – 4891

Figure I. Bar diagram showing pre, post and adjusted means on aerobic capacity

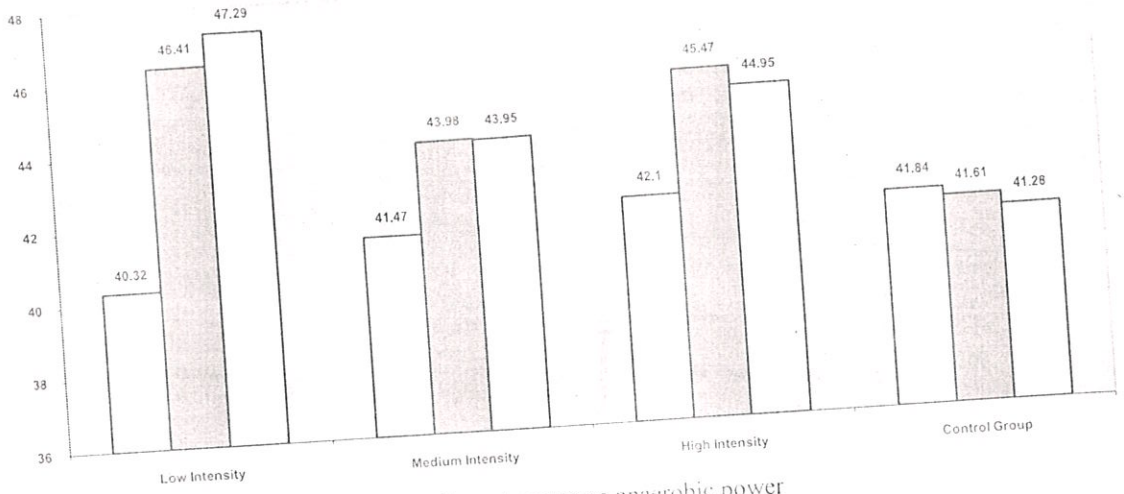
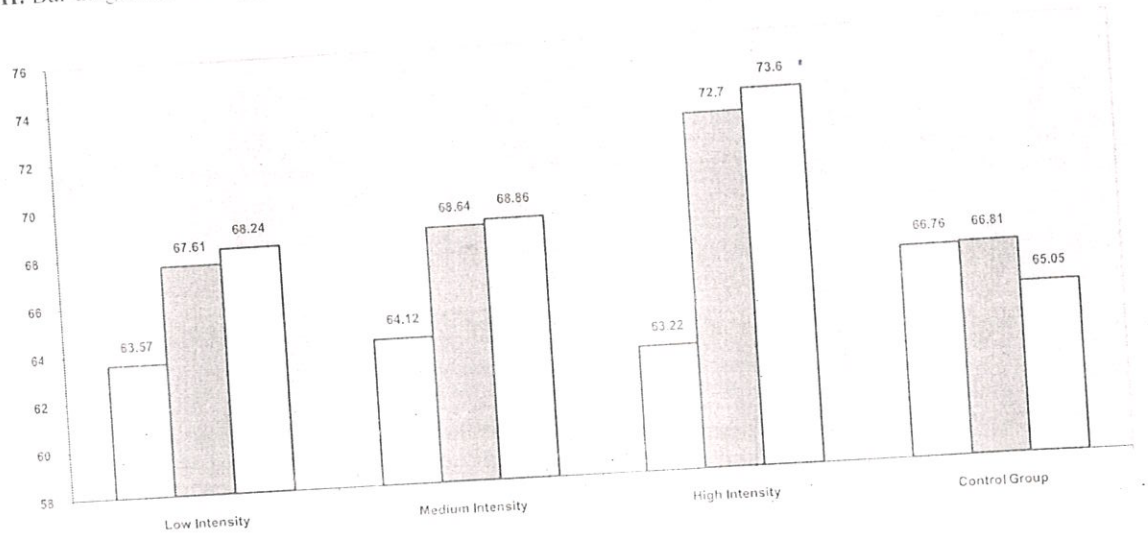


Figure II. Bar diagram showing pre, post and adjusted means on anaerobic power



This bar diagram is presented for easy understanding of the facts.

Discussions

The low resistance circuit weight training and endurance training on maximal aerobic power improved in sedentary adults (Kaikkonen. et al. 2000). Fencing is an explosive sports requiring energy production predominately from anaerobic sources Turner et al. (2014). Similarly on anaerobic power of the state level men fencers LIST group had improved. It was proved that the experimental treatments significantly improved aerobic capacity and anaerobic power of the state level men fencers. The results proved that LIST group was significantly better than MIST, HIST and control groups in improving aerobic capacity of the state level men fencers. HIST group was significantly better than LIST, MIST and control group in improving anaerobic power of the state level men fencers. Comparison between treatments groups proved that HIST was significantly better than MIST in improving anaerobic power. The results of this study are in agreement with the findings of Nash, et.al. (2007) who found the effects of circuit resistance exercise (CRT) training on muscle strength, endurance, anaerobic power and Kaikkonen, et.al. (2000) who found circuit weight training and endurance training improved maximal aerobic power.

Roi and Bianchedi (2008) reported that demands of fencing competitions are high, involving the aerobic and anaerobic alactic and lactic metabolisms, and are also affected by age, sex, level of training and technical and tactical models utilized in relation to the adversary. Further stated that it is difficult to identify a significant relationship between any one physiological characteristic and performance, and performance is more likely to be influenced by perceptual and neuro-physiological characteristics of fencers. they further

ISSN: 2349 – 49

reported that although the aerobic capacity of fencers (52.9 mL/kg per minute) is greater than that of the sedentary population (approximately 42 mL/kg per minute), it is clearly lower than that of aerobic endurance–based athletes and may be suggestive of the relatively small role a high [Combining Dot Above] VO_2max has to fencing. Ratmess (2008) found although the energy system requirements of each sword of fencers will inevitably differ, it is in their opinion none will significantly tax the aerobic system to the extent that training need directly target its development through the traditional methods of long slow distance (LSD) running. Cerizza, Roi (1994) supported that defining the predominant anaerobic system, originates from reports quantifying the blood lactate concentrations of fencing bouts. In men's foil, for example, blood lactate concentrations (measured 5 minutes after bout) averaged 2.5 mmol/L during the preliminary pools and then were consistently above 4 mmol/L (and as high as 15.3 mmol/L in the winner) during the elimination bouts. Turner, Anthony (2013) found that although foil fencing is undoubtedly an anaerobic-type sport. The theoretical foundations proved that the sport, fencing requires aerobic capacity and anaerobic power and there was lack of research to find out the effect of varied intensities of strength training on these variables among state fencers. Hence, the investigator made an attempt to this effect.

Conclusions

It was concluded that the LIST and HIST training improved the aerobic capacity and anaerobic power of the state level fencers.

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3.4.5_T – EPN-2015-1L

Academic Sports Scholars
ISSN 2277-3665

Impact Factor : 2.1052(UIF)
Volume -4 | Issue - 9 | Sept - 2015

EFFECT OF RESISTANCE TRAINING WITH VARIED NUTRITIONAL SUPPLEMENTATION ON CLEAN AND JERK AND SNATCH AMONG SUB JUNIOR NATIONAL WEIGHTLIFTER



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ABSTRACT

The purpose of the study was to find out the effect of resistance training with varied nutritional supplementation on Clean and Jerk and Snatch among Sub Junior National Weightlifter. For this purpose, thirty weight lifters were selected at random from the Army sports institute, Pune. Their age ranged between 12 and 16 years. The selected thirty weight lifters were randomly assigned into three groups namely, resistance training with whey protein isolates supplement group (RTWPIG), resistance training with whey protein concentrate group (RTWPCG) and placebo group (PG) each consisting of ten subjects. The subjects were given resistance training with whey protein supplementation for a period of twelve weeks. The subjects were tested Clean and Jerk and Snatch using 1RM. After the experimental period, the collected data was analysed by using analysis of covariance. The level of significance was fixed at 0.05 level. The results showed that the twelve weeks of resistance training with varied nutritional supplementation had a significant improvement on the Clean and Jerk and Snatch.



This restrictive concept is applied to resistance training, as opposed to the competitive sport of weightlifting, which is sometimes referred to as Olympic lifting. The sport of weightlifting is distinct from common strength training, because it involves specific types of rapid lifts, such as the "snatch" and the "clean and jerk."

KEYWORDS :*Resistance Training, Whey Protein, snatch" and the "clean and jerk.*

INTRODUCTION :

The protein requirements for athletic populations have been the subject of much scientific debate. Only recently has the notion that both strength/power and endurance athletes require a greater protein consumption than the general population become generally accepted. Protein is a key nutrient needed by the body to build and repair tissue, provide structure, serve as an enzyme to begin cellular processes, and form hormones (among other functions). The Recommended Dietary Allowance (RDA) for sedentary individuals is 0.8 grams protein per kilogram body weight per day. Some research suggests that athletes need more protein to support their increased rate of muscle breakdown and synthesis. Recommendations typically range from 1.0-2.0 grams protein per kilogram

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body weight per day, depending on type and intensity of activity. For example, a person weighing 150 lbs. (68.2 kg) would need about 55 grams of protein if he was sedentary and 136 grams of protein if he was an active weight lifter.

Whey is a dairy protein that is a by-product of the cheese making process. In its raw state, whey contains substantial amounts of fat and lactose (milk sugar). The primary difference between isolate and concentrate is that the isolate is more pure. In other words, isolate contains more protein with less fat and lactose per serving. Whey isolate usually contains between 90-94% proteins while whey concentrate has a protein ratio of 70-85% (Keri, 2004).Whey protein is a soluble, easy to digest protein and is efficiently absorbed into the body. It is often referred to as a "fast" protein for its ability to quickly provide nourishment to muscles.

Athletes' training is carried out in an oriented, planned, systematic and long-term way, aiming to achieve performance. The changes during workouts cover both the component performance, as a result, and the structural component. The transformation in terms of performance refers to the mainly quantitative improvement of athlete's performance individual potential, which occurs usually in competition (Ulareanu, 2012).

Exercise training of particular kinds clearly has a dramatic impact on muscle morphology and function compared with the effects of weight lifting and distance running on fiber type diameters and proportions or mitochondrial density. It is no surprise that different modes of training, aimed at increasing the performance of particular kinds of muscular activity (or, in bodybuilding, simply muscle mass) have differential effects on muscle protein metabolism. Resistance exercise training is well known to result in hypertrophy of the trained muscles (Luthi, et al 1986).

Protein supplementation and athletic performance have shown positive effects from proteins of various sources. However, only limited research is available on comparisons between various protein sources and changes in human performance. Hence, the aim of investigation is to find out the effect of resistance training with Whey Protein Isolates Supplement (WPI) and Whey Protein concentrate Supplement (WPC) on performance of Clean and Jerk and Snatch of the weight lifters.

METHODS AND MATERIALS

For this purpose, thirty weight lifters were selected at random from the Army sports institute, Pune. Their age ranged between 12 and 16 years. The selected thirty weight lifters were randomly assigned into three groups namely, resistance training with whey protein isolates supplement group (RTWPIG), resistance training with whey protein concentrate group (RTWPCG) and placebo group (PG) each consisting of ten subjects. The subjects were given resistance training with whey protein supplementation for a period of twelve weeks. The subjects were tested Clean and Jerk and Snatch using 1RM. After the experimental period, the collected data was analysed by using analysis of covariance. The level of significance was fixed at 0.05 level.

RESISTANCE TRAINING PROTOCOL

All subjects participated in a supervised, periodized resistance training session three days per week, per week for a total of twelve weeks. Prior to the workout, subjects performed a standardized series of stretching exercises. The participants then performed 3 sets of leg press, bench press, and military press, pull-ups, bent over rows, barbell curls and extensions. Immediately following the workout, subjects consumed 40 grams of Whey Protein Isolates Supplement (WPI) and Whey Protein concentrate Supplement (WPC) respectively. The program was designed to train all major muscle groups using mostly compound movements for the upper and lower body. The programmed, non-

linear training split was divided into hypertrophy days consisting of 8–12 RM loads for 3 sets, with 60–120 seconds rest and strength days consisting of 2 to 5 RM loads for 3 sets for all exercises except the leg press and bench press which received 5 total sets. Weights were progressively increased by 5% when the prescribed repetitions could be completed. All training sessions were closely monitored by the researchers to ensure effort and intensity was maximal each training session.

RESULTS ON CLEAN &JERK AND SNATCH

The results presented in the table I shows that the pre and post test scores of resistance training with whey protein isolates supplement group (RTWPIG), resistance training with whey protein concentrate group (RTWPCG) and placebo group on clean & jerk and snatch. The obtained pre test F value of 1.15 and 1.39 respectively was lesser than the required table value of 3.35. The obtained post test F value of 8.13 and 7.56 respectively was greater than the required table value of 3.35. Hence, it was proved that there was significant improvement in clean & jerk and snatches among sub junior national weight lifters due to resistance training with whey protein supplementations.

Table I
Computation of Analysis of Covariance on Clean & Jerk and Snatch
(Scores in Kg)

VARIABLES	TEST	CTWPI GROUP	CTWPC GROUP	PLACEBO GROUP	SV	SS	df	MS	F
CLEAN & JERK	Pre Test	83.30	82.60	82.10	B	7.27	2	3.63	1.15
					W	85.40	27	3.16	
	Post Test	95.80	93.80	91.80	B	80.00	2	40.00	8.13*
					W	132.80	27	4.92	
	Adjusted	95.22	93.86	92.32	B	38.97	2	19.48	8.23*
					W	61.56	26	2.37	
	Mean Gain	12.50	11.20	9.70					
SNATCH	Pre Test	53.20	52.10	52.20	B	7.40	2	3.70	1.39
					W	72.10	27	2.67	
	Post Test	64.50	62.60	61.40	B	48.87	2	24.43	7.56*
					W	87.30	27	3.23	
	Adjusted	63.99	62.89	61.62	B	26.48	2	13.24	7.04*
					W	48.93	26	1.88	
	Mean Gain	11.30	10.50	9.20					

*Significant at 0.05 level of confidence for 2 and 27 (df) = 3.35, 2 and 26 (df) = 3.37

The statistical analysis on adjusted mean values using ANCOVA revealed that there was significant difference existed among resistance training with whey protein isolates supplement group (RTWPIG), resistance training with whey protein concentrate group (RTWPCG) and placebo group on clean and jerk and snatch since the obtained adjusted mean F value 8.23 and 7.04 was greater than the table value of 3.37 at 0.05 level.

Since the F value was significant, the results were subjected to post hoc analysis using Scheffe's confidence interval test. The results were presented in Table II.

Table II
Scheffe's Confidence Interval Test Score on Clean & Jerk and Snatch
(Scores in Kg)

VARIABLE	PLACEBO GROUP	CTWPI GROUP	CTWPC GROUP	Mean Difference	CI
CLEAN & JERK	92.32	95.22		2.90*	1.43
	92.32		93.86	1.54*	
		95.22	93.86	1.36	
SNATCH	61.62	63.99		2.37*	1.27
	61.62		62.89	1.27*	
		63.99	62.89	1.10	

*Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between resistance training with whey protein isolates supplement group (RTWPIG) and placebo group. There was significant difference between resistance training with whey protein concentrate group (RTWPCG) and placebo group. There was no significant difference between treatment groups, namely resistance training with whey protein isolates supplement group (RTWPIG) and resistance training with whey protein concentrate group (RTWPCG).

The pre test, post test and ordered adjusted means are presented through bar diagram for better understanding of the result of this study in figures.

Figure – 1
Bar Diagram on Adjusted Means of Clean & Jerk

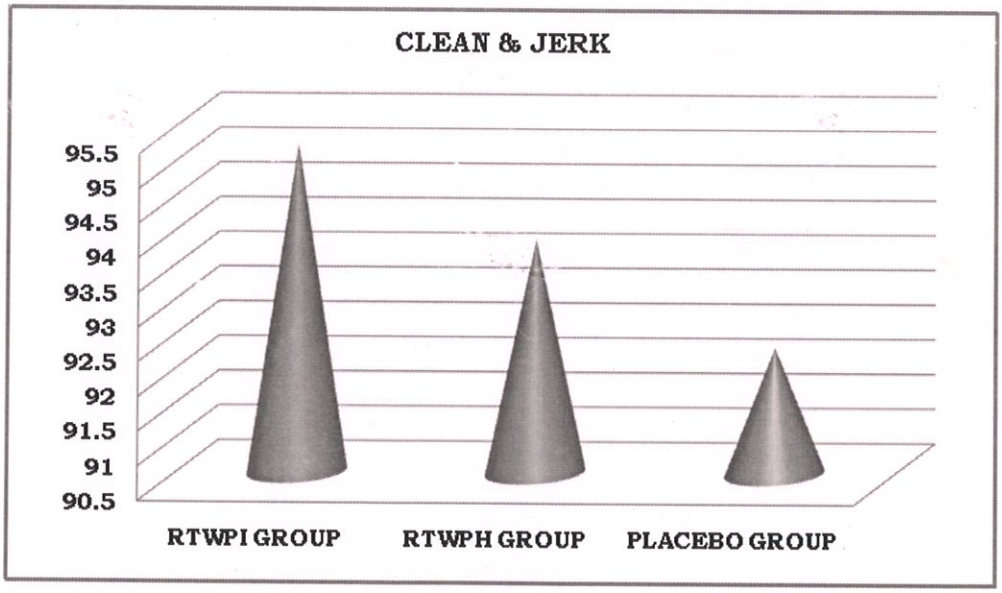
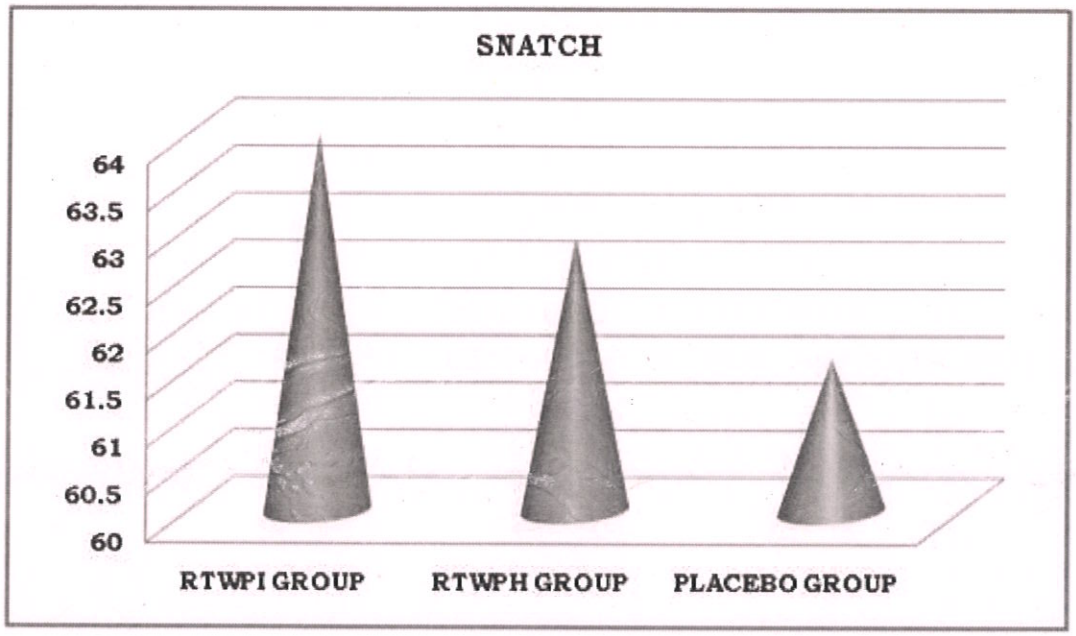


Figure – 2
Bar Diagram on Adjusted Means of Snatch



DISCUSSION AND CONCLUSION

Skeletal muscle is an integral body tissue playing key roles in strength, performance, physical function, and metabolic regulation. It is essential for athletes to ensure that they have optimal amounts of muscle mass to ensure peak performance in their given sport. A combination of resistance exercise and whey protein consumption, results in a synergistic stimulation of muscle protein synthesis.

The results proved that the both whey protein isolate and whey protein concentrate administration post resistance exercise improved indices of body composition and exercise performance of clean & jerk and snatches. However, there were no differences between the two groups.

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3.4.5-J-EPN-2015-16

Vol 5 Issue 9 March 2016 ISSN No :2231-5063

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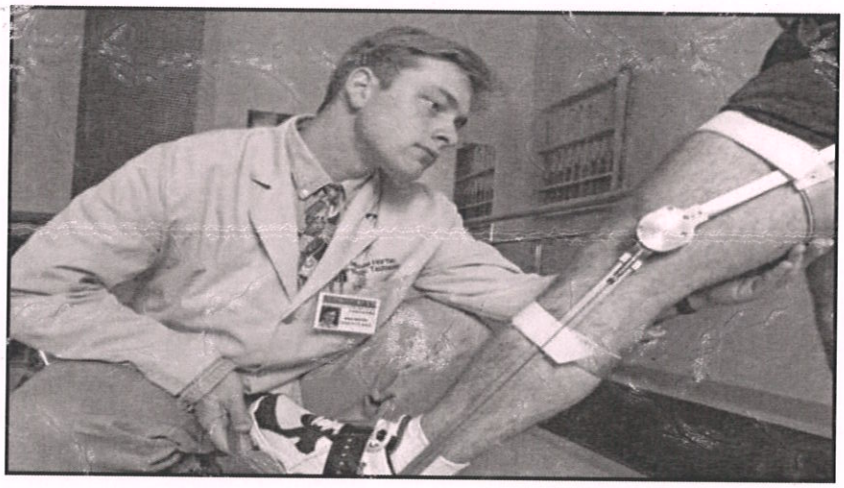
ISSN: 2231-5063 Impact Factor : 3.4052(UIF) Volume - 5 | Issue - 9 | March - 2016

NON OPERATIVE TREATMENT FOR ANTERIOR CRUCIATE LIGAMENT INJURY



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ABSTRACT:

The aim of the study was to examine the rehabilitation program on Nonoperative treatment for anterior cruciate ligament injury. While data support anterior cruciate ligament injury (ACL) reconstruction for young athletes in order to allow sports participation and reduce the risk of damage to the articular cartilage and menisci as a result of recurrent giving way, less active patients may be better treated nonoperatively. **Methods:** Fifteen patients were selected for the anterior cruciate ligament injury (ACL) rehabilitation program and their age ranged between 20 and 25 years. The patients were performed core stability exercise, joint range motion exercise and muscle strengthen exercise program for 3 months, five days per week each session consist of two hours. The data were collected on range of motion, flexibility, knee stability, strength and proprioception were assessed before and after anterior cruciate ligament injury (ACL) rehabilitation program intervention. To compare pre and post test data 't' test were used to find out the significant differences on anterior

cruciate ligament injury (ACL) patients . **Results:** The results of the study showed that there was significant improvement in range of motion, flexibility, knee stability and proprioception. **Conclusion:** The finding of the study proved that the Nonoperative treatment for anterior cruciate ligament injury rehabilitation program improves the patient's range of motion, flexibility, knee stability and proprioception.

KEYWORDS: ACL, core stability exercise, joint range motion exercise and muscle strengthen exercise, range of motion, flexibility, knee stability, strength and proprioception.

INTRODUCTION:

Knowledge of exercise physiology is essential for implementing strategies to develop optimal physical performance among individuals with anterior cruciate ligament (ACL). Knee anterior cruciate ligament (ACL) is one of the most often injured knee anatomical structures. After anterior cruciate ligament injury (ACL) rupture decreased neuromuscular and sensorimotor system control as well as muscle activation and muscle strength affects body imbalance and increased variability of muscle torque **(Bonsfills et al., 2008; Ingersol et al., 2008).** Despite increasing knowledge of anterior cruciate ligament (ACL) anatomy and the development of improved surgical techniques for reconstruction, uncertainty still remains regarding optimal indications for ACL reconstruction in active individuals. While data support ACL reconstruction for young athletes in order to allow sports participation and reduce the risk of damage to the articular cartilage and menisci as a result of recurrent giving way, less active patients may be better treated nonoperatively. Recently, a prospective randomized trial in young active adults with ACL tears concluded that a strategy of initial nonoperative treatment for all patients along with optional delayed ACL reconstruction can reduce significantly the need for reconstruction compared to a strategy of early ACL reconstruction. Yet, this study also showed that the group initially treated nonoperatively with only optional delayed ACL reconstruction underwent significantly more meniscal procedures and had significantly higher frequency of subjective or clinical knee instability. This indicates that a strategy of early nonoperative management for all active adults with ACL tears may result in suboptimal outcomes for some patients due to recurrent instability. While some patients demonstrate normal knee stability and good outcome without reconstruction following ACL injury, knowledge about how to identify patients who can be managed nonoperatively without risking future instability is still lacking. These patients were treated without surgery. The purpose of this study was to evaluate the outcome of these nonoperated anterior cruciate ligament injuries for athletes **(Ikuta, 2002).**

MATERIAL & METHODS

For the purpose of the study fifteen anterior cruciate ligament injury (ACL) patients was selected from "physiotherapy centre, Chennai". An anterior cruciate ligament injury (ACL) tear, or torn anterior cruciate ligament, is one of the most common knee injuries. As one of the four primary ligaments of the knee, the anterior cruciate ligament injury (ACL) connects the front top part of the shinbone to the back bottom part of the thigh bone. The anterior cruciate ligament injury (ACL) also keeps the shin from sliding forward, and provides rotational stability to the knee. The patients were performed core stability exercise, joint range motion exercise and muscle strengthen exercise program for 3 months, five days per week each session consist of two hours. The data were collected on range of motion, flexibility, knee stability, strength and proprioception were assessed before and after anterior cruciate ligament injury (ACL) rehabilitation program intervention. To compare pre and post test data

't' test were used to find out the significant differences on anterior cruciate ligament injury (ACL) patients.

ACL REHABILITATION INTERVENTION FOR 12 WEEKS

1st week, Lower Body Stretches		
Calf	15 Sec Holding	3 Rep
Hamstring	15 Sec Holding	3 Rep
Gluteus	15 Sec Holding	3 Rep
Adductor	15 Sec Holding	3 Rep
Quads	15 Sec Holding	3 Rep
IT	15 Sec Holding	3 Rep
Hip Flexor	15 Sec Holding	3 Rep
Tibilias Posterior	15 Sec Holding	3 Rep

2nd week Core Training and Lower Limb Strengthen			
SLR	10 to 15 Sec Holding	8 to 15 Rep	2 to 3 Set
Toe Out	10 to 15 Sec Holding	8 to 15 Rep	2 to 3 Set
Abduction	10 to 15 Sec Holding	8 to 15 Rep	2 to 3 Set
Hip Ext	10 to 15 Sec Holding	8 to 15 Rep	2 to 3 Set
Bridge	10 to 15 Sec Holding	8 to 15 Rep	2 to 3 Set

3rd week Balance Training on the Floor		
Hip Flexion (Front Kick)	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep
Abduction (Side Kick)	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep
Hip Extension (Back Kick)	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep
High Knee	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep

4th week Lower Limb Strengthens With Swiss Ball				
Squat	Rest 30 to 1 Min		10 To 15 Rep	2 to 4 Set
Lunges	Rest 30 to 1 Min		10 To 15 Rep	2 to 4 Set
Groin Press	5 Sec Rest	10 to 15 Sec Press	8 To 12 Rep	2 Set
Ham Press	5 Sec Rest	10 to 15 Sec Press	8 To 12 Rep	2 Set
Calf Raise	Rest 30 to 1 Min		10 To 15 Rep	2 to 4 Set

5th week Balance Training on the Core Board		
Hip Flexion (Front Kick)	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep
Hip Flexion (Front Kick)	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep
Abduction (Side Kick)	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep
Hip Extension (Back Kick)	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep
High Knee	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep

6th week Core Training with Swiss Ball		
T.A Activation	15 Sec Press 5 Sec Rest Each Side	10 Re 2 Set
Straight Core Press	15 Sec Press 5 Sec Rest Each Side	10 Rep 2 Set
Core Diagonal Press	15 Sec Press 5 Sec Rest Each Side	10 Rep 2 Set
Groin Press with Bridging	15 Sec Press 5 Sec Rest Each Side	10 Rep 2 Set
Ham Press with Bridging	15 Sec Press 5 Sec Rest Each Side	10 Rep 2 Set

7th week Ankle Weights Training on Standing (Weight 1.5 Kg or Less Than 1.5 Kg)		
High Knee	8 to 15 Rep	2 to 4 Set
Abduction	8 to 15 Rep	2 to 4 Set
Hip Ext	8 to 15 Rep	2 to 4 Set
Ham Curl	8 to 15 Rep	2 to 4 Set
Cycling	8 to 15 Rep	2 to 4 Set

8th week Balance Training on Trampolin		
Hip Flexion (Front Kick)	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep
Hip Flexion (Front Kick)	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep
Abduction (Side Kick)	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep
Hip Extension (Back Kick)	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep
High Knee	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep

9th week Core Stability			
Cat and Camel	10 To 15 Sec Holding	8 to 15 Rep	2 to 3 Set
Side Bridge	10 To 15 Sec Holding	8 to 15 Rep	2 to 3 Set
Iron Man	10 To 15 Sec Holding	8 to 15 Rep	2 to 3 Set
Hip Ext	10 To 15 Sec Holding	8 to 15 Rep	2 to 3 Set
Super Man	10 To 15 Sec Holding	8 to 15 Rep	2 to 3 Set

10th week Free Squat Training with window Holding		
Squat	8 to 15 Rep	2 to 4 Set
Squat Side To Side	8 to 15 Rep	2 to 4 Set
Lunges	8 to 15 Rep	2 to 4 Set
Single Leg Squat	8 to 15 Rep	2 to 4 Set
Calf Raise	8 to 15 Rep	2 to 4 Set

11th week Floor Core Training		
Basic Curl	8 to 15 Rep	2 to 4 Set
Knee Up And Down	8 to 15 Rep	2 to 4 Set
Heel Touch	8 to 15 Rep	2 to 4 Set
Knee Side To Side	8 to 15 Rep	2 to 4 Set
Cycling	8 to 15 Rep	2 to 4 Set
Sessiors	8 to 15 Rep	2 to 4 Set
Sky Touch	8 to 15 Rep	2 to 4 Set
Bridge Up And Down	8 to 15 Rep	2 to 4 Set

12th week Trampolin Training Balance		
Hip Flexion (Front Kick)	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep
Hip Flexion (Front Kick)	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep
Abduction (Side Kick)	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep
Hip Extension (Back Kick)	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep
High Knee	Open Eyes 10 Sec Holding Closed Eyes 5 Sec Holding	8 to 15 Rep

Results

Table I

The comparative mean values mean differences, standard deviation and paired t-value between pre and post test of ACL.

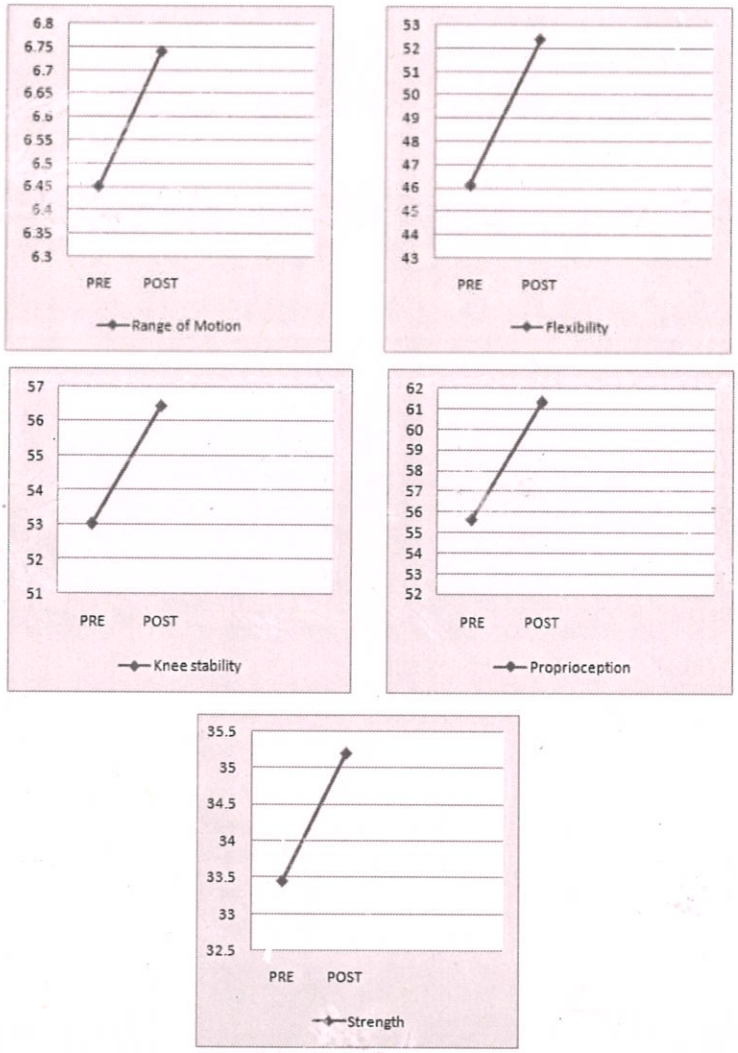
Variables	Pre test mean ±SD	Post test mean ± SD	M. D	SEM	't'-ratio
Range of Motion	6.45 ±0.28	6.74 ± 0.28	0.29	0.03	**8.96***
Flexibility	46.15 ±8.43	52.40 ± 7.44	6.25	0.35	**18.01***
Knee stability	53.05 ±2.70	56.45 ± 2.50	3.40	0.26	**13.31***
Strength	33.45 ±5.45	35.20 ± 5.55	1.75	0.12	14.23
Proprioception	55.64 ±3.75	61.35 ± 2.43	5.71	0.39	**14.53***

*Significant at 0.05 level

Table 1 shows that the Range of Motion significantly increases due to the ACL rehabilitation intervention of core stability exercise, joint range motion exercise and muscle strengthen exercise program from pre test to post. As a result individual's range of motion is improved. It shows that the flexibility increases from pre test to post test. The results proved that flexibility increases after the rehabilitation intervention of core stability exercise, joint range motion exercise and muscle strengthen exercise program. Further, it shows that the knee stability increases significantly increases from pre test to post test. It shows that the strength of muscles increases from pre test to post test. The results proved that Proprioception also increases as a result rehabilitation intervention of core stability exercise, joint range motion exercise and muscle strengthen exercise program.

Figures-1

Bar diagram shows the pre and post ACL rehabilitation intervention on range of motion, flexibility, knee stability, strength and proprioception



CONCLUSION

Exercise stress testing is important since it enables exercise capacity and metabolic and cardiopulmonary responses to be ascertained. By repeating this testing periodically, fitness changes

over a period of time can be objectively tracked. Rehabilitation intervention of core stability exercise, joint range motion exercise and muscle strengthen exercise program has a strong theoretical basis in anterior cruciate ligament injury (ACL) rehabilitation treatment, as well as other musculoskeletal afflictions, as is evidenced by its widespread clinical use. Studies have shown that these programs may help decrease pain and improve function in patients with anterior cruciate ligament injury (ACL). However studies are limited, and some show conflicting results. Future studies are needed to elucidate precise core strengthening programs and their effects on treatment anterior cruciate ligament injury (ACL), in comparison with other exercise training programs.

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ISSN No : 2230-7850

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Indian Streams Research Journal
International Recognized Multidisciplinary Research Journal

ISSN: 2230-7850 Impact Factor : 4.1625(UIF) Volume - 6 | Issue - 2 | March - 2016

INFLUENCE OF BRISK WALKING AND ELLIPTICAL TRAINING ON BASAL METABOLIC RATE AND RESTING PULSE RATE AMONG SEDENTARY WOMEN



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ABSTRACT:

The aim of this study was to find out the influence of brisk walking and elliptical training on basal metabolic rate and resting pulse rate among sedentary women. To achieve the purpose, thirty (N=30) sedentary women were randomly selected and their age ranged between 30 and 40 years and they were assigned into three groups, brisk walking group (BWG), elliptical training group (ETG) and Control group (CG) consisting of 10 in each. After assessing the basal metabolic rate and resting pulse rate initially, the experimental groups underwent respective treatments for eight weeks. After the completion of eight weeks experimental period, all the subjects were measured of their selected variables. The results proved that brisk walking and elliptical training improved basal metabolic rate of sedentary women comparing to initial and final scores; brisk walking and elliptical training reduced

resting pulse rate. The differences were found to be significant P <0.05. The comparisons proved that elliptical training was significantly better than brisk walking group in improving basal metabolic rate and reducing the resting pulse rate. Thus, it was concluded that sedentary women may use elliptical training than brisk walking to improve their basal metabolic rate and resting pulse rate.

KEY WORDS: Brisk walking, Elliptical Training, Basal Metabolic Rate, Resting Pulse Rate

INTRODUCTION:

Sedentary lifestyle is threatening the health of every individual in every moment of life. In middle aged and elderly people such lifestyle, encourages or increases the risk of obesity, muscle weakness, postural deficiencies, diabetes, hypertension and coronary heart disease. A regular physical activity causes important changes that it shows in the increase of health related fitness and in the decrease of the risk factors in many of developing medical conditions in inactive people *(Physical Activity Guidelines Advisory Committee Report,2008).*

Human energy requirements are estimated from measures of energy expenditure plus the additional energy needs for growth, pregnancy and lactation. Recommendations for dietary energy intake from food must satisfy these requirements for the attainment and maintenance of optimal health, physiological function and well-being. The latter (i.e. well-being) depends not only on health, but also on the ability to satisfy the demands imposed by society and the environment, as well as all the other energy-demanding activities that fulfill individual needs.

Energy intake is essential for life. Energy is required to sustain the body's various functions, including the maintenance of core body temperature, respiration, circulation, deposition of tissues during growth and pregnancy, milk secretion, and physical work. Estimation of how much energy an individual needs is critical for nutritional planning and assessment in individuals and populations. "The energy requirement of an individual is a level of energy intake from food that will balance energy expenditure when the individual has a body size and composition, and level of physical activity, consistent with long-term good health; and that would allow for the maintenance of economically necessary and socially desirable physical activity".

In a normal, healthy individual the typical resting heart rate is between 60-80 beats per minute (BPM). It is not uncommon, however, to see significant fluctuations in these normal values with relatively healthy individuals. For example, sedentary individuals may have a resting heart rate of over 100 bpm while some conditioned athletes may have rates as low as 28-40 bpm. The vast discrepancies between the high and low values primarily reflect the efficiency of the heart. The heart of a trained individual has adapted to become capable of ejecting more blood with each beat. When one begins to exercise, the nervous and endocrine system respond by influencing the heart's beating frequency and force. In response to exercise, heart rate will rise in a predictable manner.

To our knowledge, no studies exist that have addressed the influence of Brisk walking and elliptical cross training on basal metabolic rate (BMR) and Resting Pulse Rate (RHR) in sedentary individuals. Many individuals participate in brisk walking and other type of endurance training programs, yet limited information is known about the influence of this type of training on metabolic rate and Resting Pulse Rate. Therefore, the purpose of this study was to examine the influence of brisk walking and elliptical cross training on basal metabolic rate (BMR) and Resting Pulse Rate (RHR) among sedentary women.

METHODOLOGY

Thirty sedentary women were selected from Chidambaram, Cuddalore district. They were in the age group of 30 – 40 years. The study was formulated as a true random group design consisting of a pre-test and post test. The subjects (N=30) were randomly assigned to three equal groups of ten sedentary women each. The groups were assigned as experimental group I – (Brisk walking exercises), Experimental Group II (Elliptical cross training) and control group respectively. Pre tests were conducted for all the 30 subjects on basal metabolic rate and resting pulse rate. Height was measured to the nearest 0.1 cm on a stadiometer with the participants shoeless. Body weight was measured to the nearest 0.1 kg using a pre-calibrated tanita electronic scale. Basal Metabolic Rate (BMR): Caloric expenditure was calculated based on the weight of the subject via the Harris-Benedict formula based on total body weight (BMR = 655 + (9.6 X wt in kg) + (1.8 X ht in cm) - (4.7 X age in years)). Resting pulse rate was measured through electronic heart rate monitor. After the experimental period of eight weeks post test were conducted and the scores were recorded. The differences between the initial and final scores were considered as the effect of brisk walking and Elliptical cross training on selected variables. The obtained data were statistically analysed using ANCOVA.

Exercise Program:

The program included 1) warming up and stretching, 2) Brisk walking part, 3) cool down and stretching. Warming-up phase for 5 minutes of stretching exercises, 30 minutes walking at 60-80% of maximum heart rate and cooling-down phase for 5 minutes of stretching, three times a week for 2 months. The brisk walking exercise accompanied by music. The exercise intervention was not limited with any nutrition restriction or modification. A target heart rate ranged between 60-80% of age adjusted maximum heart rate, intensity was calculated by each walker from her age and walking supine resting heart rate. Heart rate was measured with an electronic polar heart rate monitor. Walking is the most significant physical activity in the lives of most persons, walking was taken as the reference activity. The control group did not participate in any activity aerobic dance exercise program during the eight-week period in two months.

Elliptical training:

Following the warm up, the training programme was applied alternately with intensive and relaxed effort. The intense muscular effort was set with the pedal rates of 50 to 55 revolutions per minute (rpm) were repeated 5 times on the elliptical cross trainer. Every intense effort lasted for 2 minutes. Initial loading was set at approximately 60% of the maximum ability. The resistance of the load was checked by the corresponding heart rate. Loads were then increased every two week by 5 % and were estimated by the maximum load every individual performed at the end of the week testing. For the first two weeks the target intensity was 60%- 65% of maximum heart rate (MHR) for 20 minutes. For 3-4th weeks the intensity progressively increased 65% - 70% of MHR for 25 minutes. For 5-6th weeks the intensity increased 70% - 75% of MHR for 30 minutes and for 7-8th weeks the intensity increased 75% - 80% of MHR for 35 minutes.

RESULTS

Tab I: Effects of brisk walking and elliptical cross training on basal metabolic rate and resting pulse rate among sedentary women

BASAL METABOLIC RATE (Scores in kcl)								
	BWG	ECT G	CG	S V	SS	df	MS	Obtained F
Pre Test	104.30	102.70	103.40	B	12.87	2	6.43	1.01
				W	172.60	27	6.39	
Post Test	127.50	125.00	106.40	B	2658.07	2	1329.03	**166.98***
				W	214.90	27	7.96	
Adjusted	126.76	125.68	106.46	B	2606.71	2	1303.36	**426.52***
				W	79.45	26	3.06	
Mean Gain	23.20	22.30	3.00					
RESTING PULSE RATE (Scores in beats per minute)								
Pre Test	77.40	77.20	79.80	B	41.87	2	20.93	1.21
				W	465.60	27	17.24	
Post Test	73.40	72.60	78.90	B	235.27	2	117.63	**8.32***
				W	381.70	27	14.14	
Adjusted	73.96	73.31	77.63	B	99.53	2	49.77	**11.65***
				W	111.03	26	4.27	
Mean Gain	4.00	4.60	0.90					

*Significant at 0.05 level of confidence for 2 and 27 (df) = 3.35, 2 and 26 (df) = 3.37

The results presented in Table I proved that there was significant variation due to brisk walking and elliptical cross training on basal metabolic rate and resting pulse rate. The obtained adjusted post test F values 426.52 and 11.65 were greater than the required F value of 3.37 to be significant at 0.05 level. Since significant results were obtained multiple comparisons of adjusted means on basal metabolic rate and resting pulse rate comparing the effects of brisk walking and elliptical cross training were presented in Table II.

Tab II: Multiple Comparison of Paired Adjusted Means of basal metabolic rate and resting pulse rate due to brisk walking and elliptical cross training

BASAL METABOLIC RATE				
ADJUSTED MEANS			Mean Difference	Required . C I
Brisk walking Group	Elliptical cross Training Group	Control Group		
106.46	126.76		**20.30***	1.62
106.46		125.68	**19.22***	1.62
	126.76	125.68	1.08	1.62
RESTING PULSE RATE				
77.63	73.96		**3.67***	1.91
77.63		73.31	**4.32***	1.91
	73.96	73.31	0.65	1.91

* Significant at 0.05 level.

DISCUSSIONS

The results presented in Table I proved that there was significant improvement on basal metabolic rate and resting pulse rate due to brisk walking and elliptical cross training. Brisk walking improved basal metabolic rate of sedentary women 23.20 kcl, elliptical cross training improved 22.30kcl and control group 3 kcl, comparing to initial and final scores. The ANCOVA results proved that these differences were significant at 0.05 level. The comparison of effects of brisk walking and elliptical cross training (Table II) proved that both the experimental protocol significantly improved basal metabolic rate of sedentary women, it was found that elliptical cross training was significantly better than brisk walking. Similarly elliptical cross training stabilized resting pulse rate 4.60 and brisk walking stabilized 4.00 beats per minutes and the control group, there was a slight increase of 0.90. These differences were found to be significant at 0.05 level. The comparison of effects of brisk walking and elliptical cross training among sedentary women proved that elliptical cross training significantly better in reducing resting pulse rate. The findings of this study are in agreement with the findings of Habibzadeh and Rahmani-nia, (2010), Evrim Cakmakc, et al., (2011) and Mark Watsford and Aron Murphy, (2008), Egana, and Donne, (2004).

CONCLUSIONS

It was concluded that sedentary women may use brisk walking and elliptical cross training to improve their physiological levels of Basel Metabolic rate and Resting pulse rate. The exercise is intimately connected with our State of Health and improper Basel Metabolic Rate will often reflect various disturbances of body and mind. The brisk walking and elliptical cross training had significant effect on the Basel Metabolic rate. Basel metabolic Rate is one of the indicators for Person's calories expenditure level which increases through various exercises. Resting pulse rate is an effective, non-invasive assessment of cardiovascular fitness and also allows adaptation to aerobic training.

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3.4.5 - J - EPN - 2015-16
Original Article

ISSN: 2349 - 4891

International
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(Multidisciplinary Open Access Refereed e-Journal)

IJRRAS

Effect of Resistance Training with Whey Protein Isolates and Whey Protein Concentrate Supplementation on Muscular Power and Muscular Strength among Sub Junior National Weightlifter

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Received 20th June 2015, Accepted 1st September 2015

Abstract

The purpose of the study was to find out the effect of resistance training with Whey Protein Isolates and Whey Protein Concentrate Supplementation on Muscular power and Muscular strength among Sub Junior National Weightlifter. For this purpose, thirty weight lifters were selected at random from the Army sports institute, Pune. Their age ranged between 12 and 16 years. The selected thirty weight lifters were randomly assigned into three groups namely, resistance training with whey protein isolates supplement group (RTWPIG), resistance training with whey protein concentrate group (RTWPCG) and placebo group (PG) each consisting of ten subjects. The subjects were given resistance training with whey protein supplementation for a period of twelve weeks. The subjects were tested Muscular power and Muscular strength through using medicine ball throw and 1RM. After the experimental period, the collected data was analysed by using analysis of covariance. The level of significance was fixed at 0.05 level. The results showed that the twelve weeks of resistance training with varied nutritional supplementation had a significant improvement on the Muscular power and Muscular strength. Resistance training has been shown to improve not only the force production of a muscle, but also muscular power and strength. In addition to intense training, a proper nutrition program is also responsible for maximizing the performance of strength and power athletes.

Keywords: Resistance Training, Whey Protein, Muscular power, Muscular strength.

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Introduction

Exercise training of particular kinds clearly has a dramatic impact on muscle morphology and function compared with the effects of weight lifting and distance running on fiber type diameters and proportions or mitochondrial density. It is no surprise that different modes of training, aimed at increasing the performance of particular kinds of muscular activity (or, in bodybuilding, simply muscle mass) have differential effects on muscle protein metabolism. Resistance exercise training is well known to result in hypertrophy of the trained muscles (Luthi, et al 1986).

Proper nutrition is an important consideration for athletes who seek to maximize performance. No diet directly increases strength, power, or aerobic endurance, but an adequate diet allows athletes to train and compete to the best of their ability. The physiological needs of competitive athletes often require diets that are quite different from a sedentary individual's diet. The ideal diet for an athlete depends upon many different factors including age, body size, gender, genetics, and environmental training conditions, as well as training duration, frequency, and intensity. Therefore, requirements vary greatly between, as well as within, different athletic groups and the best diet for any given athlete is one that is individualized for that specific athlete.

Different sports place unique metabolic requirements on bioenergetics systems, and these differences alter the nutritional requirements among athletes involved in various types of strength and power sports. Particularly important to strength and power athletes are increasing lean muscle mass that translates into functional sport-specific strength, increasing power and speed over short distances and increasing explosiveness. These goals typically drive athletes to seek various options in their training methodologies to maximize the training stimulus. In addition to intense training, a proper nutrition program is also responsible for maximizing the performance of strength and power athletes. More specifically, precise nutritional supplementation provides the impetus for maximizing lean muscle mass, power, speed, and explosiveness. Therefore, any nutritional program (including sports supplements) that enhances lean muscle mass, power,

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ISSN: 2349 – 4891

speed, and explosiveness, when combined with a proper training program, should translate into improvements in exercise and sport performance.

Protein supplementation and athletic performance have shown positive effects from proteins of various sources. However, only limited research is available on comparisons between various protein sources and changes in human performance. Hence, the aim of investigation is to find out the effect of resistance training with Whey Protein Isolates Supplement (WPI) and Whey Protein concentrate Supplement (WPC) on performance of Muscular power and Muscular strength of the weight lifters.

Methods and Materials

For this purpose, thirty weight lifters were selected at random from the Army sports institute, Pune. Their age ranged between 12 and 16 years. The selected thirty weight lifters were randomly assigned into three groups namely, resistance training with whey protein isolates supplement group (RTWPIG), resistance training with whey protein concentrate group (RTWPCG) and placebo group (PG) each consisting of ten subjects. The subjects were given resistance training with whey protein supplementation for a period of twelve weeks. The subjects were tested Muscular power and Muscular strength through using medicine ball throw and 1RM test. After the experimental period, the collected data was analysed by using analysis of covariance. The level of significance was fixed at 0.05 level.

Resistance Training Protocol

All subjects participated in a supervised, periodized resistance training session three days per week, per week for a total of twelve weeks. Prior to the workout, subjects performed a standardized series of stretching exercises. The participants then performed 3 sets of leg press, bench press, and military press, pull-ups, bent over rows, barbell curls and extensions. Immediately following the workout, subjects consumed 40 grams of Whey Protein Isolates Supplement (WPI) and Whey Protein concentrate Supplement (WPC) respectively. The program was designed to train all major muscle groups using mostly compound movements for the upper and lower body. The programmed, non-linear training split was divided into hypertrophy days consisting of 8–12 RM loads for 3 sets, with 60–120 seconds rest and strength days consisting of 2 to 5 RM loads for 3 sets for all exercises except the leg press and bench press which received 5 total sets. Weights were progressively increased by 5% when the prescribed repetitions could be completed. All training sessions were closely monitored by the researchers to ensure effort and intensity was maximal each training session.

Results on Muscular power and Muscular strength

The results presented in the table I shows that the pre and post test scores of resistance training with whey protein isolates supplement group (RTWPIG), resistance training with whey protein concentrate group (RTWPCG) and placebo group on Muscular power and Muscular strength. The obtained pre test F value of 0.82 and 1.81 respectively was lesser than the required table value of 3.35. The obtained post test F value of 3.54 and 6.91 respectively was greater than the required table value of 3.35. Hence, it was proved that there was significant improvement in Muscular power and Muscular strength among sub junior national weight lifters due to resistance training with whey protein supplementations.

Table I. Computation of Analysis of Covariance on Muscular power and Muscular strength (Scores in Kg)

VARIABLES	TEST	CTWPI GROUP	CTWPC GROUP	PLACEBO GROUP	SV	SS	df	MS	F
Muscular power	Pre Test	70.40	70.30	68.20	B	30.87	2	15.43	0.82
					W	508.10	27	18.82	
	Post Test	76.80	76.20	72.20	B	125.07	2	62.53	3.54*
					W	476.80	27	17.66	
	Adjusted	76.08	75.58	73.54	B	34.12	2	17.06	14.19*
					W	31.25	26	1.20	
	Mean Gain	6.40	5.90	4.00					
Muscular strength	Pre Test	93.20	92.30	92.20	B	6.07	2	3.03	1.81
					W	45.30	27	1.68	
	Post Test	105.30	103.40	101.50	B	72.20	2	36.10	6.91*
					W	141.00	27	5.22	

ISSN: 2349 – 48

	Adjusted	105.09	103.49	101.62	B	54.53	2	27.26	**5.22***
					W	135.90	26	5.23	
	Mean Gain	12.10	11.10	9.30					

*Significant at 0.05 level of confidence for 2 and 27 (df) = 3.35, 2 and 26 (df) = 3.37

The statistical analysis on adjusted mean values using ANCOVA revealed that there was significant difference existed among resistance training with whey protein isolates supplement group (RTWPIG), resistance training with whey protein concentrate group (RTWPCG) and placebo group on Muscular power and Muscular strength since the obtained adjusted mean F value 14.19 and 5.22 was greater than the table value of 3.37 at 0.05 level. Since the F value was significant, the results were subjected to post hoc analysis using Scheffe's confidence interval test. The results were presented in Table II.

Table II. Scheffe's Confidence Interval Test Score on Muscular power and Muscular strength (Scores in Kg)

VARIABLE	PLACEBO GROUP	CTWPI GROUP	CTWPC GROUP	Mean Difference	CI
Muscular power	73.54	76.08		**2.54***	1.02
	73.54		75.58	**2.03***	
		76.08	75.58	0.51	
Muscular strength	101.62	105.09		**3.46***	2.12
	101.62		103.49	1.87	
		105.09	103.49	1.60	

*Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between resistance training with whey protein isolates supplement group (RTWPIG) and placebo group in Muscular power and Muscular strength. There was significant difference between resistance training with whey protein concentrate group (RTWPCG) and placebo group in Muscular power and there was no significant difference Muscular strength. There was no significant difference between treatment groups, namely resistance training with whey protein isolates supplement group (RTWPIG) and resistance training with whey protein concentrate group (RTWPCG). The pre test, post test and ordered adjusted means are presented through bar diagram for better understanding of the result of this study in figures.

Figure I. Bar Diagram on Adjusted Means of Muscular power

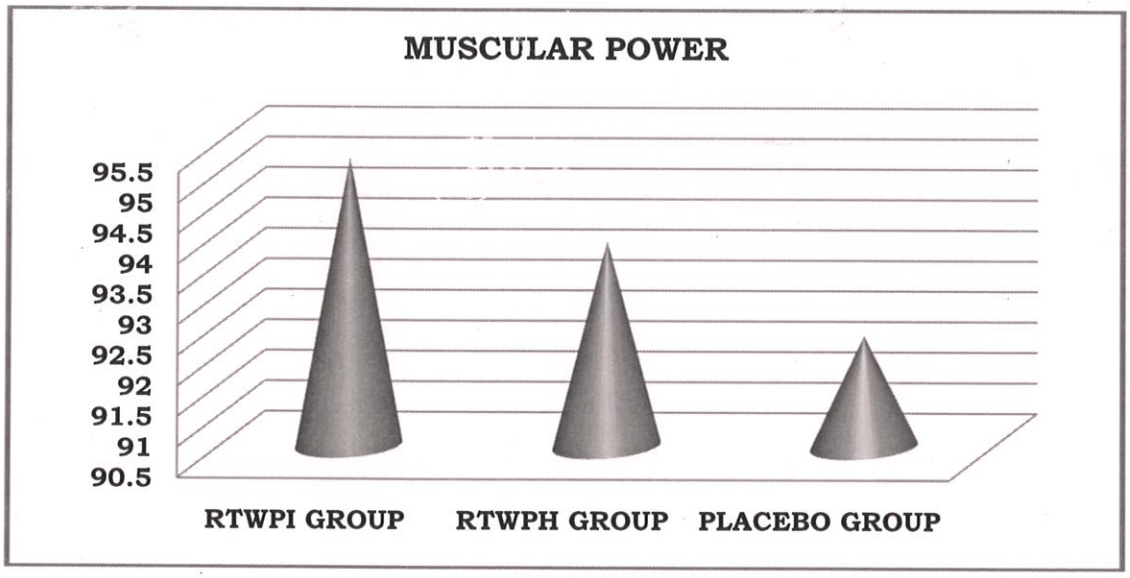

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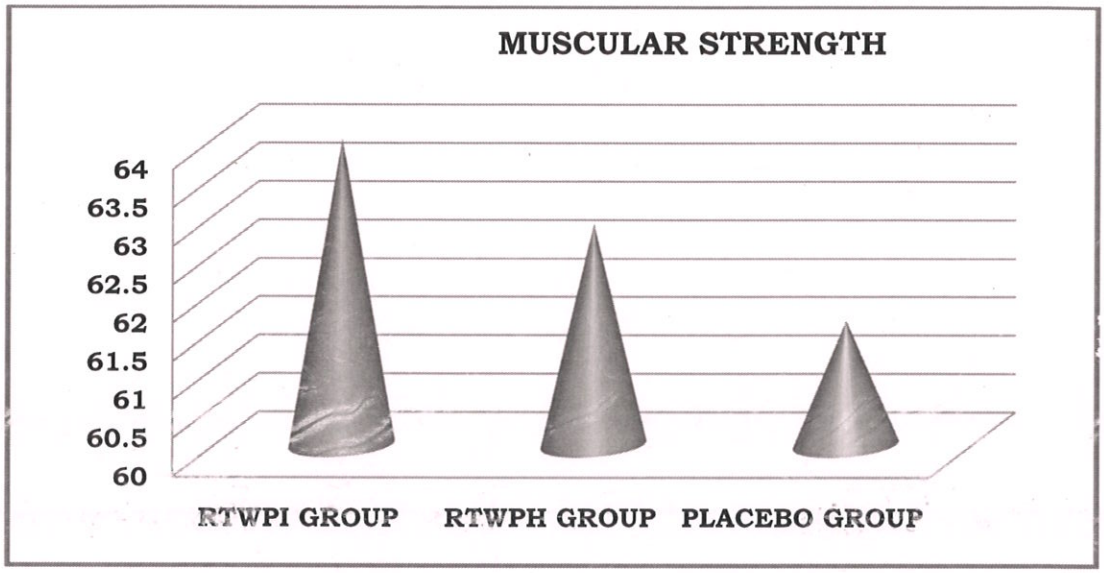
Figure II. Bar Diagram on Adjusted Means of Muscular strength



Discussion and Conclusion

Skeletal muscle is an integral body tissue playing key roles in strength, performance, physical function, and metabolic regulation. It is essential for athletes to ensure that they have optimal amounts of muscle mass to ensure peak performance in their given sport. A combination of resistance exercise and whey protein consumption, results in a synergistic stimulation of muscle protein synthesis.

The results proved that the both whey protein isolate and whey protein concentrate administration post resistance exercise improved indices of body composition and exercise performance of Muscular power and Muscular strength. However, there were no differences between the two groups.

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3.4-5-J-EPN-2015-16
Original Article

ISSN: 2349 - 4891

International
Journal of Recent Research and Applied Studies
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Efficacy of Brisk Walking and Elliptical Training on Cardiorespiratory Endurance and Mean Arterial Blood Pressure among Sedentary Women

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Received 27th January 2016, Accepted 10th March 2016

Abstract

The aim of this study was to find out the effect of brisk walking and elliptical training on selected physiological variables among sedentary women. To achieve the purpose, 30 sedentary women were randomly selected and assigned into three groups, brisk walking group (BWG), elliptical training group (ETG) and Control group (CG) consisting of 10 in each. After assessing the cardiorespiratory endurance and mean arterial blood pressure initially, the experimental groups underwent respective treatments for eight weeks. After the completion of eight weeks experimental period, all the subjects were measured of their selected variables. The results proved that brisk walking improved cardiorespiratory endurance of sedentary women (6.20), elliptical training improved (7.70)and control group (1.00), comparing to initial and final scores; brisk walking reduced mean arterial blood pressure (1.64) and elliptical training reduced (2.35) and the control group there was a slight increase of (0.17). The differences were found significant P <0.05. The comparisons proved that elliptical training was significantly better than brisk walking group in improving cardiorespiratory endurance and reducing mean arterial blood pressure. Thus, it was concluded that sedentary women may use elliptical training than brisk walking to improve their physiological levels of cardiorespiratory endurance and mean arterial blood pressure.

Keywords: Brisk walking, Elliptical Training, Cardiorespiratory Endurance, Mean Arterial Blood Pressure.

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Introduction

To maintain a healthy lifestyle, the importance of physical activity cannot be underestimated. It is the single most important endeavor that one can participate in to promote health throughout a lifetime. For decades, epidemiological research has accumulated highlighting the health benefits associated with regular physical activity. Furthermore, there is overwhelming research illustrating the morbid and mortal consequences of being sedentary. The benefits of a proper exercise regimen increase in the efficiency of cardiovascular and respiratory function. The physiological response to dynamic aerobic exercise is an increase in oxygen consumption and heart rate that parallels the intensity of the imposed activity and a curvilinear increase in stroke volume. There is a progressive increase in systolic blood pressure, with maintenance of or a slight decrease in the diastolic blood pressure, and a concomitant widening of the pulse pressure. Blood is shunted from the viscera to active skeletal muscle, where increased oxygen extraction widens the systemic arteriovenous oxygen difference. Thus, aerobic exercise imposes primarily a volume load on the myocardium (Lind and McNicol, 1967).

Blood pressure (mmHg) is determined by multiplying the cardiac output by the total peripheral resistance. Total peripheral resistance is defined as the frictional resistance, or impedance to blood flow in the vascular system. Total peripheral resistance increases with overall vasoconstriction and decreases with overall vasodilation. Although there is abundant vasoconstriction during exercise in the vessels described above, peripheral resistance actually decreases due to the massive vasodilation of vessels supplying working skeletal muscle. This would lead one to believe that exercise causes blood pressure to go down. On the contrary, although there is an overall decrease in peripheral resistance, the increases in cardiac output are substantial enough to cause an overall increase in blood pressure. For example, a normal individual has a cardiac output of 5 liters per minute at rest. This can increase 400% to 20 liters per minute during maximum exercise. While at the same time, total peripheral resistance may have dropped to only a third of resting values. An increase in blood pressure is vital during exercise to meet the supply of increasing demand on the musculoskeletal system. Endurance training seems to be more effective in decreasing resting heart rate and blood pressure (Smith, et al, 2006).

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ISSN: 2349 – 4891

Mean arterial blood pressure increases in response to dynamic exercise, largely owing to an increase in systolic blood pressure, because diastolic blood pressure remains at near-resting levels. Systolic blood pressure increases linearly with increasing rates of work, reaching peak values of between 200 and 240 millimeters of mercury in normotensive persons. Because mean arterial pressure is equal to cardiac output times total peripheral resistance, the observed increase in mean arterial pressure results from an increase in cardiac output that outweighs a concomitant decrease in total peripheral resistance. This increase in mean arterial pressure is a normal and desirable response, the result of a resetting of the arterial baroreflex to a higher pressure. Without such a resetting, the body would experience severe arterial hypotension during intense activity (Rowell 1993).

To our knowledge, no studies exist that have addressed the efficacy of Brisk walking and elliptical cross training on Cardiorespiratory Endurance and Mean Arterial Blood Pressure in sedentary individuals. Many individuals participate in brisk walking and other type of endurance training programs, yet limited information is known about the effect of this type of training on Cardiorespiratory Endurance and Mean Arterial Blood Pressure. Therefore, the purpose of this study was to examine the influence of walking and elliptical cross training on Cardiorespiratory Endurance and Mean Arterial Blood Pressure among sedentary women.

Methodology

Thirty sedentary women were selected from Chidambaram, Cuddalore district. They were in the age group of 30 – 40 years. The study was formulated as a true random group design consisting of a pre-test and post test. The subjects (N=30) were randomly assigned to three equal groups of ten sedentary women each. The groups were assigned as experimental group I – (Brisk walking exercises), Experimental Group II (Elliptical cross training) and control group respectively. Pre tests were conducted for all the 30 subjects on cardiorespiratory endurance and mean arterial blood pressure. Cardiorespiratory Endurance was assessed through Harvard step test. Mean Arterial Blood Pressure was measured through Sphygmomanometer and stethoscope. After the experimental period of eight weeks post test were conducted and the scores were recorded. The differences between the initial and final scores were considered as the effect of brisk walking and Elliptical cross training on selected variables. The obtained data were statistically analysed using ANCOVA.

Exercise Program

The program included 1) warming up and stretching, 2) Brisk walking part, 3) cool down and stretching. Warming-up phase for 5 minutes of stretching exercises, 30 minutes walking at 60-80% of maximum heart rate and cooling-down phase for 5 minutes of stretching, three times a week for 2 months. The brisk walking exercise accompanied by music. The exercise intervention was not limited with any nutrition restriction or modification. A target heart rate ranged between 60-80% of age adjusted maximum heart rate, intensity was calculated by each walker from her age and walking supine resting heart rate. Heart rate was measured with an electronic polar heart rate monitor. Walking is the most significant physical activity in the lives of most persons, walking was taken as the reference activity. The control group did not participate in any activity aerobic dance exercise program during the eight-week period in two months.

Elliptical training

Following the warm up, the training programme was applied alternately with intensive and relaxed effort. The intense muscular effort was set with the pedal rates of 50 to 55 revolutions per minute (rpm) were repeated 5 times on the elliptical cross trainer. Every intense effort lasted for 2 minutes. Initial loading was set at approximately 60% of the maximum ability. The resistance of the load was checked by the corresponding heart rate. Loads were then increased every two week by 5 % and were estimated by the maximum load every individual performed at the end of the week testing. For the first two weeks the target intensity was 60%- 65% of maximum heart rate (MHR) for 20 minutes. For 3-4th weeks the intensity progressively increased 65% - 70% of MHR for 25 minutes. For 5-6th weeks the intensity increased 70% - 75% of MHR for 30 minutes and for 7-8th weeks the intensity increased 75% - 80% of MHR for 35 minutes.

The results presented in Table I proved that there was a significant difference due to brisk walking and elliptical cross training on Cardiorespiratory Endurance and Mean Arterial Blood Pressure as the obtained F values 24.17 and 9.19 as the obtained F values were greater than the required F value of 3.37 to be significant at 0.05 level. Since significant results were obtained multiple comparisons of adjusted means Cardiorespiratory Endurance and Mean Arterial Blood Pressure comparing the efficacy of brisk walking and elliptical cross training were presented in Table II.

ISSN: 2349 – 4891

Results

Table I. Efficacy of brisk walking and elliptical cross training on Selected Physiological Variables among sedentary women

CARDIORESPIRATORY ENDURANCE (Scores in pulse rate)								
	BWG	**ECTG**	**CG**	**S V**	**SS**	**df**	**MS**	**Obtained F**
Pre Test	78.00	76.00	77.60	B	22.40	2	11.20	0.47
				W	644.40	27	23.87	
Post Test	84.20	83.70	78.60	B	192.07	2	96.03	**3.70***
				W	700.10	27	25.93	
Adjusted	83.45	84.83	78.22	B	240.66	2	120.33	**24.17***
				W	129.46	26	4.98	
Mean Gain	6.20	7.70	-1.00					
MEAN ARTERIAL BLOOD PRESSURE (Scores in mmHg)								
Pre Test	93.63	94.35	93.54	B	3.94	2	1.97	1.14
				W	46.75	27	1.73	
Post Test	91.99	92.00	93.37	B	12.60	2	6.30	**4.76***
				W	35.73	27	1.32	
Adjusted	92.10	91.74	93.52	B	16.96	2	8.48	**9.19***
				W	24.00	26	0.92	
Mean Gain	1.64	2.35	0.17					

*Significant at 0.05 level of confidence for 2 and 27 (df) = 3.35, 2 and 26 (df) = 3.37

Table II. Multiple Comparison of Paired Adjusted Means of Selected Physiological Variables due to brisk walking and elliptical cross training

CARDIORESPIRATORY ENDURANCE				
ADJUSTED MEANS			Mean Difference	Required C I
Brisk walking Group	Elliptical cross Training Group	Control Group		
78.22	83.45		**5.22***	2.07
78.22		84.83	**6.61***	2.07
	83.45	84.83	1.38	2.07
MEAN ARTERIAL BLOOD PRESSURE				
93.52	92.10		**1.43***	0.89
93.52		91.74	**1.78***	0.89
	92.10	91.74	0.35	0.89

* Significant at 0.05 level.

Discussions

The results presented in Table I proved that while brisk walking improved Cardiorespiratory Endurance of sedentary women (6.20), elliptical cross training improved (7.70) and control group (1.00), comparing to initial and final scores. The ANCOVA results proved that these differences were significant at 0.05 level. The comparison of effects of brisk walking and elliptical cross training (Table II) proved that while both the experimental protocols significantly improved Cardiorespiratory Endurance of sedentary women, it was found that elliptical cross training was significantly better than brisk walking. Similarly elliptical cross training stabilized Mean Arterial Blood Pressure (1.60) and brisk walking stabilized (2.35) and the control group, there was a slight increase of (0.17). These differences were found to be significant at 0.05 level. The comparison of efficacy of brisk walking and elliptical cross training among sedentary women proved that elliptical cross training significantly better in reducing

ISSN: 2349 – 4891

Mean Arterial Blood Pressure. The findings of this study are in agreement with the findings of Grant,e.tal, (2002) compared the obtained effects of two different aerobic exercise models on the functional abilities of women (the exercise models consisted of aerobic dance and walking). The results of the research have indicated that the aerobic dance program had a better effect on VO2max and maximal heart rate frequency than the walking program. Whelton, Chin, Xin and He (2002) studied how physical activity is connected to the decrease in arterial blood pressure. The analysis of random control tests was carried out in order to determine the effects of aerobic exercise on arterial blood pressure. The authors have concluded that aerobic exercise is connected to a significant decrease in systolic and diastolic arterial blood pressure (on average, 3, 84 mmHg for systolic blood pressure and 2, 58 mmHg for diastolic blood pressure).

Conclusions

It was concluded that sedentary women may use brisk walking and elliptical cross training to improve their cardiorespiratory endurance and mean arterial blood pressure. The exercises are intimately connected with our State of Health and improper cardiorespiratory endurance and mean arterial blood pressure will often reflect various disturbances of body and mind. The brisk walking and elliptical cross training had significant effect on the cardiorespiratory endurance and mean arterial blood pressure. The most easily accessible form of exercise is walking. It may not involve high loading, but it is accessible to majority of all women. Moreover, weight bearing exercise is also recommended due to the positive stimulus of the mechanical pull of the muscles. Although walking and other types of elliptical cross training can provide many other health benefits. This study demonstrated that elliptical cross training was better than brisk walking exercise in improving cardiorespiratory endurance and reducing mean arterial blood pressure of the sedentary women.

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Please cite this article as: P. Kannadasan, Dr. K.V. Balamurugan & Dr. P.K. Senthilkumar. Efficacy of Brisk Walking and Elliptical Training on Cardiorespiratory Endurance and Mean Arterial Blood Pressure among Sedentary Women. *International Journal of Recent Research and Applied Studies*, 2016, 3, 3(10), 39 - 42.

3.4.5-J- EPN - 2015-16

Academic Sports Scholars
ISSN 2277-3665

Impact Factor : 2.1052(UIF)
Volume -4 | Issue - 8 | Aug - 2015

EFFECT OF LOW AND HIGH INTENSITY RESISTANCE TRAINING ON SELECTED PHYSICAL FITNESS VARIABLES AMONG COLLEGE LEVEL MEN KABADDI PLAYERS

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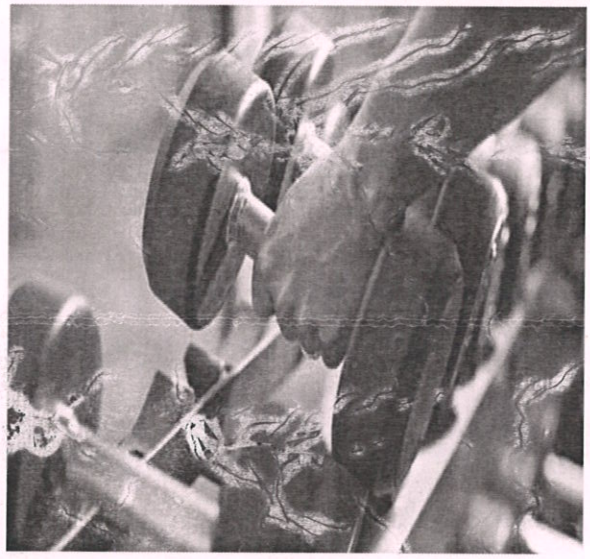

ABSTRACT

The purpose of the study was to determine the effect of Low and High intensity resistance training on muscular strength, muscular endurance and flexibility among college men kabaddi players. The study was formulated as a true random group design consisting of a pre test and post test. The subjects (N=45) were randomly assigned to three equal groups each group consists of fifteen (n=15) subjects. The groups were assigned as experimental group I (low intensity resistance training), experimental group II (high intensity resistance training) and control group respectively. The experimental groups participated in their respective resistance training for a period of three days per week for eight weeks. Pre-test was conducted for all the subjects on muscular strength, muscular endurance and flexibility. The difference between initial scores and final scores on muscular strength, muscular endurance and flexibility were subjected to statistical treatment using analysis of covariance ANACOVA was employed. The level of significant was fixed at 0.05 level. The result of this study clearly showed that there was significant difference ($p<0.05$) in the effect of the resistance training on muscular strength, muscular endurance and flexibility in college men kabaddi players. It was concluded that both the intensity resistance training is an effect mode of training to enhance the performance of muscular strength, muscular endurance and flexibility in college men kabaddi players.

KEYWORDS :*Resistance training, muscular strength, muscular endurance and flexibility.*

INTRODUCTION :

Sports is an institutionalized competitive activity that involves physical excretion or the use of relative complex physical skills by individuals whose participation is motivated by a combination of the intrinsic satisfaction associated with the activity itself and the external rewards earned through participation.

Sports have a very important role in modern society. It is important to an individual, a group, a nation and indeed the world. Sports performance is the result and expression of the total personality of sports man. The development of the sports man enabling him to achieve high level of performance

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is usually concerned in four areas namely physical power, social adjustment, psychological developments and physiological efficiency. Different activities make different demands on the organism with respect to circulatory, respiratory, metabolic, and neurological and temperature regulating junctions (John Nilson, 2006).Sports have now become an integral part of life for large sectors of the population. Sports are an important ingredient of Physical Education and are worldwide phenomenon today. Resistance training, also known as weight training or strength training has gained great popularity in recent years, largely due to its appeal and positive impact on many diverse populations, such as athletic, recreational and clinical communities. Thus, resistance training programmes are used to achieve many different goals, such as performance improvement, injury rehabilitation, muscle tone improvement and strength improvement (American College of Sports Medicine, 2001).

METHODOLOGY

The purpose of the study was to find out the effect of low and high intensity strength training on selected physical variables among college level men kabbadi players. For this purpose of the study 45 male students were selected from Chennai city. The subject age ranged from 18 - 25 years. They were divided in to three equal groups, 15 each groups. Experimental Group I acted as low intensity strength training group, Experimental Group II acted as high intensity strength training group and Group III acted as control group and there was no any training for control group. Experimental groups underwent their respective training intervention for a period of 8 weeks. The data was collected from the selected physical fitness variables such as muscular strength, muscular endurance and flexibility. The above variables were tested through for muscular strength push Ups test was used and for muscular endurance sit Up test was used and flexibility sit and reach test were used prior and after training period. The training programme started with the 5 minutes warm up and included running and free exercises so that more muscle groups would be used. Following the warm up, the training programme was applied for upper body and lower body strength exercises. The strength training program based on determination of 1RM of each subject in all the resistance training program involved Bench press, Seated row, Shoulder press, Chest press, Lateral pulldown, Abdominal crunch¬es, Leg press, Leg extension, Triceps pushdown and Seated bicep curls. Initial loading was set at approximately 50 and 80% of the maximum ability. During the first week, subjects performed 10- 15 repetitions per set with two sets per exercise corresponding to 50% of the 1-repetition maximum (RM). The program intensity and volume progressively increased by 5% of 1RM. The training programme finished every time with a cool down which lasted 5 minutes. The cool down consisted of relax walking and limbering exercise. The analysis of variance was used to assess the significance of difference between the pre-test and post-test, for each of the variables. The obtained 'F' ratio compared with critical F value for significance, when the F ratio was found to be significant, Scheffe's post hoc test was used to find out the paired mean significant difference. The level of significant was fixed at 0.05 level.

RESULTS AND DISCUSSIONS

The following tables illustrate the statistical results of the effect of low and high intensity resistance training intervention on muscular strength, muscular endurance and flexibility of college men Kabbaddi players.

Table-I

Computation of Analysis of Covariance on Physical Fitness Variables

Variables	Test	Exp Gr 1	Exp Gr 2	Control Gr	SV	SS	df	MS	F
Muscular Strength	Pre Test	24.80	22.80	23.40	B	31.600	2	15.800	1.06
					W	628.400	42	14.962	
	Post Test	27.67	27.40	23.67	B	150.044	2	75.022	5.34*
					W	590.266	42	14.054	
	Adjusted	26.68	28.15	23.90	B	139.956	2	69.978	24.47*
					W	117.251	41	2.860	
Muscular Endurance	Pre Test	28.87	27.13	27.20	B	28.933	2	14.467	1.15
					W	529.866	42	12.616	
	Post Test	32.40	29.20	27.60	B	179.200	2	89.600	6.80*
					W	553.600	42	13.181	
	Adjusted	31.29	29.79	28.12	B	72.529	2	36.265	33.74*
					W	44.067	41	1.075	
Flexibility	Pre Test	25.73	23.80	24.80	B	28.044	2	14.022	1.32
					W	447.733	42	10.660	
	Post Test	30.33	27.67	25.20	B	197.733	2	98.867	11.31*
					W	367.066	42	8.740	
	Adjusted	29.54	28.48	25.18	B	154.590	2	77.295	53.03*
					W	59.759	41	1.458	

*Significant at 0.05 level of confidence for (df) 2 at 42 = 3.22 and for (df) 2 at 41 = 3.23.

Table-II

Scheffe's Post hoc test Analysis on Physical Fitness Variables

Variables	Exp.Gp 1	Exp.Gp 2	Control Gp	MD	CI
Muscular strength	26.68	28.15	-	-1.47	1.57
	26.68	-	23.90	2.79*	
		28.15	23.90	4.25*	
Muscular endurance	31.29	29.79	-	1.50*	0.96
	31.29	-	28.12	3.17*	
		29.79	28.12	1.67*	
Flexibility	29.54	28.48	-	1.06	1.12
	29.54	-	25.18	4.36*	
		28.48	25.18	3.30*	

*Significant

The results presented in table I indicate that the experimental groups namely low intensity resistance training and high intensity resistance training significantly improved the selected dependent

variables namely muscular strength, muscular endurance and flexibility when compared to the control group. It was also found that the results presented in table II showed that the improvement caused by low intensity resistance training was greater when compared to the effects caused by the high intensity resistance training group in muscular endurance and there was no significant difference between the experimental group in muscular strength and flexibility.

Resistance training has become a primary component of athletic conditioning, rehabilitation & general fitness programmes (Pollock and Wilmore 1990). Although resistance training has long been accepted as a means for developing and maintaining muscular strength, power and muscle hypertrophy, its beneficial relationship to health factors and chronic disease has been recognized only recently. Hence, the research findings of the study proved that low and high resistance training significantly improved muscular strength, muscular endurance and flexibility of the kabaddi players was in conformity with the observations of the previous researchers cited.

Figure-1
Bar Diagram Showing the Mean Values on Muscular Strength

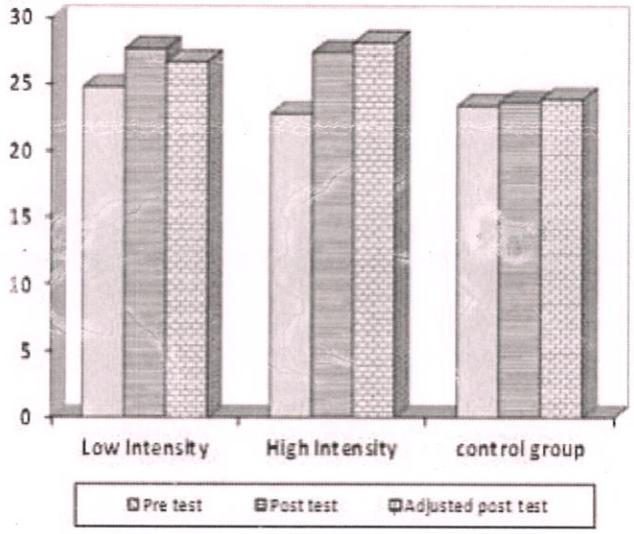


Figure-2
Bar Diagram Showing the Mean Values on Muscular Endurance

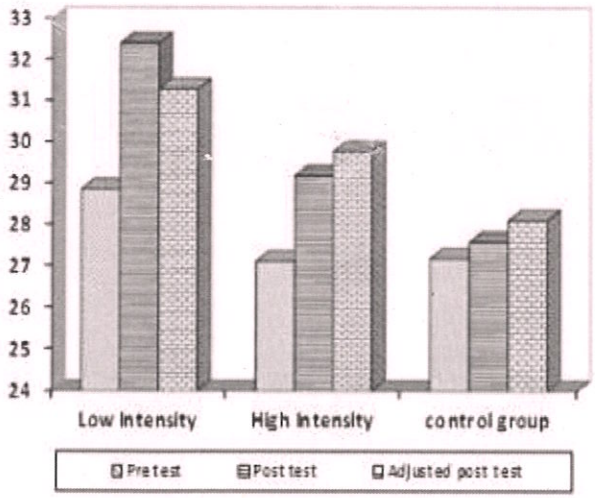
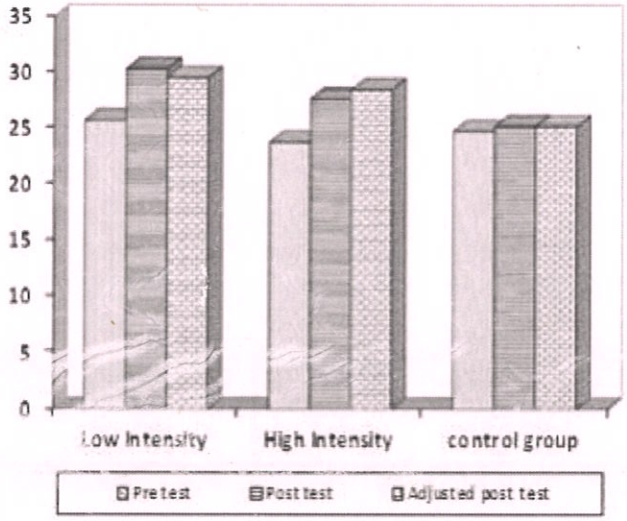


Figure-3
Bar Diagram Showing the Mean Values on Flexibility



CONCLUSIONS

It was concluded that the both the training low intensity resistance training and high intensity resistance training significantly improved the selected dependent variables such as muscular strength, muscular endurance and flexibility when compared to the control group. Further it was concluded that low intensity resistance training was greater when compared with high intensity resistance training group in muscular endurance and there was no significant difference between the experimental group in muscular strength and flexibility.

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3.4.5-J-EDN-2015-16 Original Article

ISSN: 2349 - 4891

International
Journal of Recent Research and Applied Studies
(Multidisciplinary Open Access Refereed e-Journal)

Effect of Plyometric and Functional Core Training on Selected Body Composition among Basketball Players

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Received 25th January 2015, Accepted 22nd March 2015

Abstract

The purpose of the study was to find out the effect of plyometric and functional core training on selected body composition among basketball players. To achieve the purpose of the present study, forty five men basketball players from Ernakulam district, Kerala state, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into three equal groups of fifteen subjects each. The subjects (N=45) were randomly assigned to three equal groups of fifteen subjects each. Pre test was conducted for all the subjects on selected body composition variables. This initial test scores formed as pre test scores of the subjects. The groups were assigned as Experimental Group I, Experimental Group II and Control Group in an equivalent manner. Experimental Group I was exposed to plyometric training, Experimental Group II was exposed to functional core training and Control Group was not exposed to any experimental training other than their regular daily activities. The duration of experimental period was 12 weeks. After the experimental treatment, all the forty five subjects were tested on their body composition variables. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant, scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses. The plyometric training had decreased BMI and percent body fat than the control group. The functional core training had decreased BMI and percent body fat than the control group.

Keywords: Plyometric, Core Training, BMI, Percent Body Fat, Basketball.

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Introduction

Basketball is one of the sports characterized by many of the basic and variable skills. One of the most important components of basketball is the ability to jump vertically. It is necessary to assess an athlete jumping ability and strength levels before beginning the design of the training program. Nature is such that if polymeric exercises are performed with maximum effort, the muscle can increase the opinion of many exercise physiologists, neural adaptations - the explosive power that affects muscles in 2 to 4 weeks you first start training occurs. Plyometric and weight training 3 times a week will run only when sufficient recovery time between training sessions exist. Plyometrics training is one such training strategy to improve the performance of the basketball players as the training approximates their basic needs of agility and power; allows the muscle to reach exponential increase in the maximum strength and speed of movement in the shortest duration. The training typically involves stretch-shortening cycle of muscle groups and those movements consist of eccentric, amortization and concentric phases. The shorter the duration of all three phases and more specifically the amortization phase, greater will be the development of exploratory power of the muscles being exercised (Donald, 1998). Functional training is a classification of exercise which involves training the body for the activities performed in daily life. Functional training has its origins in rehabilitation. Functional training attempts to adapt or develop exercises which allow individuals to perform the activities of daily life more easily and without injuries. In the context of body building, functional training involves mainly weight bearing activities targeted at core muscles of the abdomen and lower back (Cannone, 2007).

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Methodology

The purpose of the study was to find out the effect of plyometric and functional core training on selected body composition among basketball players. To achieve the purpose of the present study, forty five men basketball players from Ernakulam district, Kerala state, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into three equal groups of fifteen subjects each. The subjects (N=45) were randomly assigned to three equal

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Results and Discussion

The detailed procedure of analysis of data and interpretation were given below,

Table I. Computation of analysis of covariance of mean of plyometric and functional core training and control groups on BMI

	Plyometric Training	Functional Core Training	Control Group	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	24.80	24.91	24.24	BG	3.84	2	1.92	1.23
				WG	65.64	42	1.56	
Post-Test Means	22.26	22.11	24.14	BG	38.57	2	19.28	12.55*
				WG	64.53	42	1.53	
Adjusted Post-Test Means	22.19	22.00	24.31	BG	46.33	2	23.16	17.65*
				WG	53.78	41	1.31	

An examination of table - I indicated that the pre test means of plyometric, functional core training and control groups were 24.80, 24.91 and 24.24 respectively. The obtained F-ratio for the pre-test was 1.23 and the table F-ratio was 3.22. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that there were no significant difference between the experimental and control groups indicating that the process of randomization of the groups was perfect while assigning the subjects to groups. The post-test means of plyometric, functional core training and control groups were 22.26, 22.11 and 24.31 respectively. The obtained F-ratio for the post-test was 12.55 and the table F-ratio was 3.22. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that the differences between the post test means of the subjects were significant. The adjusted post-test means of plyometric, functional core training and control groups were 22.19, 22.00 and 24.31 respectively. The obtained F-ratio for the adjusted post-test means was 17.65 and the table F-ratio was 3.23. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. This proved that there was a significant difference among the means due to the experimental trainings on BMI. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in Table –II.

Table II. The scheffe's test for the differences between the adjusted post test paired means on BMI

Adjusted Post-test means			Mean Difference	Required CI
Plyometric Training	Functional Core Training	Control Group		
22.19	22.00	---	0.19	1.06
22.19	---	24.31	2.12*	
---	22.00	24.31	2.31*	

**** Significant at 0.05 level of confidence***

The multiple comparisons showed in Table II proved that there existed significant differences between the adjusted means of plyometric training with control group (2.12), functional core training with control group (2.31). There was no significant difference between plyometric training and functional core training (0.19) at 0.05 level of confidence with the confidence interval value of 1.06. The pre, post and adjusted means on BMI were presented through bar diagram for better understanding of the results of this study in Figure-I.

ISSN: 2349 – 4891

Figure I. Pre post and adjusted post test differences of the, plyometric training, functional core training and control groups on BMI

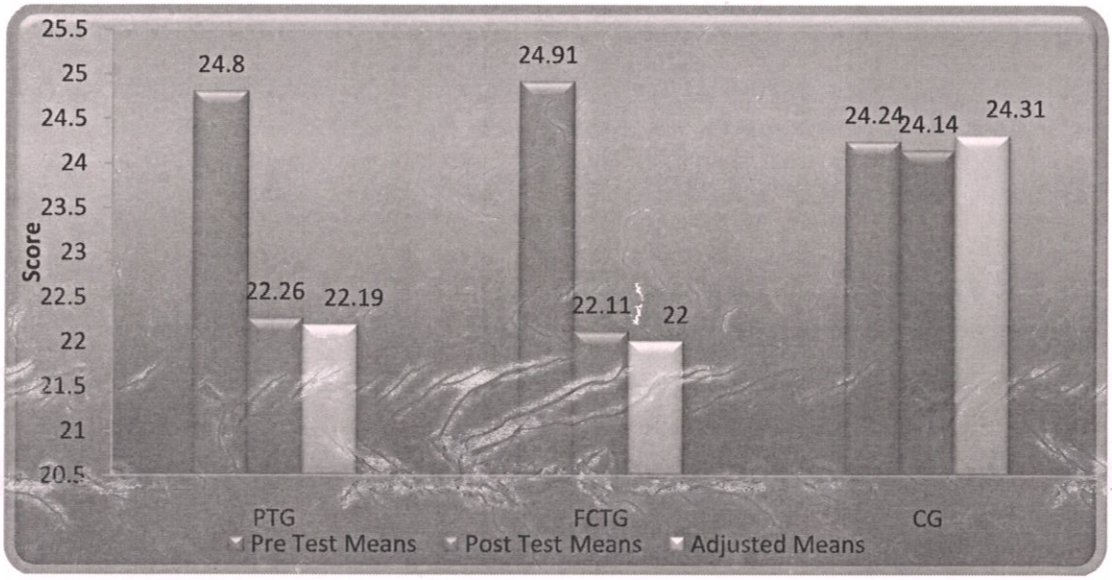


Table III. Computation of analysis of covariance of mean of plyometric and functional core training and control groups on percent body fat

	Plyometric Training	Functional Core Training	Control Group	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	18.01	18.43	18.39	BG	1.66	2	0.83	1.13
				WG	30.65	42	0.73	
Post-Test Means	16.13	15.11	18.03	BG	65.81	2	32.90	16.68*
				WG	82.82	42	1.97	
Adjusted Post-Test Means	16.23	15.06	17.99	BG	65.42	2	32.71	17.09*
				WG	78.43	41	1.91	

An examination of table - III indicated that the pre test means of plyometric, functional core training and control groups were 18.01, 18.43 and 18.39 respectively. The obtained F-ratio for the pre-test was 1.13 and the table F-ratio was 3.22. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that there were no significant difference between the experimental and control groups indicating that the process of randomization of the groups was perfect while assigning the subjects to groups. The post-test means of plyometric, functional core training and control groups were 16.13, 15.11 and 18.03 respectively. The obtained F-ratio for the post-test was 16.68 and the table F-ratio was 3.22. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that the differences between the post test means of the subjects were significant. The adjusted post-test means of plyometric, functional core training and control groups were 16.23, 15.06 and 17.99 respectively. The obtained F-ratio for the adjusted post-test means was 17.09 and the table F-ratio was 3.23. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. This proved that there was a significant difference among the means due to the experimental trainings on percent body fat. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in Table-IV.

ISSN: 2349 – 4891

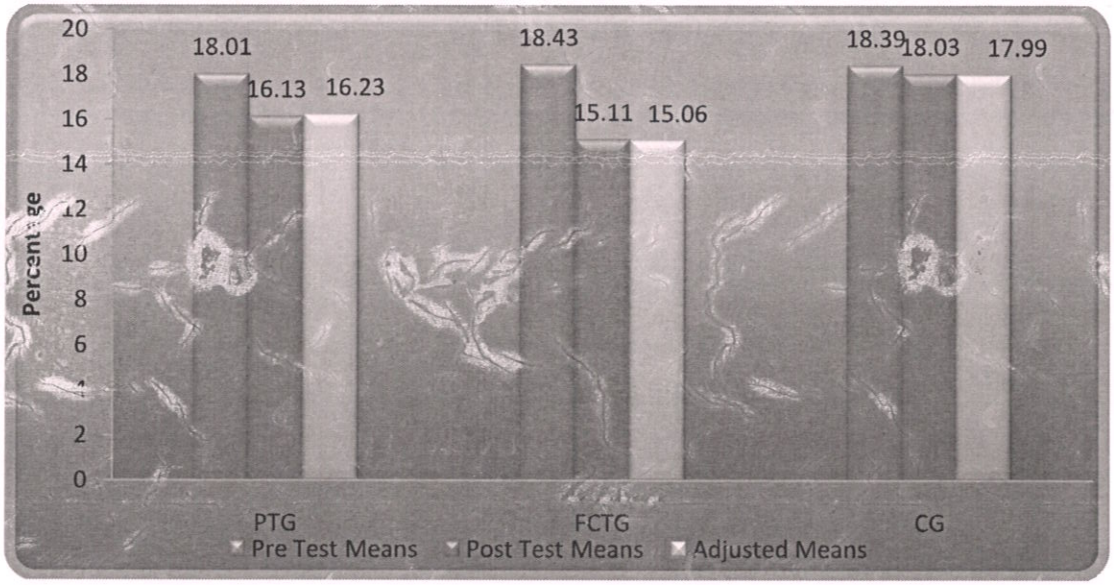
Table IV. The scheffe's test for the differences between the adjusted post test paired means on percent body fat

Adjusted Post-test means			Mean Difference	Required CI
Plyometric Training	Functional Core Training	Control Group		
16.23	15.06	---	1.17	1.28
16.23	---	17.99	1.76*	
---	15.06	17.99	2.93*	

**** Significant at 0.05 level of confidence***

The multiple comparisons showed in Table IV proved that there existed significant differences between the adjusted means of plyometric training with control group (1.76), functional core training with control group (2.93). There was no significant difference between plyometric training and functional core training (1.17) at 0.05 level of confidence with the confidence interval value of 1.28. The pre, post and adjusted means on percent body fat were presented through bar diagram for better understanding of the results of this study in Figure-II.

Figure II. Pre post and adjusted post test differences of the, plyometric training, functional core training and control groups on percent body fat



Conclusions

In the light of the study undertaken with certain limitations imposed by the experimental conditions, the following conclusions were drawn.

1. The plyometric training had decreased BMI and percent body fat than the control group.
2. The functional core training had decreased BMI and percent body fat than the control group.

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ISSN: 2349 – 4891

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3.45-J-EPN-2015-16 Original Article

ISSN: 2349 - 4891

International
Journal of Recent Research and Applied Studies
(Multidisciplinary Open Access Refereed e-Journal)

Effect of Plyometric and Functional Core Training on Selected Physical Fitness Components among Basketball Players

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Received 1st August 2015, Accepted 10th October 2015

Abstract

The purpose of the study was to find out the effect of plyometric and functional core training on selected physical fitness components among basketball players. To achieve the purpose of the present study, forty five men basketball players from Ernakulam district, Kerala state, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects (N=45) were randomly assigned to three equal groups of fifteen subjects each. Pre test was conducted for all the subjects on selected physical fitness components. This initial test scores formed as pre test scores of the subjects. The groups were assigned as Experimental Group I, Experimental Group II and Control Group in an equivalent manner. Experimental Group I was exposed to plyometric training, Experimental Group II was exposed to functional core training and Control Group was not exposed to any experimental training other than their regular daily activities. The duration of experimental period was 12 weeks. After the experimental treatment, all the forty five subjects were tested on their physical fitness components variables. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant, Scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses. The plyometric training had shown better performance on explosive strength than the other groups. The functional core training had showed better performance on muscular endurance than the other groups.

Keywords: Plyometric, Core Training, Explosive Strength, muscular Strength, Basketball.

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Introduction

Basketball is a very demanding and physically challenging game. The ability of today's athletes has far exceeded the limits of the game put on it by the original inventors. The skills required of today's players are incredibly different than those of yesterday. Basketball now allows for individual athletes to exhibit physical aptitude within the context of an offense or defense. The attributes of speed, change of direction and power rule the game as we know it today. Nowadays there are several training methods that have been developed and adopted to increase the demands of the sports. Sport training is a physical, technical, moral and intellectual participation of an athlete with the help of physical exercises. It is a planned process for the participation of athlete and players to achieve top level performance (Mindaugas et al. 2006).

Plyometric training is an excellent way to train for the demands of basketball. Plyometric drills should be progressive in nature and extend through the preparatory and preseason cycles of training. In season plyometric training is often too much for players who are maintaining a full schedule of two to four games per week (Chu, 1992). The importance of core stabilization system in creating stability and power system during sport activities has an important consideration. It is believed that a strong core allows an athlete the full transfer of forces generated with the lower extremities, through the torso, and to the upper extremities (Willardson, 2007)

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Methodology

The purpose of the study was to find out the effect of plyometric and functional core training on selected physical fitness components among basketball players. To achieve the purpose of the present study, forty five men basketball players from Ernakulam district, Kerala state, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects (N=45) were randomly assigned to three equal groups of fifteen subjects each. Pre test was conducted for all the subjects on selected physical fitness components. This initial test scores formed as pre test scores of the subjects. The groups were assigned as Experimental Group I, Experimental Group II and Control Group in an equivalent manner. Experimental

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ISSN: 2349 – 4891

Group I was exposed to plyometric training, Experimental Group II was exposed to functional core training and Control Group was not exposed to any experimental training other than their regular daily activities. The duration of experimental period was 12 weeks. After the experimental treatment, all the forty five subjects were tested on their physical fitness components. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant, Scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses.

Results and Discussion

The detailed procedure of analysis of data and interpretation were given below,

Table I. Computation of analysis of covariance of mean of plyometric and functional core training and control groups on explosive strength

	Plyometric Training	Functional Core Training	Control Group	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	27.80	28.06	27.26	BG	4.97	2	2.48	1.04
				WG	100.26	42	2.38	
Post-Test Means	40.46	36.46	27.33	BG	1359.51	2	679.75	38.96*
				WG	732.80	42	17.44	
Adjusted Post-Test Means	40.45	36.40	27.41	BG	1294.59	2	647.29	36.38*
				WG	729.35	41	17.78	

An examination of table - I indicated that the pre test means of plyometric, functional core training and control groups were 27.80, 28.06 and 27.26 respectively. The obtained F-ratio for the pre-test was 1.04 and the table F-ratio was 3.22. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that there were no significant difference between the experimental and control groups indicating that the process of randomization of the groups was perfect while assigning the subjects to groups. The post-test means of plyometric, functional core training and control groups were 40.46, 36.36 and 27.33 respectively. The obtained F-ratio for the post-test was 38.96 and the table F-ratio was 3.22. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that the differences between the post test means of the subjects were significant.

The adjusted post-test means of plyometric, functional core training and control groups were 40.45, 36.40 and 27.41 respectively. The obtained F-ratio for the adjusted post-test means was 36.38 and the table F-ratio was 3.23. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. This proved that there was a significant difference among the means due to the experimental trainings on explosive strength. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in Table-II.

Table II. The scheffe's test for the differences between the adjusted post test paired means on explosive strength

Adjusted Post-test means			Mean Difference	Required CI
Plyometric Training	Functional Core Training	Control Group		
40.45	36.40	---	4.05*	3.90*
40.45	---	27.41	13.04*	
---	36.40	27.41	8.99*	

**** Significant at 0.05 level of confidence***

The multiple comparisons showed in Table II proved that there existed significant differences between the adjusted means of plyometric training and functional core training group (4.05), plyometric training and control group (13.04), functional core training and control group (8.99) at 0.05 level of confidence with the confidence interval value of 3.90. The pre, post and adjusted means on explosive strength were presented through bar diagram for better understanding of the results of this study in Figure-I.

ISSN: 2349 – 489

Figure I. Pre post and adjusted post test differences of the, plyometric training, functional core training and control groups on explosive strength

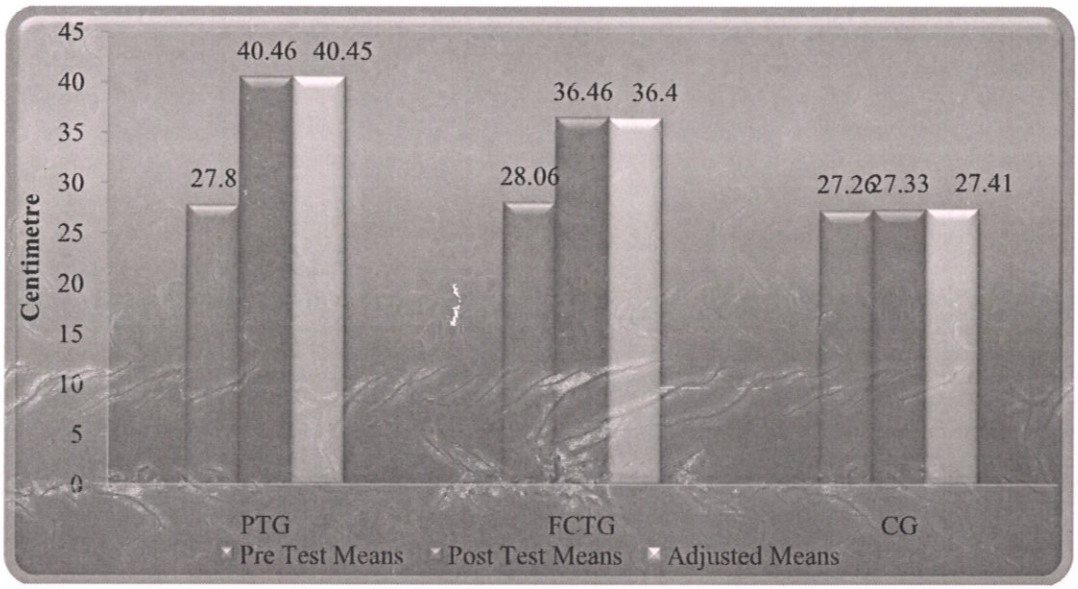


Table III. Computation of analysis of covariance of mean of plyometric and functional core training and control groups on muscular endurance

	Plyometric Training	Functional Core Training	Control Group	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	35.40	35.26	34.66	**BG**	4.57	2	2.28	1.09
				WG	87.86	42	2.09	
Post-Test Means	39.86	42.66	34.86	**BG**	468.40	2	234.20	53.22*
				WG	184.80	42	4.40	
Adjusted Post-Test Means	39.85	42.66	34.88	**BG**	448.22	2	224.11	49.75*
				WG	184.66	41	4.50	

An examination of table - III indicated that the pre test means of plyometric, functional core training and control groups were 35.40, 35.26 and 34.66 respectively. The obtained F-ratio for the pre-test was 1.09 and the table F-ratio was 3.22. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that there were no significant difference between the experimental and control groups indicating that the process of randomization of the groups was perfect while assigning the subjects to groups. The post-test means of plyometric, functional core training and control groups were 39.86, 42.66 and 34.86 respectively. The obtained F-ratio for the post-test was 53.22 and the table F-ratio was 3.22. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that the differences between the post test means of the subjects were significant. The adjusted post-test means of plyometric, functional core training and control groups were 39.85, 42.66 and 34.88 respectively. The obtained F-ratio for the adjusted post-test means was 49.75 and the table F-ratio was 3.23. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. This proved that there was a significant difference among the means due to the experimental trainings on muscular endurance. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in Table III.

ISSN: 2349 – 4891

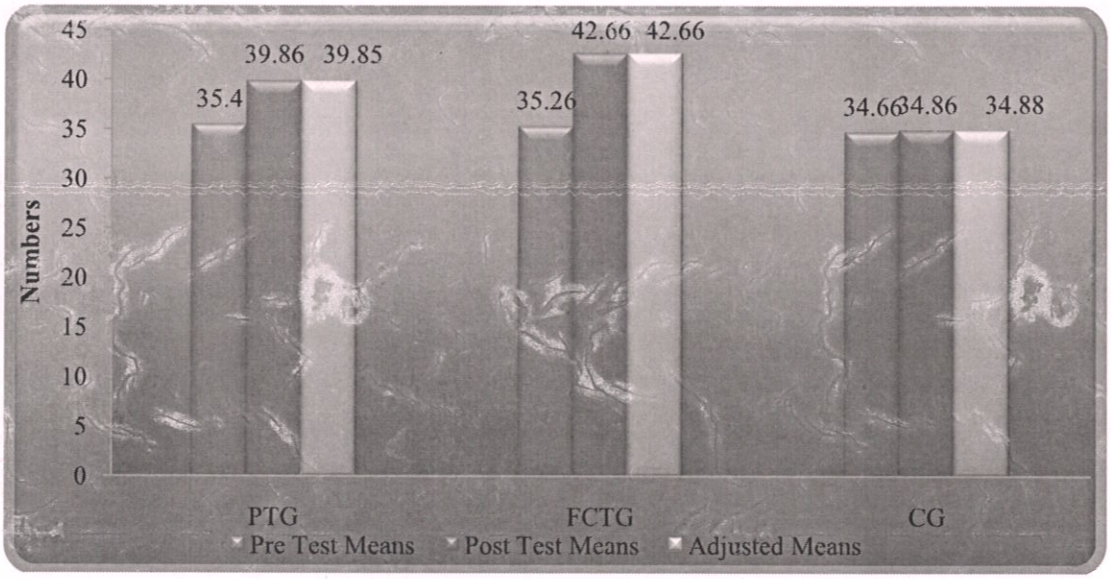
Table III. The scheffe's test for the differences between the adjusted post test paired means on muscular endurance

Adjusted Post-test means			Mean Difference	Required CI
Plyometric Training	Functional Core Training	Control Group		
39.85	42.66	---	2.81*	1.96
39.85	---	34.88	4.97*	
---	42.66	34.88	7.78*	

**** Significant at 0.05 level of confidence***

The multiple comparisons showed in Table III proved that there existed significant differences between the adjusted means of plyometric training and functional core training group (2.81), plyometric training and control group (4.97), functional core training and control group (7.78) at 0.05 level of confidence with the confidence interval value of 1.96. The pre, post and adjusted means on muscular endurance were presented through bar diagram for better understanding of the results of this study in Figure-II.

Figure II. Pre post and adjusted post test differences of the, plyometric training, functional core training and control groups on muscular endurance



Conclusions

In the light of the study undertaken with certain limitations imposed by the experimental conditions, the following conclusions were drawn.

1. The plyometric training had shown better performance on explosive strength than the other groups.
2. The functional core training had showed better performance on muscular endurance than the other groups.

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3-4-5-J-EPN-2015-16
Original Article

ISSN: 2349 - 4891

International
Journal of Recent Research and Applied Studies
(Multidisciplinary Open Access Refereed e-Journal)

Effect of Functional Core Training on Selected Skill performances among Basketball Players

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Received 25th May 2015, Accepted 15th July 2015

Abstract

The purpose of the study was to find out the effect of functional core training on selected skill performances among basketball players. To achieve the purpose of the present study, thirty men basketball players from Ernakulam district, Kerala state, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into two equal groups of fifteen subjects each. The subjects (N=30) were randomly assigned to two equal groups of fifteen subjects each. Pre test was conducted for all the subjects on selected skill performances. This initial test scores formed as pre test scores of the subjects. The groups were assigned as Experimental Group and Control Group in an equivalent manner. Experimental Group was exposed to functional core training and Control Group was not exposed to any experimental training other than their regular daily activities. The duration of experimental period was 12 weeks. After the experimental treatment, all the thirty subjects were tested on their skill performance variables. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to dependent 't' test. In all cases 0.05 level of significance was fixed to test hypotheses. The functional core training had positive impact on shooting, passing and dribbling among college basketball players.

Keywords: Functional Core Training, Shooting, Passing, Dribbling, Basketball.

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Introduction

Basketball involves approximately 450 million registered participants from over 200 national federations belonging to the Federation Internationale de Basketball (FIBA). Basketball which originated from America and has been most popular in that country has now become a game of international repute. It is played nearly everywhere in the world. Basket ball is a game much similar to the one played in ancient times by Mayas of Mexico. Basketball was invented by Dr.James Naismith in 1891. The first tournament was conducted in the year 1892. The first professional league was formed in the United States in 1899. A soccer ball was earlier used. By 1941, in was changed to the present day molded ball. The courts have also undergone many changes. The courts were small and irregular in the beginning. In 1915, the National Joint rules committee was formed to set up single code governing the game. The basketball is a ball game played by two teams of 5 players, plus 7 substitutes in each team. The players may pass, throw, roll bat or dribble the ball. The main aim of a basketball player is to obtain points by putting the ball into the basket of the opponent team's court. A goal is considered when the ball enters into the basket from above and passes through or remain in the net. In case score of both the teams are equal at the end, extra periods of 5 minutes each are provided to break the tie. The match is won by the team scoring greater number of points, or when the opponent team refuses to play, or declared winner by referee due to any other reason (Arias, 2012).

Functional core training is about power, strength and stabilization. Core muscles create a solid base for your body, allowing you to stay upright and stand strong on your two feet. Core work allows you to stabilize your spine, which improves and controls your posture. Functional core training allows you to practice movement that provides optimal motion for daily tasks. Challenging your core not only improves balance and functional movement, but it creates that toned look that so many people crave (Stephenson & Swank, 2004).

Methodology

The purpose of the study was to find out the effect of functional core training on selected skill performances among basketball players. To achieve the purpose of the present study, thirty men basketball players from Ernakulam district, Kerala state, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into two equal groups of fifteen subjects each. The subjects (N=30) were randomly assigned to two equal groups of fifteen subjects each. Pre test was conducted for all the subjects on selected skill performances. This initial test

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scores formed as pre test scores of the subjects. The groups were assigned as Experimental Group and Control Group in an equivalent manner. Experimental Group was exposed to functional core training and Control Group was not exposed to any experimental training other than their regular daily activities. The duration of experimental period was 12 weeks. After the experimental treatment, all the thirty subjects were tested on their skill performance variables. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to dependent 't' test. In all cases 0.05 level of significance was fixed to test hypotheses.

Results

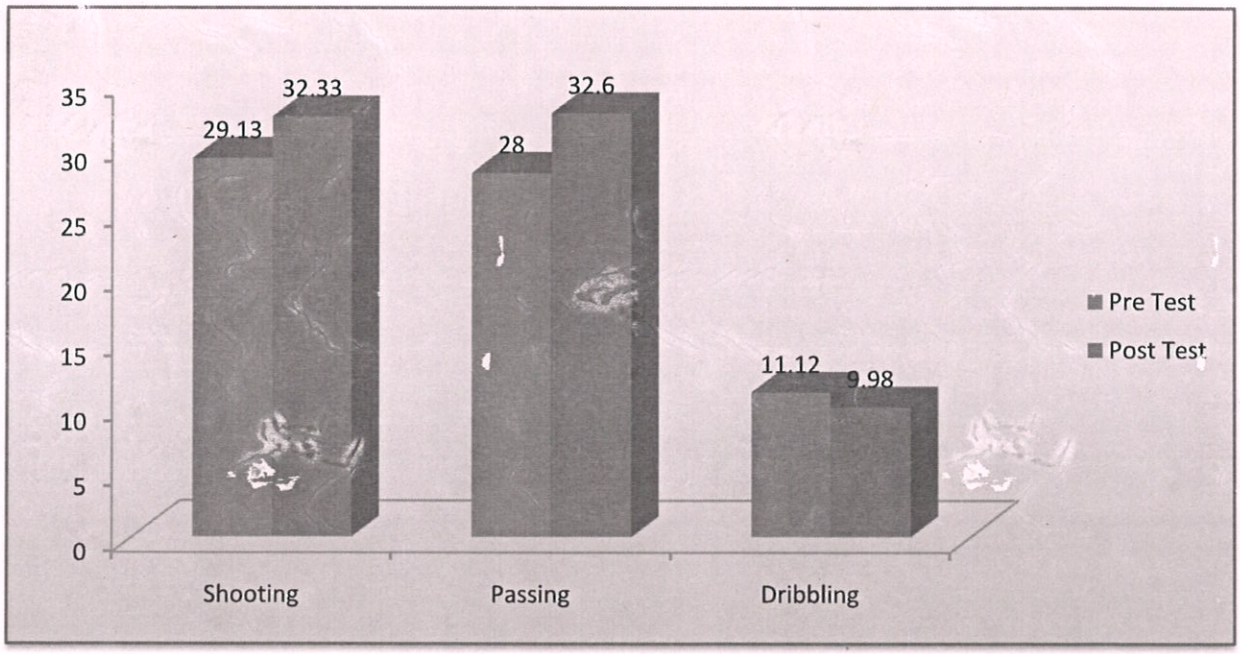
The findings pertaining to analysis of dependent 't' test between experimental group and control group on selected skill performances college basketball players for pre-post test respectively have been presented in table I to II.

Table I. Significance of mean gains & losses between pre and post test scores on selected variables of functional core training group

S.No	Variables	Pre-Test Mean	Post-Test Mean	Mean difference	Std. Dev (±)	σ DM	't' Ratio
1	Shooting	29.13	32.33	3.20	2.07	0.53	5.96*
2	Passing	28.00	32.60	4.60	1.80	0.46	9.87*
3	Dribbling	11.12	9.98	1.14	0.26	0.06	16.63*

An examination of table-I indicates that the obtained't' ratios were 5.96, 9.87 and 16.63 for shooting, passing and dribbling respectively. The obtained't' ratios were found to be greater than the required table value of 2.14 at 0.05 level of significance for 14 degrees of freedom. So it was found to be significant. The results of this study showed that statistically significant and explained its effects positively. The graphical representation of data has been presented in figure I.

Figure I. Comparisons of pre – test means and post – test means for experimental group in relation to physiological variables



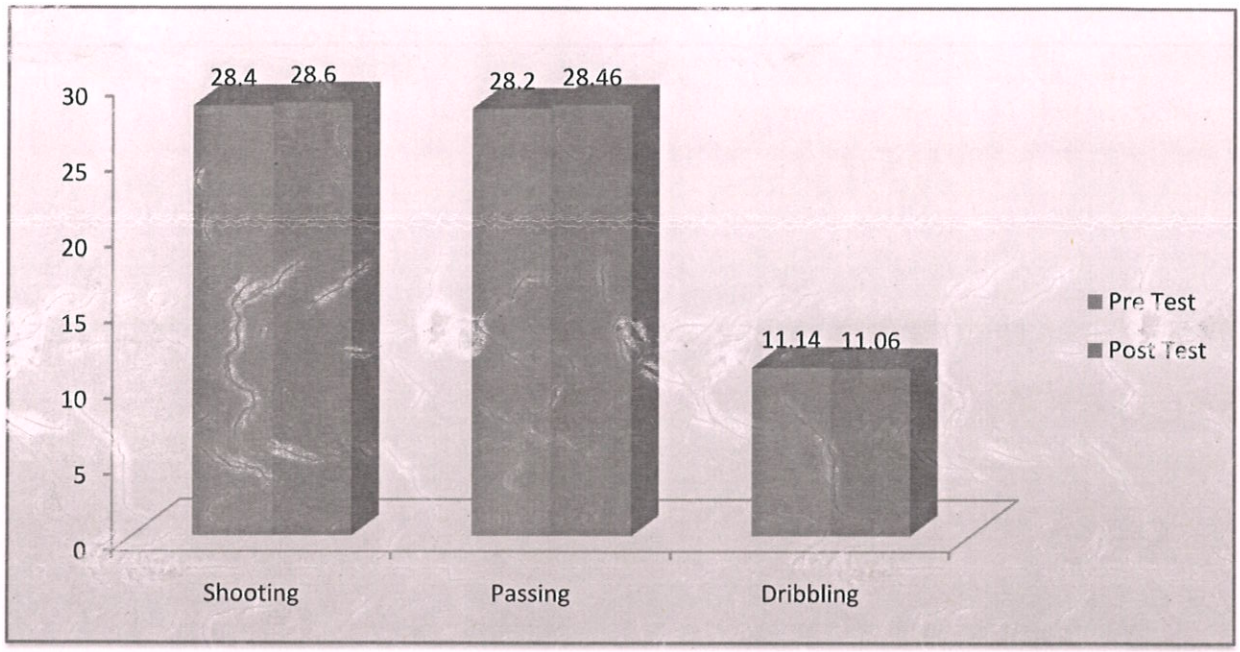
ISSN: 2349 – 4891

Table II. Significance of mean gains & losses between pre and post test scores on selected variables of control group

S.No	Variables	Pre-Test Mean	Post-Test Mean	Mean difference	Std. Dev (±)	σ DM	't' Ratio
1	Shooting	28.40	28.60	0.20	0.94	0.24	0.82
2	Passing	28.20	28.46	0.26	1.66	0.43	0.61
3	Dribbling	11.14	11.06	0.08	0.16	0.04	1.92

An examination of table-II indicates that the obtained't' ratios were 0.82, 0.61 and 1.92 for shooting, passing and dribbling respectively. The obtained't' ratios were found to be lesser than the required table value of 2.14 at 0.05 level of significance for 14 degrees of freedom. So it was found to be insignificant. The graphical representation of data has been presented in figure II.

Figure II. Comparisons of pre – test means and post – test means for control group in relation to physiological variables



In case of skill performances i.e. shooting, passing and dribbling the results between pre and post test has been found significantly higher in experimental group in comparison to control group. This is possible because due to regular functional core training which may also bring sudden spurt in skill performances in basketball players. The findings of the present study have strongly indicates that functional core training of twelve weeks have significant effect on selected skill performances i.e., shooting, passing and dribbling of college basketball players.

Conclusions

On the basis of findings and within the limitations of the study the following conclusions were drawn:

1. The functional core training had positive impact on shooting, passing and dribbling among college basketball players.
2. The experimental group showed better improvement on shooting, passing and dribbling among college basketball players than the control group.

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345-J-EDN-2015-16

Original Article

ISSN: 2349 - 4891

International
Journal of Recent Research and Applied Studies
(Multidisciplinary Open Access Refereed e-Journal)

Effect of Plyometric Training on Selected Body Composition among Basketball Players

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Received 5th July 2015, Accepted 10th September 2015

Abstract

The purpose of the study was to investigate the effect of plyometric training on selected body composition among basketball players. It was hypothesized that there would be significant differences on selected body composition due to the effect of plyometric among basketball players. For the present study the 30 male basketball players from Ernakulam district, Kerala state, India were selected at random and their age ranged from 18 to 25 years. For the present study pre test – post test random group design which consists of control group and experimental group was used. The subjects were randomly assigned to two equal groups of fifteen each and named as Group 'A' and Group 'B'. Group 'A' underwent plyometric training and Group 'B' have not underwent any training. Body composition was assessed by Bioelectrical Impedance Analyzer. The data was collected before and after twelve weeks of training. The data was analyzed by applying Analysis of Co-Variance (ANCOVA). The level of significance was set at 0.05. The plyometric training had positive impact on BMI and percent body fat among basketball players.

Keywords: Plyometric, BMI, Percent Body Fat, Basketball.

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Introduction

Basketball which originated from America and has been most popular in that country has now become a game of international repute. It is played nearly everywhere in the world. Basket ball is a game much similar to the one played in ancient times by Mayas of Mexico. Basketball was invented by Dr.James Naismith in 1891. The first tournament was conducted in the year 1892. The first professional league was formed in the United States in 1899. A soccer ball was earlier used. By 1941, in was changed to the present day molded ball. The courts have also undergone many changes. The courts were small and irregular in the beginning. In 1915, the National Joint rules committee was formed to set up single code governing the game.

Plyometrics, employed to develop power and explosive responsiveness, uses the Stretch-Shorten Cycle (SSC). The whole idea is to develop the most amount of force in the shortest possible time. When a muscle is flexed or shortened, it's under tension and will react with a more powerful and explosive contraction due to stored elastic energy. Unlike most other aerobic exercises, gravity becomes a major factor in the workout routine. Strength and flexibility are prerequisites for Plyometric training. The laws of Physics apply. A one-g force is equal to your weight. Two or more g's of force may be exerted by an individual during a jump. For example, a 250-pound (114 kg) individual would subject forces equal to or greater than 500 lbs (227 kg) of pressure on hip, knee and ankle joints. A 100 (45 kg) pound person would experience force equal to or greater than 200 pounds (91 kg). It's obvious that too much Plyometric training can be damaging to joints, as is the case with all types of exercise (Donald, 1998).

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Methodology

The purpose of the study was to investigate the effect of plyometric training on selected body composition among basketball players. It was hypothesized that there would be significant differences on selected body composition due to the effect of plyometric among basketball players. For the present study the 30 male basketball players from Ernakulam district, Kerala state, India were selected at random and their age ranged from 18 to 25 years. For the present study pre test – post test random group design which consists of control group and experimental group was used. The subjects were randomly assigned to two equal groups of fifteen each and named as Group 'A' and Group 'B'. Group 'A' underwent plyometric training and Group 'B' have not underwent any training. Body composition was assessed by Bioelectrical Impedance Analyzer. The data was collected before and after twelve weeks of training. The data was analyzed by applying Analysis of Co-Variance (ANCOVA). The level of significance was set at 0.05.

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Results

The findings pertaining to analysis of co-variance between experimental group and control group on selected body composition among basketball players for pre-post test respectively have been presented in table I to II.

Table I. ANCOVA between Experimental Group and Control Group on BMI of Basketball players for Pre, Post and Adjusted Test

	Experimental Group	Control Group	Source of Variance	Sum of Squares	df	Mean Square	F
Pre Test Mean	24.80	24.24	BG	2.35	1	2.35	1.42
			WG	46.08	28	1.64	
Post Test Mean	22.26	24.14	BG	26.69	1	26.69	19.80*
			WG	37.75	28	1.34	
Adjusted Post Mean	22.09	24.31	BG	35.28	1	35.28	45.22*
			WG	21.06	27	0.78	

*** Significant at 0.05 level.** **df: 1/27= 4.21**

Table I revealed that the obtained 'F' value of 45.22 was found to be significant at 0.05 level with df 1, 27 as the tabulated value of 4.21 required to be significant at 0.05 level. The same table indicated that there was a significant difference in adjusted means of BMI of basketball players between experimental group and control group. The graphical representation of data has been presented in figure I.

Figure I. Comparisons of Pre – Test Means Post – Test Means and Adjusted Post – Test Means for Control group and Experimental Group in relation to BMI

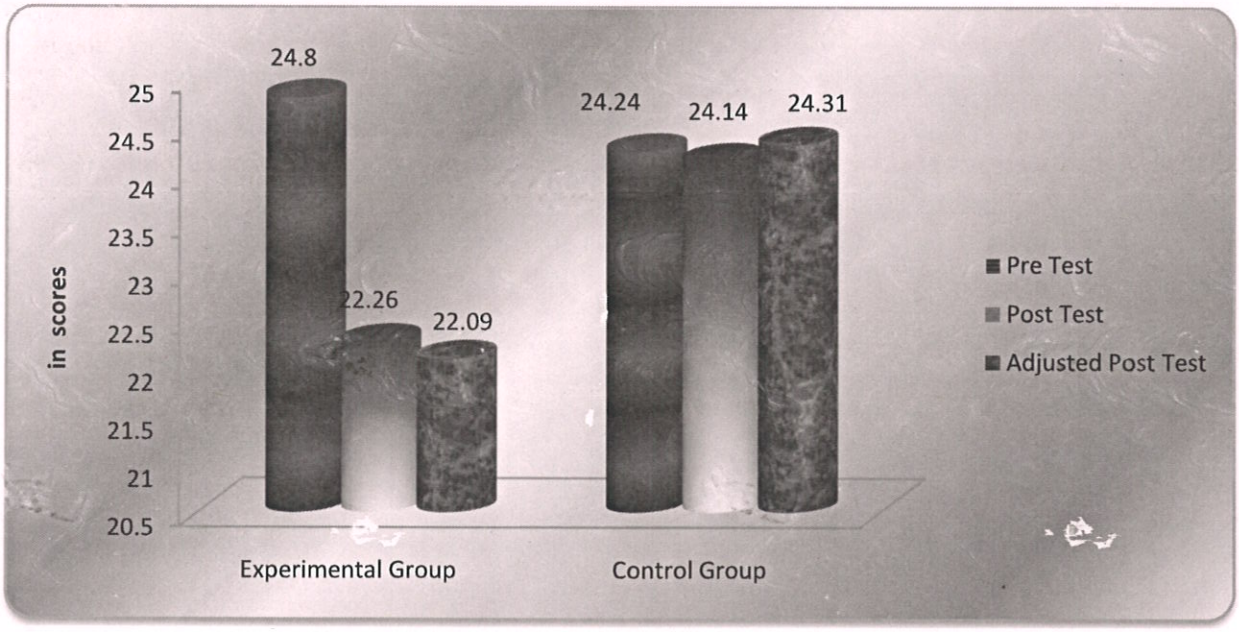

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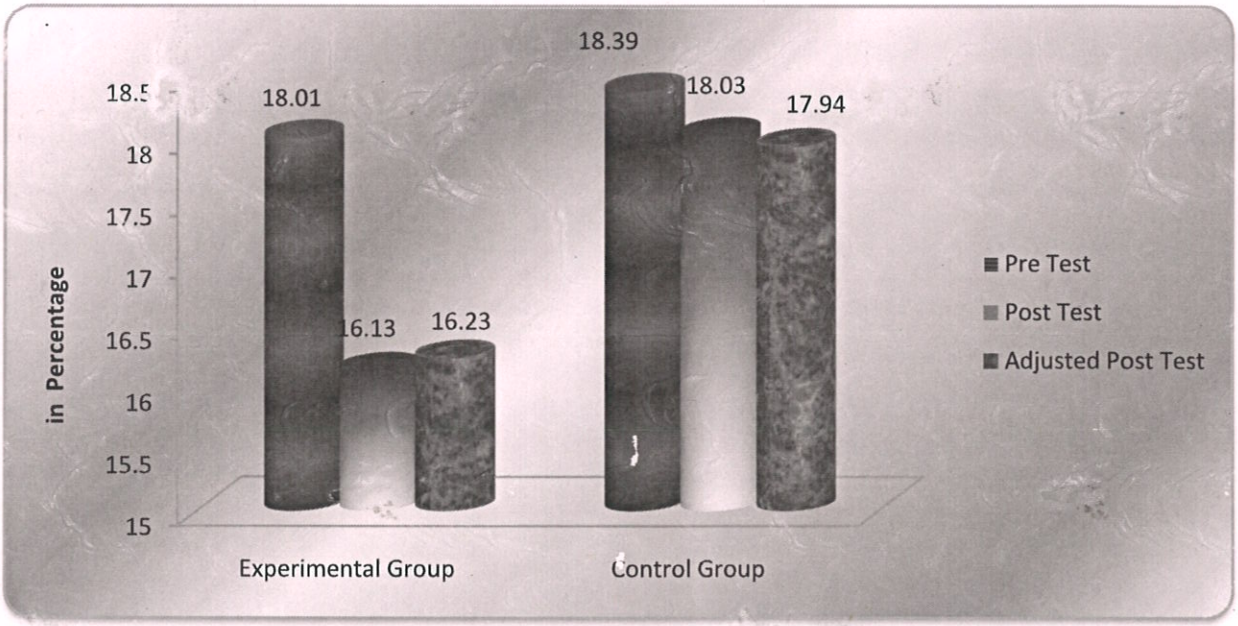
Table II. ANCOVA between Experimental Group and Control Group on Percent body fat of Basketball players for Pre, Post and Adjusted Test

	Experimental Group	Control Group	Source of Variance	Sum of Squares	df	Mean Square	F
Pre Test Mean	18.01	18.39	BG	1.10	1	1.10	1.38
			WG	22.42	28	0.80	
Post Test Mean	16.13	18.03	BG	27.09	1	27.09	17.99*
			WG	42.17	28	1.50	
Adjusted Post Mean	16.23	17.94	BG	20.91	1	20.91	15.39*
			WG	36.68	27	1.35	

*** Significant at 0.05 level.** **df: 1/27= 4.21**

Table II revealed that the obtained 'F' value of 15.39 was found to be significant at 0.05 level with df 1, 27 s the tabulated value of 4.21 required to be significant at 0.05 level. The same table indicated that there was a significant difference in adjusted means of percent body fat of basketball players between experimental group and control group. The graphical representation of data has been presented in figure II.

Figure II. Comparisons of Pre – Test Means Post – Test Means and Adjusted Post – Test Means for Control group and Experimental Group in relation to Percent body fat



In case of body composition i.e. BMI and percent body fat the results between pre and post (12 weeks) test has been found significantly higher in experimental group in comparison to control group. The findings of the present study have strongly indicates that plyometric training of twelve weeks have significant effect on selected body composition i.e., BMI and percent body fat of basketball players. Hence the hypothesis earlier set that plyometric training programme would have been significant effect on selected body composition in light of the same the hypothesis was accepted.

Conclusions

On the basis of findings and within the limitations of the study the following conclusions were drawn:

1. The plyometric training had positive impact on BMI and percent body fat among basketball players.
2. The experimental group showed better improvement on BMI and percent body fat among basketball players than the control group.

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3.4.5 - 2015-16

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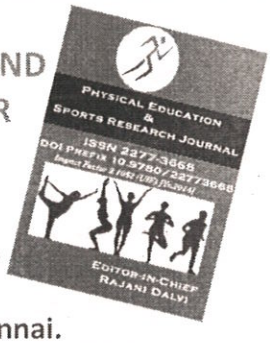
EFFECT OF RESISTANCE TRAINING WITH VARIED NUTRITIONAL SUPPLEMENTATION ON CLEAN AND JERK AND SNATCH AMONG SUB JUNIOR NATIONAL WEIGHTLIFTER



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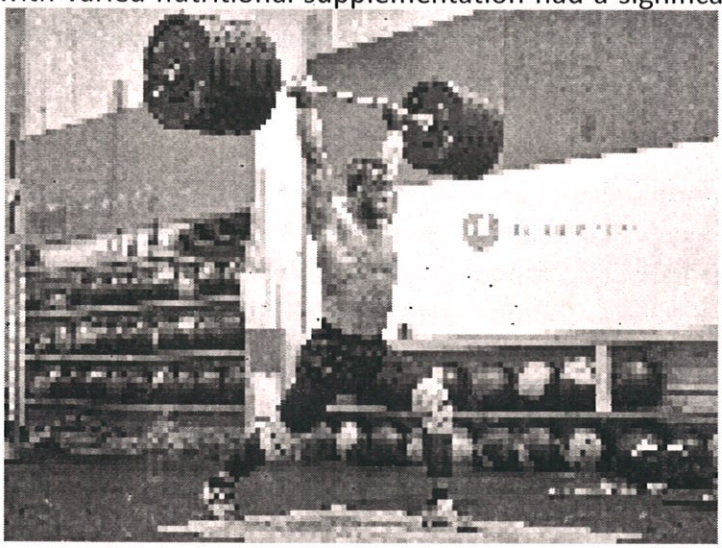
ABSTRACT

The purpose of the study was to find out the effect of resistance training with varied nutritional supplementation on Clean and Jerk and Snatch among Sub Junior National Weightlifter. For this purpose, thirty weight lifters were selected at random from the Army sports institute, Pune. Their age ranged between 12 and 16 years. The selected thirty weight lifters were randomly assigned into three groups namely, resistance training with whey protein isolates supplement group (RTWPIG), resistance training with whey protein concentrate group (RTWPCG) and placebo group (PG) each consisting of ten subjects. The subjects were given resistance training with whey protein supplementation for a period of twelve weeks. The subjects were tested Clean and Jerk and Snatch using 1RM. After the experimental period, the collected data was analysed by using analysis of covariance. The level of significance was fixed at 0.05 level. The results showed that the twelve weeks of resistance training with varied nutritional supplementation had a significant improvement on the Clean and Jerk and Snatch. This restrictive concept is applied to resistance training, as opposed to the competitive sport of weightlifting, which is sometimes referred to as Olympic lifting. The sport of weightlifting is distinct from common strength training, because it involves specific types of rapid lifts, such as the "snatch" and the "clean and jerk."



KEYWORDS :*Resistance Training, Whey Protein, snatch" and the "clean and jerk.*

INTRODUCTION :

The protein requirements for athletic populations have been the subject of much scientific debate. Only recently has the notion that both strength/power and endurance athletes require a greater protein consumption than the general population become generally accepted. Protein is a key nutrient needed by the body to build and repair tissue, provide structure, serve as an enzyme to begin cellular processes, and form hormones (among other functions). The Recommended Dietary Allowance (RDA) for sedentary individuals is 0.8 grams protein per kilogram body weight per day. Some research suggests that athletes need more protein to support their increased rate of muscle breakdown and synthesis. Recommendations typically range from 1.0-2.0 grams protein per kilogram

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body weight per day, depending on type and intensity of activity. For example, a person weighing 150 lbs. (68.2 kg) would need about 55 grams of protein if he was sedentary and 136 grams of protein if he was an active weight lifter.

Whey is a dairy protein that is a by-product of the cheese making process. In its raw state, whey contains substantial amounts of fat and lactose (milk sugar). The primary difference between isolate and concentrate is that the isolate is more pure. In other words, isolate contains more protein with less fat and lactose per serving. Whey isolate usually contains between 90-94% proteins while whey concentrate has a protein ratio of 70-85% (Keri, 2004).Whey protein is a soluble, easy to digest protein and is efficiently absorbed into the body. It is often referred to as a "fast" protein for its ability to quickly provide nourishment to muscles.

Athletes' training is carried out in an oriented, planned, systematic and long-term way, aiming to achieve performance. The changes during workouts cover both the component performance, as a result, and the structural component. The transformation in terms of performance refers to the mainly quantitative improvement of athlete's performance individual potential, which occurs usually in competition (Ulareanu, 2012).

Exercise training of particular kinds clearly has a dramatic impact on muscle morphology and function compared with the effects of weight lifting and distance running on fiber type diameters and proportions or mitochondrial density. It is no surprise that different modes of training, aimed at increasing the performance of particular kinds of muscular activity (or, in bodybuilding, simply muscle mass) have differential effects on muscle protein metabolism. Resistance exercise training is well known to result in hypertrophy of the trained muscles (Luthi, et al 1986).

Protein supplementation and athletic performance have shown positive effects from proteins of various sources. However, only limited research is available on comparisons between various protein sources and changes in human performance. Hence, the aim of investigation is to find out the effect of resistance training with Whey Protein Isolates Supplement (WPI) and Whey Protein concentrate Supplement (WPC) on performance of Clean and Jerk and Snatch of the weight lifters.

METHODS AND MATERIALS

For this purpose, thirty weight lifters were selected at random from the Army sports institute, Pune. Their age ranged between 12 and 16 years. The selected thirty weight lifters were randomly assigned into three groups namely, resistance training with whey protein isolates supplement group (RTWPIG), resistance training with whey protein concentrate group (RTWPCG) and placebo group (PG) each consisting of ten subjects. The subjects were given resistance training with whey protein supplementation for a period of twelve weeks. The subjects were tested Clean and Jerk and Snatch using 1RM. After the experimental period, the collected data was analysed by using analysis of covariance. The level of significance was fixed at 0.05 level.

RESISTANCE TRAINING PROTOCOL

All subjects participated in a supervised, periodized resistance training session three days per week, per week for a total of twelve weeks. Prior to the workout, subjects performed a standardized series of stretching exercises. The participants then performed 3 sets of leg press, bench press, and military press, pull-ups, bent over rows, barbell curls and extensions. Immediately following the workout, subjects consumed 40 grams of Whey Protein Isolates Supplement (WPI) and Whey Protein concentrate Supplement (WPC) respectively. The program was designed to train all major muscle groups using mostly compound movements for the upper and lower body. The programmed, non-

linear training split was divided into hypertrophy days consisting of 8–12 RM loads for 3 sets, with 60–120 seconds rest and strength days consisting of 2 to 5 RM loads for 3 sets for all exercises except the leg press and bench press which received 5 total sets. Weights were progressively increased by 5% when the prescribed repetitions could be completed. All training sessions were closely monitored by the researchers to ensure effort and intensity was maximal each training session.

RESULTS ON CLEAN &JERK AND SNATCH

The results presented in the table I shows that the pre and post test scores of resistance training with whey protein isolates supplement group (RTWPIG), resistance training with whey protein concentrate group (RTWPCG) and placebo group on clean & jerk and snatch. The obtained pre test F value of 1.15 and 1.39 respectively was lesser than the required table value of 3.35. The obtained post test F value of 8.13 and 7.56 respectively was greater than the required table value of 3.35. Hence, it was proved that there was significant improvement in clean & jerk and snatches among sub junior national weight lifters due to resistance training with whey protein supplementations.

Table I
Computation of Analysis of Covariance on Clean & Jerk and Snatch
(Scores in Kg)

VARIABLES	TEST	CTWPI GROUP	CTWPC GROUP	PLACEBO GROUP	SV	SS	df	MS	F
CLEAN & JERK	Pre Test	83.30	82.60	82.10	B	7.27	2	3.63	1.15
					W	85.40	27	3.16	
	Post Test	95.80	93.80	91.80	B	80.00	2	40.00	**8.13***
					W	132.80	27	4.92	
	Adjusted	95.22	93.86	92.32	B	38.97	2	19.48	**8.23***
					W	61.56	26	2.37	
	Mean Gain	12.50	11.20	9.70					
SNATCH	Pre Test	53.20	52.10	52.20	B	7.40	2	3.70	1.39
					W	72.10	27	2.67	
	Post Test	64.50	62.60	61.40	B	48.87	2	24.43	**7.56***
					W	87.30	27	3.23	
	Adjusted	63.99	62.89	61.62	B	26.48	2	13.24	**7.04***
					W	48.93	26	1.88	
	Mean Gain	11.30	10.50	9.20					

*Significant at 0.05 level of confidence for 2 and 27 (df) = 3.35, 2 and 26 (df) = 3.37

The statistical analysis on adjusted mean values using ANCOVA revealed that there was significant difference existed among resistance training with whey protein isolates supplement group (RTWPIG), resistance training with whey protein concentrate group (RTWPCG) and placebo group on clean and jerk and snatch since the obtained adjusted mean F value 8.23 and 7.04 was greater than the table value of 3.37 at 0.05 level.

Since the F value was significant, the results were subjected to post hoc analysis using Scheffe's confidence interval test. The results were presented in Table II.

Table II
Scheffe's Confidence Interval Test Score on Clean & Jerk and Snatch
(Scores in Kg)

VARIABLE	PLACEBO GROUP	CTWPI GROUP	CTWPC GROUP	Mean Difference	CI
CLEAN & JERK	92.32	95.22		**2.90***	1.43
	92.32		93.86	**1.54***	
		95.22	93.86	1.36	
SNATCH	61.62	63.99		**2.37***	1.27
	61.62		62.89	**1.27***	
		63.99	62.89	1.10	

*Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between resistance training with whey protein isolates supplement group (RTWPIG) and placebo group. There was significant difference between resistance training with whey protein concentrate group (RTWPCG) and placebo group. There was no significant difference between treatment groups, namely resistance training with whey protein isolates supplement group (RTWPIG) and resistance training with whey protein concentrate group (RTWPCG).

The pre test, post test and ordered adjusted means are presented through bar diagram for better understanding of the result of this study in figures.

Figure – 1
Bar Diagram on Adjusted Means of Clean & Jerk

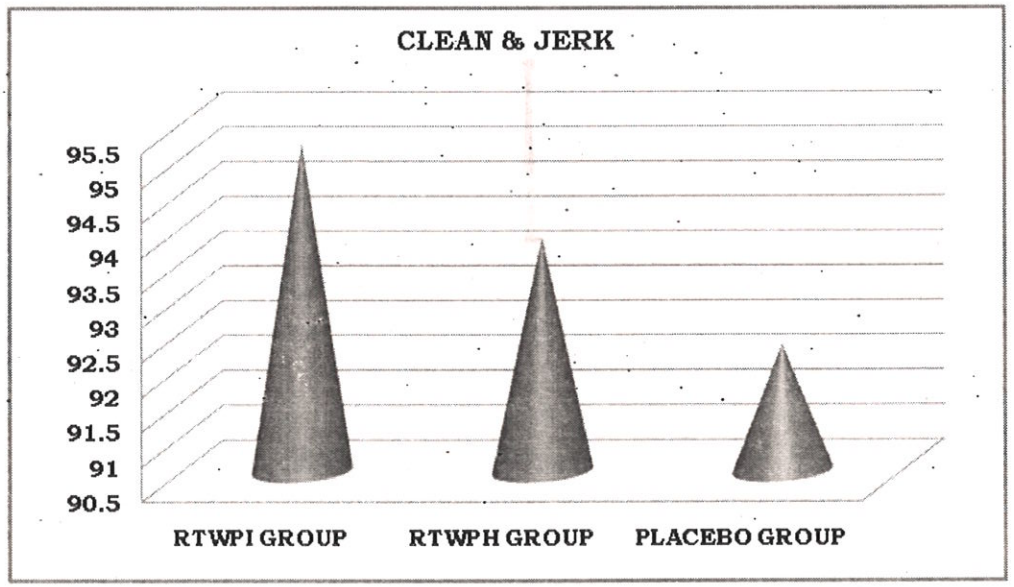
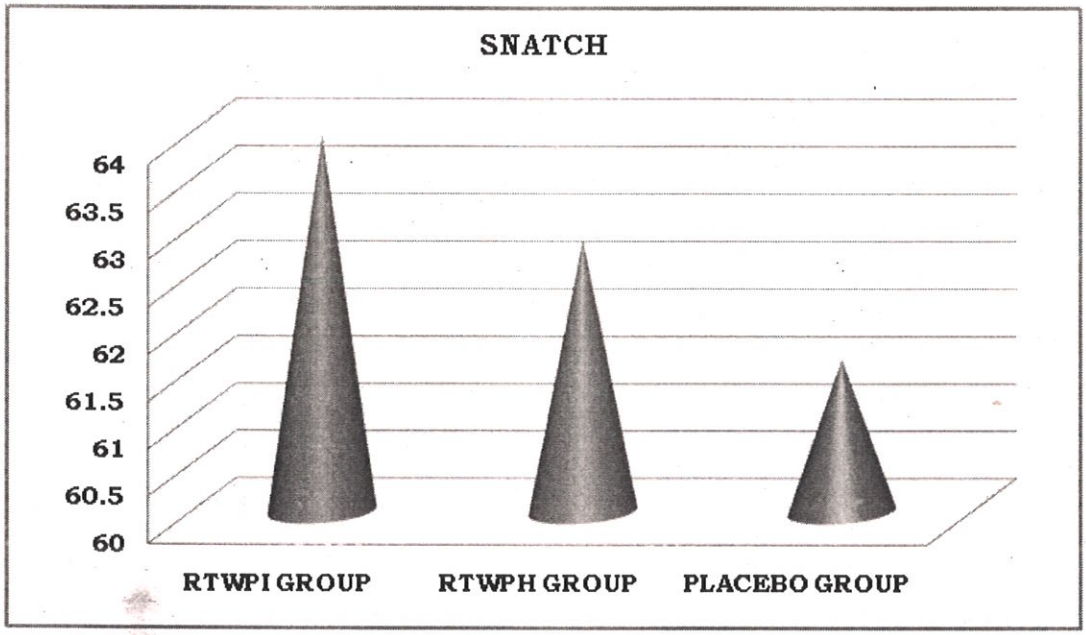


Figure – 2
Bar Diagram on Adjusted Means of Snatch



DISCUSSION AND CONCLUSION

Skeletal muscle is an integral body tissue playing key roles in strength, performance, physical function, and metabolic regulation. It is essential for athletes to ensure that they have optimal amounts of muscle mass to ensure peak performance in their given sport. A combination of resistance exercise and whey protein consumption, results in a synergistic stimulation of muscle protein synthesis.

The results proved that the both whey protein isolate and whey protein concentrate administration post resistance exercise improved indices of body composition and exercise performance of clean & jerk and snatches. However, there were no differences between the two groups.

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2015-16

Original Article

ISSN: 2349 - 4891

International
Journal of Recent Research and Applied Studies
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Resistance Training with Whey Protein Isolates and Whey Protein Concentrate ntation on Muscular Power and Muscular Strength among Sub Junior National er

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2015, Accepted 1st September 2015

purpose of the study was to find out the effect of resistance training with Whey Protein Isolates and Whey entrate Supplementation on Muscular power and Muscular strength among Sub Junior National Weightlifter. ose, thirty weight lifters were selected at random from the Army sports institute, Pune. Their age ranged nd 16 years. The selected thirty weight lifters were randomly assigned into three groups namely, resistance whey protein isolates supplement group (RTWPIG), resistance training with whey protein concentrate group nd placebo group (PG) each consisting of ten subjects. The subjects were given resistance training with whey mentation for a period of twelve weeks. The subjects were tested Muscular power and Muscular strength ; medicine ball throw and 1RM. After the experimental period, the collected data was analysed by using ovariance. The level of significance was fixed at 0.05 level. The results showed that the twelve weeks of ining with varied nutritional supplementation had a significant improvement on the Muscular power and ngth. Resistance training has been shown to improve not only the force production of a muscle, but also er and strength. In addition to intense training, a proper nutrition program is also responsible for maximizing ce of strength and power athletes.

sistance Training, Whey Protein, Muscular power, Muscular strength.

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cise training of particular kinds clearly has pact on muscle morphology and function h the effects of weight lifting and distance iber type diameters and proportions or density. It is no surprise that different ning, aimed at increasing the performance kinds of muscular activity (or, in simply muscle mass) have differential nuscle protein metabolism. Resistance ng is well known to result in hypertrophy nuscles (Luthi, et al 1986).

r nutrition is an important consideration o seek to maximize performance. No diet ses strength, power, or aerobic endurance, e diet allows athletes to train and compete their ability. The physiological needs of hletes often require diets that are quite a sedentary individual's diet. The ideal ete depends upon many different factors including age, body size, gender, genetics, and environmental training conditions, as well as training duration, frequency, and intensity. Therefore, requirements vary greatly between, as well as within, different athletic groups and the best diet for any given athlete is one that is individualized for that specific athlete.

Different sports place unique metabolic requirements on bioenergetics systems, and these differences alter the nutritional requirements among athletes involved in various types of strength and power sports. Particularly important to strength and power athletes are increasing lean muscle mass that translates into functional sport-specific strength, increasing power and speed over short distances and increasing explosiveness. These goals typically drive athletes to seek various options in their training methodologies to maximize the training stimulus. In addition to intense training, a proper nutrition program is also responsible for maximizing the performance of strength and power athletes. More specifically, precise nutritional supplementation provides the impetus for maximizing lean muscle mass, power, speed, and explosiveness. Therefore, any nutritional program (including sports supplements) that enhances lean muscle mass, power,

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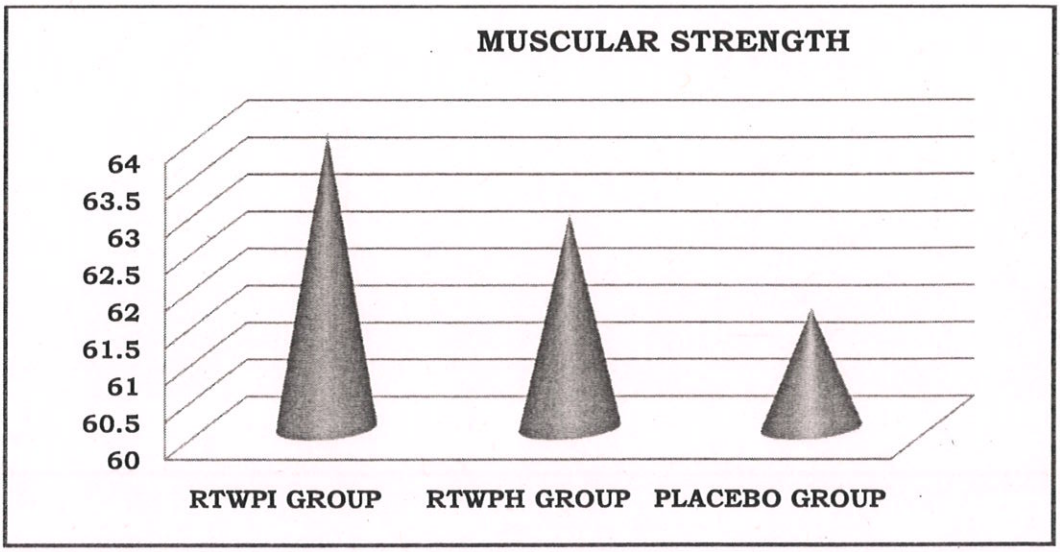
ISSN: 2349 – 4891

Figure II. Bar Diagram on Adjusted Means of Muscular strength



Discussion and Conclusion

Skeletal muscle is an integral body tissue playing key roles in strength, performance, physical function, and metabolic regulation. It is essential for athletes to ensure that they have optimal amounts of muscle mass to ensure peak performance in their given sport. A combination of resistance exercise and whey protein consumption, results in a synergistic stimulation of muscle protein synthesis.

The results proved that the both whey protein isolate and whey protein concentrate administration post resistance exercise improved indices of body composition and exercise performance of Muscular power and Muscular strength. However, there were no differences between the two groups.

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ease cite this article as: Sunkara Srinivasa Rao, Dr.R.Subramanian, Dr.P.K.Senthilkumar. Effect of Resistance Training ith Whey Protein Isolates and Whey Protein Concentrate Supplementation on Muscular Power and Muscular Strength nong Sub Junior National Weightlifter. *International Journal of Recent Research and Applied Studies*, 2015, 2, 9(2), 5 - 8.

ISSN: 2349 – 4891

	Adjusted	105.09	103.49	101.62	B	54.53	2	27.26	**5.22***
					W	135.90	26	5.23	
	Mean Gain	12.10	11.10	9.30					

*Significant at 0.05 level of confidence for 2 and 27 (df) = 3.35, 2 and 26 (df) = 3.37

The statistical analysis on adjusted mean values using ANCOVA revealed that there was significant difference existed among resistance training with whey protein isolates supplement group (RTWPIG), resistance training with whey protein concentrate group (RTWPCG) and placebo group on Muscular power and Muscular strength since the obtained adjusted mean F value 14.19 and 5.22 was greater than the table value of 3.37 at 0.05 level. Since the F value was significant, the results were subjected to post hoc analysis using Scheffe's confidence interval test. The results were presented in Table II.

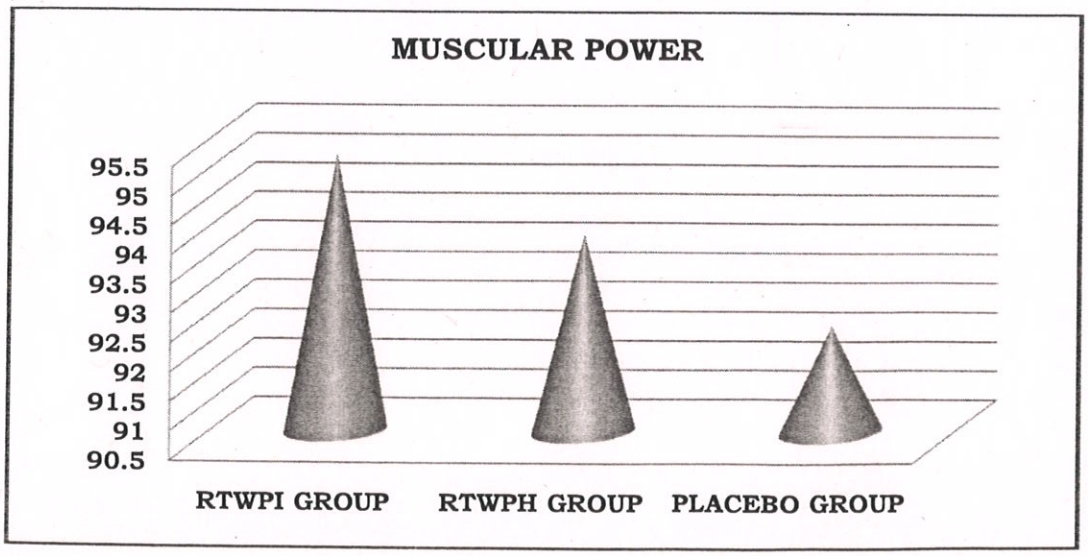
Table II. Scheffe's Confidence Interval Test Score on Muscular power and Muscular strength (Scores in Kg)

VARIABLE	PLACEBO GROUP	CTWPI GROUP	CTWPC GROUP	Mean Difference	CI
Muscular power	73.54	76.08		**2.54***	1.02
	73.54		75.58	**2.03***	
		76.08	75.58	0.51	
Muscular strength	101.62	105.09		**3.46***	2.12
	101.62		103.49	1.87	
		105.09	103.49	1.60	

*Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between resistance training with whey protein isolates supplement group (RTWPIG) and placebo group in Muscular power and Muscular strength. There was significant difference between resistance training with whey protein concentrate group (RTWPCG) and placebo group in Muscular power and there was no significant difference Muscular strength. There was no significant difference between treatment groups, namely resistance training with whey protein isolates supplement group (RTWPIG) and resistance training with whey protein concentrate group (RTWPCG). The pre test, post test and ordered adjusted means are presented through bar diagram for better understanding of the result of this study in figures.

Figure I. Bar Diagram on Adjusted Means of Muscular power



ISSN: 2349 – 4891

speed, and explosiveness, when combined with a proper training program, should translate into improvements in exercise and sport performance.

Protein supplementation and athletic performance have shown positive effects from proteins of various sources. However, only limited research is available on comparisons between various protein sources and changes in human performance. Hence, the aim of investigation is to find out the effect of resistance training with Whey Protein Isolates Supplement (WPI) and Whey Protein concentrate Supplement (WPC) on performance of Muscular power and Muscular strength of the weight lifters.

Methods and Materials

For this purpose, thirty weight lifters were selected at random from the Army sports institute, Pune. Their age ranged between 12 and 16 years. The selected thirty weight lifters were randomly assigned into three groups namely, resistance training with whey protein isolates supplement group (RTWPIG), resistance training with whey protein concentrate group (RTWPCG) and placebo group (PG) each consisting of ten subjects. The subjects were given resistance training with whey protein supplementation for a period of twelve weeks. The subjects were tested Muscular power and Muscular strength through using medicine ball throw and 1RM test. After the experimental period, the collected data was analysed by using analysis of covariance. The level of significance was fixed at 0.05 level.

Resistance Training Protocol

All subjects participated in a supervised, periodized resistance training session three days per week, per week for a total of twelve weeks. Prior to the workout, subjects performed a standardized series of stretching exercises. The participants then performed 3 sets of leg press, bench press, and military press, pull-ups, bent over rows, barbell curls and extensions. Immediately following the workout, subjects consumed 40 grams of Whey Protein Isolates Supplement (WPI) and Whey Protein concentrate Supplement (WPC) respectively. The program was designed to train all major muscle groups using mostly compound movements for the upper and lower body. The programmed, non-linear training split was divided into hypertrophy days consisting of 8–12 RM loads for 3 sets, with 60–120 seconds rest and strength days consisting of 2 to 5 RM loads for 3 sets for all exercises except the leg press and bench press which received 5 total sets. Weights were progressively increased by 5% when the prescribed repetitions could be completed. All training sessions were closely monitored by the researchers to ensure effort and intensity was maximal each training session.

Results on Muscular power and Muscular strength

The results presented in the table I shows that the pre and post test scores of resistance training with whey protein isolates supplement group (RTWPIG), resistance training with whey protein concentrate group (RTWPCG) and placebo group on Muscular power and Muscular strength. The obtained pre test F value of 0.82 and 1.81 respectively was lesser than the required table value of 3.35. The obtained post test F value of 3.54 and 6.91 respectively was greater than the required table value of 3.35. Hence, it was proved that there was significant improvement in Muscular power and Muscular strength among sub junior national weight lifters due to resistance training with whey protein supplementations.

Table I. Computation of Analysis of Covariance on Muscular power and Muscular strength (Scores in Kg)

VARIABLES	TEST	CTWPI GROUP	CTWPC GROUP	PLACEBO GROUP	SV	SS	df	MS	F
Muscular power	Pre Test	70.40	70.30	68.20	B	30.87	2	15.43	0.82
					W	508.10	27	18.82	
	Post Test	76.80	76.20	72.20	B	125.07	2	62.53	3.54*
					W	476.80	27	17.66	
	Adjusted	76.08	75.58	73.54	B	34.12	2	17.06	14.19*
					W	31.25	26	1.20	
	Mean Gain	6.40	5.90	4.00					
Muscular strength	Pre Test	93.20	92.30	92.20	B	6.07	2	3.03	1.81
					W	45.30	27	1.68	
	Post Test	105.30	103.40	101.50	B	72.20	2	36.10	6.91*
					W	141.00	27	5.22	

3.4.5. 2015-2016

ISSN 2321-6557

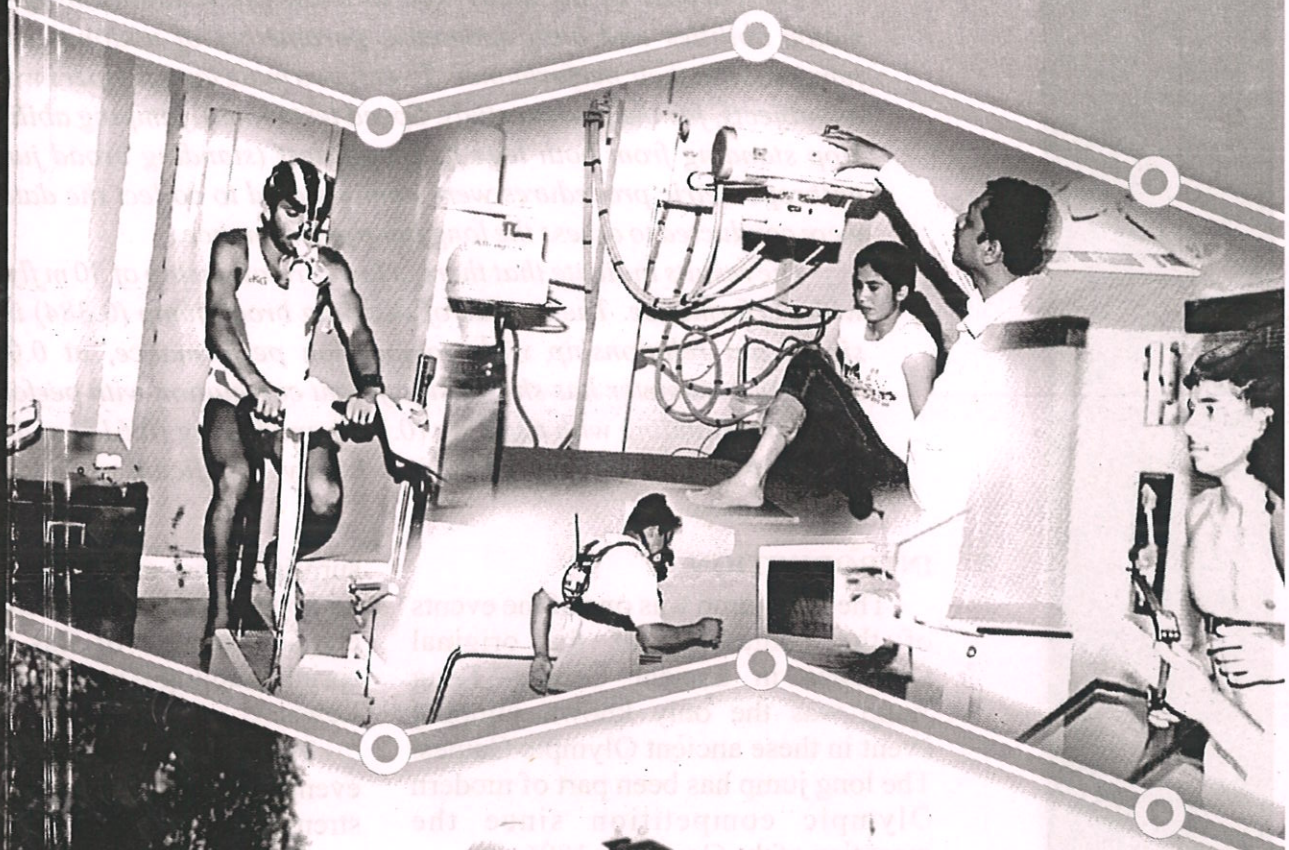
RNI NO. : PUNENG/2012/4

Sports Research

Quarterly

Vol. 4 No.4

October 2015





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Relationship of Selected Motor Abilities and Anthropometric Parameters with Long Jump Performance of National Level Jumpers

Ms. Nilima Deshpande[1], Dr. R. Subramanian[2], Dr. Simarjeet Singh[3]

ABSTRACT

The purpose of the study was to know the relationship of selected motor abilities and anthropometric parameters of national level long jumpers with their performance. Twentytwo male long jumpers were taken as subjects, for the present study. Speed test (30 m), jumping ability tests (Hop standing from both legs),strength test (standing broad jump) and anthropometric procedures were administered to collect the data. Trials were conducted to assess the long jump performance.

The results indicate that there is lower relationship of 30 m fly (0.214) with performance. The r value of standing broad jump (0.384) is having significant relationship with competition performance, at 0.05 level. Strength parameter has shown significant correlation with performance. three hop standing with right leg (0.316) and left leg (0.618) and five hop right leg (0.85I) left leg (0.809) is highly significant with long jump performance.

INTRODUCTION

The long jump was one of the events of the pentathlon of the original Olympics in ancient Greece. Long Jump was the only known jumping event in these ancient Olympic Games. The long jump has been part of modern Olympic competition since the inception of the Games, in 1896.

There are four main components of the long jump, the approach run, the last two strides, take off and action in the air, and landing. Speed in the run-up or approach and a high leap off the board are the fundamentals of success. Because speed is such an important factor of the approach, it is not surprising that many long jumpers also compete successfully in sprints. A classic example of this long jump / sprint doubling is performances by Carl Lewis.

The long jump is a track and field event in which athletes combine speed, strength and agility in an attempt to leap as far from the take-off point as possible.

Pearson (1963) stated that, in long jumping, the athlete should be capable of varying type of moments to the limit of the joints. In a 'Hitch Kick movement', a full range of movement is necessary to affect maximum contrary turning, on the upper part of the body.

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Short hamstring muscles may cause the jumper to drop his leg down earlier than required for a good landing.

According to Bosen (1972) , a successful long jumper requires speed to cover the sufficient distance with controlled speed.

Bosen (1972) reported that this event requires a run up of sufficient length to develop maximum controllable speed, combined with effective sprinting at the take off. Wilt Fred (1972) stated that approach speed the long jumping is important; but, he has also stated that the I00 m sprint time is not comparable with the result of long jumping; because, the long jumper speed requirement is decisive at a distance between 40 m to 50 m. Further, he noted that the higher speed of approach run, which jumper can maintain at the take off without great loss in the momentum, the better will be the resultant conversion of the approach speed at the take off. According to Baursfield and Schroter (1979) the performance in all jump events in track and field is based on explosive strength which is known as jumping strength for the jumpers and is related to reactive strength ability. Doherty (1984) is of the belief that the practice organization for long jump should consider at least five factors, i.e., speed, power, skill, tendon and tissue toughness and speed endurance. Victor Lopez (1989) stated that a potential horizontal jumper must possess "speed" and explosive power, which includes elastic components such as "flexibility" and good co-ordination. Dan Plaff (1996) pointed out that the tests for elastic strength, such as timed hopping over the barriers alternate bounding, provide valid prediction.

According to Bianco (1996), speed is one of the most important physical qualities required for performance in the jumps, especially in the long jumpers.

METHODOLOGY

Twentytwo male long jumpers were taken as subjects for the present study. Out of 22 long jumpers, eleven were national position holders in various national competitions at senior and junior levels and the rest had only participated in the various India competitions. The long jumpers selected for the study were from northern region.

The following test procedures were used for the assessment of anthropometric and fitness variables in the present study.

Anthropometric Measurements

- Height(cm)
- Weight(kg)
- Sitting Height(cm)

Fitness tests

30 m Run from Standing start (seconds)
- Speed

Standing broad jump (meters)
-Explosive strength

3 Hop standing right leg (meters)
-Explosive strength.

3 Hop standing left leg (meters)
-Explosive strength

5 Hop standing right leg (meters)
-Explosive strength

5 Hop standing left leg (meters)
-Explosive strength

Forward Bend and reach (cms)
-Trunk Flexibility

In addition the long jump performance was also recorded.

Mean, SD and correlation of coefficient was calculated to interpret the data.

RESULT& DISCUSSION

The main objective of the present study was to determine the relationship between selected anthropometrical and fitness variables with long jump competition performance. The mean score, standard deviation and correlation (r) values of selected variables and competitive performance are presented in Table 1 to 7.

Table-1 : Mean and SD values of selected variables (n=22)

S. No.	Test	Mean	SD
1	30 M flying (sec)	3.48	0.26
2	Standing broad jump(mts)	3.18	0.25
3	3 Hop standing right leg (mts)	8.36	1.64
4	3Hop standing left leg (mts)	8.78	0.87
5	5 Hop standing right leg (mts)	14.63	1.28
6	5 Hop standing Left leg (mts)	14.46	1.23
7	Flexibility (cm)	21.25	3.47
8	Ht. (cm)	179.9	5.38
9	Body wt. (kg)	74.81	8.84
10	Leg length (cm)	98.80	5.32
11	Performance (mts)	6.866	0.543

The Table 1 is presenting the Mean and SD Values of all selected variables.

The correlation value of height, body weight and leg length presented in Table 2 are 0.148., 0.111 and 0.095, respectively.

The height is a dominating factor to achieve higher competitive performance in long jump (Sodhi, 1981). But, the results of the present study indicate that height, weight and leg length has no relationship with long jump performance. According to Ranawat and Kang (2010), jumpers were found tallest among all athlete groups.

Table-2: Relationship between physical characteristics and long jump Performance (n=22)

Tests	Correction (r)
Ht(cm)	0.148
Body wt (kg)	0.111
Leg lenght(cm)	0.095

From the result presented in Table 3, it has been found that the correlation value of 0.214 is not significant at 0.05 level. Locatelli (1987) stressed that 30m fast runs are a must for all levels of long jumpers. Speed is the most important physical ability, among the other abilities required for jumpers (Schmolinsky, 1983)

Table-3: Relationship between physical characteristics and long jump Performance (n=22)

Tests	Correction
30m flying	-.2144

Significant at 0.05 level (required value = .360)

Table-4: Relationship between physical characteristics and long jump Performance (n=22)

Tests	Correction
Standing broad jump	0.384

Significant at 0.05 level (required value = .360)

The correlation values (r) mentioned in the Table 4 for standing broad jump is 0.384, which shows significant relationship with competitive performance.

The correlation values, presented in Table 5, show that there is a significant relationship between 3 hop standing left leg and competition performance with a value of 0.618 and a non-significant relationship of 3 op standing right leg with competition performance (0.316) . The reason behind left leg hop showing significant relationship may be that the majority of the subjects were left leg dominating jumpers. The mean value of left leg hop is higher than the right leg hop. Straznski (1987) states that the jumping ability plays a major role for performance, a faster, effective take off action.

The correlation values (r) 0.85132 and 0.80968, mentioned in Table 6, show that 5 hop standing right leg and 5 hop standing left is significantly correlated with performance at 0.05 levels, Larkins

p Performance (n=22)

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values (r) 0.85132 ed in Table 6, show ight leg and 5 hop ficantly correlated .05 levels, Larkins

Table-5: Relationship between physical characteristics and long jump Performance (n=22

Tests	Correction
3 Hop standing right leg	0.316
3 Hop standing left leg	0.618

Significant at 0.05 level (required value = .360)

Table-6: Relationship between physical characteristics and long jump Performance (n=22)

Tests	Correction
5 Hop standing right leg	0.85132
5 Hop standing left leg	0.80968

Significant at 0.05 level (required value = .360)

Table-7: Relationship between flexibility characteristics and long jump Performance (n=22)

Tests	Correction
Flexibility	-0.377

Significant at 0.05 level (required value = .360)

(1990) stated that hopping drills, that emphasize horizontal projection, rather than vertical projection, are related to long jump performance.

The reason may be that hop jumps measure the explosiveness of the muscles in horizontal direction, which is considered to be a dominating factor in long jump and pole vault.

The r values of 0.377 presented in Table 7 shows that there is a statistically significant relationship between long jump performance and flexibility in national level jumpers.

The result of trunk flexibility test indicating significant relationship between long jump performance confirms the view of Payne, H. (1981) that flexibility is one of the other motor ability for improving range of moment of joints; thus, improving running or jumping performance in long jump.

CONCLUSION

The following conclusions are warranted from the results of this study.

wing conclusions are warranted from the results of this study.

Old trainees having lower height (1.70-1.75) have shown maximum jumping performance (7.77 mts), while new trainees having maximum height (1.88 – 1.89) has lower jumping performance. So, these results had shown no co-relation between jumping performance in relation to height, leg length.

The variation may be due to having small sample size.

1. There is significant relationship between speed and jumping performance.
2. There is significant relationship between standing jump performance.
3. 3 standing hops on left leg show higher and significant relationship with long jump performance in comparison to right leg hops.
4. 5 hop jumps performance is significantly correlated to the long jumper's performance.

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International Journal of Physiology, Nutrition and Physical Education 2016; 1(1): 60-61

International Journal of Physiology, Nutrition and Physical Education



ISSN: 2156-0005
IJPNPE 2016; 1(1): 60-61
© 2016 IJPESH
www.journalofsports.com
Received: 17-02-2016
Accepted: 19-03-2016

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Effect of plyometric training and circuit training on speed muscular endurance among men volleyball players

Dr. J Anitha

Abstract
The purpose of the study was to find out the effect of plyometric training and circuit training on speed muscular endurance among men volleyball players Twenty four male volleyball players aged between 18 to 25 years were selected randomly. They were divided into two groups (two experimental and one control group) the experimental group I was given plyometric training and experimental group II was given circuit training for six weeks and control group was not allowed to participate in any training programme. The independent variables is plyometric and circuit training dependent variable is speed, muscular endurance. The speed performance tested by twenty meter dash and muscular strength performance tested by bent knee sit ups and the performance recorded in counts. The collected data on speed and muscular endurance were statistically examined to the 't' test. The 't' ratio was the difference between the mean, standard deviation and standard error of the difference between the means. The results of the study reveals that the plyometric training and circuit training had significantly improved the speed and muscular endurance.

Keywords: Plyometric training, circuit training, speed, muscular endurance, 't' ratio

Introduction

Plyometrics

Plyometric is the term now applied to exercise, that have their roots in "Europe" where they were first known simply as "jumping training".

Interest in this jump training increased during the early 1970's as east European athletes emerged as powers on the world sports scene. As the eastern bloc countries began to produce superior athletes in such sports as track and field, gymnastics, and weight lifting, the mystique of their success began to Centre on the training methods. (Donald. A. Chu, 1998) [3].

Importance of Plyometric Training

Plyometric is the name given for a type of exercise that is designed to increase intensity or explosive power in certain muscle groups. This kind of training is used to increase power of a boxer's punch or the force of volleyball and basketball player's jump. Plyometric training is different from traditional strength training exercise because it is performed quickly and explosively. It increase muscle power by capitalizing on lengthening and shortening of the muscle cycles. This kind of training usually starts with a rapid stretch of a muscle or eccentric phase followed by a rapid shortening of the same muscle (or) the concentric phase burpees, clap push-ups, jumping ropes, and jumping jacks are types of plyometric exercise. Several studies suggest that plyometric can greatly improve athletic performance in terms of vertical jumps, long jumps, sprinting, cycling, volleyball, basketball, kick boxing and many more. It is said that even one (or) two types of plyometric training completed one to three times in a week may improve motor performance with in 6 to 12 weeks. In addition to this, 3 sets of plyometric pushups may also increase upper body strength. (Donald. A. Chu, 1998) [3].

Circuit Training

Circuit training was invented in 1953 as effective and efficient way for coaches to train many athletes in a limited amount of time with limited equipment.

The exerciser moved through a series of weight training or calisthenics arranged consequently. It was past paced workout of 15 to 45 seconds per station with little (15 – 30 seconds) rest or no rest between stations.

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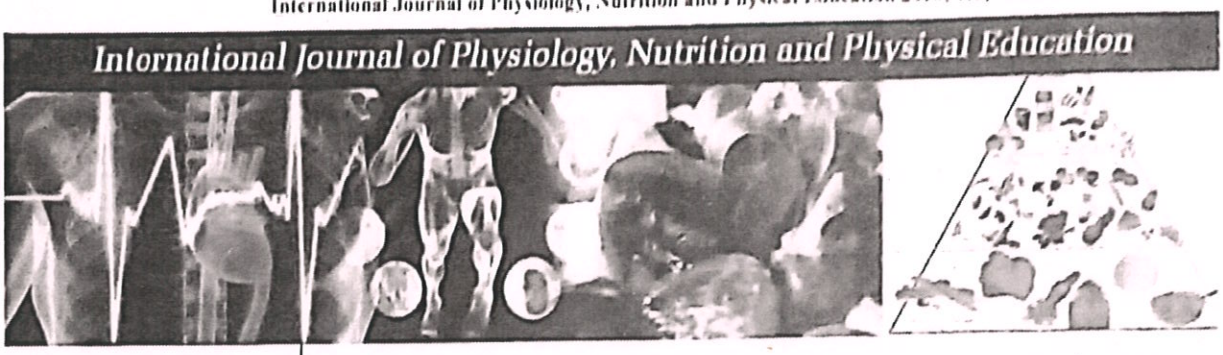
International Journal of Physiology, Nutrition and Physical Education 2016; 1(2): 220-221



ISSN: 2456-0057
IJPNPE 2016; 1(2): 220-221
© 2016 IJPESH
www.journalofsports.com
Received: 11-05-2016
Accepted: 17-06-2016

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Effect of plyometric training and circuit training on vital capacity anaerobic capacity among men volleyball players

Dr. J Anitha

Abstract
The purpose of the study was to find out the effect of plyometric training and circuit training on vital capacity and anaerobic capacity among men volleyball players. Twenty four male volleyball players aged between 18 to 25 years were selected randomly. They were divided into two groups (two experimental and one control group) the experimental group I was given plyometric training and experimental group II was given circuit training for six weeks and control group was not allowed to participate in any training programme. The independent variables is plyometric and circuit training dependent variable is vital capacity and anaerobic capacity. The vital capacity tested by Digital spirometer and anaerobic capacity tested by Margaria kalaman power test and the performance recorded in liters and second. The collected data on vital capacity and anaerobic capacity were statistically examined to the 't' test. The 't' ratio was the difference between the mean, standard deviation and standard error of the differences between the means. The results of the study reveals that the plyometric training and circuit training had significantly improved the vital capacity and anaerobic capacity.

Keywords: Plyometric training, Circuit training, vital capacity, anaerobic capacity, 't' ratio

Introduction
Interest in this jump training increased during the early 1970's as east European athletes emerged as powers on the world sports scene. As the eastern bloc countries began to produce superior athletes in such sports as track and field, gymnastics, and weight lifting, the mystique of their success began to Centre on the training methods. (Donald. A. Chu, 1998).

Circuit Training
Circuit training was invented in 1953 as effective and efficient way for coaches to train many athletes in a limited amount of time with limited equipment. The exerciser moved through a series of weight training or calisthenics arranged consequently. It was past paced workout of 15 to 45 seconds per station with little (15-30 seconds) rest or no rest between stations. Today this is known as "circuit weight training" research has shown that it can increase muscular strength and endurance. There is mild improvement in aerobic stamina but only if the rest periods are kept very short. Another variation is "aerobic circuit training" aerobic station like treadmill, rower or stepper (1 to 5 minute per station) or interspersed with weight training stations. This protocol has been found to increase aerobic stamina and muscular endurance and endurance. (Dabir. R. Qureshi, 2012).

Methodology
The purpose of the study was to find out the effect of plyometric training and circuit training on vital capacity and anaerobic capacity among men volleyball players. To achieve the purpose of the study 24 men volleyball players in the age group 18 to 25 years were selected at random from various engineering college in Chennai, Tamilnadu. Selected subjects were divided in to three groups of experimental I, experimental II and control group. The experimental group I participated combined plyometric training group and experimental group II circuit training group for the training period six weeks three alternate days per week. The control group were maintained their daily routine activities and no special training was given.

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Statistical Techniques

The collected data on speed and muscular endurance were statistically examined to the test. The various hypotheses formulated by the researcher for comparison 't' ratio was used 't' ratio was the difference between the mean, standard deviation and standard error of the difference between the means.

Table 1: Computation of 't' ratio between pre and post test scores of experimental group and control group on vital capacity

Variables	Group Name	Mean		SD		SD Error	DI	't' ratio
		Pre	Post	Pre	Post			
Vital Capacity	Experimental Group	3.75	4.15	0.61	0.42	0.076	11	5.26*
	Control Group	3.72	3.60	0.51	0.41	0.084		1.42

*level of significance was fixed at 0.05 with df 11 table value is 2.20

The table I shows that the mean values of pre-test and post-test of experimental group in vital capacity were 3.75 and 4.15 respectively. The obtained't' ratio was 5.26 since the obtained 't' ratio was greater than the required table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in vital capacity were 3.72 and 3.60 respectively The obtained't' ratio was 1.42 which was lesser than the table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on vital capacity due to combined plyometric and circuit training on male volleyball players.

Table 2: Computation of 't' ratio between pre and post test scores of experimental group and control group on anaerobic capacity

Variables	Group Name	Mean		SD		SD Error	DF	't' ratio
		Pre	Post	Pre	Post			
Anaerobic Capacity	Experimental Group	121.20	134.73	15.40	17.11	0.914	11	14.80*
	Control Group	121.03	119.23	15.41	14.41	0.86		2.08

*level of significance was fixed at 0.05 with df 11 table value is 2.20

The table II shows that the mean values of pre-test and post-test of experimental group in anaerobic capacity were 121.20 and 134.73 respectively. The obtained't' ratio was 14.80 since the obtained 't' ratio was greater than the required table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in anaerobic capacity were 121.03 and 119.23 respectively. The obtained't' ratio was 2.08 which was lesser than the table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on anaerobic capacity due to combined plyometric and circuit training on male volleyball players.

Conclusions

1. It was concluded that there was significant improvement in vital capacity due to plyometric and circuit training on men volleyball players.
2. It was concluded that there was significant improvement in anaerobic capacity due to plyometric and circuit training on men volleyball players.
3. The result of the study reveals that plyometric and circuit training would improve college men volleyball players vital capacity and anaerobic capacity significantly.

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International Journal of Yoga, Physiotherapy and Physical Education
Online ISSN: 2456-5067; Impact Factor: RJIF 5.24
www.sportsjournal.in
Volume 2; Issue 3; May 2017; Page No. 87-88

Effect of plyometric training on selected physical fitness variables among college level volleyball players

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Abstract
This study was designed to investigate the Effect of plyometric training on selected physical fitness variables among college level Volleyball players. To achieve the purpose of the study 30 inter-collegiate male Volleyball players were selected from TNPESU University, Chennai. The subjects was randomly assigned to two equal groups (n=15). Group- I underwent plyometric training (PTG) and Group - II was acted as control group (CG). The plyometric training was given to the experimental group for 3 days per week (Monday, Wednesday and Friday) for the period of twelve weeks. The control group was not given any sort of training except their routine work. A pilot study was conducted to assess the initial capacity of the subjects in order to fix the load. The physical parameters of speed (50 mts dash) and leg explosive power (vertical jump) before and after training period. The data collected from the subjects was statistically analyzed with 't' test to find out significant improvement if any at 0.05 level of confidence. The result of the speed and leg explosive power significant improvement due to influence of plyometric training with the limitations of (diet, climate, life style) status and previous training. The result of the present study coincide findings of the investigation done by different experts in the field of sports sciences. Plyometric training group significantly improved speed, leg explosive power of college level Volleyball players.

Keywords: plyometric training, speed, leg explosive power, volleyball players

Introduction: Plyometric Training

Plyometric (also known as "ploys") is a type of exercise training designed to produce fast, powerful movements, and improve the functions of the nervous system, generally for the purpose of improving performance in sports. Plyometric movements, in which a muscle is loaded and then contracted in rapid sequence, use the strength, elasticity and innervations of muscle and surrounding tissues to 23 jump higher, run faster, throw further, or hit harder, depending on the desired training goal. Plyometric is used to increase the speed or force of muscular contractions, providing explosiveness for a variety of sport-specific activities. Plyometric has been shown across the literature to be beneficial to a variety of athletes. Benefits range from injury prevention, power development and sprint performance amongst others. Plyometric can improve strength in both your upper and lower body. Examples of lower body plyometric are tuck jumps, squat jumps, box jumps and depth jumps. The goal of these jumps is to get higher, utilizing your leg strength to improve the height of your jump.

Volleyball

Volleyball is a dynamic, fast-paced game. The purpose of trength training for volleyball is not to build big muscles, but to develop the physical attributes necessary to improve a player's performance. So strength training is very important to volleyball and should not be developed independently of other abilities such as agility, quickness and endurance. When watching a great volleyball player, the one word that comes to the mind is "quick". Everything the player does is short and quick. There are no long drawn out motions like sprinting in other sports. There is simply a succession of explosive bursts that keep the ball in play and control the flow of the game. The quickness that must be focused on, when training a volleyball player is not only quickness from side to side and front to back, but also quickness from up to down. Unique from other sports, volleyball players must be able to quickly change direction from the upward motion of a vertical jump to the downward motion of a point-saving dig (or vice versa). To play volleyball one has to be good at vertical jump, known as explosive power.

Methodology

The purpose of the study was to find out the effect of plyometric training on selected physical fitness variables among college level volleyball players. To achieve the purpose of the study 30 inter-collegiate men volleyball players from TNPESU University, Chennai. The subjects were randomly assigned in to two equal groups namely, Plyometric training group (PTG) (n=15) and Control group (CG) (n=15). A pilot study was conducted to assess the initial capacity of the subjects in order to fix the load. The respective training was given to the experimental group the 3 days per weeks (alternate days) for the training period of twelve weeks. The control group was not given any sort of training except their routine.

Table 1: Computation of 'T' Ratio on Selected Plyometric training variables of college men volleyball players Speed on Experimental Group and Control Group

Variables	Group Name	Mean		Sd		Sd Error	Df	't' ratio
		Pre	Post	Pre	Post			
Speed	Experimental Group	7.81	7.77	0.04	0.43	0.003	14	13.43*
	Control Group	7.81	7.82	0.41	0.43	0.02		0.48

*level of significance was fixed at 0.05 with df 14 table value is 2.14

The table I shows that the mean values of pre-test and post-test of experimental group in speed were 7.81and 7.77 respectively. The obtained 't' ratio was 13.43 since the obtained 't' ratio was greater than the required table value of 2.14 for significance at 0.05 level of with 14 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in speed were 7.81 and 7.82 respectively. The obtained 't' ratio was 0.48 which was lesser than the table value of 2.14 for significance at 0.05 level of with 14 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on speed due to plyometric training on college level volleyball players.

Table 2: Computation of 'T' Ratio on Selected Plyometric training variables of college men volleyball players. Leg Explosive Power on Experimental Group and Control Group

Variables	Group Name	Mean		Sd		Sd Error	Df	't' ratio
		Pre	Post	Pre	Post			
Leg Explosive Power	Experimental Group	28.60	33.93	2.16	2.68	0.62	14	8.46*
	Control Group	26.73	27.60	3.01	3.06	0.80		1.07

*level of significance was fixed at 0.05 with df 14 table value is 2.14

The table II shows that the mean values of pre-test and post-test of experimental group in leg explosive power were 28.60 and 33.93 respectively. The obtained 't' ratio was 8.46 since the obtained 't' ratio was greater than the required table value of 2.14 for significance at 0.05 level of with 14 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in leg explosive power were 26.73 and 27.60 respectively. The obtained 't' ratio was 1.07 which was lesser than the table value of 2.14 for significance at 0.05 level of with 14 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on leg explosive power due to plyometric training on college level volleyball players.

Conclusions

1. It was concluded that twelve weeks Plyometric training significantly improved the speed, explosive power, of the inter collegiate male Volleyball players.
2. Plyometric training is one among the most appropriate means to bring about the desirable changes over physical variables of Volleyball players. Hence, suggested that coaches and the experts deal with Volleyball players to incorporate. Plyometric training as a component in their training programme.

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2015-16

Asian Journal of Multidisciplinary Research (AJMR) 2015

E-ISSN: 2395-1702 P-ISSN: 2395-0382
Volume 01- Issue 08-, pp-01-06
www.yadavapublication.com

Research Paper

KINEMATIC ANALYSIS OF TAKEOFF VELOCITY STANDING LONG JUMP AMONG COLLEGE MALE STUDENTS

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Abstract

The purpose of the study was to find out the effect of two different initial angles of knee joint and the influence of arm movement in the overall outcome of standing long jump performance among college male students. To achieve the purpose of the study, 15 male college students without any present or previous injuries of knee or lumbar spine were selected from the Chennai district. The subjects were restricted between age group of 18 and 23 years. Each subject was explained about the testing procedure and their consent was obtained. The following variables were selected for this study. Dependent variable was Takeoff velocity. Independent variables were Jump with 45° and restricted Arm Swing (45° & RAS), Jump with 90° and Restricted Arm Swing (90° & RAS), Jump with 45° and Free Arm Swing (45° & FAS) and Jump with 90° and Free Arm Swing (90° & FAS). The kinematics of standing long jump was analyzed and compared between four techniques using Kinovea software. The analysis of variance (ANOVA) test with Scheffe's post –hoc was used to analyze the data statistically and the level of significance was fixed at 0.05.

Keywords: Kinematic Analysis, Takeoff Velocity, Standing Long Jump, College Male Students.

Introduction

The standing long jump is an athletic event that can trace its origins back as far as the Olympic Games of Ancient Greece. Although the standing long jump was discontinued from the Modern Olympic Games after 1912, it remains in common use as a test of explosive leg power. It is used as a physical aptitude test in vocations such as firefighting, law enforcement, and the military, and many sports coaches use it to monitor an athlete's response to a training program. The standing long jump has high correlations with isokinetic measures of leg strength, and it is good predictor of sprint and long jump performance (Wiklander&Lysholm, 1987).One minor limitation in using the standing long jump as a physiological or performance test is that it is a moderately complex movement. To achieve the best possible performance a jumper must execute a coordinated pattern of counter movement, forward rotation of the whole body, and a double-arm swing. The magnitude and sequencing of the movements must ultimately project the jumper's centre of mass at high speed and at an appropriate angle to the horizontal.

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2015-16

Asian Journal of Multidisciplinary Research (AJMR) 2015

E-ISSN: 2395-1702 P-ISSN: 2395-0382
Volume 01- Issue 02-, pp-33-36
www.yadavapublication.com

Research Paper

BALL VELOCITY OF DRAG FLICK IN RELATION TO LEFT KNEE ANGLE AND STICK VELOCITY

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Abstract
The aim of the study was to find out the influence of left knee angle and stick velocity on the ball velocity of drag flick performance in field hockey. For the purpose of hhe study, fifty (N=50) male hockey players were selected from various colleges, universities, clubs, and departments from Tamil Nadu and Karnataka states in India and their age ranged between 18 and 30 years. The Pylon Basler camera and the Canon EOS 5D Mark II camera were used to capture the drag flick performances. A cage with the dimensions of 1.0 x 1.0 m at four control points was used to calibrate the space, in which drag flick was performed. The captured videos of drag flick performances were analyzed by using the Kinovea Software in the computer. The collected data were analyzed to determine if there were any significant relationship between the selected biomechanical variables and the ball velocity in the drag flick technique by using Pearson's product-moment correlation coefficients. The stick velocity had a significant correlation with the ball velocity of drag flick. The left knee angle did not have a significant relationship with the ball velocity but it had a significantly correlated with the stick velocity in the drag flick performance. It is recommended that the drag flicker should give a special concentration to enhance the stick velocity in penalty corner drag flick.

Keywords: Stick Velocity, Left Knee Angle, Drag Flick, Biomechanics and Ball Velocit

Introduction

Hockey is a national game of India. Its status is based on the assumption that it is the most popular game in our country. India has won many laurels and cups at international level matches. The drag-flick is used for shooting at goal with speed and precision (Chivers and Elliott, 1987). The drag-flick is between 1.4 and 2.7 times more efficient than hitting or push-shooting the ball towards the goal when playing a penalty corner (McLaughlin, 1997; Piñeiro et al., 2007; Yusoff et al., 2008). Only a few studies have analyzed the drag-flick. Some of them have provided kinematic information about players from different levels (McLaughlin, 1997; Yusoff et al., 2008; López de Subijana et al., 2010). Biomechanical analysis of the techniques depends on the way in which skills are executed from all parameters of biomechanics (O'Donoghue, 2010). An accurate motor execution of the drag flick techniques is essential to achieve a

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Asian Journal of Multidisciplinary Research (AJMR) 2015

E-ISSN: 2395-1702 P-ISSN: 2395-0382
Volume 01- Issue 05-, pp-39-42
www.yadavapublication.com

Research Paper

IMPACT OF TIME OF STICK CONTACT AND DRAG LENGTH ON BALL VELOCITY OF DRAG FLICK IN FIELD HOCKEY

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Abstract

The purpose of this study was to find out the impact of time of stick contact and Drag Length on ball velocity of drag flick in field hockey. Fifty field hockey players were selected from Tamil Nadu and Karnataka States for this study. The Pylon Basler Gige and Canon EOS 5D Mark I cameras were used to capture the movement of penalty corner drag flick performance. A cage with the dimensions of 1.0 x 1.0 m at four control points was used to calibrate the space. The time of stick contact, drag length and ball velocity variables were measured with KINOVEA software. The collected data were analyzed with Pearson product moment correlation. The drag length had a significant correlation with the ball velocity of drag flick. The time of stick contact did not have a significantly correlated with the ball velocity of drag flick.

Keywords: Biomechanics, Drag Flick, Drag Length, Penalty Corner and Ball Velocity

Introduction

The penalty corner allows a team to gain possession of the ball near goal, and thus carry out a set play attack on goal. In the most simple terms, a player pushes the ball from the baseline to another player standing at the top of the circle who stops it. A third player waiting behind the 'stopper' then hits to the goal (Glencross, 1985; McLaughlin, 1997). The combination of speed, accuracy and evaluation makes the drag flick a very effective goal scoring weapon (McLaughlin, 1997; Yusoff et al. 2008). "The ability to score from penalty corners can be the determining factors for winning a match" (Laird and Sutherland, 2003). The drag flick from the stop was used in 68% and the direct hit was used for 20% of penalty corners. A shot on goal using a drag flick was 2.7 times more likely to result in a goal than a shot with a direct hit (i.e. the ratio 18/68:2/20) (Yusoff, 2008). In Atlanta Olympic Games, 1996, the Netherland team was converted the highest 35% of the goals through the penalty corner, which was the highest by a nation (Bhangu, 1997). In the World Cup Trophy at New Delhi in 2010, the drag flicker of Australia Chris Cirielo's three penalty corner conversions against Netherland in the final was the feature of the contest that saw Australia retains the trophy (Times of India, 2014). The purpose of this study was to find out the impact of stick contact with ball and drag length on drag flick performance in penalty corner.

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2015-16

Asian Journal of Multidisciplinary Research (AJMR) 2015

E-ISSN: 2395-1702 P-ISSN: 2395-0382
Volume 01- Issue 04-, pp-23-26
www.yadavapublication.com

Research Paper

INFLUENCE OF TIME OF APPROACH AND STANCE WIDTH ON DRAG FLICK PERFORMANCE

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Abstract

The purpose of this study was to find out the influence of time of approach and stance width on drag flick performance in penalty corner. The penalty corner is one of the most important game situations in field hockey, with one third of the goals resulting from this tactical situation. The time of approach and stance width variables were categorized as independent variables in this study. The ball velocity of drag flick was considered as dependent variable in this study. The study was formulated as a single group random design from the research design. Fifty field hockey players were selected for this study. Those hockey players were from Tamil Nadu and Karnataka States. The Pylon Basler and Canon EOS 5D Mark II cameras were used to capture the movement of penalty corner drag flick performance cage with the dimensions of 1.0 x 1.0 m at four control points was used to calibrate the space, in which drag flick was performed. The selected biomechanical variables were measured with KINOVEA software. The collected data were analyzed with Pearson product moment correlation. The stance width had a significant correlation with the ball velocity of drag flick but the time of approach did not have a significantly correlated with the ball velocity of drag flick.

Keywords: Biomechanics, Drag Flick, Stance Width, Penalty Corner and Ball Velocity

Introduction

Hockey is a game in which players attempt to score goal by hitting, pushing or flicking the ball with hockey sticks into the opposing team's goal (Miroy, 1986). The penalty corner is one of the most important game situations in field hockey, with one third of the goals resulting from this tactical situation (Laird & Sutherland, 2003; Pinerio, 2008). The penalty corners are extremely important and over the last few years have contributed significantly to the outcome of a match. The innovation of drag flick becomes a vital part of a team's attacking arsenal. It is an impressive technique that makes the game more spectators orientated (Lees, 2002). The average success rate for teams converting penalty corners to goals at the 1994 World Cup in Sydney was 15.2% with the most successful team conversion rate 32%. There were fewer drag flicks taken at goals than direct hits (22% compared to 30%) but the same number of goals (14) was scored for each style (hybrid and Lowest

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2015-16

Asian Journal of Multidisciplinary Research (AJMR) 2015

E-ISSN: 2395-1702 P-ISSN: 2395-0382
Volume 01- Issue 07-, pp-21-24
www.yadavapublication.com

Research Paper

EFFECT OF PRANAYAMA PRACTICE ON PSYCHOLOGICAL VARIABLES AMONG HYPERTENSIVE WOMEN

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Abstract
The purpose of the study was to determine the effect of varied pranayama practice on selected psychological variables among hypertensive women. To achieve the purpose of the study, 30 hypertensive women in SRIRAM HOSPITAL from Rajapalayam were selected. The age group of the women ranged from 30 to 45 years old and they were divided in to two groups, each group consisting of fifteen subjects. Pre test and post test were conducted on both the groups. The training period of experimental group was 6 weeks; the pranayama was given for 5days in a week in the early hours between 6.30 and 7.30 am. The psychological variables selected for this study namely, stress anxiety and aggression evaluated through Girdando's stress scale, SCAT questionnaire and Smith's questionnaire test respectively. The data obtained were analysed by using Analysis of covariance and (ANCOVA) to assess the significance difference between the group, between the pre test and post test, for each of the selected variables. It was concluded that there was significant change on stress, aggression and anxiety as a result of the experimental training.

Introduction

In the modern era, the concept of yoga is not usually given much importance. Yoga is a way of life, a culture and a lifestyle which includes not just techniques and ideas, but also eating and bathing habits, prayer, social interaction and work. The practice of yoga has many benefits. The results of yogic practices have proven benefits in both organic and psychological diseases (Khalsa, 2004). Anxiety is a psychological and physiological state characterized by cognitive, somatic, emotional and behavioural components. These components combine to create an unpleasant feeling that is typically associated with uneasiness, apprehension, fear or worry. The effects of anxiety include palpitations, muscle weakness, fatigue, nausea, chest pain, shortness of breath, or headaches. It may also produce emotional reactions like restlessness, panic and irritability (Hadjistavropoulos, 1998). Yang K (2007) tried to evaluate the effect of forming an integrated yoga module on anxiety. The purpose of the study was to find out and compare the effects of asanas, yoga as an integrated module, on selected psychological variables among women with anxiety problem. An abnormal blood pressure requires confirmation on two subsequent days. An optimal blood pressure

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2015-16

Asian Journal of Applied Research (AJAR) 2015

E-ISSN: 2395-1702 P-ISSN: 2395-0382
Volume 01- Issue 04-, pp-32-36
www.yadavapublication.com

Research Paper Open Access

DIFFERENTIALS OF CADENCE AND GAIT VELOCITY BETWEEN OBESE AND NON-OBESE MEN

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Abstract
The purpose of the study was to find out the differentials of cadence and gait velocity between obese and non obese adult men. For this purpose, adult male were chosen from Transform fitness center located in Alwarpet, Chennai. Ten obese and ten non obese men were selected on the basis of Body Mass Index (BMI) guidelines given by World Health Organization (WHO). Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. Body Mass Index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m^2). The selected dependent variables namely cadence and gait were assessed through video capturing of gait and video analysis through Silicon Coach Software. The descriptive statistics and independent't' test were used to analyze the data. The findings of the study revealed that non-obese men had better cadence and there was no significant differences found on gait velocity between obese men and non obese men.

Keyword: Biomechanical Analysis, Gait, Cadence, Gait Velocity, Obese, Non Obese Men.

Introduction

Walking is a fundamental mode of human locomotion and physical activity, characterized by smooth, regular and repeated movements. The movements involved in walking appear to be relatively simple, yet kinesiological analysis shows them to be extremely complex (Hamilton and Luttgens, 2002). Though walking is performed almost unconsciously and largely automatically, there are several sources of information which help the subject to control walking such as inputs from the visual, vestibular and proprioceptive systems which adequate muscle strength, appropriate neuromuscular timing and free passive joint mobility. In each gait cycle, there are two periods of double support and two periods of single support. The stance phase usually lasts about 60 % of the cycle, the swing phase about 40 %, and each period of double support about 10% (Murray, 1967). The sustained repetition of load cycles in walking make significant demands on the musculoskeletal apparatus

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2015-16

Asian Journal of Applied Research (AJAR) 2015

E-ISSN: 2395-1702 P-ISSN: 2395-0382
Volume 01- Issue 01-, pp-62-65
www.yadavapublication.com

Research Paper Open Access

ANALYSIS OF THROW-IN IN SOCCER

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Abstract

The purpose of the study was to find out the influence of the shoulder strength and leg strength on throw –in performance in soccer with regard to distance and accuracy. The subjects selected for this study was twenty foot ballplayers from Chennai club teams and their age ranged from 18 to 27 years. The randomly selected twenty football players were measured in their throw- in performance and their shoulder strength and leg strength. The throw-in performance was meseared based on distance and accuracy. The players were asked to perform throw-in only with staggered stance. All throws were performed in a legal manner according to the laws of the game established by the world-wide governing body of soccer, the Federation Internationale de' Football Association. The throw –in performance of the subjects was measured through standing throw-in. Three throws were given to the subjects and best of three throws was taken as the final score. Throw-in performance was measured from the throw-in line to the nearest point of the ball landing. The shoulder strength and leg strength were measured through medicine ball throw and standing broad jump test respectively. To examine the relationship between throw-in performance and selected variables, Pearson's correlation co-efficient was used as statistical technique. The level of significance was fixed at 0.05 level. The results of the study revealed that there was a significant correlation between throw-in performance and leg strength and shoulder strength.

Key words: Soccer, Throw-in, Leg strength, Shoulder strength

Introduction

Football is a vigorous, strenuous, competitive game played in a wide open space. It requires both aerobic and anaerobic qualities along with speed, strength, power acceleration and agility (Hughes, 1991). The game football is played for the two halves of forty five minutes in each half. It is called a power game and requires running and body movement in different direction. The game is played mostly with leg and leg movement with various skills like dribbling, kicking, passing, throwing, heading, chipping etcetera (Frost, 1975). Throw-in is a skill and a method of restarting in football match. A throw-in occurs whenever the ball goes out of bounds on the sides of the ground. And statically, a team will have an average of 26 throw-in opportunities during a match. The team makes use of them either to gain possession in player or to create scoring chances. The distance attained in a long soccer throw-in one male soccer player performed maximum-effort throws using

Tamilnadu Physical Education and Sports University Chennai

2015-16

ISSN 0973-1989

Research Bi-Annual For Movement

Volume - 32 Number - 2 April - 2016



Registrar
Tamilnadu Physical Education
and
Sports University
Chennai

Movement Is Living, Learning And Language.

Research Bi-Annual For Movement

Volume 32 **Number - 2** **April-2016**

Collaboration : *National Association of Physical Education & Sports (NAPES)*

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EFFECT OF YOGIC PRACTICES ON SELF CONFIDENCE AMONG HANDBALL PLAYERS

P. Gopinathan
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Abstract

The purpose of the present study was to find out the effect of Yogic practices on self confidence among Handball players. For achieving the purpose of the study total of 30 inter collegiate men Handball players were selected as samples from the Arts and Science College of Chennai city. The age group was in between 18 to 26 years and the selected subjects were divided in to two groups equally with 15 each as control and experimental group. All the selected subjects were represented for their college in the inter-collegiate tournaments and all of them were used to practice volleyball for the duration of two hours in the evening except Sundays and apart from the volleyball practice the experimental group underwent yogic practice in a schedule of weekly three days with one hour session each in the morning. The training period was of six weeks. Analysis of covariance was (ANCOVA) used as a statistical tool to find out the significant differences. The statistical findings of this study revealed that the experimental group underwent the yogic practices significantly improved the self-confidence level.

Key words: Self-confidence, yogic practice

Introduction

Players are facing with many challenges and it includes their physical, technical, tactical and psychological skills. The elite level of sports performance requires complete psychological preparation. The self-confidence is

2015-16

ISSN 2321-6557

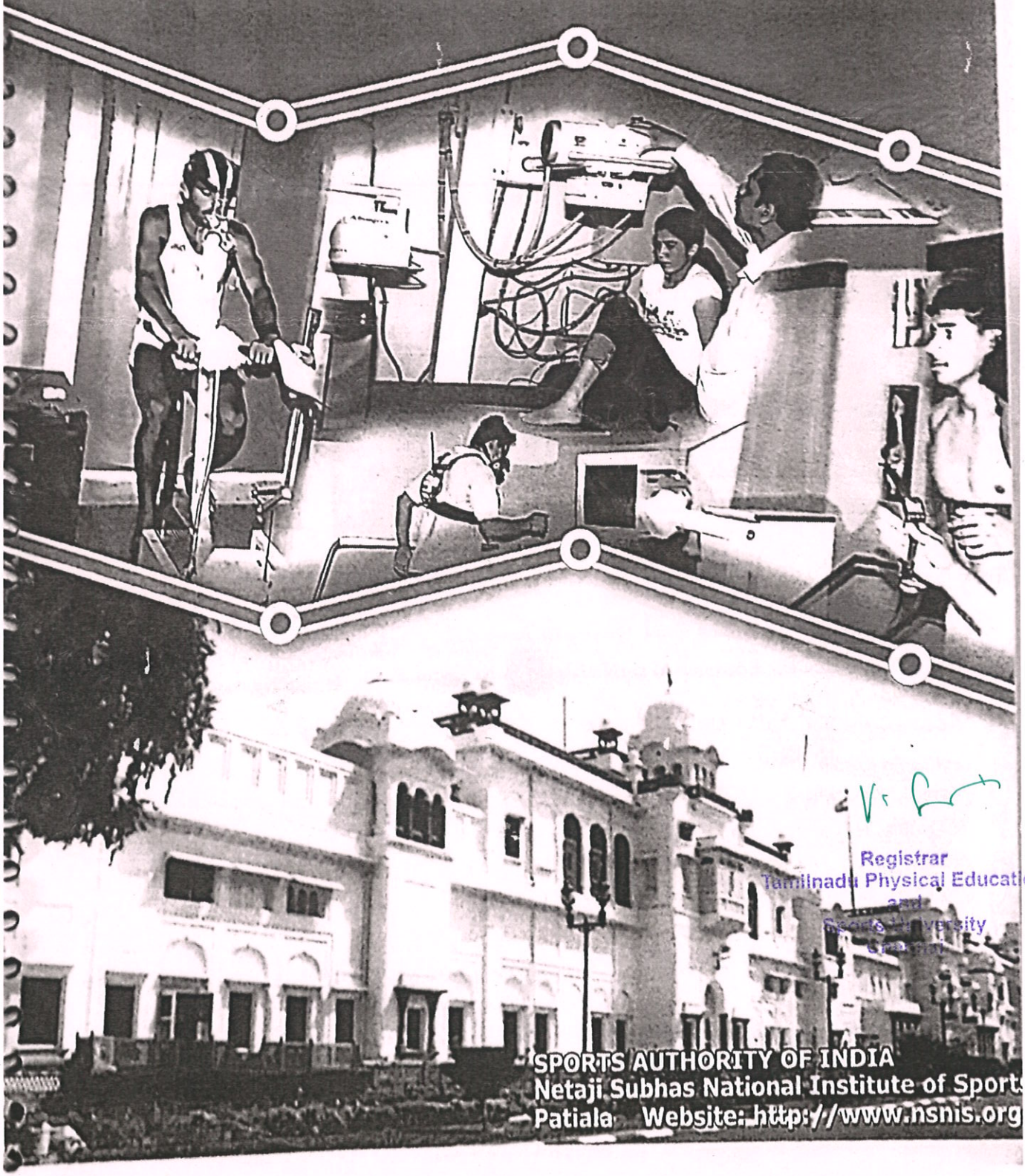
RNI NO. : PUNENG/2012/47863

Sports Research

Quarterly

Vol. 5 No.2

April 2016



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Effect of Yogic Practices with and without Counselling on Self-Confidence and Self-Esteem among Inter-Collegiate Athletes

Dr.K.Gopinathan*

ABSTRACT

The purpose of the present study was to find out the effect of yogic practices with and without counselling on self-confidence and self-esteem among inter collegiate athletes. For achieving the purpose of the study total of 45 subjects were selected as sample from sports academies in Chennai, taking athletic training. Their age group was between 18 to 25 years and the selected subjects were divided in to three group equally with 15 each as experimental group-I with yogic training experimental group-II yogic training with counselling and control group. All the selected subjects were undergraduate and post graduate students studying in Chennai city colleges and they all taken the athletic training both morning and evening in the city based Athletic academy. The experimental group I and II underwent yogic practice for eight weeks in a schedule of weekly three days with forty five minute session each, and in addition the yogic training experimental group-II underwent fifteen minutes psychological counselling after the yogic training. Analysis of covariance (ANCOVA) was used as a statistical tool. The statistical findings of the study revealed that the experimental group which had done the yogic practices with counselling significantly improved the self-confidence and self-esteem qualities than other groups.

KEY WORDS: self-confidence, self-esteem, yogic training and counselling

INTRODUCTION

Athletes are doing different types of training to enhance their performance. New training procedures are coming frequently due to research in training method. It is proven method that yogasanas enhance psychological state; and counseling is a new area where the benefits of counseling are to be found out. Yoga helps psychologically to relax and handle stressful situations more easily. Yoga teaches to have a calm mind and to focus our energy on the particular activity. Yoga brings positive thoughts and self-acceptance. Yoga is a great form of exercise for mind-body that can have physical, mental and emotional benefits. Yoga is also an effective way to develop greater self awareness, acceptance, and the ability to be present in the moment.

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VYAYAM-VIDNYAN
व्यायाम-विज्ञान
Vol 49
No 3
Aug. 2019
SHREE HANUMAN
VYAYAM PRASARAK MANDAL
AMRAVATI - PUBLICATION

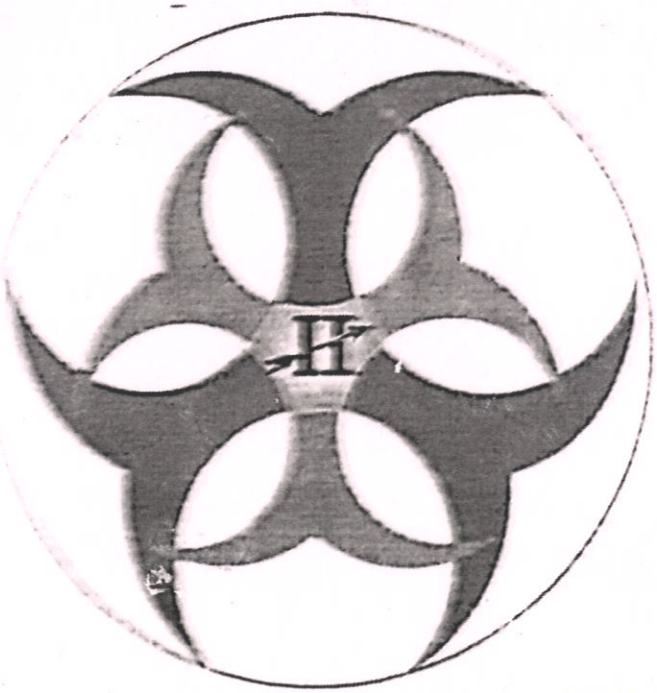
2015-16

(c)

ISSN 0973-1989

Research Bi-Annual For Movement

Volume - 3Z Number - 2 October - 2015



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Tamilnadu Physical Education
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Sports University
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Movement Is Living, Learning And Language.

Research Bi-Annual For Movement

Volume 32 Number - 1 October-2015

Collaboration : National Association of Physical Education & Sports (NAPES)

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EFFECT OF YOGIC PRACTICES ON MENTAL TOUGHNESS AND MENTAL HEALTH AMONG COLLEGE STUDENTS

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Abstract

The purpose of the present study was to find out the effect of Yogic practices on mental toughness and mental health among college men students. For achieving the purpose of the study total of 30 subjects were selected as samples from the Chennai city college students residing in the hostel. Their age group between 18 to 23 years and the selected subjects were divided in to two groups equally with 15 each as control and experimental group. All the selected subjects were under graduate men students studying various courses in an arts and science college. The experimental group underwent yogic practice for eight weeks in a schedule of weekly three days with one hour session each. Analyze of covariance (ANCOVA) variance was used as a statistical tool. The statistical findings of the study revealed that the experimental group done the yogic practices significantly improved the mental toughness and mental health qualities.

Key words: Mental Toughness, Mental Health, Yogic Practice

Introduction

Yoga helps psychologically to relax and handle stressful situations more easily. Yoga teaches to have a calm mind and can focus our energy on the particular activity. Yoga brings positive thoughts and self-acceptance. Yoga is a great form of exercise for mind-body that can have

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Combined Effect of Yogasanas and Relaxation Training on Selected Psychological Variables among Tennis Players

Dr.P.Gopinathan*

ABSTRACT

The purpose of the present study was to find out the combined effect of yoga and relaxation training on selected psychological variables namely stress, mental toughness and sports competition anxiety, among Tennis players. For achieving the purpose of the study total of 30 male Tennis players were selected as samples, from two Tennis academies in Chennai city. Their age ranged between 16 to 22 years and the selected subjects were divided in to two groups, equally, with 15 each as experimental and control group. All the selected subjects were state ranked male Tennis players and all of them were used to practice Tennis for the duration of two hours, every day except Mondays, and apart from the Tennis practice the experimental group underwent yoga and relaxation training for six weeks, in a schedule of weekly three days yogic practices and three days progressive muscle relaxation training, in alternative days, for one hour. To find out significant difference ANCOVA was used as a statistical tool. The statistical findings of the study revealed that there was a significant difference in stress, mental toughness and anxiety due to six weeks combined yoga and relaxation training. Further the mean value of experimental group indicated that there was a higher improvement in mental toughness and decreased in stress and sports competition anxiety than control group.

Key words

yogic practice, progressive muscle relaxation, mental toughness, stress and anxiety

INTRODUCTION

Athletes are facing with many challenges and for facing these challenges they should have strong physical, technical, tactical and psychological skills. To enhance these qualities different types of training Programmes are essential. The elite level of sports, performance requires complete psychological preparation. The athletes become mentally strong to face any challenges on the field. Tennis is a mental game because Tennis players should have strong psychic power to overcome many psychological obstacles during the match. Each day, players work hard to improve these skills by many means and methods. Yoga and relaxation training have become an accepted part of the training regimen, to improve psychic powers as well as physical skills. Yoga is becoming a common part of the preparation and workout routines in all the sports and games. The present study is also with the sole aim to find out the effect of yogic practices combined with deep muscle relaxation on stress, mental toughness and anxiety among Tennis players.

Progressive muscle relaxation are another effective and widely used strategy for stress relief and beneficial to improve many psychological qualities. It involves a two-step process in which you systematically tense and relax different muscle groups in the body. There is a

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Available online at www.ijpcr.com
International Journal of Pharmaceutical and Clinical Research 2016; 8(4): 239-242

ISSN- 0975 1556

Research Article

Association Between Body Mass Index and Bone Mineral Density Among Rural and Urban Post Menopausal Women

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Available Online: 01st April, 2016

ABSTRACT

*Introduction:*Osteoporosis is a growing health problem recognized in both developed and developing countries · The increasing prevalence of osteoporosis will lead to increased socioeconomic burdens because of the high cost of treatment). Weight and, body mass index (BMI) have been recognized as good predictors among the anthropometric parameters, for the evaluation of osteoporosis and osteoporotic fracture risk. Several retrospective and prospective studies also showed relatively consistent association between anthropometric characteristics and bone mass and fractures (Adami S et al 2004.,)[1] Aim: To study the association between body mass index and bone mineral density among rural and urban post menopausal women. Setting and Participants: In this comparative study 500 postmenopausal women in the age group of 45-60 years were randomly selected from rural and urban area (250 in each group) of Tamil Nadu, India. Rural subjects were selected from Somangalam region which is located in Kancheepuram district. Urban subjects were selected from Perambur region, Chennai. The height and weight of all the subjects were recorded and BMI was calculated. BMD was measured in calcaneus (heel bone) using Furuno's CM-200 light ultrasound bone densitometer. Results: The correlations between the variables were calculated by Pearson correlation test. P value < 0.05 was considered significant. Positive correlation was observed between BMI and BMD among urban samples whereas negative correlation was observed between BMI and BMD among rural samples BMI was found to be significantly associated with BMD in both rural and urban postmenopausal women. Conclusions: Body Mass Index (BMI) was found to be significantly associated with BMD. BMI is an important determinant of BMD in Indian females.

Keywords: Bone mineral Density; Body Mass Index, Osteoporosis, Rural and Urban Postmenopausal women

INTRODUCTION

Osteoporosis is a public health problem worldwide and is a common disease in the older population, especially in the postmenopausal women (Srivastava M et al.,2002)[2]. This disease is characterized by low bone mass and destruction of bone tissue, leading to increased fracture risk. Prospective studies by Ravn et al.,1999[3] and Bjarnason and Christiansen.,2000[4] indicates that early postmenopausal women who have low BMI lose more bone compared to those with higher BMI tertiles. Measurement of body mass index is an inexpensive and valuable technique to guide public health policy, clinical decisions, and evaluation of nutritional status (Mahan LK et al.,2012)[5]. Bone mineral density (BMD) test measures the density of minerals present in the bones using a special scan. Quantitative ultrasound (QUS) measurement could be an ideal tool to screen for osteoporosis at the community level (Kim KI et al.,2001)[6]. A study conducted by Iqbal et al.,2005[7] found that low BMI is a good indicator for referral of women less than 60 yr for measurements of BMD.The present study was conducted to assess the association between BMI and status of BMD among rural and urban postmenopausal women.

MATERIALS AND METHODS

Quantitative approach was adopted for this Comparative study.The study was conducted in rural Somangalam village in Kanchipuram district. Somangalam is a Village in Kunnattur Taluk in Kanchipuram District of Tamil Nadu State, India. Around six villages are nearby Somangalam. Urban Perambur is a locality in the northern region of the metropolitan city of Chennai in Tamilnadu state, India. Free medical camps for women where organized in both the areas on Saturdays and Sundays for a period of one month in each area. About 398 women in rural area and 431 women in urban area attended the camp among them 500 postmenopausal women age between 45-60 years where selected from rural and urban area (250 from each group) by random sampling method. The independent variables included rural and urban postmenopausal women, and the dependent variable included height,weight,bone mineral density .Inclusion criteria for the sample selection comprises of postmenopausal women age between 45-60 years. With the brief introduction of the study, informed consent was obtained from all the study participants. BMD was measured in calcaneus (heel bone) using Furuno's CM-200 light ultrasound bone densitometer. A single technician

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Table 1: Correlation Coefficient between Bone mineral density and body mass index among Rural and Urban Postmenopausal Women.

S.no	Correlation between variables		Obtained "r"	Required "r"
1	Urban BMI	Urban BMD	0.076	0.073
2	Rural BMI	Rural BMD	-0.089	0.073

*significant at 0.05 level of confidence.

Table 2: Number and Percentage of Type of Activity Pattern among Rural and Urban Postmenopausal Women (Scores in %)

S. No	Activity pattern	Rural women		Urban women	
		Number	Percentage	Number	Percentage
1	Sedentary	221	88.4	187	74.8
2	Moderate	29	11.6	63	25.2
3	Heavy	-	-	-	-

performed all QUS measurement to minimize subjective error. BMD values were measured in terms of QUS device specific T-score criteria which is similar to WHO's criteria**.** (Kanis JA et al.,1994)[8]. T- score is the number of standard deviation relative to the standard speed of sound (SOS) value of the young age group. • Normal is a T-score of −1.0 or higher • Osteopenia is defined as between −1.0 and −2.5 • Osteoporosis is defined as −2.5 or lower.Weights and heights of patients were measured without shoes in light indoor clothing by the use of well calibrated digital weight and height scale measuring device, BMI was calculated by dividing weight in kilograms by the square of the height in meters as in the equation : weight (kilograms) /height (meters)² (Sahu, m.t. et al 2007)[9] .The standard categorisation of BMI by Centre for disease control indicates less than 18.5 as Underweight, 18.5–24.9 as Normal, 25.0–29.9 as overweight, and 30.0 and above as obese.

Ethical Considerations

Permission to carry out this study was obtained from local authorities of that respective area. With brief introduction of the study, informed consent was obtained from all the study participants.

DATA ANALYSIS

The results of the variables were statistically analysed and compared using percentile and Pearson's Correlation coefficient. Data analysis and results are tabulated below.

RESULTS

Table –I shows the Correlation Coefficient between Bone mineral density and body mass index among Rural and Urban Postmenopausal Women. The above table shows the correlation coefficient ("r") between Bone mineral density(BMD) and Body mass index(BMI) among rural and urban postmenopausal women. The Obtained r value between Bone mineral density and Body mass index among urban subjects was 0.076. This value was higher than the table value of 0.073 at 0.05 level of confidence, hence it was significant. Among rural subjects obtained r value between BMI and BMD was -0.089. This Obtained r value between BMI and BMD value was also higher (without considering – ve sign) than the required r value of 0.073 at 0.05 level of confidence, hence it was also significant. Positive correlation was observed between BMI and BMD among urban postmenopausal women whereas rural subjects showed negative correlation. Table-II shows the Number and Percentage of Type of Activity Pattern among Rural and Urban Postmenopausal Women Among the 250 Rural postmenopausal women 221 (88.4%) were involved in sedentary activity and 29 (11.6%) were involved in moderate activity. In Urban postmenopausal women 187 respondents were involved in sedentary activity which was about 74.8 percent and 63 respondents were involved in moderate activity which was about 25.2 percent. No one was involved in heavy activity in both the groups.

DISCUSSIONS

In various epidemiological and clinical studies, bone quality, bone mineral density (BMD), as well as risk of falling have been associated with lifestyle and anthropometric/demographic characteristics. Studies conducted by Van der Voort et al.,2001[10] illustrates that thinness is related to both osteoporosis and increased fracture risk; hence, low BMI was included in the risk assessment tools for evaluation of osteoporosis and osteoporotic fracture risk as suggested by Eddy et al.,1998[11]and National Osteoporosis Foundation 1998[12] and Black et al. 2001[13]. The results of this study shows the association between Bone mineral density and Body mass index among rural and urban postmenopausal women. There was significant relationship between Bone mineral density and Body mass index among both rural and urban subjects. In several studies it was found that BMD was highly associated with BMI. There was an increase in BMD with an increase in BMI. Overweight may protect women against bone loss after menopause. This protective effect appears to be related to both mechanical support and increased estrogen synthesis in adipose tissue. (Ribot C et al 1994)[14]. The BMI has an effect on BMD and BMI can be protective in bone loss by increasing the BMD. A.Laria et al ., 2015[15] in their study concluded that the BMD seems to have a direct relationship with BMI for every BMI value in post menopausal women .The results of the study is consistent with Naseer J.H.et al ., 2014[16] evaluated the osteoporosis risk factors occurrence and its association with BMD in rural and urban women from the Lublin Region in Poland and found that BMI have a strong

positive association with BMD (g/cm2). The findings of this study goes in congruence with study of Biplob Chowdhury et al., 2014[17].They investigated the associations between body weight, BMI, BMD and subsequent fracture risks in postmenopausal women aged 45 to 85 years and concluded that low BMI confers a risk of substantial importance for all fractures that is largely independent of age and sex, but dependent on BMD. The significance of BMI as a risk factor varies according to the level of BMI. Its validation on an international basis permits the use of this risk factor in case-finding strategies. Several studies in the UAE, India, Japan, Netherlands, the US and Morocco (Mehrdad Aghaei et al.,2013)[18] have considered a positive correlation between BMI and bone mineral density. In this present study Positive correlation was observed between BMI and BMD among urban postmenopausal women whereas rural subjects showed negative correlation. The reason for negative correlation in rural subjects may be because of sedentary activity pattern as shown in table2 in which the number of sedentary subjects where greater in rural population than urban subjects. Physical activity has been proved to have a protective effect on BMD in epidemiological surveys (Filip RS et al 2005)[19],.The findings of the study is consistent with Pongchaiyakul C et al 2005[20],study comparing bone mineral density (BMD) between rural and urban populations in Thailand, femoral neck BMD was found to be higher in males and females living in rural areas compared with urban dwellers from Bangkok, while little difference was observed at the lumbar spine Previous studies also reported that individuals with low physical activity were susceptible to bone disorders including bone loss or osteoporotic fracture (Morin S et al.,2009)[21]. Study by Filip RS et al 2005 also concluded that Body Mass Index (BMI) was found to have strong positive association with BMD.

SUMMARY AND CONCLUSION

This Comparative study between body mass index and bone mineral density among rural and urban post menopausal women indicated Positive correlation between BMI and BMD among urban samples whereas negative correlation was observed between BMI and BMD among rural samples BMI was found to be significantly associated with BMD in both rural and urban postmenopausal women. It was concluded that BMD was influenced by BMI. The quality of life will be better in urban than the rural post menopausal women. The body mass index will be lower in rural than in urban postmenopausal women due to level of activities and nutritional habits (Kaur R et al.,2015)[22]BMI is an important predictors of BMD, affecting bone loss. Therefore, it is recommended to assess BMD and BMI with a larger number of patients.

ACKNOWLEDGEMENT

I would like to thank the paramedical staffs and trained assistants for their help. Sincere gratitude to all the subjects for their participation and co-operation.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare

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2016-17

PSY 3.4.5-J-PSY-2016-17

INDIAN STREAMS RESEARCH JOURNAL
International Recognition Multidisciplinary Research Journal
Volume - 6 | Issue - 11 | December - 2016
4.1625(UIF) 2250-7850

STUDY ON SELECTED LIFE SKILLS TRAINING ON CHENNAI TENNIS PLAYERS



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Indian Streams Research Journal

ISSN: 2230-7850 Impact Factor : 4.1625(UIF) Volume - 6 | Issue - 11 | December - 2016

STUDY ON SELECTED LIFE SKILLS TRAINING ON CHENNAI TENNIS PLAYERS

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ABSTRACT

The present study was to find out selected Life Skills Training among Tennis players. 60 Tennis players age ranging between 14 and 22 years were selected, out of which 30 were in experimental group and the rest 30 were in controlled group. For this study, Manual for Life Skills Assessment Scale was used. By Rathakrishnan Nair. A, Subasree. R and SunithaRajan. The statistical treatment t ratio was used for analyzing the data. The study indicates four weeks of specific life skills training increases Decision Making, Problem Solving, Creativity, Self Awareness and Coping with Emotion. In the same way it is evident from the result the training got positive effects. So it can be concluded that specific life skills training increases the life skills.



KEYWORDS: *Life skills, tennis, Decision Making, Problem Solving, Creativity, Self Awareness and Coping with Emotion.*

INTRODUCTION:

Life skills refers to a positive behavior, that encompasses a mix of knowledge, behavior, attitudes and values and designates the possession of certain skills and know how to do something positively, or reach a goal. The strength of the positive behavior depends on the depth of the skills acquired by the individual. Life skills are developed as a result of a constructive processing of information, impression, encounters and experiences, - both individual and social – that are a part of one's daily life and work and the rapid changes that occur in the course of one's life. Life skills are essentially those abilities that help promoting mental well being and competence in young people as they face the realities of life.

METHODOLOGY

A sample of 60 Chennai tennis players comprising of Experimental group and control group, 30 players in each group, belonging to the age of 14 to 22 years were distributed randomly. Experimental group underwent selected life skills training for 4 weeks in Self Awareness, Creative Thinking, Decision Making, Coping with Emotion and Problem solving. 12 sessions training 45 Minutes per session and weekly 3 sessions on alternate days and selected life skills, were trained with related minor games and on court situation of life skills. And no training was given for control group. Manual for Life Skills Assessment Scale by Rathakrishnan Nair. A, Subasree. R and SunithaRajan, was used. The data were collected on selected criterion variables before and after the four weeks of specific life skills training Pre test and Post test data were statistically tested using t ratio to find out significant difference if any between the experimental and control group.

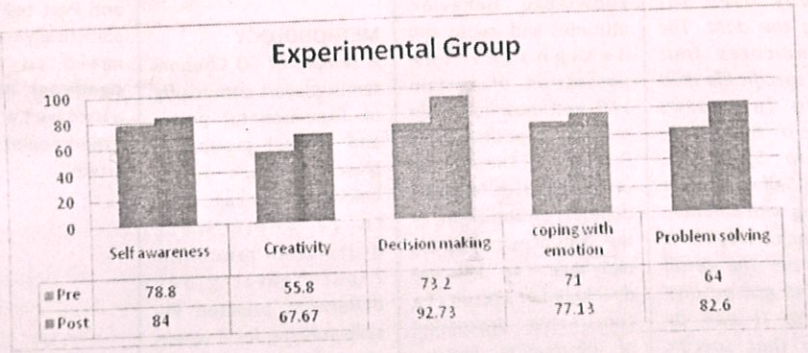
Result and Discussion

Experimental Group

Variable	TEST	Mean	STD Deviation	DF	t ratio
Self Awareness	Pre Test	78.80	7.84	59	3.81
	Post Test	84.00	8.23		
Creativity	Pre Test	55.80	2.11	59	8.70
	Post Test	67.67	3.58		
Decision Making	Pre Test	73.20	5.59	59	14.32
	Post Test	92.73	7.63		
Coping with Emotion	Pre Test	71.00	4.90	59	4.50
	Post Test	77.13	7.84		
Problem Solving	Pre Test	64.00	6.50	59	13.63
	Post Test	82.60	8.36		

Control Group

Variable	TEST	Mean	STD Deviation	DF	t ratio
Self Awareness	Pre Test	76.00	5.40	59	1.37
	Post Test	74.13	6.36		
Creativity	Pre Test	60.00	5.27	59	0.05
	Post Test	59.93	5.15		
Decision Making	Pre Test	69.60	5.98	59	1.81
	Post Test	67.13	6.52		
Coping with Emotion	Pre Test	66.20	5.29	59	1.76
	Post Test	63.80	5.64		
Problem Solving	Pre Test	64.40	6.46	59	1.76
	Post Test	62.00	6.60		



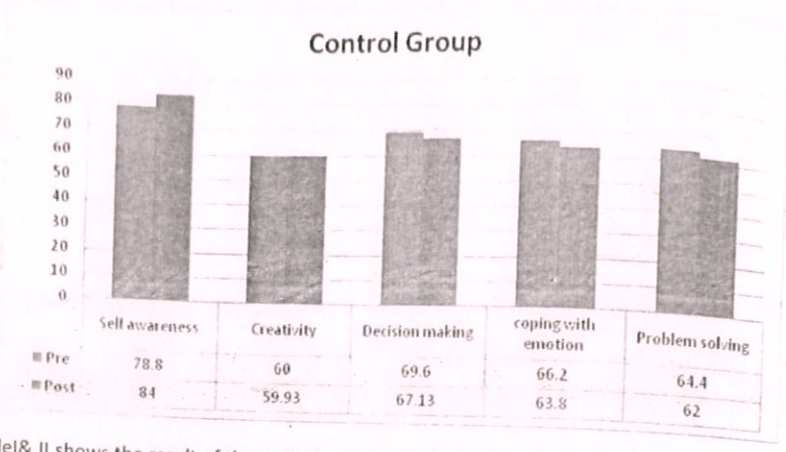


Table I & II shows the result of the study that there was a significant difference between experimental and control group on selected life skills. On comparing the t ratio between experimental group and control group, it was found that the tennis players of experiment group had better skills in: Decision Making, Problem Solving, Creativity, Coping with Emotion and Self Awareness with scores as 14.32, 13.03, 8.70, 4.50 and 3.81 respectively, due to four weeks of specific life skill training program. Decision making improved by the training like where to place the ball in a critical situation was trained by choosing the greater percentage winner shots so it helped them to decide better. Problem solving improved by the training like how to solve the problem on court by various problem situations was given and trained. Creative thinking improved by how creative to select the shot, how to surprise the opponent was trained. Self-awareness training given to understand the strength and weakness it helped them to understand better. There is no much difference in coping with emotion training it may be due to lack of match exposure and set practice it might be improved by experience.

CONCLUSIONS:

1.There was a significant difference between experimental and control group on selected specific life skills training group.

2.There was a significant improvement in the Decision making, Problem Solving, Creative Thinking, Self Awareness and Coping with Emotion. However this improvement was in favor of experimental group due to 4 weeks selected specific life skills training program.

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PSY

3.4.5-J-PSY-2016-17

Vol. 2, Issue III. (UGC Approved) June 2017

Research Inspiration

An International Multidisciplinary e- Journal

ISSN: 2455-443X

ISSN 2455-443X

Impact Factor: 4.012(IIJIF)

e-ISJN: A4372-3069



Vol.2 Issue III, June-2017

Opened Access & Peer Reviewed e-Journal

(UGC Approved)

Indexing:

Editor-in-chief

Raj Kumar Verma

Research Inspiration: An International Multidisciplinary e journal

JMS Institute of law 52, Mayur Market Above Dr. Ambedkar Bank, Thatipur Morar Gwalior, M.P. India Pin 474011

Mob. +91 9755599942, 07514066000 Web: www.researchinspiration.com

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Research Ambition ISSN: 2456-0146
An International Multidisciplinary e-Journal
(Peer Reviewed, Open Access & Indexed)
Web: www.researchambition.com, Email: publish2017@gmail.com
Vol. 2, Issue-I
May 2017
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Research Ambition
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(Peer Reviewed, Open Access & Indexed)
Web: www.researchambition.com, Email: publish2017@gmail.com
Impact Factor: 3.071 (IIJIF) The UGC-Approved Journal S.No. 2750
ISSN: 2456-0146
Vol. 2, Issue-I
Mav 2017
e-ISJN: A4372-3068

EFFECT OF PSYCHO-REGULATIVE TRAINING ON ANXIETY AMONG HOCKEY PLAYERS

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ABSTRACT:

The twenty first century is a revolt against the traditional practices prevalent in the past. To keep pace with the fast and vast changes that are taking place in the various disciplines, there is a tremendous demand and responsibility cast on the training system to meet the challenges of preparing men and women to achieve tasks with success and excellence. Sport is no exception to this and so emphasis is placed on psychological aspects of a player to attain success (Mohan etal 1986). A sample of 90 Men Hockey Players were included in the study. They were randomly assigned to two Experimental Groups and Control Group, and so each of these 3 groups had 30 subjects. All the subjects had represented national and University and their age ranged between 18 and 25 years. They were administered Sports Performance Anxiety by Ahmed Shahin and Swaminathan V.D. Results showed that Autogenic training proved to be more beneficial than the Yogasanas in improving the Sports Performance Anxiety.

Key Words: Psycho regulation, Anxeity, Autogenic Training.

The twenty first century is a revolt against the traditional practices prevalent in the past. To keep pace with the fast and vast changes that are taking place in the various disciplines, there is a tremendous demand and responsibility cast on the training system to meet the challenges of preparing men and women to achieve tasks with success and excellence. Sport is no exception to this and so emphasis is placed on psychological aspects of a player to attain success (Mohan etal 1986). The application of psychological principles in the improvement of performance in sports has received greater attention in these days. There are certain accepted psychological principles which have to be applied, so that the athletes and players are able to show their best in their performances. Sports

Research Ambition ISSN: 2456-0146
An International Multidisciplinary e-Journal
(Peer Reviewed, Open Access & Indexed)
Web: www.researchambition.com, Email: publish2017@gmail.com
Vol. 2, Issue-I
May 2017
Impact Factor: 3.071 (IIJIF) The UGC-Approved Journal S.No. 2750 e-ISJN: A4372-3068

Training improves sports performance as any other types of human performance, which is not the product of one single system or aspect of human personality, on the contrary, it is the product of total personality of sports person. Researchers found that several methods of psychological preparations and regulations are programmed by Coaches, Sports Administrators, Physical Educationists etc., These Psycho-regulative programs includes Yogasanas, Autogenic Training, Relaxation Training, Mental Health etc., Hockey being a national game and also the researcher has a keen interest on the psychological pathways of players going through a regular course of training.

In recent years, due to ever increasing competitiveness and due to lacuna in training the players on psycho-regulative parameters, the players are not able to cope up with the demanding situations. As a result they are under stimulated or over stimulated which finally leads to decline in performance. In order to improve upon the performances we need to train athletes on their mental aspects, so the investigator selected Yogasanas and Autogenic training as a module to find the impact on the anxiety of the players. Asanas: Yogasanas are simple actions for keeping internal and external parts of the body in good health. Asanas makes your body supple and brings alertness to your mind, while soothing your nerves and glands relaxing your brain and maintaining physical, physiological and emotional balance. Autogenic Training: It is also one of the technique to produce best performance. This relaxation technique by Schultz, helps to gain control over the involuntary nervous system by maintaining homeostatic self-regulation.

Objectives:

i} To ascertain the effect of Yogasanas on Sports Performance Anxiety among Men Hockey Plalyers.

ii} To ascertain the effect of Autogenic training on Sports Performance Anxiety among Men Hockey Players.

Hypothesis:

i} Yogasanas would significantly reduce the Sports Performance Anxiety among Men Hockey Players.

ii} Autogenic Training would significantly reduce the Sports Performance Anxiety among Men Hockey Players.

Research Ambition
An International Multidisciplinary e-Journal
(Peer Reviewed, Open Access & Indexed)
Web: www.researchambition.com, Email: publish2017@gmail.com
Impact Factor: 3.071 (IIJIF) The UGC-Approved Journal S.No. 2750
ISSN: 2456-0146
Vol. 2, Issue-I
May 2017
e-ISJN: A4372-3068

Methodology: A sample of 90 Men Hockey Players were included in the study. They were randomly assigned to two Experimental Groups and Control Group, and so each of these 3 groups had 30 subjects. All the subjects had represented national and University and their age ranged between 18 and 25 years. All the players had playing experience between 8 and 10 years and their practice hours for competitions ranged from 18 to 21 hours per week.

Assessment Method: Sports Performance Anxiety Scale was developed by Ahmed, Shahin and Swaminathan, V.D (1990).

Training Tools: The players numbering 30 in Experimental Group I (Yogasanas) were taught and made to practice the basic 5 Yogasanas for 2 hours in the morning and evening with 5 minutes warming up and stretching, 50 minutes Asanas and 5 minutes relaxation. The players in the Experimental Group II (Autogenic Training) were taught and given practical sessions for the duration of 20-30 minutes everyday for 8 weeks. The players were checked everyday by their coaches and the investigator.

Summary of scores obtained on SPAS among three groups during Pre-test and Post- test

Tests	Mean Exp.Group I (Yogasana)	Mean Exp. Group II (Autogenic)	Mean Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtain edf
Pre- test	67.7	66.27	67.17	Between	31.49	2	15.744	0.38
				Within	3596.33	87	41.34	
Post-test	64.16667	61.80	68.87	Between	776.29	2	388.14	10.86
				Within	3108.43	87	35.73	
Adjusted	63.67	62.39	68.77	Between	683.28	2	341.64	29.16
				Within	1007.483	86	11.71	
Mean gain	3.533333	4.47	-1.70					

Research Ambition ISSN: 2456-0146
An International Multidisciplinary e-Journal
(Peer Reviewed, Open Access & Indexed)
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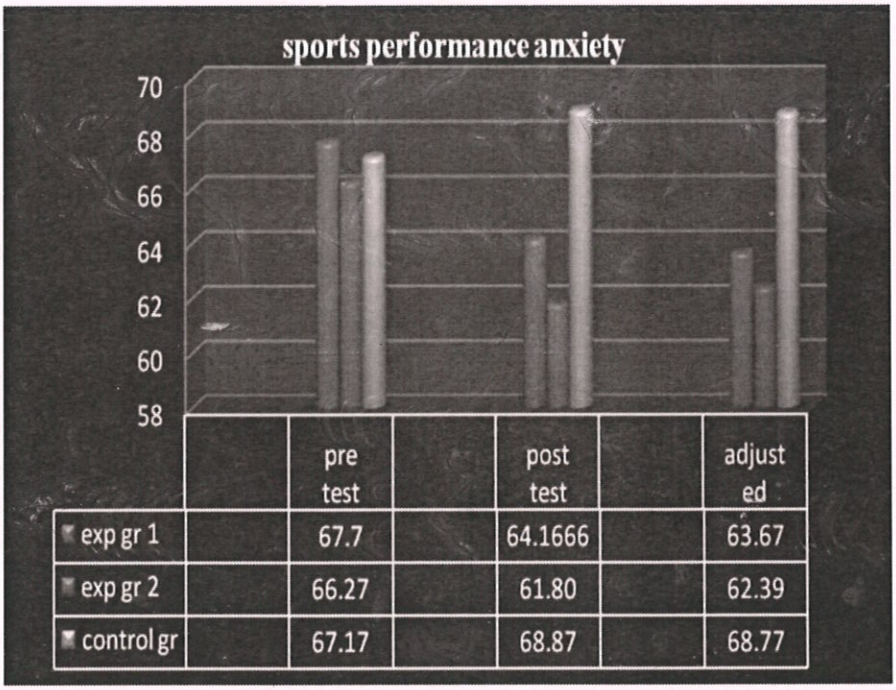
Vol. 2, Issue-I
Mav 2017
Impact Factor: 3.071 (IIJIF) The UGC-Approved Journal S.No. 2750 e-ISJN: A4372-3068

Table II shows Scheffe's Confidence Interval Test Scores on SPAS

Means			Mean Difference	Required C.I.
Exp. Group I (Yogasanas)	Exp. Group II (Autogenic)	Control Group		
63.67	-	68.77	5.11	2.20
-	62.39	68.77	6.38	2.20
63.67	62.39	-	1.27	2.20



3.4.5-J-PSY - 2016-17

Research Ambition ISSN: 2456-0146
An International Multidisciplinary e-Journal
(Peer Reviewed, Open Access & Indexed)
Web: www.researchambition.com, Email: publish2017@gmail.com
Vol. 2, Issue-I
May 2017
Impact Factor: 3.071 (IIJIF) The UGC-Approved Journal S.No. 2750 e-ISJN: A4372-3068

Table I shows that there was no significant difference between the groups (Experimentl I, II and Control) at baselevel indicating that the three groups were evenly matched on all aspects before training. Experimental Group who underwent Yogasanas training showed significant improvement, thereby accepting the first hypothesis. This has proved that through Yogasanas, the body becomes strong and healthy and the whole body is purified and the mind improves in ability to concentrate. Experimental Group II who did autogenic training showed significant gain after 8 weeks. Thus, the second hypothesis is accepted. This shows that through psycho-regulatory training, the mind is controlled to maintain the equilibrium of psycho-physical reactions through thought.

There was no absolute improvement in the Control Group and this shows that if the players in the Group too had undergone any of these training, they would have shown some improvement.

Table II shows that there was significant difference between the Experimental Group I

(Yogasanas) and Control Group and marked significant difference was also shown between Experimental Group I and Control Group on Sports Performance Anxiety. Further, it could also be seen that Experimental Group II had significant gain that Experimental Group I, thereby showing that all other things being equal in two opponent in sports, the one with better Psychological Training or Mental Conditioning will always have an upper edge over the other (Kamlesh, 2011).

The adjusted mean values on Experimental Group I, II and Control Groups on Sports Performance Anxiety were presented through a bar diagram in Fig, 1 for better understanding of the results.

Conclusions:

Psycho-regulative training such as Yogasanas and Autogenic training had a significant impact on the improvement of Sports Performance Anxiety. It is also seen that Autogenic training proved to be more beneficial than the Yogasanas in improving the Sports Performance Anxiety.

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e-ISJN: A4372-3069 (UGC Approved) ISSN: 2455-443X

Research Inspiration

An International Multidisciplinary e-Journal

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Vol. 2, Issue-III
June 2017

Impact Factor : 4.012 (IIJIF)

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e-ISJN: A4372-3069 (UGC Approved) ISSN: 2455-443X
Research Inspiration
An International Multidisciplinary e-Journal
(Peer Reviewed, Open Access & Indexed)
www.researchinspiration.com
Email: researchinspiration.com@gmail.com, publish1257@gmail.com
Vol. 2, Issue-III
June 2017
Impact Factor : 4.012 (IIJIF)

A STUDY ON MENTAL TOUGHNESS AMONG HOCKEY PLAYERS OF THIRUVALLUR DISTRICT (AVADI TOWN)

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Abstract

The present study was to find out the mental toughness of Men Hockey Players in Thiruvallur district (Avadi town). The sample consisted of 100 men hockey players which comprised of 50 players who had represented at inter college level (Group I) and the other 50 were working class who had represented district levels from various clubs and associations (Group II).. The age of the subjects ranged between 18 to 35 years. Independent randomized research design was used for this study as the subjects were selected randomly from Thiruvallur distrtict. Two independent groups college and non college hockey players, Mental Toughness by Lochr et al. (1992) questionnaire was administrated to ascertain the mental toughness. The collected data were subjected to statistical treatment to find out any difference between the groups in the depended variable selected using independent 't' test. The result showed that the players who had and Non College Hockey Players do not differ significantly on Mental Toughness.

Key words: *Mental toughness, Hockey players.*

Introduction

At the elite level preparation for winning field hockey focuses on the physical aspects of the game. Drills are designed to improve conditioning and physical skills like stick handling, passing, shooting and marking the opposition. Mental skills like focus, mental toughness and emotional control are relatively neglected. When people do get around to talking about the mental game it is

e-ISJN: A4372-3069 (UGC Approved) ISSN: 2455-443X
Research Inspiration
An International Multidisciplinary e-Journal
(Peer Reviewed, Open Access & Indexed)
www.researchinspiration.com
Email: researchinspiration.com@gmail.com, publish1257@gmail.com
Vol. 2, Issue-III
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Impact Factor : 4.012 (IIJIF)

usually in terms of qualities like pride, character, and confidence, with little awareness of what they can actually do to develop these qualities.

Mental Toughness

It is a physiological edge that enables you to be consistent, confident, focused and determined during high pressure situation in order to perform at maximum potential. An individual with mental toughness can be quite well mannered, ethical, friendly, helpful, affable and warm. The quality of mental toughness means that an individual has the ability to master the naturally unmanageable desire of the body and mind and bring them under a single line to achieve and sustain demanding goals and performance under pressure. Mental toughness is the ability to preserve in pursuit of a goal, no matter how long it takes or how much pain is involved. It is the willpower needed to complete the mission regardless of obstacles.

Connaughton, Declain et. Al.(2010) studied that the eleven super elite participant s (7 performers, 2 coaches and 2 sport psychologist0 were interviewed regarding the development and maintenance of mental toughness .Findings revealed that this processes occurred over four distinct career phases; three developmental phase and maintenance phase. Factor influencing development and maintenance included: skill mastery, competitiveness, successes, international competitive experience, education and advice, the use of physiological skills, access to an understanding social support network, and reflective practice. In addition, positive and negative critical incidents were perceived by participants to act as catalysts in initiating or enhancing specific components of mental toughness. Practical implications highlight the importance of a mental toughness attitude/mindset to development, while future directions are discussed in relation to measurement and intervention strategies.

Objective:

To ascertain whether there is any significant difference on Mental Toughness between Hockey Players (Men) who had represented inter college level (Group I) and the other 50 who had represented district levels from various clubs and associations (Group II).

e-ISJN: A4372-3069 (UGC Approved) ISSN: 2455-443X
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An International Multidisciplinary e-Journal
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Vol. 2, Issue-III
June 2017
Impact Factor : 4.012 (IIJIF)

Hypothesis:

There will be significant difference on Mental Toughness between Hockey Players (Men) who had represented inter college level (Group I) and the other 50 who had represented district levels from various clubs and associations (Group II).

Methodology

To facilitate the study 100 Men Hockey Players from Thiruvalluvar District specifically from Avadi Town were selected comprising of 50 players who had represented at inter-college and district levels (Group I) and the other 50 Hockey Players were working class who had represented district levels from various clubs and associations (Group II). Their age ranged between 18 and 35 years. Mental Toughness was selected as the Dependent Variable (Psychological Variable).Independent randomized research design was used for this study. Mental Toughness by Lochr et al. (1992) questionnaire was administrated to ascertain their Mental Toughness. The collected data were subjected to statistical treatment to find out any difference between the groups in the depended variable selected using independent 't' test

Table –I

Shows the Mean, Standard Deviation, t-value, Level of Significance among inter -college and clubs and associations Men Hockey Players on Mental Toughness

Variable	Group	No of Subjects	Mean	SD	t-value
Mental Toughness	Group I	50	24.30	3.60	4.06*
	Group II	50	28.75	2.93	

Significance at 0.05 level, t (0.5) 98 = 1.98

Table I revealed that the mean mental toughness of Hockey players (Men) who had represented district and College levels and other Hockey Players (Men) who had represented from different clubs and associations were 24.30 and 28.75 respectively. The standard deviation of district

e-ISJN: A4372-3069 (UGC Approved) ISSN: 2455-443X
Research Inspiration
An International Multidisciplinary e-Journal
(Peer Reviewed, Open Access & Indexed)
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Email: researchinspiration.com@gmail.com, publish1257@gmail.com
Vol. 2, Issue-III
June 2017
Impact Factor : 4.012 (IIJIF)

and College levels and other Hockey Players (Men) who had represented from different clubs and associations in mental toughness were 3.60 and 2.93 respectively. The obtained 't' ratio in flexibility was 4.06. Since the obtained 't' ratio value of 4.16 was greater than the required table value of 1.98 at 0.05 level of confidence with 98 degree of freedom. It was found to be statistically significant.

Conclusion

The result of the study showed that the there was a significant difference in mental toughness between Hockey players (Men) who had represented district and inter -college levels and other Hockey Players (Men) who had represented from different clubs and associations

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3.4.5-J- ST- 2016-17

International Journal of ChemTech Research
CODEN (USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555
Vol.10 No.6, pp 367-372, 2017

Tribological properties of micro and nano SiC reinforced Aluminium metal matrix composites

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Abstract : Metal matrix composites (MMCs) have a prospective for improved wear resistance over the unreinforced alloy and are the most capable in achieving enhanced mechanical properties. In this research, composites of Al 6061- micro SiC (5, 10 and 15 wt.%) and Al 6061- nano SiC (0.5, 1.0 and 1.5 wt.%) were produced by stir casting technique. Hardness and wear tests were performed on the micro and nano composite specimens. The fabricated nano composites showed improvement in hardness and wear resistance over the micro composites. The microstructure of the worn out specimen was examined by scanning electron microscope. Considering all the factors, it can be concluded that aluminium based composite with 1.0% by weight nano SiC reinforcement possess better wear resistance properties as compared to micro SiC reinforced aluminium metal matrix composites.

Keywords : Metal matrix composites, Silicon carbide, Wear test, Stir casting, Hardness.

1. Introduction

Metal matrix composites have a possible for increased wear resistance over the unreinforced alloy and are the foremost promising in achieving increased mechanical properties [1]. Among different composites, metal matrix composite are promising new materials for recent engineering application having high specific strength, stiffness and their high temperature stability and widely used in aerospace and automotive industries. Aluminium is the most popular matrix for the MMC's and the aluminium alloys are quite attractive due to their low density, low cost, its capability to strengthen by precipitation, good corrosion resistance, high electrical and thermal conductivity and improved tribological properties [2,3]. The mechanical property results of micro and nano composites led in to improvement of yield strength, ultimate tensile strength, compressive strength and hardness. The fabrication process such as compocasting and the size of the reinforcement particles were the effective factors influencing on the mechanical properties [4]. Uniform dispersion of reinforcement particulates with aluminium matrix material is a greatest drawback in producing metal matrix composites. It is revealed by microscopic observation for A356 with nano SiC particulates also the highest yield strength, ultimate tensile strength and hardness are obtained [5,6].

Wear rate of SiC reinforced composite specimen reduces with the increase in reinforcement content in the dry sliding wear tests. Also wear rate decreases as the sliding speed increases up to transition speed and load due to work hardening of the surface, formation of iron-oxide and crushing of SiC particles [7]. To avoid agglomeration of nano particles during solidification process, a non-contact method, where the ultrasonic probe is not in direct contact with the liquid metal was attempted to disperse nanosized Al_2O_3 particulates in aluminium matrix and the mould was subjected to ultrasonic vibration [8]. SiC and Al2O3 are the common reinforcing materials used in aluminum matrix composites [9]. SiC is composed of tetrahedral of carbon and

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ISSN (Print) : 2319-8613
ISSN (Online) : 0975-4024

3.4.5- J-81-2016-17

Tribological Properties of Micro and Nano TiO_2 Reinforced Aluminium Metal Matrix Composites

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Abstract - **Metal Matrix Composites (MMCs) have a prospective for improved wear resistance over the unreinforced alloy and are the most capable in achieving enhanced mechanical properties. In this research, composites of Al 6061- micro TiO_2 (5, 10 and 15 wt.%) and Al 6061- nano TiO_2 (0.5, 1.0 and 1.5 wt.%) were produced by stir casting technique. Hardness and wear tests were performed on the micro and nano composite specimens. The fabricated nano composites showed improvement in hardness and wear resistance over the micro composites. The microstructure of the worn out specimen was examined by scanning electron microscope. Considering all the factors, it can be concluded that aluminium based composite with 1.0% by weight nano TiO_2 reinforcement possess better wear resistance properties as compared to micro TiO_2 reinforced aluminium metal matrix composites.**

Keyword - Aluminium Metal Matrix Composites, wear resistance, stir casting, nano TiO_2.

I. INTRODUCTION

Metal matrix composites have a prospect for increased wear resistance over the unreinforced alloy and are the foremost promising in achieving increased mechanical properties [1]. Amongst different composites, MMCs are promising new materials for recent engineering applications having high specific strength, stiffness and their high temperature stability and widely used in aerospace and automotive industries. Aluminium is the most popular matrix for the MMC's and the aluminium alloys are quite attractive due to their low density, low cost, its capability to strengthen by precipitation, good corrosion resistance, high electrical and thermal conductivity and improved tribological properties [2,3]. The mechanical property results of micro and nano composites led in to improvement of wear rate, yield strength, ultimate tensile strength, compressive strength and hardness. The fabrication process such as compo casting and the size of the reinforcement particles were the effective factors influencing on the mechanical properties [4,5]. To avoid agglomeration of nano particles during solidification process, a non-contact method, where the ultrasonic probe is not in direct contact with the liquid metal was attempted to disperse nanosized Al_2O_3 particulates in aluminium matrix and the mould was subjected to ultrasonic vibration [6]. SiC and Al_2O_3 are the common reinforcing materials used in aluminum matrix composites [7].

In recent times extensive study on Al-SiC composites has been made as SiC in particular delivers superior wear resistance and mechanical properties. Addition of SiC reinforcement to the base aluminum metal added strength to the composite [8]. The improvements in wear resistance of Al alloy-SiC particles reinforced composite is a strong function of reinforcement content and its size [9]. The occurrence of SiC makes the composites hard to be machined due to its brittle property. Adding up of metal oxides like TiO_2 shifts the brittleness of SiC and widens its engineering applications. Use of TiO_2 as reinforcement in aluminium alloy has established modest attention even though it posses high hardness and modulus in the midst of superior corrosion resistance [10]. Momentous enrichment in wear resistance and hardness characteristics were achieved with Al6061 alloy with TiO_2 reinforcement. Hardness, density and wear rate was improved with TiC and TiO_2 reinforcements with Al alloy [11]. The function of TiO_2 particles on the powder surface morphology and grain refinement, the effect of particle size-to-reinforcement ratio in terms of green compressive strength, and densification as percentage theoretical density of Al- TiO_2 composites were studied. Structure and sinter ability of micro and nano TiO_2 with Al-6061 was synthesized [12]. The composite with good dispersion of reinforcement particulates has shown higher hardness and wear resistance [13].

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3-4-5-J - ST - 2016-17

International Journals of Advanced Research in Computer Science and Software Engineering
ISSN: 2277-128X (Volume-7, Issue-6)

Research Article | June 2017

Design an Alert System for Motorbike Riders by Analysis of Hand Forces Using Wireless Sensor Network

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DOI: 10.23956/ijarcsse/V7I6/0102

Abstract*— Accurate measurement of hand forces in motorbike riding is highly desirable for studies of safe riding. In this paper, we implement a force-sensing system for measuring real-time hand forces during motorbike riding with the aim of giving feedback to the riders. It consists of sensors suitably mounted and configured for data acquisition via a wireless Smartphone. Consequently, a series of data classification algorithms ensure accurate hand performance feedbacks for motorbike riders. The feedback data could potentially alert the riders to predict and prevent accidents. This project has a strong potential as a tool for hand performance monitoring in real environment.

Keywords*— Wireless Sensor Network, force sensors, audio processor, Bluetooth SPP, Blue Term APP.

I. INTRODUCTION

A. Overview of WSN

Wireless sensor networks (WSN), sometimes called wireless sensor and actuator networks (WSAN), are autonomous sensors that are distributed to monitor physical conditions such as temperature, sound, pressure, etc. and to cooperatively pass their data through the network to a main location. The more modern networks are bi-directional, also enabling control of sensor activity. The development of wireless sensor networks was motivated by military applications such as battlefield surveillance. Today such networks are used in many industrial and consumer applications, such as industrial process monitoring and control, machine health monitoring, and so on. The WSN is built of "nodes", from a few to several hundreds or even thousands, where each node is connected to one (or sometimes several) sensors. Each such sensor network node has typically several parts: a radio transceiver with an internal antenna or connection to an external antenna, a microcontroller, an electronic circuit for interfacing with the sensors and an energy source, usually a battery or an embedded form of energy harvesting. A sensor node might vary in size from that of a shoebox down to the size of a grain of dust. The cost of sensor nodes is similarly variable, ranging from a few to hundreds of dollars, depending on the complexity of the individual sensor nodes. Size and cost constraints on sensor nodes result in corresponding constraints on resources such as energy, memory, computational speed and communications bandwidth. The topology of the WSNs can vary from a simple star network to an advanced multi-hop wireless mesh network.

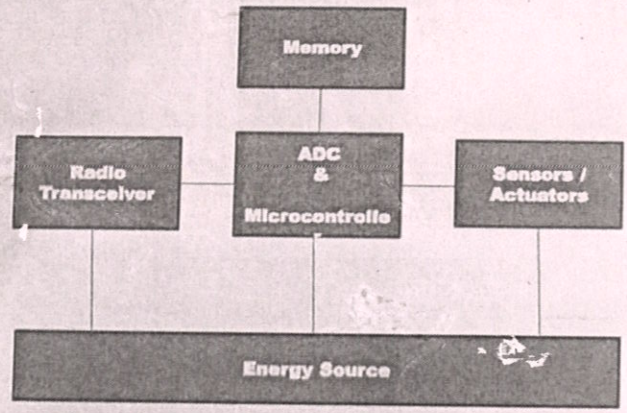

Fig.1 General Architecture of single sensor node

B. Trends in Wireless Sensor Networks

1)Area monitoring:

In area monitoring, the WSN is deployed over a region where some physical phenomenon such as temperature, humidity, sound, pressure, etc. is to be monitored. A military is taken as a example in which the sensors are used to detect enemy intrusion.

2)Health care monitoring:

The medical applications can be of two types: wearable and implanted. Wearable devices are used on the body surface of a human or just at close proximity of the user. The implantable medical devices are those that are inserted inside human body. There are many other applications too e.g. body position measurement and location of the person, overall

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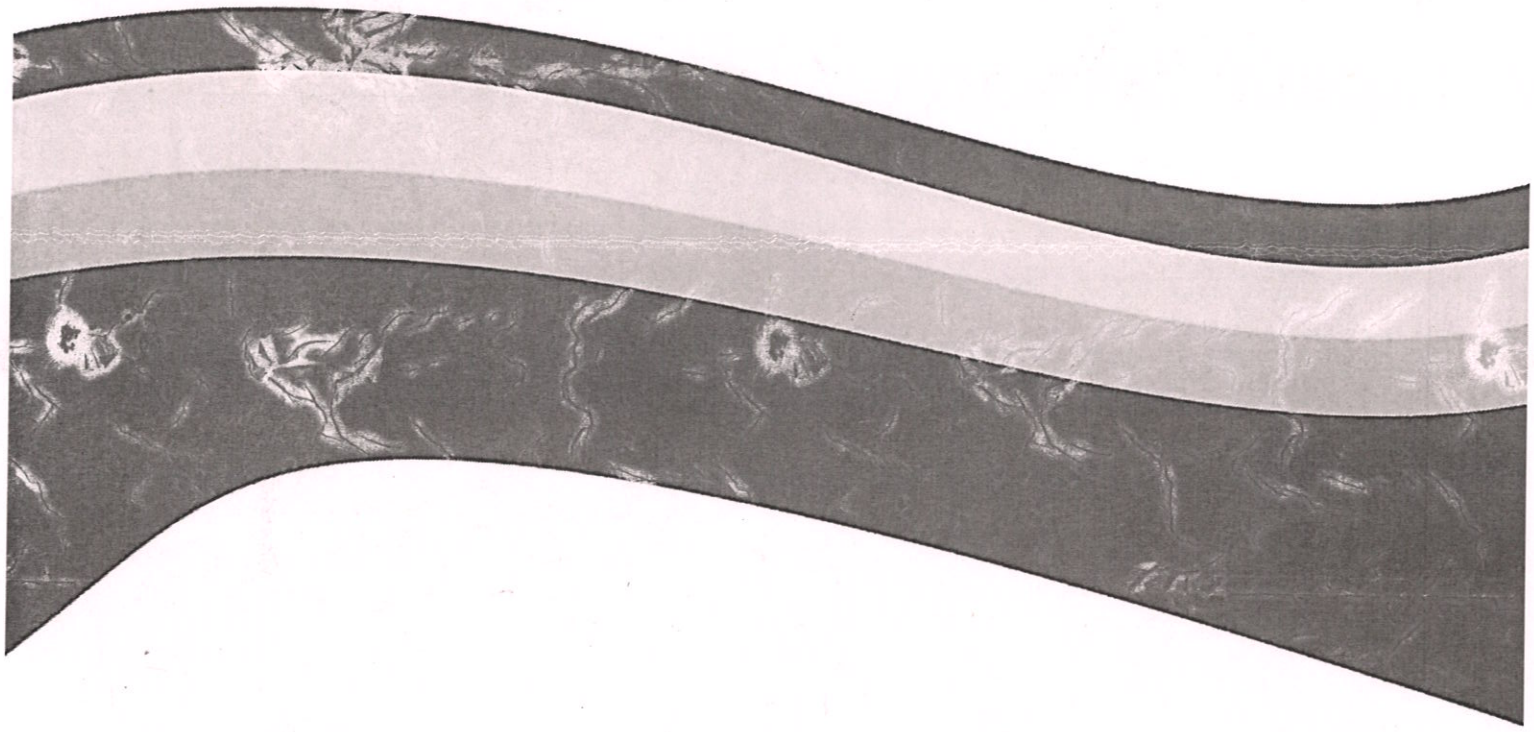
3 # 5. Dr. Premkumar 2016-17

E-ISSN NO : 2347-856X
ISSN NO: 2348 – 0653

International Journal of Business and Administration Research Review

Volume No- 1 Issue No- 17 Jan - March 2017
Impact Factor 4.729

Refereed Quarterly Journal



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Research Paper
Impact Factor: 4.729
Refereed, Listed & Indexed

IJB
E- ISSN -2347-856X
ISSN -2348-0653

ROLE OF WORK EXPERIENCE OF WOMEN EMPLOYEES IN BPO INDUSTRY ON VARIOUS DIMENSIONS OF EMOTIONAL INTELLIGENCE

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Abstract

Emotional intelligence (EI) is a relatively new and growing area of behavioral investigation. The researchers strive to understand its influence on women Business Process Outsourcing (BPO) employees since it is difficult to maintain their Emotional Intelligence. A review of the literature highlights the need for examination of the relationship of emotional intelligence and performance, so that women employees can be assisted in their emotional intelligence competencies thus expanding their behavior and improving their ability to perform. This study attempts to explore the influence of work related variable experience on various dimensions of Emotional Intelligence. 462 women employees working in BPO companies in Chennai were selected for the study. Structured questionnaire were used for the measurement of influence of respondent's age on various EI dimensions like Self Regard, Interpersonal Relations, Impulse control, Problem solving, Flexibility, Reality Testing, Emotional Self Awareness, Stress Tolerance, Assertiveness and Empathy. One way ANOVA is applied to identify the significant influence of work experience on various EI dimensions. Results indicate that there is a significant influence of work experience on all the dimensions of EI.

Keywords: Emotional intelligence, Business Process Outsourcing, Women employees, Dimension of EI.

Introduction

Emotional Intelligence (EI) is the ability to acquire and apply knowledge from your emotions and the emotions of others. You can use the information about what you're feeling to help you make effective decisions about what to say or do. It has received a substantial amount of attention in the Organizational Behavior, Human Resources, and Management literatures in recent years from those who champion its use and others who are wary of its validity. Currently, there are three main models of EI namely ability model, mixed model (usually subsumed under trait EI) and trait model. Different models of EI have led to the development of various instruments for the assessment of the construct. While some of these measures may overlap, most researchers agree that they tap different constructs.

Dimensions of Emotional Intelligence

- Self Regard
- Interpersonal Relations
- Impulse control
- Problem solving
- Flexibility
- Reality Testing
- Emotional Self Awareness
- Stress Tolerance
- Assertiveness and
- Empathy

BPO Industries in India- An Overview

The term Business Process Outsourcing refers the contracting of a specific business task, such as payroll, to a third-party service provider. In India, Business Process Outsourcing (BPO) is the fastest growing segment of the ITES (Information Technology Enabled Services) industry. India is now the world's favored market for BPO companies, among other competitors, such as, Australia, China, Philippines and Ireland. As of 2012, around 2.8 million people work in outsourcing sector. Annual revenues are around $11 billion, around 1% of GDP. Indian BPO Companies offer varied services, such as customer support, technical support, telemarketing, insurance processing, data processing, forms processing, bookkeeping and internet, online, web-search.

Review of Literature

Reuven Bar-On (2002) agrees on the qualities of emotional self awareness, self-actualization, interpersonal relationship, reality testing, stress tolerance, optimism, happiness, etc. as those that decide the emotional intelligence of a person. Bar-On"s (2002) model of emotional intelligence relates to the potential for performance and success, rather than performance or success itself, and is considered process-oriented rather than outcome-oriented. It strives to identify in a person the latent capability of being emotionally intelligent. His model outlines the following five components –

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- Intrapersonal
- Interpersonal
- Adaptability
- Stress management and
- General mood components (Bar-On, 2002)

They are similar to Mayer and Salovey"s model on emotional self awareness, self control, self expression, and empathy, but along with these aspects, Bar-On includes reality testing, - the ability to assess the relation between the emotionally experienced and the actual nature of an object, stress tolerance, and the strength to stay happy and optimistic in the face of adversity. Goleman"s model deviates slightly as he includes organizational awareness, leadership, teamwork and collaboration along with self awareness, self control and empathy, as his focus is on workplace success.

Locke (2005) He believes that these emotional competencies are not innate talents but those that can be learnt and developed. In turn, the potential to develop these emotional competencies depended on a person's emotional intelligence which he believes is a latent, inborn talent. Emotional intelligence and emotional competencies are like apples and apple sauces While EI is natural, emotional competencies are the offshoot of EI. His four branch model (2001) included:Self-Awareness: Emotional Self-awareness, Accurate Self-Assessment and Self-Confidence. b) Self-Management: Self-Control, Trustworthiness, Conscientiousness, Adaptability, Achievement Drive and Initiative. c) Social Awareness: Empathy, Social Orientation and Organizational Awareness. d) Relationship Management: Developing Others, Influence, Communication, Conflict Management, Leadership, Change Catalyst, Building Bonds, Teamwork and Collaboration.

Bar-On's (2006) model outlines five components which are further classified into fifteen subcomponents. Intrapersonal: Self Regard, Emotional Self-Awareness, Assertiveness, Independence, and Self-Actualization. Interpersonal: Empathy, Social Responsibility and Interpersonal Relationship Adaptability: Reality Testing, Flexibility and Problem Solving Stress Management: Stress Tolerance and Impulse Control General Mood Components: Optimism and Happiness.

Statement of the Problem

Emotional intelligence cannot be seen solely as the understanding of feelings, but must be examined from a functional perspective as in the exhibition of performance and behaviors. If there is a relationship between emotional intelligence and performance, Women employees can be assisted in their emotional intelligence competencies thus expanding their behavior and improving their ability to perform. While considering the assessment of Emotional Intelligence, experience has been the prominent work related factor. Therefore, the study attempts to explore the influence of work experience on various dimensions of EI.

Research Methodology

The descriptive research design was used for this study. The objectives of the study is to find out whether the work experience of the women employees working in BPO industry in Chennai makes an impact on their Emotional Intelligence. Women employees who were employed in the BPO companies in Chennai City during the study period consist of six months starting from July, 2014 to December, 2014 are considered as the sample population of the study.

The sample size for the survey is determined by applying the following formula:

Sample size $n = (ZS/E)^2$

Where

Z = 1.96 (Standardized value corresponding to95% confidence interval)

S = Sample standard deviation from pilot study = 0.58

E = Acceptable error = 0.05 (5%)

Sample size (n) $= (ZS/E)^2$

$= (1.96*0.58/0.05)^2$

$= 516.9 \sim 517$

The researcher made sincere efforts to collect data from 517 respondents using the well structured questionnaires. But, only 481 respondents have returned the duly filled questionnaires. However, 19 questionnaires were rejected due to inadequate data. Hence, the sample size chosen for the study was determined as Four hundred and Sixty Two (462) women employees working in BPO companies in Chennai city. The researcher used snowball sampling for the selection of samples. Snowball sampling is a method of sampling in which sample elements are selected as they are identified by successive respondents (samples). The researcher has used One-way ANOVA to achieve aforementioned research objective and for testing the null hypothesis (H_0).

Impact of work experience of women employees in BPO industry on various dimensions of emotional intelligence:

One way analysis of variance is used to test the following hypothesis:

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E- ISSN -2347-856X
ISSN -2348-0653

H_0: There is no significant influence of work experience on Self Regard, Interpersonal Relations, Impulse control, Problem solving, Flexibility, Reality Testing, Emotional Self Awareness, Stress Tolerance, Assertiveness and Empathy of the women employees in BPO industry in Chennai city.

Table 1: One way analysis of variance among work experience of Women employees in BPO Industry with regards to various dimensions of Emotional Intelligence

Variable	Dimensions	Category	N	Mean	S D	F values
Work Exp	Self Regard	Up to 5 years	276	33.92	5.161	F=11.648** (p<.001)
		6-10 years	75	32.36	5.672	
		11-15 years	66	30.22	5.322	
		Above 15 years	45	35.40	5.297	
	Interpersonal Relations	Up to 5 years	276	28.06	3.890	F=15.463** (p<.001)
		6-10 years	75	25.72	3.551	
		11-15 years	66	25.31	2.281	
		Above 15 years	45	27.06	3.512	
	Impulse control	Up to 5 years	276	15.17	3.565	F=7.353** (p<.001)
		6-10 years	75	14.28	3.126	
		11-15 years	66	14.59	3.525	
		Above 15 years	45	17.13	2.417	
	Problem solving	Up to 5 years	276	22.32	2.841	F=12.609** (p<.001)
		6-10 years	75	23.08	3.282	
		11-15 years	66	20.18	2.955	
		Above 15 years	45	22.00	3.022	
	Flexibility	Up to 5 years	276	23.95	3.938	F=5.581** (p=.001)
		6-10 years	75	23.08	2.759	
		11-15 years	66	21.90	3.657	
		Above 15 years	45	23.53	4.272	
Work Exp	Reality Testing	Up to 5 years	276	18.01	2.406	F=4.621** (p=.003)
		6-10 years	75	19.04	2.214	
		11-15 years	66	18.40	1.626	
		Above 15 years	45	18.00	1.381	
	Emotional Self Awareness	Up to 5 years	276	17.77	2.783	F=12.001** (p<.001)
		6-10 years	75	18.68	2.574	
		11-15 years	66	16.27	1.669	
		Above 15 years	45	18.66	2.730	
	Stress Tolerance	Up to 5 years	276	27.13	3.551	F=4.892** (p=.902)
		6-10 years	75	27.12	2.454	
		11-15 years	66	26.36	2.364	
		Above 15 years	45	28.66	2.266	
	Assertiveness	Up to 5 years	276	20.05	2.792	F=6.881** (p<.001)
		6-10 years	75	20.96	1.982	
		11-15 years	66	20.54	1.448	
		Above 15 years	45	18.86	3.195	
	Empathy	Up to 5 years	276	17.55	3.333	F=3.579* (p=.014)
		6-10 years	75	18.80	2.731	
		11-15 years	66	17.40	2.266	
		Above 15 years	45	17.73	2.871	

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E- ISSN -2347-856X
ISSN -2348-0653

From the Table 1 it can be observed that 'F' value of Self regard, Interpersonal Relations, Impulse control, Problem solving, Flexibility, Reality Testing, Emotional Self Awareness, Stress Tolerance, Assertiveness are **11.648, 15.463, 7.353, 12.609, 5.581, 4.621, 12.001, 4.892, 6.881** and they are significant at 1% level. It is also observed that 'F' value of Empathy is **3.579** and it is significant at 5% level. Therefore, the formulated hypothesis H_0 is rejected. It indicates that there is significant influence of women employee's work experience on Self regard, Interpersonal Relations, Impulse control, Problem solving, Flexibility, Reality Testing, Emotional Self Awareness, Stress Tolerance, Assertiveness and Empathy.

Findings of the Study

- Significant influence of women employee's total work experience on Self regard is observed. Women employees with total work experience of more than 15 years are better in Self regard and the women employees having total work experience of 11-15 years are lacking in Self regard in BPOs.
- Significant influence of women employee's total work experience on Interpersonal relation is observed. Women employees with total work experience of up to 5 years are better in Interpersonal relation and the women employees having total work experience of 11-15 years are lacking in Interpersonal relation in BPOs.
- Significant influence of women employee's total work experience on Impulse control is observed. Women employees with total work experience of more than 15 years are better in Impulse control and women employees having total work experience of 6-10 years are lacking in Impulse control in BPOs.
- Significant influence of women employee's total work experience on Problem solving is observed. Women employees with total work experience of 6-10 years are better in Problem solving and women employees having total work experience of 11-15 years are lacking in Problem solving in BPOs.
- Significant influence of women employee's total work experience on Flexibility is observed. Women employees with total work experience of up to 5 years are more flexible and the women employees with a total work experience of 11-15 years are showing less Flexibility in BPOs.
- Significant influence of women employee's total work experience on Reality testing is observed. Women employees with total work experience of 6-10 years are better in Reality testing and the women employees having total work experience of more than 15 years are lacking in Reality testing in BPOs.
- Significant influence of women employee's total work experience on Emotional self awareness is observed. Women employees with total work experience of 6-10 years are better in Emotional self awareness and the women employees having total work experience of 11-15 years are lacking in Emotional self awareness in BPOs.
- Significant influence of women employee's total work experience on Stress tolerance is observed. Women employees with total work experience of more than 15 years are better in tolerating the stress and the women employees having total work experience of 11-15 years are lacking in Stress tolerance in BPOs.
- Significant influence of women employee's total work experience on Assertiveness is observed. Women employees with total work experience of 6-10 years are better in Assertiveness and women employees having total work experience of more than 15 years are lacking in Assertiveness in BPOs.
- Significant influence of women employee's total work experience on Empathy is observed. Women employees with total work experience of 6-10 years are showing more sympathy and the women employees having total work experience of 11-15 years are showing less sympathy to others in BPOs.

Conclusion

This study has been conducted mainly for the purpose of identifying the role of work experience of women employees of BPO companies in Chennai city on their emotional intelligence. It is suggested that the companies could devise suitable strategies to improve the emotional intelligence of women employees having less than five years of experience so as to enable the companies to be competitive and achieve service quality.

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3.4.5. J-MGT - 2016-17

Research Paper
Impact Factor: 3.853
Peer Reviewed, Listed & Indexed

IJBAPR
E- ISSN -2347 856X
ISSN -2348-0653

ROLE OF AGE GROUP OF WOMEN EMPLOYEES IN BPO INDUSTRY ON VARIOUS DIMENSIONS OF EMOTIONAL INTELLIGENCE

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Abstract

Emotional intelligence (EI) is a relatively new and growing area of behavioral investigation. The researchers strive to understand its influence on women Business Process Outsourcing (BPO) employees since it is difficult to maintain their Emotional Intelligence. A review of the literature highlights the need for examination of the relationship of emotional intelligence and performance, so that women employees can be assisted in their emotional intelligence competencies thus expanding their behavior and improving their ability to perform. This study attempts to explore the influence of age group of women employees in BPO industry on various dimensions of their Emotional Intelligence. 462 women employees working in BPO companies in Chennai were selected for the study. Structured questionnaire were used for the measurement of influence of respondent's age on various EI dimensions like Self Regard, Interpersonal Relations, Impulse control, Problem solving, Flexibility, Reality Testing, Emotional Self Awareness, Stress Tolerance, Assertiveness and Empathy. One way ANOVA is applied to identify the age group has any significant influence on various EI dimensions. Results indicate that there is a significant influence of age on all the dimensions of EI except Assertiveness and Empathy.

Keywords: Emotional intelligence, Business Process Outsourcing, Women employees, Dimensions of EI.

Introduction

Emotional Intelligence (EI) is the ability to acquire and apply knowledge from your emotions and the emotions of others. You can use the information about what you're feeling to help you make effective decisions about what to say or do. It has received a substantial amount of attention in the Organizational Behavior, Human Resources, and Management literatures in recent years from those who champion its use and others who are wary of its validity. Currently, there are three main models of EI namely ability model, mixed model (usually subsumed under trait EI) and trait model. Different models of EI have led to the development of various instruments for the assessment of the construct. While some of these measures may overlap, most researchers agree that they tap different constructs.

Dimensions of Emotional Intelligence

The following are the important dimensions that determine the emotional intelligence of a person

- Self Regard
- Interpersonal Relations
- Impulse control
- Problem solving
- Flexibility
- Reality Testing
- Emotional Self Awareness
- Stress Tolerance
- Assertiveness and
- Empathy

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The term Business Process Outsourcing refers the contracting of a specific business task, such as payroll, to a third-party service provider. In India, Business Process Outsourcing (BPO) is the fastest growing segment of the ITES (Information Technology Enabled Services) industry. India is now the world's favored market for BPO companies, among other competitors, such as, Australia, China, Philippines and Ireland. As of 2012, around 2.8 million people work in outsourcing sector. Annual revenues are around $11 billion, around 1% of GDP. Indian BPO Companies offer varied services, such as customer support, technical support, telemarketing, insurance processing, data processing, forms processing, bookkeeping and internet, online, web-search.

Review of Literature

Reuven Bar-On (2002) agrees on the qualities of emotional self awareness, self-actualization, interpersonal relationship, reality testing, stress tolerance, optimism, happiness, etc. as those that decide the emotional intelligence of a person. Bar-On's (2002) model of emotional intelligence relates to the potential for performance and success, rather than performance or

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success itself, and is considered process-oriented rather than outcome-oriented. It strives to identify in a person the latent capability of being emotionally intelligent. His model outlines the following five components namely intrapersonal, interpersonal, adaptability, stress management and general mood components (Bar-On, 2002). They are similar to Mayer and Salovey"s model on emotional self awareness, self control, self expression, and empathy, but along with these aspects, Bar-On includes reality testing, - the ability to assess the relation between the emotionally experienced and the actual nature of an object, stress tolerance, and the strength to stay happy and optimistic in the face of adversity. Goleman"s model deviates slightly as he includes organizational awareness, leadership, teamwork and collaboration along with self awareness, self control and empathy, as his focus is on workplace success.

Locke (2005) He believes that these emotional competencies are not innate talents but those that can be learnt and developed. In turn, the potential to develop these emotional competencies depended on a person's emotional intelligence which he believes is a latent, inborn talent. Emotional intelligence and emotional competencies are like apples and apple sauces While EI is natural, emotional competencies are the offshoot of EI. His four branch model (2001) included: Self-Awareness: Emotional Self-awareness, Accurate Self-Assessment and Self-Confidence. b) Self-Management: Self-Control, Trustworthiness, Conscientiousness, Adaptability, Achievement Drive and Initiative. c) Social Awareness: Empathy, Social Orientation and Organizational Awareness. d) Relationship Management: Developing Others, Influence, Communication, Conflict Management, Leadership, Change Catalyst, Building Bonds, Teamwork and Collaboration.

Bar-On's (2006) model outlines five components which are further classified into fifteen subcomponents. Intrapersonal: Self Regard, Emotional Self-Awareness, Assertiveness, Independence, and Self-Actualization. Interpersonal: Empathy, Social Responsibility and Interpersonal Relationship Adaptability: Reality Testing, Flexibility and Problem Solving Stress Management: Stress Tolerance and Impulse Control General Mood Components: Optimism and Happiness.

Statement of The Problem

Emotional intelligence cannot be seen solely as the understanding of feelings, but must be examined from a functional perspective as in the exhibition of performance and behaviors. If there is a relationship between emotional intelligence and performance, Women employees can be assisted in their emotional intelligence competencies thus expanding their behavior and improving their ability to perform. While considering the assessment of Emotional Intelligence age has been the prominent demographic factor, therefore the study attempts to explore the influence of age on various dimensions of EI.

Research Methodology

The descriptive research design was used for this study. The objective of the study is to find out whether the age group of the women employees working in BPO industry in Chennai makes an impact on their emotional intelligence. Women employees who were employed in the BPO companies in Chennai City during the study period consist of six months starting from July, 2014 to December, 2014 were considered as the sample population of the study.

The sample size for the survey is determined by applying the following formula:
Sample size n = (ZS/E)2,Where
Z = 1.96 (Standardized value corresponding to95% confidence interval)
S = Sample standard deviation from pilot study = 0.58
E = Acceptable error = 0.05 (5%)
Sample size (n) = (ZS/E)2
= (1.96*0.58/0.05)2
= 516.9 ~ 517

The researcher made sincere efforts to collect data from 517 respondents using the well structured questionnaires. But, only 481 respondents have returned the duly filled questionnaires. However, 19 questionnaires were rejected due to inadequate data. Hence, the sample size chosen for the study was determined as Four hundred and Sixty Two (462) women employees working in BPO companies in Chennai city. The researcher used snowball sampling for the selection of samples. Snowball sampling is a method of sampling in which sample elements are selected as they are identified by successive respondents (samples). The researcher has used One-way ANOVA to achieve aforementioned research objective and for testing the null hypothesis (H0).

Impact of Age Group of Women Employees in BPO Industry on various dimensions of Emotional Intelligence:

One way analysis of variance is used to test the following hypothesis:
H0: There is no significant influence of age group on Self Regard, Interpersonal Relations, Impulse control, Problem solving, Flexibility, Reality Testing, Emotional Self Awareness, Stress Tolerance, Assertiveness and Empathy of the women employees in BPO industry in Chennai city.

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Table 1: One way analysis of variance among age group on of Women Employees in BPO Industry with regards to various dimensions of Emotional Intelligence

Variable	Dimensions	Category	N	Mean	S D	F values
Age	Self Regard	Below 25 years	252	34.17	5.000	F=7.217** (p< .001)
		26-30 years	78	31.84	6.484	
		31-35 years	72	31.41	4.889	
		Above 35 years	60	33.65	5.742	
	Interpersonal Relations	Below 25 years	252	34.17	5.000	F=39.308** (p< .001)
		26-30 years	78	31.84	6.484	
		31-35 years	72	31.41	4.889	
		Above 35 years	60	33.65	5.742	
	Impulse control	Below 25 years	252	15.34	3.420	F=7.040** (p< .001)
		26-30 years	78	13.65	4.158	
		31-35 years	72	15.16	2.690	
		Above 35 years	60	16.15	2.944	
	Problem solving	Below 25 years	252	22.53	2.967	F=16.606** (p< .001)
		26-30 years	78	22.92	3.157	
		31-35 years	72	20.00	2.432	
		Above 35 years	60	21.80	2.898	
	Flexibility	Below 25 years	252	23.91	4.111	F=2.791* (p=.040)
		26-30 years	78	23.11	3.567	
		31-35 years	72	22.58	3.376	
		Above 35 years	60	23.20	3.150	
Age	Reality Testing	Below 25 years	252	18.33	2.560	F=3.701* (p=.012)
		26-30 years	78	18.11	2.150	
		31-35 years	72	18.66	1.255	
		Above 35 years	60	17.45	1.370	
	Emotional Self Awareness	Below 25 years	252	17.77	2.758	F=6.961** (p< .001)
		26-30 years	78	18.80	2.847	
		31-35 years	72	16.83	1.784	
		Above 35 years	60	17.70	2.818	
	Stress Tolerance	Below 25 years	252	27.25	3.525	F=2.689* (p=.049)
		26-30 years	78	27.57	3.072	
		31-35 years	72	26.25	1.976	
		Above 35 years	60	27.40	2.750	
	Assertiveness	Below 25 years	252	20.26	2.700	F=0.917 (p=.432)
		26-30 years	78	20.30	2.788	
		31-35 years	72	20.00	1.592	
		Above 35 years	60	19.70	2.993	
	Empathy	Below 25 years	252	17.71	3.527	F=0.877 (p=.453)
		26-30 years	78	18.19	3.058	
		31-35 years	72	17.75	2.180	
		Above 35 years	60	17.35	1.839	

Source: Primary data **p< 0.01,*p<0.05

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E- ISSN -2347-856X
ISSN -2348-0653

From the Table 1 it can be observed that 'F' value of Self regard, Interpersonal Relations, Impulse control, Problem solving, Emotional Self Awareness are 7.217, 39.308, 7.040, 16.606, 6.961 and they are significant at 1% level. It is also observed that 'F' value of Flexibility, Reality Testing, and Stress Tolerance are 2.791, 3.701, 2.689 and they are significant at 5% level. Therefore, the formulated hypothesis H0 is rejected. It indicates that there is significant influence of women employee's age on Self regard, Interpersonal Relations, Impulse control, Problem solving, Emotional Self Awareness.

Table 1 also indicates that the 'F' value of Assertiveness and Empathy are 0.917 and 0.877 and they are significant at 5% level. Therefore, the formulated hypothesis H0 is accepted. And it indicates that there is no significant influence of women employee's age on Assertiveness and Empathy.

Findings of the Study

The following are the findings of the study

- Significant influence of women employee's age on Self regard is observed. Women employees with age below 25 years are better in Self regard and women employees with age between 31-35 years are lacking in Self regard in BPOs.
- Significant influence of women employee's age on Interpersonal relation is observed. Women employees with age less than 25 years are better in Interpersonal relation and women employees with age between 31-35 years are lacking in Interpersonal relation in BPOs.
- Significant influence of women employee's age on Impulse control is observed. Women employees with age more than 35 years are better in Impulse control and women employees with age between 26-30 years are lacking in Impulse control in BPOs.
- Significant influence of women employee's age on Problem solving is observed. Women employees with age 26-30 years are better in Problem solving and women employees with age between 31-35 years are lacking in Problem solving in BPOs.
- Significant influence of women employee's age on Flexibility is observed. Women employees with age less than 25 years are more flexible and the women employees with age between 31-35 years are lacking in Flexibility in BPOs.
- Significant influence of women employee's age on Reality testing is observed. Women employees with age 21-35 years are better in Reality testing and the women employees with age more than 35 years are lacking in Reality testing in BPOs.
- Significant influence of women employee's age on Emotional self awareness is observed. Women employees with age 26-30 years are better in Emotional self awareness and women employees with age between 31-35 years are lacking in Emotional self awareness in BPOs.
- Significant influence of women employee's age on Stress tolerance is observed. Women employees with age 26-30 years are better in Stress tolerance and women employees with age between 31-35 years are lacking in Stress tolerance in BPOs.
- Significant influence of women employee's age on Assertiveness is not observed.
- Significant influence of women employee's age on Empathy is not observed.

Conclusion

This study has been conducted mainly for the purpose of identifying the role of age of women employees working in BPO Industry at Chennai City on their emotional intelligence. It is suggested that the companies could devise suitable interventional strategies to improve the respondents who lack emotional intelligence than the other age groups as found in the study so as to enable the companies maintain the overall acceptable emotional intelligence in order to be more competitive than the other companies.

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3-4-5-J-SC - 2016-17

Arumugam / Star, Vol.4 Issue. 10(4), October (2016) ISSN: 2321-676X

STAR Research Journal

Available online at www.starresearchjournal.com (Star International Journal)

PHYSICAL EDUCATION

COMBINED EFFECT OF CROSS TRAINING AND INSTRUCTIONAL SKILL TRAINING ON SELECTED PHYSICAL FITNESS AND SKILL PERFORMANCE VARIABLES OF SCHOOL VOLLEYBALL PLAYERS

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Abstract

This research aims to design a training program using cross- training and instructional skill training then to identify its effect on the selected physical abilities such as reaction speed, agility, and, flexibility among the volleyball players from Chennai. The percentage of improvement for different measurements of both control and experimental groups were observed. The researcher used the experimental method on a sample of 60 school volleyball players under 14-16 years old, four groups were used and was given 12 weeks of training except the control group. Most important tools of data collection were physical tests as pre and post measurements. Statistical work was done using arithmetic mean, standard deviation, T test, Ancova. Training program using combined cross-training and instructional training led to development of all physical abilities such as reaction speed agility and flexibility within volleyball research sample. And clear improvement rates between experimental and control groups in all variables under consideration in favor of experimental group.

Key words: Cross training, Instructional training, Pass, service and attack.

INTRODUCTION

Cross-training has been widely used approach for structuring a training programme to improve competitive performance in a specific sport by training in a variety of sports (Tanaka 1994). Cross training is a tool underlies strength training, which helps players to reach pinnacle of their speciality sport competition. A strategy used by coaches to organize the training program and fitness activities, which are of greatest use of diverse activities and physical challenges in order to make their players continue to acquisition and achieve the requirements and objectives of overall fitness in a satisfactory and secure manner Loy *et al* (1992). Yacenda(1994). Cross training activities include both training with weights using few and large repetitions and ploy metric exercises like jump on box, which work to build body strength, development of muscle strength, legs muscles ability, and also includes activities of aerobic endurance including water running exercises and use of moving belt and fixed training cycle, as well as activities include anaerobic endurance including running exercises (Moran et al 1997). Despite numerous anecdotal reports claiming benefits for cross-training, very few scientific studies have investigated this particular type of training. It appears that some transfer of training effects on maximum oxygen uptake (VO2max) exists from one mode to another. The nonspecific training effects seem to be more noticeable when running is performed as a cross-training mode. Swim training, however, may result in minimum transfer of training effects on VO2max. Cross-training effects never exceed those induced by the sport-specific training mode. The principles of specificity of training tend to have greater significance, especially for highly trained athletes. For the general population, cross-training may be highly beneficial in terms of overall fitness. Similarly, cross-training may be an appropriate supplement during rehabilitation periods from physical injury and during periods of overtraining or psychological fatigue (Tanaka H. 1994)

Instructional skill training has been shown to improve an athlete's ability to reach their full potential, minimize injuries, and increase their ability and fitness. Many coaches believe instructional volleyball training molds the athlete by targeting areas for improvement more directly than group sessions or practices can, and is a recommended way to develop the athlete's ability and become a stronger player. It was hypothesizes that there would be significant improvement exists due to the experimental groups, and especially the combined training group. The instructional training improved only spike jump and speed among the Australian Junior Volleyball players whom represented the World youth volleyball Championships and also induced meaningful improvements in all measurements of skill in volleyball and greater improvements in technical skill in these

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athletes (Gabbett -2008)

Methodology

For the purpose of this study was to mark out the effect of chosen training programme on the physical fitness variables among school volleyball players. The subjects selected for this study were from Chennai and were randomly selected as 60 numbers. The age group of the subjects was ranging from 14 to 16 years with standard deviation of ± 0.52 and they divided into four equal groups and each group consists of twenty subjects. The physical fitness variables selected for this study was Reaction Speed, Agility and Flexibility and to assess the outcome the experiment standardized tests were used to collect the date. Cross Training and skill based training was formulated and implemented for twelve weeks.

Experimental Design

Randomly selected school volleyball players (N=60) were assigned into four groups. As per the experimental design Group I acted as experimental group which underwent cross training (CT), group II underwent instructional skill training (IST), group III underwent combined cross training and instructional skill training (CTIST) and group IV did not participated in any special training and were strictly under control (CG). Prior to experimental treatment all the subjects were measured of their physical fitness such as reaction speed, agility and flexibility. The subjects underwent respective experimental treatments for a period of 12 weeks. After the experimental period, post measurements were taken for the selected variables. The difference between the initial and final scores was considered as the effect of respective treatments. To test the statistical significance of the data collected were subjected to statistical analysis using ANCOVA to test the significance. In all cases 0.05 level was fixed to test the hypotheses of this study. The statistical analysis comparing the initial and final means of Reaction Speed Time due to cross training, instructional skill training, combined cross training and instructional skill training and control groups of school volleyball players is presented in Table I.

Table I

COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO CROSS TRAINING, INSTRUCTIONAL SKILL TRAINING AND COMBINED TRAINING ON REACTION SPEED TIME

	Cross training Group	Instructional skill training Group	Combined Group	Control Group	SOV	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	0.279	0.233	0.264	0.281	B	0.030	3	0.010	1.366
Std Dev	0.055	0.056	0.057	0.050	W	0.227	56	0.003	
Post Test Mean	0.253	0.209	0.242	0.281	B	0.060	3	0.020	5.930*
Std Dev	0.046	0.046	0.057	0.050	W	0.256	56	0.003	
Adjusted Post Test Mean	0.240	0.236	0.243	0.271	B	0.015	3	0.005	4.139*
					W	0.089	55	0.001	

Required table value 0.05 level (df 3 &55) 2.77. * Significant at 0.05 level of confidence

Taking into consideration of the pre test means and post test means, adjusted post test means for analysis of covariance. The obtained F value was greater than the required value of 2.77 and hence it was accepted that there was significant differences existed in reaction speed among the school volleyball players. Since significant improvements were recorded, Schaffe's post hoc test was used to find out the paired mean difference among the groups and the results were presented in Table II.

Table II
MULTIPLE COMPARISONS BETWEEN CROSS TRAINING, INSTRUCTIONAL SKILL TRAINING, COMBINED TRAINING AND CONTROL GROUPS AND SCHEFFE'S POST HOC ANALYSIS ON REACTION SPEED TIME

Cross training Group	Instructional skill training Group	Combined Group	Control Group	Mean difference	C.I
0.240	0.236			0.004	0.029
0.240		0.243		0.002	0.029
0.240			0.271	0.031*	0.029
	0.236	0.243		0.006	0.029
	0.236		0.271	0.035*	0.029
		0.243	0.271	0.029*	0.029

* Significant at 0.05 level.

From the above table it is clear that combined training group had significant improvement in reaction speed among the school volleyball players when compared to other two groups. Cross training and instructional skill training had also improved the reaction capacity among the rural volleyball players. The pre test, post test and ordered adjusted means were presented through line graph for better understanding of the results of this study in Figure 1.

Figure 1
LINE GRAPH SHOWING PRE, POST AND ADJUSTED MEANS ON REACTION SPEED

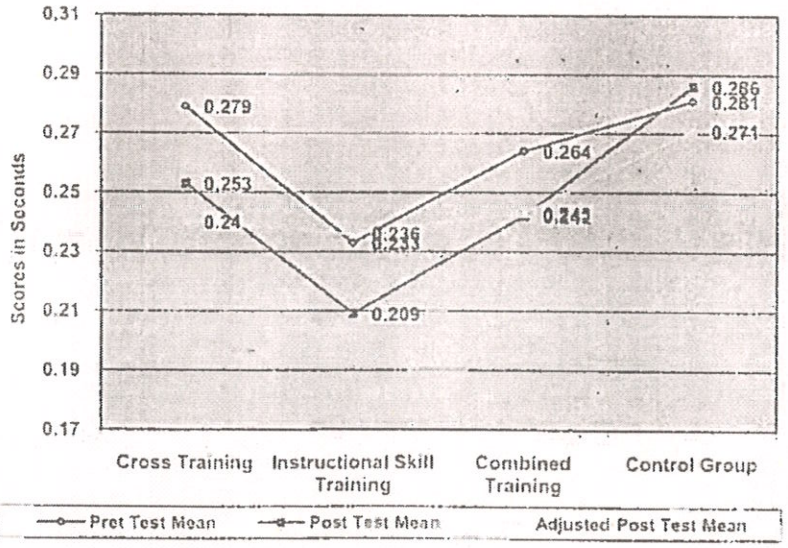


Table III
COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO CROSS TRAINING, INSTRUCTIONAL SKILL TRAINING AND COMBINED TRAINING ON FLEXIBILITY

	Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	SOV	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	12.55	12.95	13.05	13.10	B	3.74	3	1.25	0.22
Std Dev	1.88	2.09	2.21	3.21	W	438.65	56	5.77	
Post Test Mean	13.75	14.35	14.80	13.10	B	17.44	3	5.81	1.15
Std Dev	1.68	2.06	2.21	3.21	W	384.05	56	5.05	
Adjusted Post Test Mean	14.08	14.32	14.68	13.48	B	15.13	3	5.04	14.25*
					W	26.55	55	0.35	

Required table value 0.05 level (df 3 &55) 2.77, * Significant at 0.05 level of confidence

As shown in Table III, the pre test mean on Flexibility of cross training group instructional skill training group combined group consisting of cross training and instructional skill trainings training and control group found to be insignificant. The post test means, adjusted post test means revealed that there existed significant improvement and Schaffe's post hoc test was used to find out the paired mean difference among the groups and the results were presented in Table IV.

Table IV
MULTIPLE COMPARISONS BETWEEN AND SCHEFFE'S POST HOC ANALYSIS ON FLEXIBILITY

Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	Mean difference	C.I
14.08	14.32			0.24	0.54
14.08		14.68		0.60*	0.54
14.08			13.48	0.60*	0.54
	14.32	14.68		0.36	0.54
	14.32		13.48	0.84*	0.54
		14.68	13.48	1.20*	0.54

* Significant at 0.05 level.

Multiple mean comparisons shows that there found to be better improvement in flexibility among the school volleyball players, due to combined training when compared to other two training groups, and the instructional skill training group and cross training group were also improved on Flexibility. The results were presented through line graph for better understanding of the results of this study in Figure 2.

Figure 2
LINE GRAPH SHOWING PRE, POST AND ADJUSTED MEANS ON FLEXIBILITY

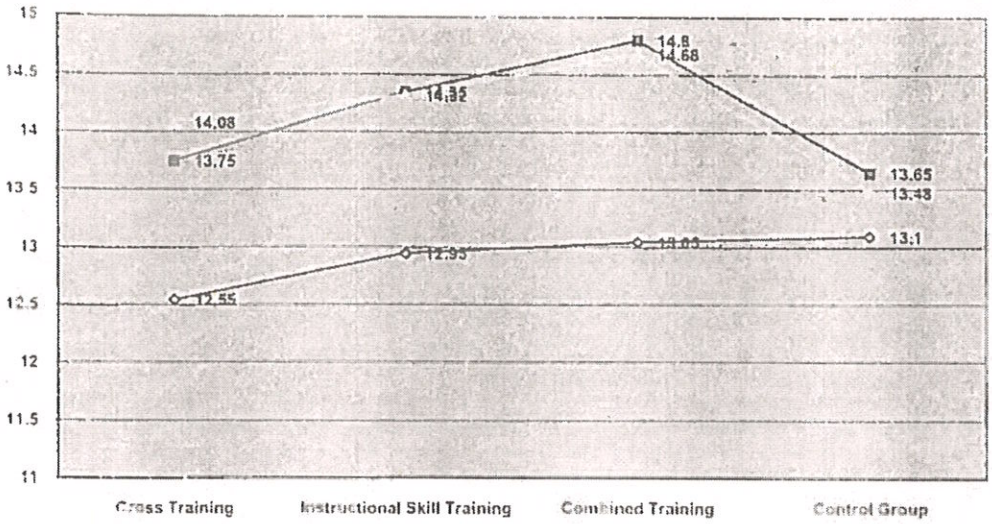


Table V
COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO CROSS TRAINING, INSTRUCTIONAL SKILL TRAINING AND COMBINED TRAINING ON AGILITY

	Cross training Group	Instructional skill training Group	Combined Group	Control Group	SOV	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	17.85	17.87	17.66	17.95	B	0.90	3	0.30	1.60
Std Dev	0.44	0.46	0.39	0.45	W	14.35	56	0.197	
Post Test Mean	17.22	17.24	16.97	17.95	B	9.92	3	3.31	23.61*
Std Dev	0.30	0.46	0.39	0.45	W	10.65	56	0.14	
Adjusted Post Test Mean	17.21	17.23	17.03	17.87	B	7.73	3	2.58	23.00*
					W	8.40	55	0.11	

Taking into consideration of the pre test means and post test means, adjusted post test means for analysis of covariance. The obtained F value was greater than the required value of 2.77 and hence it was accepted that there was significant differences existed in agility among the school volleyball players. Since significant improvements were recorded, Schaffe's post hoc test was used to find out the paired mean difference among the groups and the results were presented in Table IV. Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table VI.

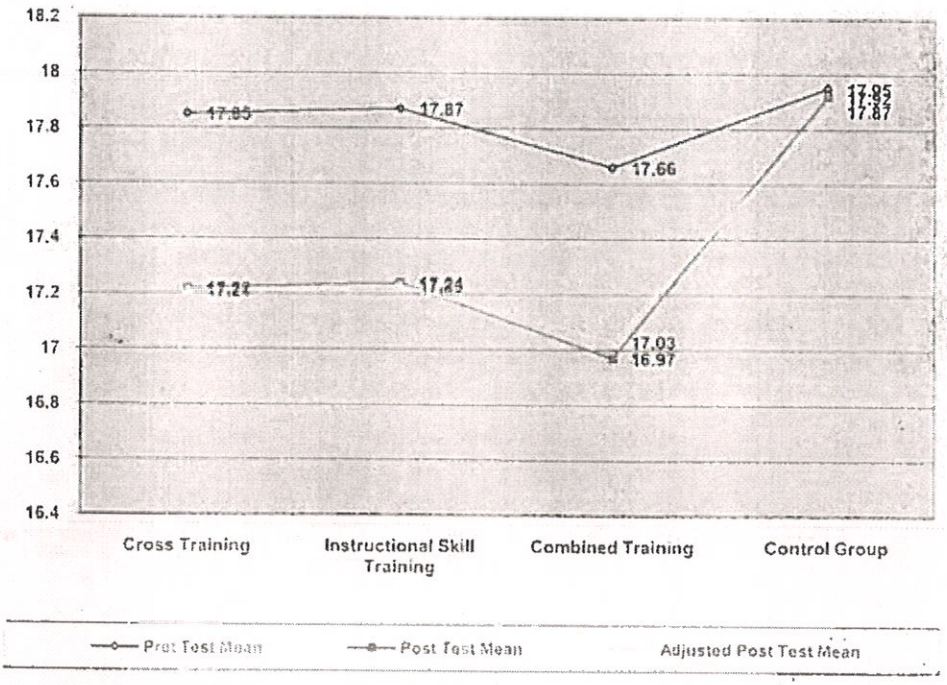
Table VI
MULTIPLE COMPARISONS AND SCHEFFE'S POST HOC ANALYSIS ON AGILITY

Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	Mean difference	C.I
17.21	17.23			0.01	0.30
17.21		17.03		0.18	0.30
17.21			17.87	0.65*	0.30
	17.23	17.03		0.19	0.30
	17.23		17.87	0.64*	0.30
		17.03	17.87	0.84*	0.30

* Significant at 0.05 level

Multiple mean comparisons shows that there found to be better improvement in agility among the school volleyball players, due to combined training when compared to other two training groups, and the instructional skill training group and cross training group were also improved on agility. The results were presented through line graph for better understanding of the results of this study in Figure 3.

Figure 3
LINE GRAPH SHOWING PRE, POST AND ADJUSTED MEANS ON AGILITY



DISCUSSION

Instructional lessons are a great way to get an athlete ready for their school or club teams and in fighting shape for matches and scrimmages. By focusing on specific skills and techniques, instructional volleyball coaching grooms players to evolve their skills to be prepared to play at the next level. Most players are looking for a confidant in the sport to provide motivation, push them when they lose focus, and instruct training drills to help them develop more technical skills. An athlete is driven towards success when there is a person available to turn to with questions or direction with their position or game.

Experts now say that the cross training is a much better approach and all sorts of professional athletes, from ball players to golfers, tennis players to swimmers, and other sports too make cross training part of their regimes and cross training is also making its way into the average person's fitness routine, with more and more benefits. The cross training takes into consideration the fact that many muscles in different parts of the body contribute to a single activity. So to get the most out of

any activity, and to do it safely, one must pay attention to all the muscles in his body that are involved, not just the ones directly related to that activity.

Researches on instructional training for improving physical fitness and skills in junior elite volleyball players found that skill-based conditioning games induced improvements in vertical jump, spike jump, speed, agility, upper-body muscular power, and estimated maximal aerobic power, whereas technical instruction improved only spike jump and speed while instructional training induced meaningful improvements in all measurements of skill, whereas improvements in technical skill after skill-based conditioning games were uncommon and typically small. Hence, the benefits of cross training, instructional training and combined effect of cross training and instructional training on physical fitness variables, reaction speed time, agility, and, flexibility were explored and hence, an attempt was made in this study. Thus, the findings of this study that the combined effect of cross training and instructional skill training significantly altered selected physical variables were in agreement with these previous studies.

CONCLUSIONS

Combined effect of cross training and instructional skill training significantly improved physical fitness variable, such as, reaction speed time, agility and explosive power of school volleyball players. It was also found that there was no significant difference among treatment groups on reaction speed time.

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Abstract

This study aims to design a training program using cross- training and skill based instructional then to identify its effect on some of the volleyball skills such as pass, service and attack among the rural volleyball players, and percentage of improvement for different measurements of both control and experimental groups. In this study the researcher used the experimental method on a sample of 60 school volleyball players from Chennai in Tamil Nadu under 14-16 years old, training were given as cross training and instructional skill training for twelve weeks. Most important tools of data collection were references survey, single skills tests. Statistical work was done using arithmetic mean, standard deviation, T test, Ancova. Training program using combined cross-training and instructional training led to development skill performance within volleyball research sample. And clear improvement rates between experimental and control groups in all variables under consideration in favor of experimental group.

Keywords: Cross training, Instructional training, Pass, service and attack.

INTRODUCTION

The concept of cross training is a relatively recent athletic application, in which a training regime includes the use of one distinct athletic discipline to build skills or fitness in another. In the not-so-distant past, sporting success was equated to the devotion of an athlete to the discipline. For an individual pursuit such as running or cycling, devotion was translated into the athlete spending every training opportunity engaged in one aspect or another of the sport to simulate competition. In team sports, the athlete would play or practice at every available moment; where there were no formal practices or games, the striving basketball player, soccer player, or ice hockey player would find a pickup game in their sport to continue the quest for excellence. Increased popular interest in multi-sport events such as the triathlon in the 1980s, and the appreciation by the wider sport community of the training demands that such sports required, spurred a broader interest in the use of cross training. It became a fashionable approach to physical improvements in a very wide range of sports. European sports trainers had advocated variety and intensity in athletic training regimens since the 1940s, usually through the introduction of cycling or an aerobic sport like soccer into an anaerobic training discipline, both for the building of strength as well as an understanding that, for the mental health of a serious athlete, "a change is often as good as a rest."

Today, the principles of effective cross training are well established. Cross training generally is accepted as building a better all-around athlete, while providing a measure of protection for injury through increased fitness, as well as reducing the mental fatigue associated with a lack of training variety. Cross training also permits an injured athlete to continue with workouts and thereby reduce the degree of fitness that might otherwise be lost to injury. The specific areas of human performance that are addressed in a typical cross-training program include: cardiovascular fitness; power, through increased muscle strength; speed; agility/reflexes; the use of all three of the body's energy systems, the aerobic system (endurance), the anaerobic lactic (intense energy demands of up to 90 seconds in duration), and the anaerobic lactic (short, very intense energy requirements); musculoskeletal flexibility; and mental acuity.

Instructional skill training has been shown to improve an athlete's ability to reach their full potential, minimize injuries, and increase their ability and fitness. Many coaches believe that the instructional volleyball training molds the players by targeting areas for improvement more directly than group sessions or practices can, and is a recommended way to develop the athlete's ability and become a stronger player.(www.coachup.com/volleyball). Talita M., a volleyball coach, believes that the instructional lessons are a great way to get an athlete ready for their school or club teams and in fighting shape for matches and scrimmages. By focusing on specific skills and techniques, instructional volleyball coaching grooms players to evolve their skills to be prepared to play at the next level. Talita noted most players are looking for a confidant in the sport to provide motivation, push them when they lose focus, and instruct training drills to help

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Table II
SCHEFFE'S POST HOC ANALYSIS ON PASS

Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	Mean deference	C.I
34.27	34.76			0.49	0.67
34.27		35.31		1.05*	0.67
34.27			33.22	1.05*	0.67
	34.76	35.31		0.55	0.67
	34.76		33.22	1.54*	0.67
		35.31	33.22	2.09*	0.67

* Significant at 0.05 level.

The multiple mean comparisons shows in the above table proved that there existed significant difference between the experiential groups and the combined training group had better improvement than the cross training and instructional skill training group in improving passing ability among the school volleyball players. The pre test, post test and ordered adjusted means were presented through line graph for better understanding of the results of this study in Figure 1.

Figure 1
LINE GRAPH SHOWING PRE, POST AND ADJUSTED MEANS ON PASS

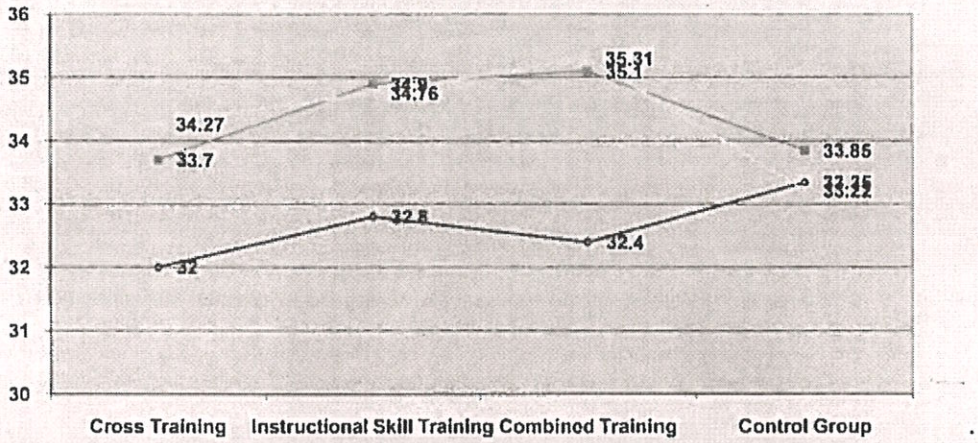

Table III
COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO CROSS TRAINING, INSTRUCTIONAL SKILL TRAINING AND COMBINED TRAINING ON SERVICE

	Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	SOV	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	27.55	27.70	27.30	27.90	B	3.84	3	1.28	0.16
Std Dev	2.91	3.15	2.08	2.99	W	601.15	56	7.91	
Post Test Mean	29.50	30.15	30.60	27.90	B	74	3	25	2.96*
Std Dev	2.80	3.33	2.08	2.99	W	635	56	8	
Adjusted Post Test Mean	29.56	30.07	30.89	27.78	B	103.22	3	34.41	22.31*
					W	115.68	55	1.54	

* Significant at 0.05 level of confidence

Table V
COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO CROSS TRAINING, INSTRUCTIONAL SKILL TRAINING AND COMBINED TRAINING ON ATTACK

	Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	SOV	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	8.85	8.75	8.90	8.90	B	0.30	3	0.10	0.14
Std Dev	0.75	0.85	0.85	0.97	W	55.90	56	0.74	
Post Test Mean	10.00	10.40	10.80	8.90	B	37.94	3	12.65	13.94*
Std Dev	0.97	0.88	0.85	0.97	W	68.95	56	0.91	
Adjusted Post Test Mean	10.00	10.48	10.76	8.91	B	39.91	3	13.30	34.90*
					W	28.59	55	0.38	

* Significant at 0.05 level of confidence

From the above table V, it is observed that the pre test found to be insignificant and the post test means, adjusted post test means were statistically significant and there was an improvement in attack ability among the school volleyball players and to find out which group had significant improvement Schefee's post hoc test was used to determine the paired mean difference and the results were presented in Table VI.

Table VI
MULTIPLE COMPARISONS AND SCHEFFE'S POST HOC ANALYSIS ON ATTACK

Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	MEAN DIFF	C.I
10.00	10.48			0.48	0.56
10.00		10.76		0.76*	0.56
10.00			8.91	1.09*	0.56
	10.48	10.76		0.27	0.56
	10.48		8.91	1.58*	0.56
		10.76	8.91	1.85*	0.56

* Significant at 0.05 level.

From the above table VI, it is observed that the pre test found to be insignificant and the post test means, adjusted post test means were statistically significant and there was an improvement in attack ability among the school volleyball players and to find out which group had significant improvement Schefee's post hoc test was used to determine the paired mean difference and the results were presented in figure -3.

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INDIAN STREAMS RESEARCH JOURNAL

International Recognition Multidisciplinary Research Journal

Volume - 6 | Issue - 11 | December - 2016

4.1625(UIF) 2230-7850

EFFECT OF AMBIDEXTERITY CONVENTIONAL TRAINING AND COMBINED TRAINING ONSELECTED PHYSICAL FITNESS VARIABLES



S.Vengadesan



S.Vengadesan

PhD Scholar

ABSTRACT:- The purpose of the study was to find out the effect of ambidexterity training, conventional trainingand combined training on selected physical fitness variables. Sixty male students aged between 14 and 17 years were selected ....

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Editor - In - Chief - H. N. Jagtap

Indian Streams Research Journal

ISSN: 2230-7850 Impact Factor : 4.1625(UIF) Volume - 6 | Issue - 11 | December - 2016

EFFECT OF AMBIDEXTERITY CONVENTIONAL TRAINING AND COMBINED TRAINING ONSELECTED PHYSICAL FITNESS VARIABLES

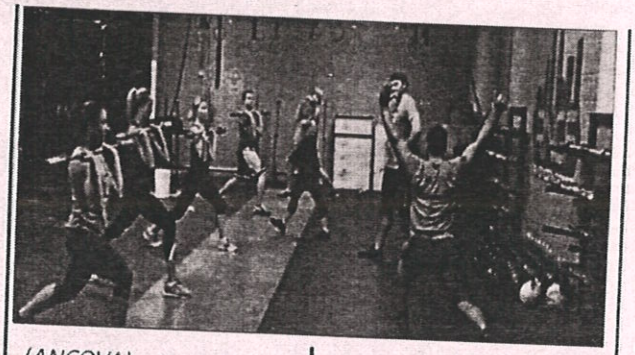
S.Vengadesan[1] and Dr. C. Arumugam[2]

[1]PhD Scholar ,

[2]Assistant Professor in Tamilnadu Physical Education and Sports University, Chennai.

ABSTRACT

The purpose of the study was to find out the effect of ambidexterity training, conventional trainingand combined training on selected physical fitness variables. Sixty male students aged between 14 and 17 years were selected from different schools in Chennai were for the study. They were divided into four equal groups, each group consisting of fifteen subjects in whom Group I underwent ambidexterity training, group II underwent conventional training, group III underwent combination training, three days per week for twelve weeks and group IV acted as control, which did not participate in any training. The subjects were tested on selected criterion variables such as leg strength, back strength and cardio-respiratory endurance at prior to and immediately after the training period. The analysis of covariance (ANCOVA) was used to find out the significant difference if any, between the experimental groups and control group on selected criterion variables separately. Since there were four groups involved in the present study, the SchefféS test was used as post-hoc test. The selected criterion variables such as leg strength, back strengthand cardio-respiratory were improved significantly in all the training groups when compared with the control group and the leg and back strength were improved significantly for combined training group and ambidexterity training group, and in cardio-respiratory endurance , the conventional training group and combined training groups were significantly improved.



KEYWORDS:*Ambidexterity training, conventional training, physical fitness.*

INTRODUCTION:

Human body is a gift by nature beings are designed for the physical activity, primitive humanshad to be able to run, climb, jump and throw to provide for their needs and to escape constantthreats to their lives. Throughout the history of mankind physical fitness has been consideredan essential element of everyday life. The ancient people were mainly dependent upon theirindividual strength, vigour, and vitality for physical survival. This involved the mastery ofsome basic skills like strength, speed, endurance, and agility for balance, running, jumping,climbing and other skills employed in hunting for food, fighting animals and other groups ofhumans and to escape from constant threats to their lives. Fitness is all things to all people, aprecious commodity which enables us to live our lives to the full yet is really cherished onlywhen it begins to fade away.. To a coach it issomething which comes with training, to a physician a functional state of the body defines intechnical terms. It is strength, flexibility, agility, power, speed and muscular and cardiovascular endurance, according to Percival (1999).

Physical training is one of the most important ingredients in training to achieve high

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345-J-SC-2016-17

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ISSN: 2231-5063 **Impact Factor 4.6052(UIF)**

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ISSN 2230-7850
Impact Factor : 5.1651(UIF)
RNI: MAHMUL 2011/38595

This is to certify that our review board accepted research paper of Dr./Shri./Smt.: A. Prabukumar and C. Arumugam Topic:-A Study About The Factors That Stresses An Umpire and Their Decision Making Skills.College:-Department of Physical Education, Tamilnadu Physical Education and Sports University,Chennai.The research paper is original & innovative. It is done double blind peer reviewed. Your article is published in the month of April year 2017.

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3.4.5-J-SC - 2016-17

ISSN: 2231-5063 IMPACT FACTOR : 4.6052(UIF) VOLUME - 6 | ISSUE - 10 | APRIL - 2017

GRT GOLDEN RESEARCH THOUGHTS

ANALYSIS OF HUMAN INTERFERENCE AS A PARAMETER THAT AFFECTS THE DECISIONS MADE BY UMPIRES AND REFEREES IN BADMINTON SPORT

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ABSTRACT

Human interference in badminton sport is a common menace faced by the officials in local circuits such as zone, divisions, district, and state tournaments. With very less media coverage and lack of video coverage make the fundamental qualification rounds very stressful for players, organizers and officials. Umpires who deliver decisive decisions experience stress throughout a match/tournament. They need to be part of the match/tournament well prior to (many hours before) start of a match and need to contribute to the ending of the match/tournament in the same way. During the officiating time they face many challenges due to interference. Most of them are not bothered or documented so as to prevent its reoccurrences in future in local circuits. Also very fewer thoughts have been put on these to estimate their impact on the decision making skills of an official. Thus, in this study, with the help of a carefully prepared questionnaire and 100 respondents, the exactness of the human interference and their magnitude in affecting an official is discussed. From the study it was elucidated that the human interference is a key parameter that demoralizes and affects an official.



KEY WORDS: *human interference, officiating, umpires, challenges, estimate, impact, questionnaire, affects, official.*

INTRODUCTION

Badminton evolved, from being a simple amateur game played between two persons or team of two against two using battledores, made from wood with non-woven strings and a birdie made of 14-16 feathers of the left wing of bird goose or duck, into a World Sport through International Badminton Federation (IBF) in 1980's and as an Olympic sport with their induction in 1992 (www.olympic.org). The elevation of the sport from simple leisure sport into the fastest racket sport resulted in 130 member associations around the world with almost 14 million members under newly adopted name Badminton World Federation (BWF) (Badminton Asia.org, 2006). The wide coverage of the respective national and international grand prix events worldwide through television partners and using advanced data mining tools to analyze a match or predict a match

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ISSN: 2230-7850 IMPACT FACTOR : 5.1651(UIF) VOLUME - 7 | ISSUE - 3 | APRIL - 2017

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A STUDY ABOUT THE FACTORS THAT STRESSES AN UMPIRE AND THEIR DECISION MAKING SKILLS

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ABSTRACT

Decision making skills of an umpire determines the outcome of any contest that uplifts the quality of a sport as well the quality of a player. Though an umpire has sufficient skill sets to be regarded as the best man to judge a competition, many on field events disturbs him or shatters his focus at times, resulting in unpleasant outcomes. It is always important to identify the factors that affect the umpires to prevent the loss of quality of the sport and players. Thus, in this study, through a questionnaire, the factors that disturb or create a stress on the umpires are identified by recording the responses from 100 skilled umpires. The same has been presented in this article with suggestions and recommendation for the welfare of umpires as well as the sport.



KEYWORDS- *decision making, disturbs, unpleasant, factors.*

INTRODUCTION :

Competition provides stimulation and challenge as well as the opportunity to apply, test and further develop skills in a contest situation. Properly managed, competition should be seen by both participants and others as a healthy and desirable part of badminton. Competition is also a test of ability and potential, with the pursuit of excellence as desirable in badminton as in other forms of endeavor. All players should be encouraged to achieve, to do their best, and to develop their full sporting potential. Challenging competition is one element of this development process.

Officials and referees also have an important influence on the enjoyment of people in badminton and this affects their continued participation. Mental toughness can also give an edge like focusing on the match no matter what is happening around, keeping calm and cool in the court. Having mental toughness is having a high EQ (Emotional Quotient). Many incidents, good or bad, can happen during a match outside or inside the court.

Everyone experiences stressful events; however, the level of stress associated with a certain situation depends on individual perception (Singer, 1986). In general, stress can reduce creativity, productivity, and the ability to enjoy oneself (Smith, 1993), therefore, being able to overcome stress is definitely important for trying to attain a higher quality of life.

Stressful situations in sport may appear at any time, such as prior to a game (e.g., fear of failure), during

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3.4.5-J-Sc- 2016-1

ISSN: 2230-7850 IMPACT FACTOR : 5.1651(UIF) VOLUME - 7 | ISSUE - 3 | APRIL - 2017

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EFFECT OF CONVENTIONAL TRAINING PROGRAMME ON PHYSICAL FITNESS VARIABLES OF MEN CRICKET PLAYERS

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[1]PhD Scholar

[2]Assistant Professor in Tamilnadu Physical Education and Sports University, Chennai.

ABSTRACT

The purpose of this study was to find out the effect of Conventional training programmer on physical fitness variables of men Cricket players. 40 school level Cricket players were selected from Chennai. Their age group ranged from 14 to 16. They were divided into two equal groups at a random basis, in which Group I named as experimental group and Group II named as control group. The following variables are used speed- 50 meter dash, Agility -4 x 10 yards Shuttle Run, Endurance - 600 yards. Flexibility- sits and reach test. The initial and final tests were conducted on the above variables for both experimental and control groups. No treatment was given to control group whereas experimental group were given Conventional training for 6 weeks. After 6 weeks of treatment the post test was conducted again for both groups. The 't' ratio was used to find out the difference between two groups. It was concluded that there is a significant improvement on physical fitness variables namely Speed, Agility, Endurance and flexibility due to 6 weeks of Conventional training.



KEYWORDS- *Speed, Agility, Endurance and Flexibility.*

INTRODUCTION :

Fitness is a very important aspect of cricket performance with physically prepared cricketers proven to perform better, more consistently and with fewer injuries. The physical attributes of strength, speed and endurance enables a cricketer to bat with power over long periods of time, bowl faster and with greater accuracy, and to field athletically. Every cricketer has a different role, position, action or technique and fitness training should recognize these differences and be programmed accordingly. A well-structured training program for a cricketer must consider the individuals training history, injury history, training age, positional requirements, technical execution and training objectives.

SPEED

Speed is your ability to repeat movements in a short time frame, and cricket players use speed while running on offense and defense. You can build and improve your speed using plyometric exercises, shuttle sprints or speed workouts.

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Vol 6 Issue 3 September 2016

ISSN No :2231-5063

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ISSN: 2231-5063 Impact Factor :4.6052(UIF) Volume - 6 | Issue - 3 | September - 2016

GRT Golden Research Thoughts

IMPACT OF SELECTED YOGIC PRACTICES AND AEROBIC DANCE ON CARDIORESPIRATORY ENDURANCE AND FLEXIBILITY AMONG JUVENILE MALE

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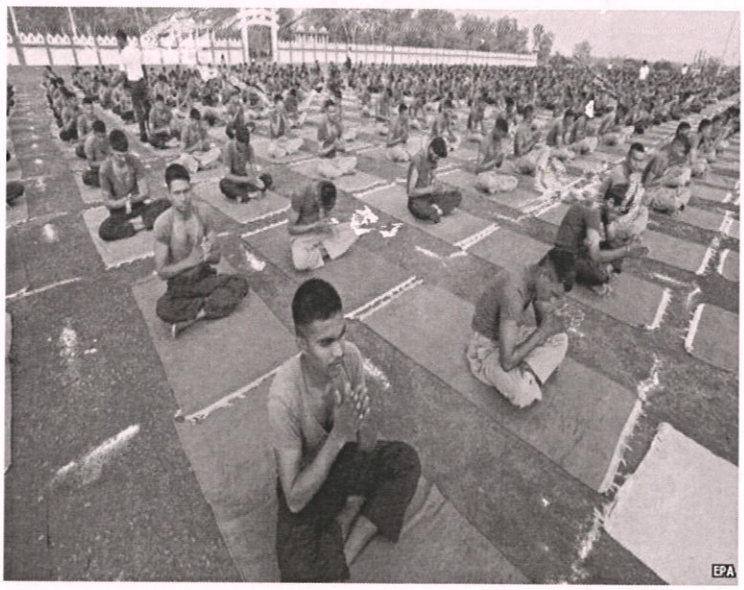
ABSTRACT:

The purpose of the study was to examine the Impact of selected yogic practices and aerobic dance on cardiorespiratory endurance and flexibility among juvenile male. To achieve the purpose of the study forty five (N=45) male students were selected from different colleges in Chennai. The age of the subjects ranged from 18 to 22 years. The selected subjects were randomly divided into two experimental groups and one control group. Group I underwent selected Yogic practices; Group II underwent Aerobic dance and Group III acted as Control Group for three alternate days in a week for a period of 12 weeks. The dependent variables selected for this study were Cardiorespiratory Endurance and Flexibility. The dependent variables namely Cardiorespiratory Endurance assessed by Cooper's 12 min run/walk test and Flexibility measured by Sit and Reach Test. The data were collected from each subject before and after the training period statistically analyzed by using dependent 't' test and analysis of covariance (ANCOVA). The level of significance was set at 0.05 level of confidence. It was found that Aerobic dance group was found to be better in improving cardiorespiratory endurance when compared to the yogic practices group. Yogic practices group was found to be better in improving flexibility when compared to the aerobic dance training group.



Key Words: *Yogic practices, Aerobic Dance, Cardiorespiratory Endurance and Flexibility.*

INTRODUCTION

The science of yoga works on physical, mental, emotional, psychic and spiritual aspects person. When imbalance is experienced at this level, the organs, muscles and nerves no singer function in harmony, rather they act in position to each other. Therefore, yoga aims at bringing the different bodily functions into perfect co-ordination so that they work for the good at the whole body. Yoga is also blissful contact with the supreme element, higher than the highest of the known elements, through the process of absorption or dissolution, the process called Laya. It is establishing ecstatic oneness between the finite and the infinite, between the microcosm and the macrocosm, between the inner being and the Supreme Being (Swami Rajarishi Muni, 1999).

Aerobic dance is an activity which produces more complex impacts on one's ability and health. Aerobic dance constitutes a group of exercise accompanied music of a certain tempo, rhythm and dynamics. It is one of the workouts used to develop cardiovascular fitness. Health-related physical fitness is defined as fitness related to some aspect of

health. This type of physical fitness is primarily influenced by an individual's exercise habits; thus, it is a dynamic state and may change. Physical characteristics that constitute health-related physical fitness include strength and endurance of skeletal muscles, joint flexibility, body composition, and cardiorespiratory endurance. All these attributes change in response to appropriate physical conditioning programs, and all are related to health. Based on the recommendations of the American College of Sports Medicine, issued for people who would like to maintain or allow the further development of their abilities, it is sufficient to exercise three to five days a week at an intensity of 55/65% to 90% of the maximal heart rate, for a period of 20 to 60 minutes of constant training or training in bouts using a rhythmic, aerobic activity which activates large muscle groups in the human body (ACSM, 1998).

METHODOLOGY

Forty five juvenile male were randomly selected from Chennai city. The age of the subjects ranged from 18 to 22 years. The selected subjects were divided into two experimental groups and one control group by random. During the training period the experimental groups underwent their respective training program in addition to their regular program of the course of study. Group I underwent Yogic practices in selected Asanas and Pranayama; Group II underwent Aerobic dance and Group III acted as Control Group for three alternate days in a week for a period of 12 weeks. The dependent variables selected for this study were cardiorespiratory endurance and Flexibility. The instrument used to measure cardiorespiratory endurance assessed by Cooper's 12 min run/walk test and Flexibility measured by Sit and Reach Test. The duration of training session in the 12 weeks was between 30 to 60 minutes approximately, including warming up and cooling down. Group III acted as control. They did not participate in any specific training on par with experimental group.

YOGIC PRACTICES INTERVENTION

The subjects were involved in Yogic practices during the morning hours between 6 and 7 am, consisting of yogic asana for 40 min, pranayamas for 15 min, and last 5 min of Shavasana/relaxation, for 1 h daily, for 12 weeks (3 days a week).

Yogic practice consisting of 12 weekly 60-minute sessions, participants were taught the breathing technique and commonly loosening exercises and yogic poses taught in including (1) standing poses which include Chair Pose (Utkatasana), Mountain Pose (Tadasana), Standing Forward Bend (Uttanasana), Tree Pose (Vrkshasana), Triangle Pose (Trikonasana), (2) sitting poses which include Half Lotus Posture (Ardha Padmasana), Thunderbolt Posture (Vajrasana), Cow-Face Pose (Gomukhasana), Seated Forward Bend (Paschimottanasana) and Sitting Sideward Twist Posture (Vakrasana) (3) kneeling poses which include Camel Pose (Ushtrasana) (4) supine which include the All-Parts Pose (Sarvangasana), Corpse Pose (Shavasana), Preparation exercise for Plow Pose, Plow Pose (Halasana) (5) prone poses which include Bow (Dhanurasana), Cobra (Bhujangasana), Locust (Shalabhasana), and The Plough Pose (Halasana) (6) Pranayama which include Surya Anuloma Viloma - Right Nostril, Chandra Anuloma Viloma-Left Nostril Yoga Breathing, Brahmari -Bumble Bee Breathing, Kapalabhati-Stimulating The Brain Cells and Bhastrika Pranayama.

The subjects were instructed to perform these asanas in a relaxed state of mind, without undue force, in a smooth, coordinated, rhythmic controlled manner, being fully conscious of the physical movements with well-coordinated breathing pattern. Pranayama consisted of both slow and fast pace breathing manoeuvres without practicing breath holding (Kumbhaka).

AEROBIC DANCE INTERVENTION

Aerobic Dance Group was included in one hour programme of aerobic exercise for 3 to 5 minutes each with the help of western music. The exercises are basic Warm up stepping, basic V step, basic L step, basic A step, straddle step Jump and turn Jump and bend forward Climbing action with a right leg and raising hands above head Climbing action with a left leg and raising hands above head climbing action with right leg and clap Climbing action with left leg and clap. Duration of training intervention was 60 minutes per day for 3 days in a week for total period of 12 weeks. Intensity: 60%-80% of HRmax. The number of beats was calculated on the basis of the

well-known formula: from 220 subtract one's age and then multiply that number by 60% to 65%, 65% to 70%, 70% to 75% and 75% to 80%. The duration of an individual training session: 60 min. The duration of an individual aerobic dance: 40 min. The structure of each individual workout encompassed: The warm-up lasted for 10 minutes. The cool-down part of the workout lasted for 10 minutes.

Results

Table – I

Summary of Mean and Dependent "t" Test for the Pre and Post Test on Selected Variables of Experimental and Control Groups

Variables	Mean	Yogic practices Group	Aerobic Dance Group	Control Group
Cardiorespiratory Endurance	Pre test Mean	1813.33 ± 130.98	1733.33 ± 181.35	1753.33 ± 132.25
	Post test Mean	2063.33 ± 139.60	2153.33 ± 135.97	1770.00 ± 115.18
	't' Test	**34.11***	**29.48***	2.15
Flexibility	Pre test Mean	25.76 ± 1.92	25.20 ± 2.75	25.72 ± 3.19
	Post test Mean	29.72 ± 2.64	27.40 ± 3.11	25.76 ± 3.14
	't' Test	**10.23***	**11.00***	0.137

*Significant at .05 level.

The obtained "t" ratio value of experimental groups was higher than the required table value and it was understood that both yogic practice and aerobic dance had significantly improved the cardiorespiratory endurance and flexibility in male. During yoga practice and aerobic dance, one consistently and willfully override the stimuli to respiratory centers, thus acquiring control over the respiration, this improved cardiorespiratory performance. The analysis of covariance on the data obtained on selected criterion variables due to the both the practices have been analysed and presented in Table II.

Table –II

Analysis of Covariance of Yogic Practices, Aerobic Dance and Control Groups on Selected Variables

Variable	Source of Variance	Sum of Squares	df	Mean Square	Obtained F ratio
Cardiorespiratory Endurance	Pre Test	52000.00	2	26000.00	1.08
		1013000.00	42	24119.05	
	Post Test	1205444.44	2	602722.22	**32.93***
		768766.67	42	18301.59	
	Adjusted Post Test	1203518.82	2	601759.41	**43.53***
		566835.77	41	13825.26	
Flexibility	Pre Test	9.24	2	4.62	1.33
		145.73	42	3.47	
	Post Test	380.31	2	190.16	**22.77***
		350.80	42	8.35	
	Adjusted Post Test	371.76	2	185.88	**21.76***
		350.31	41	8.54	

*Significant. (The table value required for significance at .05 level with df 2 & 42 and 2 & 41 are 3.22 and 3.23 respectively).

Table II shows that the obtained F-ratio value was higher than the table value of 3.22 with df 2 and 42 required for significance at .05 level. Since the value of F-ratio was higher than the table value, it indicates that there was significant difference among the adjusted post-test means of yogic practices, aerobic dance and control groups. To find out which of the three paired means had a significant difference, the Scheffe"s post-hoc test was applied and the results are presented in Table III.

Table – III
Scheffe's Test for the Differences between the Adjusted Post Test Paired Means of Selected Criterion Variables

Adjusted Post Mean values				MD	C. I
Variables	Yogic practices Group	Aerobic Dance Group	Control Group		
Cardiorespiratory Endurance	2042.50	2168.21	-	**125.71***	109.12
	2042.50	-	1775.95	**266.55***	109.12
		2168.21	1775.95	**392.26***	109.12
Flexibility	30.34	28.50	-	1.85	2.71
	30.34	-	23.49	**6.85***	2.71
		28.50	23.49	**5.00***	2.71

*Significant at .05 level.

Table III shows that the adjusted post test means differences on cardiorespiratory endurance was between the yogic practices and aerobic dance groups; the values are greater than the confidence interval value 109.12. When compared between the treatment groups aerobic dance group had greater improvement in cardiorespiratory endurance. Further, the mean difference between the yogic practices and control groups was 6.85 and it was greater than 2.71, which shows significant difference at .05 level of confidence.

CONCLUSION

It is a known fact that the yogic practice and aerobic exercises is best suited for developing physical fitness and mainly improving the cardiorespiratory endurance and flexibility. The reason may be due to the regular, long time practice of Asanas, pranayama and aerobic exercises. The present study also revealed that the above findings of the study were supported by Bera and Rajapurkar (1993), Ray et al (2001), Bharatha Priya and Gopinath, (2001), Selvakumar, Chandrasekar and Pushparaj,(2001), & Tran et.al.,(2001).

The results proved that Yogic techniques and aerobic dance involve isometric contraction which is known to increase skeletal muscle strength. Aerobic dance group was found to be better in improving cardiorespiratory endurance when compared to the yogic practices group. Yogic practices group was found to be better in improving flexibility when compared to the aerobic dance group.

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345-J-EPN-2016-17

Vol 6 Issue 4 October 2016 ISSN No :2231-5063

International Multidisciplinary Research Journal

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ISSN: 2231-5063 Impact Factor :4.6052(UIF) Volume - 6 | Issue - 4 | October - 2016

GRT Golden Research Thoughts

AN EXPERIMENTAL STUDY ON BONE MINERAL DENSITY AMONG SEDENTARY MEN

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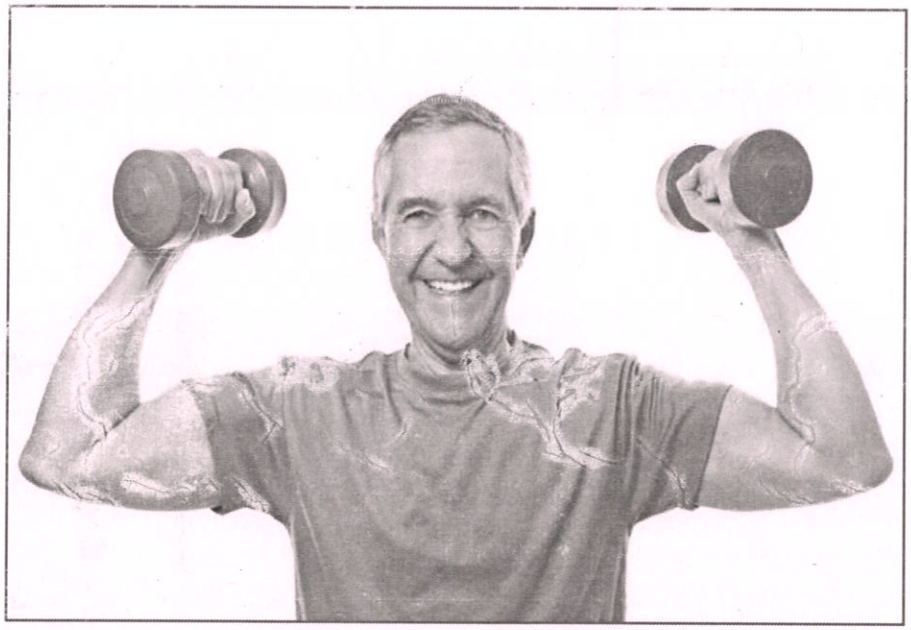


ABSTRACT

Osteoporosis is one of the leading causes of fracture and disability. The data for the study was undertaken to determine osteoporosis through bone mineral density among the population in salem city, Tamil Nadu, india. For the purpose of the study a total of 254 male subjects aged (30-80) were engaged. The Bone mineral density was measured at the calcaneus by Quantitative Ultra Sound (QUS) method and T – score values were compared with world health organization (WHO) criteria and classified as normal or osteopenia / osteoporosis. The present study reports that the bone mineral density among the sedentary men of the subjects were found to have a significant level (P< 0.05) of osteopenia 42.92% and 2.36% of osteoporosis. Among the study participants 54.7% were certainly neither osteoporotic nor osteopenia. A total of 115 subjects low bone mineral density screened of which 12.17% of subjects were belonging to the age group of 30-40 years and 18.26% of subjects were falling under 40-50 years. The maximum number of subjects in the study population that is 29.57 was found to be between 50- 60 years. In the age group of 60-70 years, there are 26.09% subjects and 13.91% of subjects in 70-80. There was significant trend of decreasing bone mineral density with increasing age. The ageing process increases the influence on the osteoporosis and osteopenia of the male. The subjects with low bone mineral density have to undergo dual energy absorptiometry (DEXA) scan in order to confirm the diagnosis.

KEYWORDS:*Bone mineral density, osteopenia and osteoporosis.*

INTRODUCTION

In today's lifestyle, usage of advanced technology like computers, mobile, televisions and cars, most people do not have sufficient time to do physical exercise and proper diet to maintain adequate health. In reality, many people have become so inactive; that their method of lifestyle has become a serious threat to their health. Physical inactivity has become the global pandemic. About 5.3 million deaths per year worldwide; 1/3 of the world's adult people are unsuccessful

in achieving the suggested 150 min per week of physical activity (PA). In addition to the lack of prevention of non-communicable diseases leads to premature mortality which is 9 % (Lee et al, 2012).

Osteoporosis is considered as serious health problem seen in the elderly especially in a rural. (Ford,Bass,Zhao, Bray, & Zhao, 2011). In elderly men, osteoporosis, and osteoporotic fractures are a significant cause of disability and mortality (Johnell&Kanis 2006). The United States Library of Medicine has confirmed it as the most familiar type of bone disease that has become a silent epidemic (Nazarko, 2011) and recognized as a major health problem throughout the world (HimaBindu& Naga Anusha, et al, 2011).

The publications on osteoporosis released on World Osteoporosis Day, October 20, 2004 by International osteoporosis foundation aims to highlight the relatively unobserved issue of osteoporosis in men, show how men bones are different from women bone, looks at challenges in awareness, diagnosis and treatment, and suggested the steps should be taken so osteoporosis can prevent fractures in men. Traditionally it has been thought of as a women's disease, in the last decade bone loss is also a predictable consequence of ageing in men has finally emerged. Even though fragility fractures are less common in men than in women, when fracture occur, it is associated with high morbidity and death than in women (Center et al., 1999). Because of the lack of awareness about osteoporosis and fractures as a disease in men is alike to the lack of awareness in women 50 years ago.

Men do not realize that the 'silent epidemic' of osteoporosis affects them and their bones are becoming thinner and more porous and frail during adult life. (Bindu et al, 2010). Bone mass achieved during growth to young adulthood is lost just under half over a man's lifetime. The loss of bone is the same as the quantity lost in women but men compensate better by placing down more new bone on the exterior surface of the bone as part of the natural process of bone remodelling (Seeman, 1995). However, this addition of new bone on the exterior surface does not completely compensate for the loss of bone in inside surface and so one in five men over 50 will have a bone fracture that decreases the quality of their lives, and lessens the length of their lives (poor,1995).

BONE FORMATION

Bone formation, also known as ossification or osteogenesis, is driven by the osteoblast cells that produce bone. Osteoblasts surrounded by the mineralized matrix become osteocytes. Thereafter osteoclasts appear and the remodelling process begins. The remodelling process converts immature woven bone into mature lamellar bone and furthermore resorbs and replaces mature lamellar bone.

BONE MODELLING AND REMODELLING

Modelling occurs when bone resorption and bone formation happen on separate surfaces (i.e. formation and resorption are not coupled). In general, during modelling the shape of the bone is altered. Bone modelling occurs during birth to adulthood and is responsible for gain in skeletal mass and changes in skeletal form (International Osteoporosis Foundation 2015). Remodelling is referred as turnover, is process of replacing existing bone matrix with new bone matrix This generally occurs in the adult skeleton to maintain bone mass (Anderson, 1991).

AGE RELATED BONE LOSS

After attaining the peak bone mass there is a progressive loss of bone (Hui,Slemenda and Johnston 1990;Kelly et al, 1995;Heaney et al,2000). The age related bone loss can be attributed to a number of age related factors including malnutrition, reduced levels of sex hormones, heritability, inactivity, medications, and diseases causing secondary osteoporosis (Rosen, 2005). When the loss of bone starts in men, they lose approximately 1% of their bone mineral density per year as they age (Hannan, 2000).

OSTEOPOROSIS

According to the National Osteoporosis Foundation, "osteoporosis, or porous bone, is a disease characterized by low bone mass and structural deterioration of bone tissue, leading to bone fragility and an increased susceptibility to fractures, especially of the hip, spine and wrist, although any bone can be affected." A hip fracture can impair a person's ability to walk unassisted and may cause prolonged or permanent disability or even death".

The condition, osteoporosis is identified in which bone mass decreases gradually andpainlessly, resulting in weak, fragile, brittle bones which are prone to fractures (Germano, 2000).

Bone mineral density peaks before the age of 30 after which it slowly decreases (National Osteoporosis Foundation 2005). Osteoporosis is diagnosed by a DXA (Dual-energyX-ray absorptiometry) scan which measures bone mineral density (National Osteoporosis Foundation, 2002). This provides a T Score, which is the measurement used to assist in determining whether or not an individual has osteopenia or osteoporosis.

Normal	T Score Higher than -1
Osteopenia	-1 to -2.5
Osteoporosis	-2.5 or lower

It is worth noting that a T score of less than -1 does not necessarily mean that an individual's bone density is decreasing. An individual may naturally have decreased bone density and may have had so for their entire life. Further testing should be conducted to and compared to the original T score for further clarification (Schousboe et al, 2007).

SELECTION OF AREA AND SUBJECT

For the purpose of the study a total of 254 male subjects aged 30-80 years were randomly selected from Salem and surrounding communities to participate in this cross-sectional investigation of bone health and nutrition. The screening of bone mineral density was carried out at Mahatma Gandhi stadium.

ASSESSMENT OF BONE MINERAL DENSITY

As Quantitative Ultrasound CM 400 is apt for measurements at the field level, this was used for measurement of the bone mass for the selected subjects with the help of well-trained specialists under the supervision of ortho surgeons. The results attained were compared with the standards given by IOF (2012) for classification as either normal or ostoepenic or/osteoporotic.

RESULT AND DISCUSSION

Table - I: Distribution of age among the selected subjects

Age Group	Frequency	Percentage
30-40	28	11.02
40-50	66	25.98
50-60	88	34.65
60-70	48	18.9
70-80	24	9.45
TOTAL	254	100

From the above table it is evident that 11.02% of subjects were belonging to the age group of 30-40 years and 25.98% of subjects were falling under 40-50 years. The maximum number of subjects in the study population that is 34.65% was found to be between 50-60 years. In the age group of 60-70 years, there are 18.9% subjects and 9.45% of subjects in 70-80 years.

Table: II Distribution of BMD scores indicating the levels of bone porosity.

S. No	BMD Category	Number of Subjects	Mean	SD	Percentage
1	Normal	139	-0.071	±0.65	54.72%
2	Osteopenia	109	-1.482	±0.32	42.92%
3	Osteoporosis	6	-3.045	±0.41	2.36%

The present study reports that the bone mineral density among the sedentary male were found to have a significant level (P<0.05) of osteopenia 42.92% and 2.36% of osteoporosis. Among the study participants 54.7% were certainly neither osteoporotic norosteopenic.

Figure -1

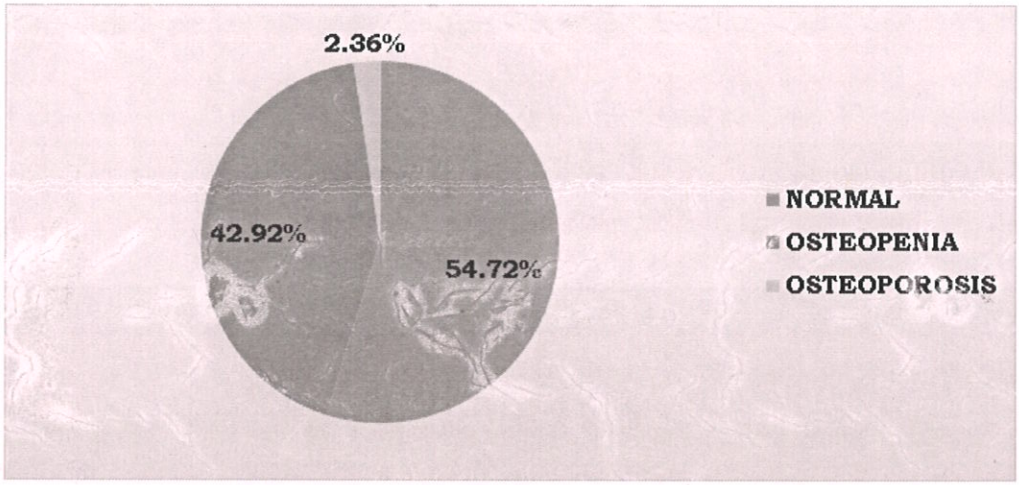
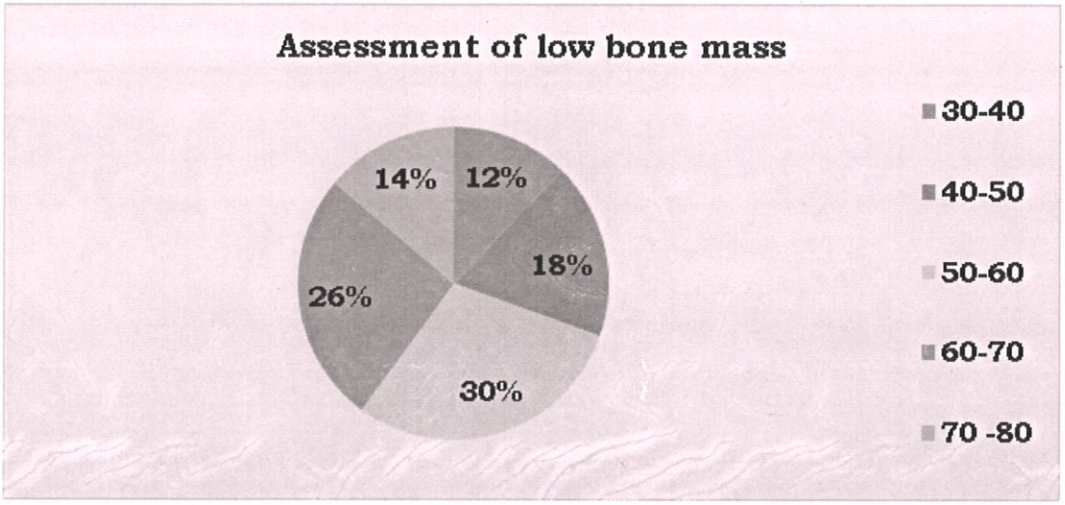


Table: III Assessment of Low Bone Mass

Age	Low BMD	Percentage
30-40	14	12.17
40-50	21	18.26
50-60	34	29.57
60-70	30	26.09
70 -80	16	13.91
Total	115	100

From the above table III, it is sensibly understood that (n= 115) of the subjects were found with low bone mineral density. It shows that 12.17% of subjects were belonging to the age group of 30-40 years and 18.26% of subjects were falling under 40-50years. The maximum number of subjects in the study population that is 29.57 was found to be between 50-60 years. In the age group of 60-70 years, there are 26.09 subjects and 13.91% of subjects in 70 -80 years.



The study report shows that Osteopenia is the early stages of Osteoporosis and this can develop into Osteoporosis unless prevention methods are put in place. Osteoporosis can affect the whole skeleton, but the most common areas to break are the wrist, spine and hip. The disease affects all age groups and both sexes.

There was significant trend of decreasing bone mineral density with increasing age. The age processes increases the influence on the osteoporosis and osteopenia. The subjects with low bone mineral density have to undergo dual energy absorptiometry (DEXA) scan in order to confirm the diagonosis.

CONCLUSION

Reasons ascribed for lower BMD in Indians include possible genetic differences, nutritional deficiency and smaller skeletal size (Shivane et al, 2012). Bone that lasts throughout a lifetime is built during childhood and teenage. After thirty years of age, the cells that build bone are not efficient and bone progressively will be lost. Bones begin to breakdown faster than the formation of new bone (Evelien et al 2011). Exercise habits, osteoporosis knowledge, and health beliefs perceived susceptibility and seriousness, exercise barriers and benefits, and health motivation (Taggart and Connor, 1995) are lacking in the adulthood.

In the 2009, IOF Asian Audit, expert groups predicted that the number of osteoporosis patients in India was approximately 26 million in 2003, would rise to 36 million patients by 2013 (Malhotra & Mittal, 2008) but in 2013, 50 million people in India are either osteoporotic (T score lower than -2.5) or have low bone mass (T-score between-1.0 and -2.5).

With estimates showing that approximately 80% of the urban Indian population is vitamin D deficient (Beloyartseva et al, 2012) and hip fractures occur about a decade earlier than in western nations (Malhotra & Mittal, 2008). Indians have lower BMD than their North American counterparts (ICMR 2010). A study involving more than 3,500 subjects carried out at tertiary care center in South India to study the influence of the newly generated ICMR database (ICMRD) on the study of osteoporosis reported that a greater percentage were diagnosed as having osteoporosis as compared to the ICMR database. Osteoporosis at the spine and hip was present in 42.7% and 11.4% subjects using the database and in 27.7% and 8.3% subjects using the ICMR database (Paul et al, 2012).

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3.45-J-EPN-2017

Vol 6 Issue 10 Nov 2016

ISSN No : 2230-7850

International Multidisciplinary Research Journal

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ISSN: 2230-7850 Impact Factor :4.1625(UIF) Volume - 6 | Issue - 10 | November - 2016

Indian Streams Research Journal

IMPACT OF FUNCTIONAL STRENGTH TRAINING ON SELECTED BODY COMPOSITION PARAMETERS AMONG MEN WITH OSTEOPENIA

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ABSTRACT

For the purpose of the study was to examine the impact of functional strength training on selected body composition parameters among men with Osteopenia. The cross-sectional investigation of bone health and nutrition a total of 165 male aged 50-60 years were selected from Salem and surrounding communities. The screening of body composition was carried out at shri Gokulam Hospital by using DEXA scan; among 165 male 88 male are having osteopenia. From this 88 male 20 male Osteopenia subjects were randomly selected. The subjects were assigned into two group's namely experimental group I (functional strength Training) and group II acted as control group. The study was formulated as a true random group design consisting of pre - test and post –test. The experimental group participated in their training for a period of 12 weeks. Initial test were conducted for all the subjects on selected body composition parameters like Fat Mass, Lean Mass and Bone Mineral Density by using Dual-Energy X-ray Absorptiometry (DXA, DPX-NT, NT+73679 GE LUNAR MEDICAL SYSTEM) of the Whole Body scan. The post test is conducted on the above said parameters after the 12 weeks for the two groups. The results proved that there was a significant reduction in fat mass and significant improvement in lean body mass and bone mineral density among men with Osteopenia.

KEYWORDS:*Osteopenia, Fat Mass, Lean Mass and Bone Mineral Density.*

INTRODUCTION

Men do not realize that the 'silent epidemic' of osteoporosis affects them and their bones are becoming thinner and more porous and frail during adult life (Bindu et al, 2010). Bone mass achieved during growth to young adulthood is lost just under half over a man's lifetime. The loss of bone is the same as the quantity lost in women but men compensate better by placing down more new bone on the exterior surface of the bone as part of the natural process of bone remodeling (Seeman, 1995). However, this addition of new bone on the exterior surface does not completely compensate for the loss of bone in inside surface and so one in five men over 50 years will have a bone fracture that decreases the quality of their lives, and lessens the length of their lives (poor,1995).

The risk factors are similar, such as: age, gender, menopause, having a family history, low body weight i.e. being small and thin, medical



history, not getting enough calcium and Vitamin D, not eating enough fruits and vegetables, having a diet high in protein, sodium and caffeine, long-term sedentary lifestyle, smoking, excessive alcohol consumption and delayed puberty in male (Chestnut,1994).

PHYSICAL ACTIVITY AND OSTEOPOROSIS

Physical activity is clinically accepted as a beneficial activity for osteoporotic patients, although little information exists regarding the best and most appropriate type, duration and intensity of exercise to provide the maximum protective effect against bone loss (Bass et al, 1998; Chilibeck, 1995). The exercise pattern should be analyzed according to the type of training, intensity, frequency and duration of each period. Most of the researches are in general on post-menopausal women. There exist just a few studies which include men (Bailey and Brooke-Wavel, 2008).

Physical activity is a very important factor in skeletal development and can prevent and treat age-related reductions in bone strength due to the inherent sensitivity to mechanical loading in bone tissue. When the skeleton is exposed to altered levels and patterns of mechanical loading the bone tissue responds by an adaptive mechanism called the mechanostat hypothesis, by analogy with a thermostat, based on "Wolff's Law"(Frost 1987,1998).

The skeleton must be as strong and flexible as possible to prevent fracture when the environmental demands increase and at the same time as light as possible to facilitate mobility (Seeman 2006). Perhaps the most convincing evidence that mechanical loading is important for bone adaptation comes from studies of the skeleton put in a state of disuse, i.e. bed rest, spaceflight or spinal cord injury. These studies demonstrate that bone loss is rapid and large when mechanical loading forces acting on the bone tissue are remarkably reduced (Giangregorio & Blimkie 2002). Also, the consistent effectiveness of exercise to increase bone mass, or at least arrest the loss of bone mass (Borer 2005).

FUNCTIONAL STRENGTH TRAINING ON BONE MASS

Functional strength training is the practice of motion against resistance, with an objective of improving a participant's ability to perform a specific athletic activity (Reynolds, M. 2003). Functional fitness has been defined by (Brill 2008) as emphasizing multiple muscle and joint activities, combining upper body and lower body movements, and utilizing more of the body in each movement. Functional strength training as a form of exercise gets little to no attention compared to cardiovascular training. Most people know that walking or riding their bike is an essential part of maintaining good health. A study by (de Vreede 2005) involving a group of elderly women demonstrated that functional task exercises were more effective than resistance exercises at improving functional task performance. These results suggested that functional task exercises play an important role in maintaining an independent lifestyle.

The skeleton must be as strong and flexible as possible to prevent fracture when the environmental demands increase and at the same time as light as possible to facilitate mobility (Seeman 2006). The roles of strength training on bone mineral density in men have obtained combined results. Few studies evaluated increased mineralization while others reported demineralization. But still functional strength training is the best way to increase bone mineral density among men with osteopenia in preventing bone loss (Hinton, Nigh, & Thyfault, 2015, Nelson et al, 1994). Training directed towards lower extremity and balance may reduce the risk of falling in osteopenia. This training will mechanically load the bone and evoked reflexive muscle contractions. Resistance training studies suggested that muscle contraction can also increase bone mineral density by stimulating tissue remodeling (Pruitt et al., 1992),bone formation (Menkes et al., 1993),or even augmentation of bone formation associated with an inhibition of reabsorption (Andreoli et al., 2001). Thus, functional strength training should be recommended as an adjunct lifestyle approach to osteoporosis prevention or in combination with other treatments in this group of women.

METHODOLOGY

For the purpose of the cross-sectional investigation of bone health and nutrition a total of 165 male aged

50-60 years were selected from Salem and surrounding communities. The screening of body composition was carried out at shri Gokulam Hospital by using DEXA scan; among 165 male 88 male are having osteopenia. From this 88 male 20 male Osteopenia subjects were randomly selected. The subjects were assigned into two group's namely experimental group I (Aerobic exercise with functional strength Training) and group II acted as control group. The study was formulated as a true random group design consisting of pre - test and post –test. Initial test were conducted for all the subjects on selected body composition parameters like Fat Mass, Lean Mass and Bone Mineral Density. The experimental group participated in their training for a period of 12 weeks. The post test is conducted on the above said parameters after the 12 weeks for the two groups. The functional strength training program is scheduled at 6.30 am to 7.30 am on alternate days.

As per the recommends ACSM the older adults perform 10 – 15 reps of 8-10 exercise that maintains muscle strength or endurance (Nelson et al, 2007). In general, progressive weight training for 25 minutes at 50-80% of maximum heart rate is recommended for older adults to develop muscle mass. Large muscle group functional strength training should be 25 minutes, small muscle group strength training for 10 min using Phyio ball, Theraband and abdominal strength training for 5 minutes considered to be a safe and effective method for increasing strength and lean muscle tissue, and attenuating age-related muscle loss (Metcalf et al, 2001; Reeves et al, 1985; Vincent et al., 2002; Roth et al., 2000).

RESULT AND DISCUSSION

Table – I

Test	Training Group	Control Group	SV	SS	df	MS	F
Pre Test	24.26	23.12	Between	6.56	1	6.555	0.33
			Within	362.38	18	20.13	
Post Test	19.26	23.55	Between	92.21	1	92.21	**4.99***
			Within	332.79	18	18.49	
Adjusted	18.75	24.06	Between	138.29	1	138.29	**47.25***
			Within	49.76	17	2.93	
Mean Gain	5.00	-0.44					

Table F- ratio at 0.05 level of confidence for 1 and 18 (df) = 4.41, 2 and 17 (df) = 4.45 *Significant.

Table I shows that the obtained F value on pre test scores on Fat mass was 0.33 lesser than the required value of 4.41 to be significant at 0.05 level. This proved there is no significant difference between the groups at initial stage and the randomizations at the initial stage are equal. The obtained post test F value of 4.99 was greater than the required F value of 4.41. Further, the obtained adjusted post test F value of 47.25 was greater than the required F value of 4.45. Hence, it was proved that the functional strength training significantly improved fat mass among men with osteopenia.

Figure-1
Bar Diagram showing the pre and post test mean on Fat Mass

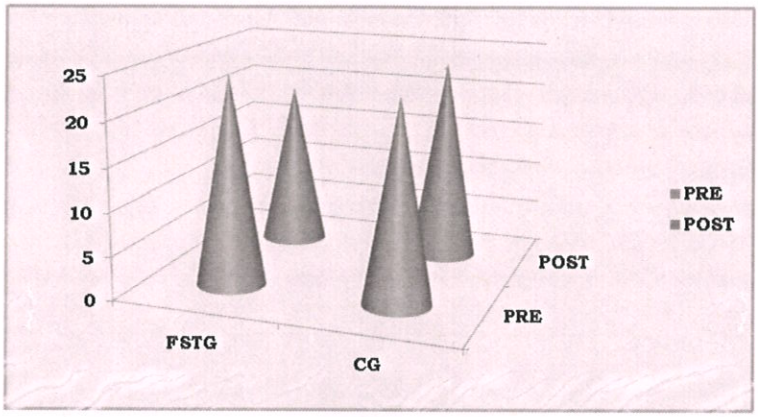


Table – II
Computation of Analysis of Covariance on Lean Mass

Test	Training Group	Control Group	SV	SS	df	MS	F
Pre Test	40.64	40.32	Between	0.51	1	0.512	0.03
			Within	290.96	18	16.16	
Post Test	44.22	40.36	Between	74.50	1	74.50	**4.95***
			Within	270.68	18	15.04	
Adjusted	44.07	40.51	Between	63.36	1	63.36	**54.21***
			Within	19.87	17	1.17	
Mean Gain	3.58	0.04					

Table F- ratio at 0.05 level of confidence for 1 and 18 (df) = 4.41, 2 and 17 (df) = 4.45 *Significant.

Table II shows that the obtained F value on pre test scores on Lean body mass was 0.03 less than the required value of 4.41 to be significant at0.05 level. This proved there is no significant difference between the groups at initial stage and the randomizations at the initial stage are equal. The obtained post test F value of 4.95 was greater than the required F value of 4.41. Further, the obtained adjusted post test F value of 54.21 was greater than the required F value of 4.45. Hence, it was proved that the functional strength training significantly improved lean body mass among men with osteopenia.

Figure-2
Bar Diagram showing the pre and post test mean on Lean Body Mass

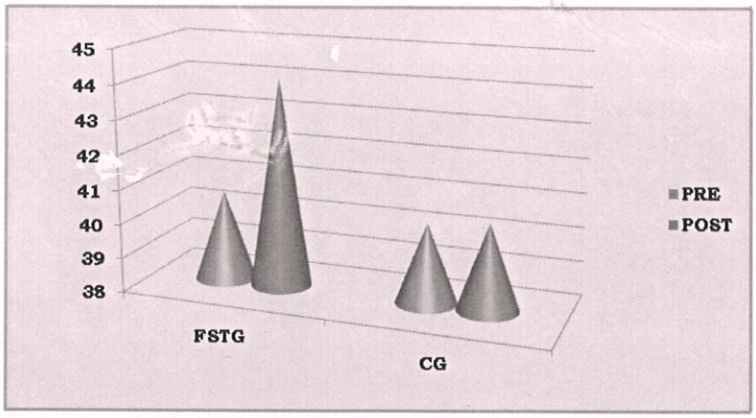


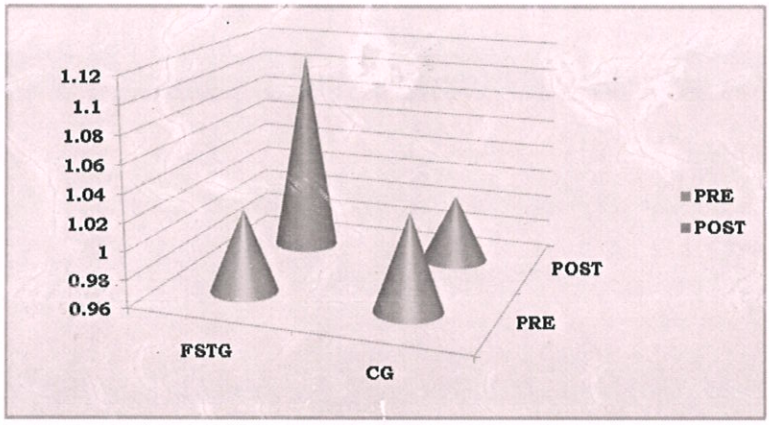
Table – III
Computation of Analysis of Covariance on Bone Mineral Density

Test	Training Group	Control Group	SV	SS	df	MS	F
Pre Test	1.02	1.03	Between	0.00	1	0.000	0.07
			Within	0.07	18	0.00	
Post Test	1.11	1.01	Between	0.05	1	0.05	**16.46***
			Within	0.06	18	0.00	
Adjusted	1.11	1.01	Between	0.06	1	0.06	**29.90***
			Within	0.03	17	0.00	
Mean Gain	0.09	0.02					

Table F- ratio at 0.05 level of confidence for 1 and 18 (df) = 4.41, 2 and 17 (df) = 4.45 *Significant.

Table III shows that the obtained F value on pre test scores on Bone mineral density was 0.07 lesser than the required value of 4.41 to be significant at 0.05 level. This proved there is no significant difference between the groups at initial stage and the randomizations at the initial stage are equal. The obtained post test F value of 16.46 was greater than the required F value of 4.41. Further, the obtained adjusted post test F value of 29.90 was greater than the required F value of 4.45. Hence, it was proved that the functional strength training significantly improved Bone mineral density among men with osteopenia.

Figure-3
Bar Diagram showing the pre and post test mean on Bone Mineral Density



CONCLUSION

The results clearly confirmed that from the current study notorious that the changes over time in the majority of the body composition variables due to the functional strength training. Training treatment altered the distribution of Lean mass, Fat Mass and Bone mineral density among the men with osteopenia.

In summary, Active people who are performing exercise lives longer and healthier (Chakravarthy et al, 2008). In men, Lean Mass is more important than Fat mass. Several mechanisms have been proposed for the associations between Fat Mass and Lean Mass with bone mineral density. Both Lean Mass and Fat Mass may contribute to an increase in bone mineral density by causing increased mechanical loading (Reid, Plank and Evans, 1992).

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Effect of Small Sided Games Training on Resting Heart Rate and Maximal Oxygen Consumption among State Level Men Football Players

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Received 6th October 2016, Accepted 5th November 2016

Abstract

The purpose of this study was to determineEffect of Small Sided Games Training on Resting Heart Rate and Maximal Oxygen Consumption among State Level Men Football Players. The research was conducted on a sample of 30State Level Men Football players and their age ranged between 18 and 25 years. They were randomly divided into two groups: those undertaking a Small Sided Gamestraining (n=15) and a control group (n=15). The subjects took part in a Small Sided Gamestraining for five days a week for ten weeks. The subjects' Resting Heart Rate and Maximal Oxygen Consumption were assessed before and after the completion of the Small Sided Games training. The result shows that after the ten weeks of the Small Sided Gamestraining proved significant variation were found in the subjects' Resting Heart Rate and Maximal Oxygen Consumption in the experimental group ($p<0.05$). There were no significant differences in the control group after the experiment in terms of the same measures ($P>0.05$). The Small Sided Games training proved to be a useful training modality for football players and in terms of altering Resting Heart Rate and Maximal Oxygen Consumption.

Keywords: Resting Heart Rate, Maximal Oxygen Consumption and Small sided games.

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Introduction

Small-sided games (SSGs) are played on reduced pitch areas, often using modified rules and involving a smaller number of players than traditional football. These games are less structured than traditional fitness training methods but are very popular training drills for players of all ages and levels. At present, there is relatively little information regarding how Small-sided games (SSGs) can best be used to improve physical capacities and technical or tactical skills in footballers. Small-sided games (SSGs), also referred to as skill-based conditioning games (Gabbett, 2006) or game-based training, (Gabbett, Jenkins and Abernethy, 2009) are modified games played on reduced pitch areas, often using adapted rules and involving a smaller number of players than traditional football games. These small-sided games develop physical abilities, as well as technical and tactical skills (Impellizzeri, et al. 2006&Dellal, et al. 2011). As far as physical condition is concerned, small-sided games develop aerobic capacity (Dellal, et al. 2008&Hill-Haas, et al.2011). Heart rate (HR) is the most common measure used for objectively monitoring training intensity in many sports, (Achten and Jeukendrup, 2003) and several studies have shown Heart rate (HR) to be a valid indicator of exercise intensity in football (Drust, Reilly and Cable, 2000 &Esposito, et al.2004). For example, the mean Heart rate (HR) and oxygen consumption (VO_2) relationship have been reported to be similar during treadmill based intermittent exercise that reproduced the demands of a football game.

More important for performance than average oxygen uptake during a game may be the rise in the rate of oxygen uptake during many short intense actions. A player's heart rate during a game is rarely below 65% of HRmax, suggesting that blood flow to the exercising leg muscles is continuously higher than at rest, which means that oxygen delivery is high. However, the oxygen kinetics during changes from low to high-intensity exercise during the game appear to be limited by local factors and depend on, among other factors, the oxidative capacity of the contracting muscles (Bangsbo et al., 2001; Krustrup et al., 2004; Nyberg et al., 2010). The rate of increase in oxygen uptake can be changed by intense interval training (Krustrup et al., 2004).

Methodology

The purpose of the study was to determine the effect of small sided games training on Resting Heart Rate and Maximal Oxygen Consumptionamong state level men football players. In the present study 30 men student were selected by random sample from Andhra Pradesh. The subject chosen for this study were divided randomly into two equal groups called one control and

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ISSN: 2349 – 4891

one experimental groups consisting of 15 players in each group. Their age ranged from 18 to 25 years. The investigator explained to them the purpose, importance of the experiment and the procedure to be employed and the testing procedure was also explained to them in detail. Ten weeks of small sided games training were given to the experimental groups. The control group was allowed to do their regular work. The experimental groups underwent the training programme as per the training schedule prepared the investigator. The training programme was held five days in a week for 10 week, the training was conducted. The tests selected for the study were standardized tests and most suitable for the present study. The investigator was present with subjects of the control group and the experimental groups during the experimentation of the pre test and the post test was conducted. The data collected were statically examined for significant differences, if any by applying analysis of covariance (ANCOVA). In all the cases, 0.05 level of confidence was used to test the significance, which was considered as appropriate.

Results

Table I. Results of ANCOVA between small sided games training and Control Groups on Resting Heart Rate

Test	CG	SSG	SV	SS	df	MS	F
Pre Test	70.20	71.27	Between	8.53	1	8.533	1.14
			Within	209.33	28	7.48	
Post Test	70.60	68.67	Between	28.03	1	28.03	4.20*
			Within	186.93	28	6.68	
Adjusted	71.04	68.23	Between	56.80	1	56.80	33.07*
			Within	46.37	27	1.72	
Mean Gain	0.40	2.60					

The table values required for significance at .05 level of confidence for degree of freedom 1 and 28 and 1 and 27 are 4.20 and 4.21 respectively.

Table II. Results of ANCOVA between small sided games training and Control Groups on Maximal Oxygen Consumption

Test	CG	SSG	SV	SS	df	MS	F
Pre Test	42.74	43.74	Between	7.55	1	7.550	1.05
			Within	201.50	28	7.20	
Post Test	41.95	46.61	Between	162.87	1	162.87	15.40*
			Within	296.14	28	10.58	
Adjusted	42.53	46.03	Between	88.21	1	88.21	100.72*
			Within	23.65	27	0.88	
Mean Gain	0.79	2.87					

The table values required for significance at .05 level of confidence for degree of freedom 1 and 28 and 1 and 27 are 4.20 and 4.21 respectively

In table I and II, the results of the ANCOVA for Resting Heart Rate and Maximal Oxygen Consumption are presented. In analysis of covariance, the final means are adjusted for differences in the initial means and the adjusted means of small sided games group and control group on Resting Heart Rate and Maximal Oxygen Consumption are tested for significance. From the table it can be seen that the calculated F value of 33.07 for Resting Heart Rateand 100.72 for Maximal Oxygen Consumption between groups is greater than the table value 4.21 indicating that it is significant ($P < 0.05$) for the degrees of freedom (1,27) at 0.05 level. The calculated F value indicated that there were significant alterations in Resting Heart Rate and Maximal Oxygen Consumption between the groups because of the training effect of small sided games training.

ISSN: 2349 – 4891

Figure I. Bar diagram showing the Initial and Final Adjusted Mean Values of Resting Heart Rate between Control and Small sided games groups

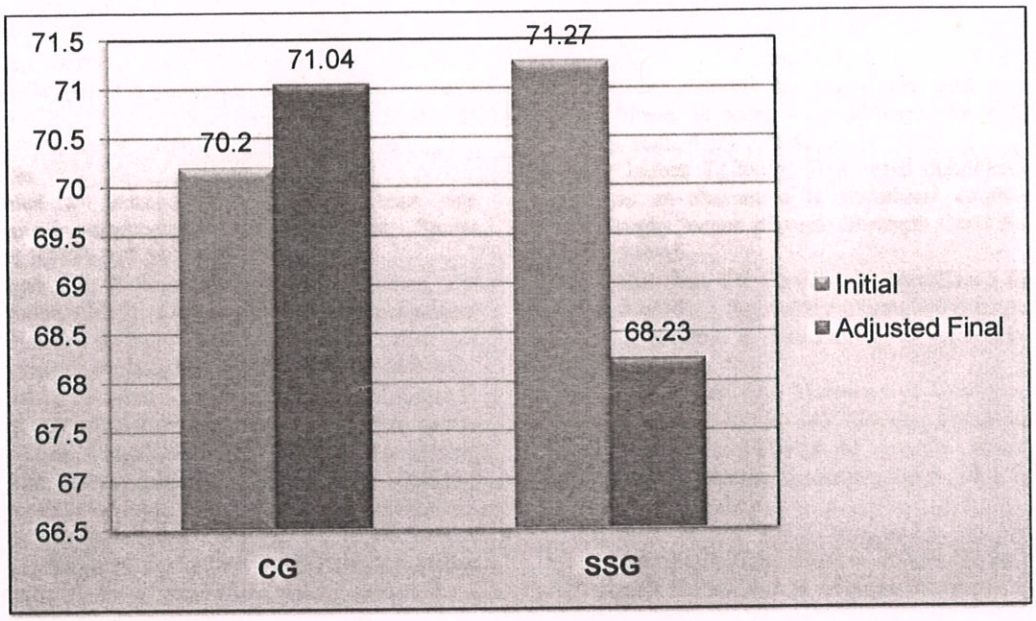
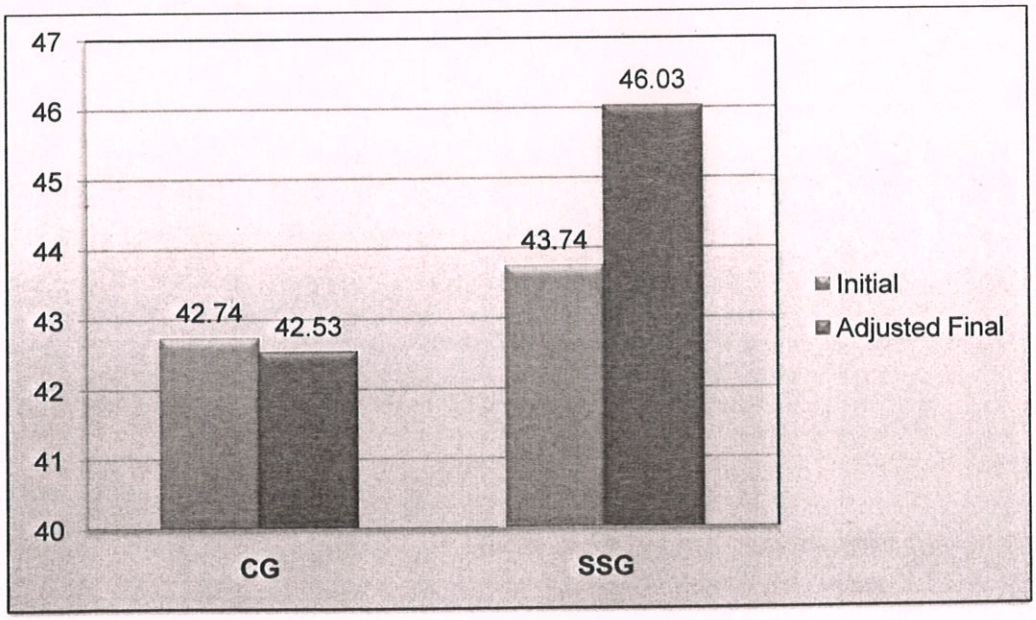


Figure II. Bar diagram showing the Initial and Final Adjusted Mean Values of Maximal Oxygen Consumption between Control and Small sided games groups



Conclusions

Physiological indicators are essentially found in the intensity, frequency and duration of matches and training sessions. During a match or training session, the physical effort causes physiological stress in the player, which characterizes the internal load that is generally seen in the physiological responses of the body to the effort exerted. The physiological level linear relationship between expenditure of energy (VO_2) and heart rate for all levels of intensity, the heart rate is very often used to estimate the intensity of the workload on the pitch; as it is easy to measure, it is a tool that allows the rhythm of the intensity of the activity to be monitored and adjusted. From the analysis of the data, There was a significant

ISSN: 2349 – 4891

difference existed between small sided games group and control group due to ten weeks of experimental training on Resting Heart Rate and Maximal Oxygen Consumption. Among the two groups, small sided games group significantly changed the Resting Heart Rate and Maximal Oxygen Consumption than that of Control group.

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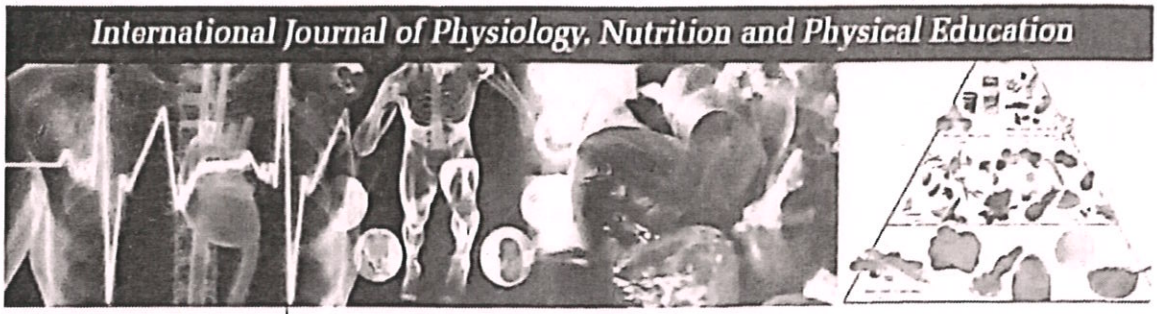
Please cite this article as: B. Venugopal & Dr.R.Subramanian. Effect of Small Sided Games Training on Resting Heart Rate and Maximal Oxygen Consumption among State Level Men Football Players. *International Journal of Recent Research and Applied Studies*. 2016. 3. 11(7). 27-30.

3.4.5-J-EPN- 2016-17

International Journal of Physiology, Nutrition and Physical Education 2017; 2(2): 1094-1095



ISSN: 2456-0057
IJPNPE 2017; 2(2): 1094-1095
© 2017 IJPNPE
www.journalofsports.com
Received: 12-05-2017
Accepted: 16-06-2017

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Effect of plyometric training on selected physiological variables among college level volleyball players

Dr. J Anitha

Abstract
This study was designed to investigate the Effect of plyometric training on selected physiological variables among college level Volleyball players. To achieve the purpose of the study 30 intercollegiate male Volleyball players were selected from TNPESU University, Chennai. The subjects were randomly assigned to two equal groups (n=15). Group- I underwent plyometric training (PT) and Group- II acted as control group (CG). The plyometric training was given to the experimental group three days per week (Monday, Wednesday and Friday) for the period of twelve weeks. The control group was not given any sort of training except their routine work. A pilot study was conducted to assess the maximum capacity of the subjects in order to fix the load. The physiological parameters (Breath Holding Time, Resting Heart Rate) before and after training period. The data collected from the subjects was statistically analyzed with 't' test to find out significant improvement if any at 0.05 level of confidence. The result of the Breath Holding Time, Resting Heart Rate significant improvement due to influence of plyometric training with the limitations of (diet, climate, life style) status and previous training. The result of the present study coincide findings of the investigation done by different experts in the field of sports sciences. Plyometric training group significantly improved Breath Holding Time and Resting Heart Rate college level Volleyball players.

Keywords: Plyometric training, Breath holding time, resting heart rate, volleyball players

Introduction

Plyometric Training

Plyometric (also known as "ploys") is a type of exercise training designed to produce fast, powerful movements, and improve the functions of the nervous system, generally for the purpose of improving performance in sports. Plyometric movements, in which a muscle is loaded and then contracted in rapid sequence, use the strength, elasticity and innervations of muscle and surrounding tissues to 23 jump higher, run faster, throw further, or hit harder, depending on the desired training goal. Plyometric is used to increase the speed or force of muscular contractions, providing explosiveness for a variety of sport-specific activities. Plyometric has been shown across the literature to be beneficial to a variety of athletes. Benefits range from injury prevention, power development and sprint performance amongst others. Plyometric can improve strength in both your upper and lower body. Examples of lower body plyometric are tuck jumps, squat jumps, box jumps and depth jumps. The goal of these jumps is to get higher, utilizing your leg strength to improve the height of your jump.

Volleyball

Volleyball is a dynamic, fast-paced game. The purpose of strength training for volleyball is not to build big muscles, but to develop the physical attributes necessary to improve a player's performance. So strength training is very important to volleyball and should not be developed independently of other abilities such as agility, quickness and endurance. When watching a great volleyball player, the one word that comes to the mind is "quick". Everything the player does is short and quick. There are no long drawn out motions like sprinting in other sports. There is simply a succession of explosive bursts that keep the ball in play and control the flow of the game. The quickness that must be focused on, when training a volleyball player is not only quickness from side to side and front to back, but also quickness from up to down. Unique from other sports,

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Today this is known as "circuit weight training" research has shown that it can increase muscular strength and endurance. There is mild improvement in aerobic stamina but only if the rest periods are kept very short. Another variation is "aerobic circuit training" aerobic station like treadmill, rower or stepper (1 to 5 minute per station) or interspersed with weight training stations. This protocol has been found to increase aerobic stamina and muscular endurance and endurance. (Dabir. R. Qureshi, 2012).

Methodology

The purpose of the study was to find out the effect of plyometric training and circuit training on speed and muscular endurance among men volleyball players. To achieve the purpose of the study 24 men volleyball players in the age group 18 to 25 years were selected at random from various engineering college in Chennai, Tamil nadu. Selected subjects were divided in to three groups of experimental I, experimental II and control group. The experimental group I participated combined plyometric training group and experimental group II circuit training group for the training period six weeks three alternate days per week. The control group were maintained their daily routine activities and no special training was given.

Statistical Techniques

The collected data on speed and muscular endurance were statistically examined to the test. The various hypotheses formulated by the researcher for comparison 't' ratio was used. 't' ratio was the difference between the mean, standard deviation and standard error of the difference between the means.

Table 1: Computation of 't' ratio between pre and post test scores of experimental group and control group on speed

Variables	Group Name	Mean		SD		SD Error	DF	't' ratio
		Pre	Post	Pre	Post			
Speed	Experimental Group	3.64	3.54	0.24	0.21	0.012	11	8.33*
	Control Group	3.63	3.64	0.23	0.31	0.032		0.312

*level of significance was fixed at 0.05 with df 11 table value is 2.20

The table I shows that the mean values of pre-test and post-test of experimental group in speed were 3.64 and 3.54 respectively. The obtained't' ratio was 8.33 since the obtained 't' ratio was greater than the required table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in speed were 3.63 and 3.64 respectively. The obtained't' ratio was 0.312 which was lesser than the table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on speed due to combined plyometric and circuit training on men volleyball players.

Table 2: Computation of 't' ratio between pre and post test scores of experimental group and control group on muscular endurance

Variables	Group Name	Mean		Sd		Sd Error	Df	't' ratio
		Pre	Post	Pre	Post			
Muscular Endurance	Experimental Group	40.00	44.75	7.73	6.63	0.41	11	11.58*
	Control Group	39.91	39.25	3.36	3.07	0.43		1.56

*level of significance was fixed at 0.05 with df 11 table value is 2.20

The table II shows that the mean values of pre-test and post-test of experimental group in muscular endurance were 40.00 and 44.75 respectively. The obtained't' ratio was 11.58 since the obtained 't' ratio was greater than the required table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in muscular endurance were 39.91 and 39.25 respectively. The obtained't' ratio was 1.53 which was lesser than the table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on muscular endurance due to combined plyometric and circuit training on men volleyball players.

Conclusions

1. It was concluded that there was significant improvement in speed due to plyometric and circuit training on men volleyball players.
2. It was concluded that there was significant improvement in muscular endurance due to plyometric and circuit training on men volleyball players.
3. The result of the study reveals that plyometric and circuit training would improve college men players speed and muscular strength significantly.

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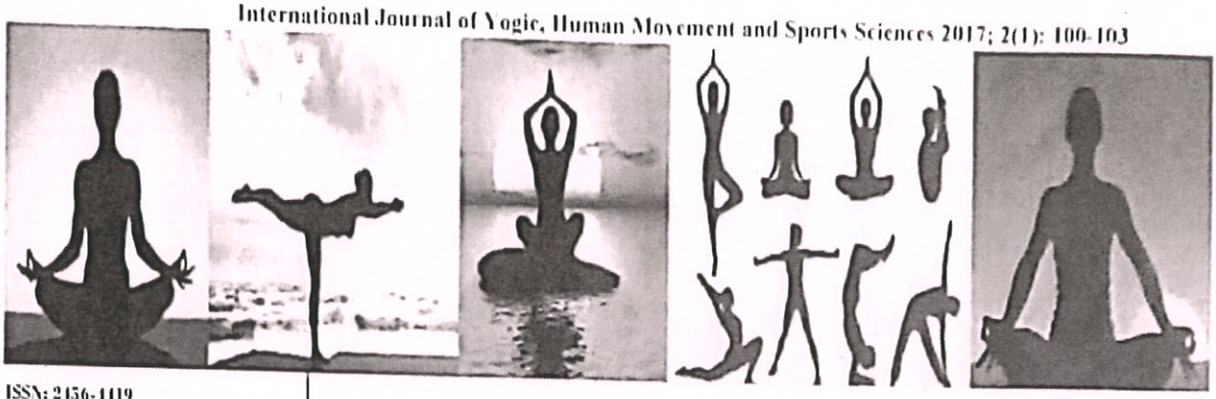
International Journal of Yogic, Human Movement and Sports Sciences 2017; 2(1): 100-103



ISSN: 2456-1419
Impact Factor: (RJIF): 5.18
Yoga 2017; 2(1): 100-103
© 2016 Yoga
www.theyogicjournal.com
Received: 22-11-2016
Accepted: 23-12-2016

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Effect of SAQ training and interval training on selected physical fitness variables among men handball players

Dr. J Anitha

Abstract
The purpose of the study was to find out the effect of SAQ training and interval training on selected physical fitness variables among men handball players. To achieve the purpose of the study forty five handball players were selected on random bases from the college located at Chennai city. Their age were ranged between 18 and 24 years. They were divided in to three equal groups (two experimental and one control group) the experimental group I was given SAQ training and experimental group II was given interval training for six weeks and control group was not allowed to participate in any training programme. Pretest was conducted on selected dependent variables such as speed, agility and quickness at the beginning before the experimental treatment and posttest was taken after the experimental treatment. The data were analyzed by applying ANCOVA. The result revealed that the SAQ training and interval training had significantly improved the speed, agility and quickness of the men handball players.

Keywords: SAQ training, interval training, speed, agility, quickness

Introduction

SAQ Training

The SAQ training method is an easily coachable method of training, it relies on the athlete being coached the correct technique for the movements. SAQ is a programme of progressive exercises which could develop the basic motor abilities of the athlete enhancing their capabilities of completing skills at faster speeds with greater accuracy. SAQ training has been found to capitalize on the stretch-shortening cycle (SSC), as well as plug the gap between traditional resistance training and specific sporting movements. Some of the benefits of SAQ include increased muscular power, brain signal efficiency, kinesthetic spatial awareness, motor skills and reaction time.

Interval Trianing

One method of training that allows appropriate metabolic systems to be stressed is interval training. Interval training is based on the concept of more work which can be performed at higher exercise intensities with the same or less fatigue compared to continuous training. The theoretical metabolic profile for exercise and rest intervals stressing aerobic metabolism, fast glycolysis, and the phosphagen system is based on the knowledge of which energy system predominates during exercise and time of substrate recovery.

Hypotheses

It was hypothesized that there would be significant difference among SAQ training, interval training groups, control group on selected physical fitness variables such us speed, agility, quickness.

Delimitations

1. The study was restricted to 45 handball players.
2. The age of subjects was ranged 18 to 24 years.
3. The duration of training was restricted to 6 weeks.

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For a discussion of interval training and sample programs, including programs for developing speed and anaerobic endurance Vivan H. Heyward, (2010).

Hypotheses

It was hypothesized that there would be significant difference among SAQ training, interval training groups, control group on selected physiological variables such us resting pulse rate and VO2 max

Delimitations

1. The study was restricted to 45 handball players.
2. The age of subjects was ranged 18 to 24 years.
3. The duration of training was restricted to 6 weeks.

Limitations

1. Factors like habit, life style, daily routine work, climatic conditions etc., will not be taken in to consideration.
2. The subject's previous experience in the game of football will not be considered.

Methodology

The purpose of the study was to examine the effect of SAQ training and interval training on selected physiological variables among handball players. To achieve the purpose of the study 45 handball players will be selected on random bases from the college located at Chennai city. The subjects will be divided in to three equal groups of 15 each and designated as control and experimental groups. Their age will be ranged between 18 and 24 years. Group one acted as experimental group one and Group two acted as experimental group two and group three acted as control group. Group three underwent their routine work, group one underwent core board training exercises group II underwent staircase training for a period of six weeks. The data pertaining to the variables in this study were examined analysis of covariance (Ancova) for each variables separately in order to determine the difference and tested at 0.05 level of significance and post hoc test also administered whenever 'F' ratio was significant.

Results on resting heart rate

Table 1: Computation of analysis of covariance SAQ training group, interval training and control group on resting heart rate

	SAQ Training group	Interval training group	Control group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained I
Pre Test Mean	71.05	69.9	64.05	Between	177.6	2	88.8	2.26
				Within	849	42	14.89	
Post Test Mean	66.7	64.9	62.5	Between	563.63	2	281.8	14.06*
				Within	1111.7	42	20.02	
Adjusted Post Test Mean	69.68	69.76	65.5	Between	199.83	2	99.91	7.56*
				Within	746.01	41	13.32	

Table F-ratio at 0.05 level of confidence for 2 and 42 (df) =3.22,
*Significant at 0.05 level

The Table I shows that the pretest means of experimental group I, experimental II, and control group were 71.05, 69.9 and 64.05 respectively, the obtained F value on the scores of pretest means 2.26 was less than the required table of 3.22 value, which proved that the random assignment of the subjects were successful and their scores in speed before the training were equal and there was no significant differences at 0.05 level. The post test means of experimental I and experimental II and control group were 66.7, 64.9 and 62.5 respectively, the obtained F value on post test means was 14.06 which was greater than the required table value of 3.22 the study was significant at 0.05 level. The adjusted post test mean of experimental group I, experimental group II, and control group were 69.68, and 69.76 and 65.5 respectively, the obtained I value 7.56 was greater than the required table value of 3.22 and hence it was accepted that there was significant differences among the treated groups at 0.05 level. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table II.

Table 2: Scheffe's Confidence Interval Test Scores on resting heart rate

Means				Required C. I
SAQ Training group	Interval Training group	Control group	Mean Difference	
69.68	69.76		4.13*	2.87
69.68		65.55	4.21*	2.87
	69.76	65.55	0.07	2.87

* Significant at 0.05 level

The Scheffe's post hoc analysis of obtained ordered adjusted means proved that I there was significant differences existed between SAQ training and control group II there was no significant differences existed between interval training and control group and III there was significant difference between SAQ training and interval training on power in vertical.

Results on vo2 max

Table 3: Computation of analysis of covariance SAQ training group, interval training and control group on VO2 Max

	SAQ Training group	Interval Training group	Control group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F
Pre Test Mean	88	88	89	Between	6.67	2	3.33	0.56
				Within	1010	42	37.41	
Post Test Mean	79	76	88	Between	780	2	390	4.56*
				Within	1290	42	47.77	
Adjusted Post Test Mean	79.26	76.26	87.46	Between	671.72	2	335.86	14.03*
				Within	194.20	41	26.45	

Table F-ratio at 0.05 level of confidence for 2 and 42 (df) =3.22,
*Significant at 0.05 level.

Table 4

SAQ Training group	Interval Training group	Control group	Mean Difference	

* Significant at 0.05 Level

The scheffe's post hoc analysis of obtained ordered adjusted means proved that I there was significant difference existed between SAQ training and control group II there was no significant difference existed between interval training and control group and III there was significant difference between SAQ training and interval training on power in vertical

Conclusions

1. It was concluded that there was a significant improvement on resting heart rate due to SAQ and Interval training Handball players
2. It was concluded that there was a significant improvement on Vo2 Max due to SAQ and Interval training Handball players

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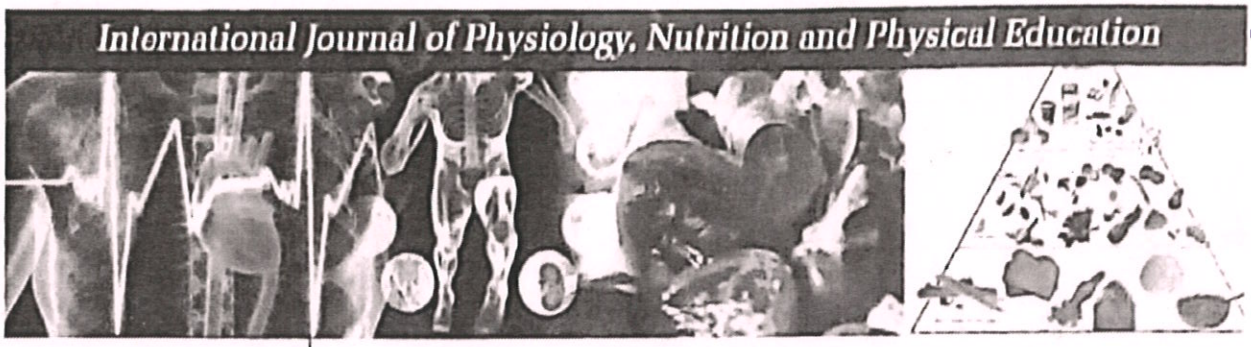
3.4.5-J-EPN-2016-17

International Journal of Physiology, Nutrition and Physical Education 2017; 2(1): 455-457



ISSN: 2456-0057
IJPNPE 2017; 2(1): 455-457
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www.journalofsports.com
Received: 26-11-2016
Accepted: 28-12-2016

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Effect of SAQ training and interval training on selected physiological variables among men handball players

Dr. J Anitha

Abstract
The purpose of the study was to find out the effect of SAQ training and interval training on selected physiological variables among men handball players. To achieve the purpose of the study forty five handball players were selected on random bases from the college located at Chennai city. Their age were ranged between 18 and 24 years. They were divided in to three equal groups (two experimental and one control group) the experimental group I was given SAQ training and experimental group II was given interval training for six weeks and control group was not allowed to participate in any training programme. Pretest was conducted on selected dependent variables such as resting heart rate and Vo2 max at the beginning before the experimental treatment and posttest was taken after the experimental treatment. The data were analyzed by applying ANCOVA. The result revealed that the SAQ training and interval training had significantly improved the resting pulse rate and Vo2 max of the men handball players.

Keywords: SAQ training, interval training, resting pulse rate, Vo2 max

Introduction

SAQ Training

Speed, agility, and quickness (S.A.Q.) training has become a popular way to train athletes. Whether they are school children on a soccer field or professional in a training camp, they can all benefit from speed, agility, and quickness training. This method has been around for several years, but it is not used by all athletes primarily due to a lack of education regarding the drills. Speed, agility, and quickness training may be used to increase speed or strength, or the ability to exert maximal force during high-speed movements. Some benefits of speed, agility, and quickness training include increases in muscular power in all multi planar movements; brain signal efficiency; kinesthetic or body spatial awareness; motor skills; and reaction time. SAQ training can cover the complete spectrum of training intensity, from low to high intensity. Every individual will come into a training programme at a different level; thus training intensity must coincide with the individual's abilities. Low intensity speed, agility, and quickness drills can be used by everyone for different applications. SAQ drills can also be used to teach movement, warm-up, or to condition an athlete. No significant preparation is needed to participate at this level of speed, agility, and quickness training. Higher intensity drills require a significant level of preparation. A simple approach to safe participation and increased effectiveness is to start a concurrent strength-training program when starting speed, agility, and quickness training (McGhee, 1979).

Interval Training

Each work interval consist of running at a pace such that a distance of 1100 yd(1005m)is covered in 3 to 4 min. The work interval is followed by a rest relief interval of 1.5 to 2 min. This sequence is repeated three times. During the rest –relief interval, the individual usually walks or jogs while recovering from the work to rest relief if usually 1:1 or 1:0.5. Each work interval is 3 to 5 min and is repeated 5 to 7 times. The exercise intensity usually ranges between 70%and 85%. Vo2 max. Apply the overload principal by increasing the exercise intensity or length of the work interval, or increasing the number of work interval per exercise session.

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Chennai

For a discussion of interval training and sample programs, including programs for developing speed and anaerobic endurance Vivan H. Heyward. (2010).

Hypotheses

It was hypothesized that there would be significant difference among SAQ training, interval training groups, control group on selected physiological variables such as resting pulse rate and VO2 max

Delimitations

1. The study was restricted to 45 handball players.
2. The age of subjects was ranged 18 to 24 years.
3. The duration of training was restricted to 6 weeks.

Limitations

1. Factors like habit, life style, daily routine work, climatic conditions etc., will not be taken in to consideration.
2. The subject's previous experience in the game of football will not be considered.

Methodology

The purpose of the study was to examine the effect of SAQ training and interval training on selected physiological variables among handball players. To achieve the purpose of the study 45 handball players will be selected on random bases from the college located at Chennai city. The subjects will be divided in to three equal groups of 15 each and designated as control and experimental groups. Their age will be ranged between 18 and 24 years. Group one acted as experimental group one and Group two acted as experimental group two and group three acted as control group. Group three underwent their routine work. group one underwent core board training exercises group II underwent staircase training for a period of six weeks. The data pertaining to the variables in this study were examined analysis of covariance (Ancova) for each variables separately in order to determine the difference and tested at 0.05 level of significance and post hoc test also administered whenever 'F' ratio was significant

Results on resting heart rate

Table 1: Computation of analysis of covariance SAQ training group, interval training and control group on resting heart rate

	SAQ Training group	Interval training group	Control group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained I
Pre Test Mean	71.05	69.9	64.05	Between	177.6	2	88.8	2.26
				Within	849	42	14.89	
Post Test Mean	66.7	64.9	62.5	Between	563.63	2	281.8	11.06*
				Within	1111.7	42	20.02	
Adjusted Post Test Mean	69.68	69.76	65.5	Between	199.83	2	99.91	7.56*
				Within	746.01	41	13.32	

Table F-ratio at 0.05 level of confidence for 2 and 42 (df) =3.22,
*Significant at 0.05 level

The Table I shows that the pretest means of experimental group I, experimental II, and control group were 71.05, 69.9 and 64.05 respectively, the obtained F value on the scores of pretest means 2.26 was less than the required table of 3.22 value, which proved that the random assignment of the subjects were successful and their scores in speed before the training were equal and there was no significant differences at 0.05 level. The post test means of experimental I and experimental II and control group were 66.7, 64.9 and 62.5 respectively, the obtained F value on post test means was 14.06 which was greater than the required table value of 3.22 the study was significant at 0.05 level. The adjusted post test mean of experimental group I, experimental group II, and control group were 69.68, and 69.76 and 65.5 respectively, the obtained I value 7.56 was greater than the required table value of 3.22 and hence it was accepted that there was significant differences among the treated groups at 0.05 level. Since significant differences were recorded the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table II.

Table 2: Scheffe's Confidence Interval Test Scores on resting heart rate

Means				Required C.I.
SAQ Training group	Interval Training group	Control group	Mean Difference	
69.68	69.76		4.13*	2.87
69.68		65.55	4.21*	2.87
	69.76	65.55	0.07	2.87

* Significant at 0.05 level

The Scheffe's post hoc analysis of obtained ordered adjusted means proved that I there was significant differences existed between SAQ training and control group II there was no significant differences existed between interval training and control group and III there was significant difference between SAQ training and interval training on power in vertical.

Results on vo2 max

Table 3: Computation of analysis of covariance SAQ training group, interval training and control group on VO2 Max

	SAQ Training group	Interval Training group	Control group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F
Pre Test Mean	88	88	89	Between	6.67	2	3.33	0.56
				Within	1010	42	37.41	
Post Test Mean	79	76	88	Between	780	2	390	4.56*
				Within	1290	42	47.77	
Adjusted Post Test Mean	79.26	76.26	87.46	Between	671.72	2	335.86	14.03*
				Within	194.20	41	26.45	

Table F-ratio at 0.05 level of confidence for 2 and 42 (df) =3.22,
*Significant at 0.05 level.

Table 4

SAQ Training group	Interval Training group	Control group	Mean Difference	

* Significant at 0.05 Level

The scheffe's post hoc analysis of obtained adjusted mean means proved that I there was significant difference existed between SAQ training and control group II there was no significant difference existed between interval training and control group and III there was significant difference between SAQ training and interval training on power in vertical

Conclusions

1. It was concluded that there was a significant improvement on resting heart rate due to SAQ and Interval training Handball players
2. It was concluded that there was a significant improvement on Vo2 Max due to SAQ and Interval training Handball players

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Journal of Physical Education and Allied Sciences ISSN No. 2395-6895, Volume -2, No.2, Half Yearly, Jan to June-2017

TRAINING EFFECT OF SPECIFIC STRENGTH PROGRAME WITH SELECTED PHYSICAL PHYSIOLOGICAL AND PERFORMANCE VARIABLES AMONG MG UNIVERSITY AFFILIATED COLLEGES NALGONDA HOCKEY PLAYERS

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INTRODUCTION

sports is a word wide phenomenon today. The word realized the importance of sports for the modern civilization. The main objects of physical education are to promote physical fitness. Which in promotes health and happiness.

Sports training is done for improve sports performance. The sports performance, as any other type of human performance is not the product of one single system or aspect of human personality on the contrary it is the product of the total personality of the sports person.

HYPOTHESIS

It is hypothesized that the effects of strength training program will the significantly improvement speed due to the relative among the MG University affiliated colleges hockey players.

It is hypothesized that there be significant improve on cardio respiratory endurance due to the relative effects specific training with selected variables of strength training among MG university affiliated colleges hockey players.

It is hypothesized that they may be significant 0improvement and explosive power due to related effects of specific strength training with selected variables among the MG university affiliated colleges hockey players.

METHODOLOGY

The main purpose of the study is "EFFECTS OF SPECIFIC STRENGTH PROGRAM WITH SELECTED PHYSICAL, PHYSIOLOGICAL, AND PERFORMANCE VARIABLES AMONG MG university affiliated colleges NALGONDA HOCKEY PLAYERS".

Hence it is to achieve the purpose of the study 50 male hockey players. The subjects were selected at random by a lot method. The age groups of the subjects were ranged between 18 to 25 years.

SUBJECTS & VARIABLES

50 male hockey players from MG university affiliated colleges NALGONDA in the age groups 18 to 25 years were selected their consent.

The selected subjects were randomly assigned to both the concurred training and control group of twenty five each.

TRAINING PROTOCAL

The training period the experimental groups underwent their respective training program, four days for week for 12 weeks in addition to their regular activities. Every day the workout lasted for 30 to 45 minutes approximately including warm-up and warm-down period.

EXPERIMENTAL DESIGN AND STATISTICAL PROCEDURE

The experimental design used in this study was random group design involving fifty subjects who were divided at random in to two groups of twenty five each. This study consisted of two independent variables such as strength training program.

The data collected from the four groups before and after the experimental period were statistically explained for significant improvement by dependent t-test.

The analyses of covariance (ANACOVA) was used as a statistical procedure with two groups were involving the "F" ratio was found to be significant for adjusted post means, scheffe's test was followed as a post hoc test to determine which of the paired

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...eans difference was significant. In all the caused ...level was fixed significance level to test the ...othesis.

RESULTS & DISCUSSION

TABLE-1 TEST SELECTION

Criterion variables	Test items	Unit of measurment
...peed	50 mtrs run	Seconds
...rdio respiratory endurance	Cooper's 12 minute run	Meters
...plosive power	Standing broad jump	meters
...sting pulse rate	Biomonitor	Numbers
...eath holding time	Stop watch(manual)	Seconds
...spiratory rate	Expiro graph	Numbers
...ibbling	Field test	Numbers
...ting	Field test	Numbers
...shing	Field test	Numbers

TABLE-2

...LYSIS OF COVARIANCE ON SPEED WITH ...NG PROGRAME OF STRENGTH TRAINING ... GROUPS AND CONTROL GROUP

...up	Control group	Sources of variance	Sum of square	Df	Mean squares	F-ratio
	8.04	Between	1.034	2	0.517	64.625*
		within	0.474	56	0.008	

...t at 0.05 level of confident

...shows that the adjusted post-test means of ...training program with training group and ...roup are7.72 and 8.07 respectively. The ...F-ratio value is 64.625. which is higher ...table value is 3.16 with DF 2 and 56 ...for significance at 0.05 level. Since, the ...F-ratio is higher than the table value, in ...that their significance difference among ...ed post-test means of strength training ...with training group and control group

TABLE-3

...TEST FOR THE DIFFERENCES BETWEEN ...STED TEST PAIRED MEANS ON SPEED

...	Control group	Mean differences	Confidence Interval
...	8.07	0.22*	0.07
...	8.07	0.35*	0.07
...		0.13*	0.07

Significant at 0.05 level

Table3 shows that the adjusted post test means differences on speed between strength training group and control groups are 0.22 0.35 and 0.13 respectively, which are greater then the confidence interval value of 0.07 at level of 0.05 confidence.

CONCLUSION

It was found that the experimental group namely strength training program have achieved significant improvement on speed, cardio respiratory endurance, explosive power, resting pulse rate, breath holding time, respiratory rate, dribbling, hitting, pushing when compared to the control group. It may be included that running program to increase speed, cardio respiratory endurance, explosive power, resting pulse rate, breathing holding time, respiratory rate, dribbling, hitting and pushing.

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A STUDY ON COMPARISON OF EXPLOSIVE STRENGTH BETWEEN VOLLEYBALL AND FOOT BALL PLAYERS OF ANNAMACHARYA INNISTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET KADAPA

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Physical Director In Annamacharya Innistitute Of Technology And Sciences Rajampet Kadapa and Part-time physical Education PhD-scholar-

INTRADUCTION

EXPLOSIVE STRENGTH: The property of being physically or mentally strong, "fatigue sapped his strength" capability in terms of personnel and material that effect the capacity to fight a war. We faced an army of great strength, politicians are neglected out military posture" physical energy of intencity. He hit with all the forse he could muster. It has destroyed by the strength of the gayle. " a government has not the vitality and forcefulness of a living man". Independent of those local circumastances which tend to beget and increase power in one part and to impede its progress in another. We must advert to the effects of that supervisor policy and good management which would probably distinguish the government of one above the rest, and by which their relative equality in strength and concedaration would be destroyed.

HYPOTHESIS

It was hypothesized that the foot ball players may have better then volley ball players.

DELIMITATION

The subjects were selected at random from Annamacharya Innistitute Of Technology And Sciences rajampet Kadapa. The test administrated for on ten volleyball and ten foot ball players with in the age group of 16-25.

LIMITATION

As a matter of convenience and because of time of limitations, this study was conducted only on ten volley ball and ten foot ball players from Annamacharya Innistitute Of Technology And Sciences rajampet Kadapa.

METHODOLOGY

The purpose of study was to comparison selection on physical fitness competition of college level volleyball and foot ball players in order to achieve this purpose, ten foot ball players and ten volley ball players from Annamacharya Innistitute Of Technology And Sciences rajampet Kadapa.

EXPERIMENTAL DESIGN

For this study was to comparison selection on physical fitness competition of college level volleyball players and foot ball players in order to achieve this purpose, ten foot ball players and ten volley ball players from Annamacharya Innistitute Of Technology And Sciences rajampet Kadapa.

TEST ADMINISTRATION

STANDING BROAD JUMP

At the whistle, subject is made is to jump from the starting long jump pit the finish the jump and taken the measurement the tape. A space on the floor or an outdoor long jump pit.

STATISTICAL TECHNIQUES

As following statistical procedures were following to find out selected physical fitness components between the volley ball players and foot ball players among Annamacharya Innistitute Of Technology And Sciences rajampe Kadapa. The research scholar used t-ratio calculate the significance.

PRESENTATION AND INTERPRETATION OF DATA

The test conducted by selecting ten volley ball players From Annamacharya Innistitute Of Technology And Sciences rajampet Kadapa and ten foot ball players from Annamacharya Innistitute

Of Technology And Sciences rajampet Kadapa. The data was collected by conducting explosive strength. The collected data were subjected to the t-ratio test of analyses for significance.

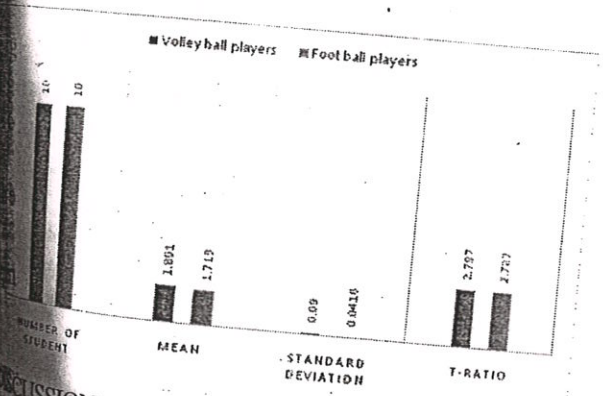
RESULTS AND DISCUSSIONS

TABLE-1

Explosive strength test (standing broad jump) THE MEAN, STANDARD DEVIATION, OF THE MEAN AND T-RATIO OF VOLLEY BALL AND FOOT BALL PLAYERS AMONG Annamacharya Innistitute Of Technology And Sciences Rajampet Kadapa.

TEAM	VARIABLE	NUMBER OF STUDENT	MEAN	STANDARD DEVIATION	T-RATIO
Volley ball players	Explosive strength	10	1.801	0.090	2.787
Foot ball players	Explosive strength	10	1.713	0.0416	2.787

05 level of confidence



DISCUSSION OF FINDINGS

table shows that the difference between the mean in being ley ball players and foot ball players mean when the ndard deviation difference between the wars the calculation t-ratio (2.787) the t-ratio was found to be significance at el of confidence the hypothesis was accepted.

NCLUSIONS

following conclusion were made on comparing sive strength between ten volley ball players and ten ball players. It was find out the foot ball players had ter explosive strength volley ball players in college macharya Innistitute Of Technology And Sciences Kadapa.

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EFFECT OF SELECTED YOGASANAS ON BODY WEIGHT AND BODY FAT OF HIGHER SECONDARY SCHOOL OBESE BOYS

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Introduction

Asanas are an integral part of yoga. Yoga uses the body to exercise and controls the mind so that at a later stage the body and the mind together may harmonize with the soul. The yogasanas affect and penetrate every single cell and tissues making them come to life.

Pranayama, the yogic art of breathing, comes from the root words prana and ayama. Prana means "life force" and ayama means "expansion, manifestation, or prolongation." The practice of pranayama therefore is the practice of expanding our own prana so that it harmonizes with the universal prana. This results in oneness or merging of a person's own consciousness with universal consciousness. It is in this union that we realize we are not simply a limited physical body, but are, in fact, an immortal spirit.

Yoga is defined as a practice consisting of three components, gentle stretching; exercises for breath control; and meditation as a mind-body intervention (Post, 2001). The version used mainly in the West is hatha yoga, which consists of an integration of asana (postures), pranayama (breathing exercise), and meditation (Riley, 2004).

All the orthodox systems of Indian Philosophy have one goal in view, the liberation of the soul through perfection. The method is by Yoga (Swami Vivekananda (2007).

Yoga is an ancient discipline designed to bring balance and health to the physical, mental, emotional, and spiritual dimensions of the individual. It is long popular practice in India that has become increasingly more common in Western countries. "Yoga" means union of our individual consciousness with the Universal Divine Consciousness in a super-conscious state known as Samadhi (Swami Vivekananda (2007).

Material and Methods

The aim of the study was to determine the Effect of Selected Yogasanas on Body Weight and body fat of higher secondary school obese boy's words. Fourty college men students were selected from ambattur in Tamil Nadu and their ages ranged between 15 to 18 years. The subjects (N= 40) were randomly assigned to two equal groups of twenty men in each. The groups were assigned as selected yogasanas and group and control group. Before the administration of the test, all the subjects were oriented for the purpose of the experimental treatments and the tests. They were made known about the importance of the treatment and tests. All the subjects whole heardly co- operated for this study. Pre tests were conducted for all the subjects Body Weight and Body Fat. The experimental groups participated in their respective experiments, namely, selected yogasanas for a period of three days for twelve weeks. Selected Yogasanas program consisted of 60 minutes with 10 minutes warm up, 35 minutes on yogasanas and pranayama practices and 10 minutes cool down. The intensity of practices was then increased by 5% every 2 weeks. The duration was also increased 5 minutes per session every 2 week. After the experiment, post test scores were obtained and compared with using Analysis of covariance (ANOVA) statistical technique was used to test the differences among the experimental groups. The significance level of this study was set at $p < 0.05$.

Results On body weight

The following tables illustrate the statistical results on the Effect of Selected Yogasanas on Body Weight of higher secondary school obese boys

EFFECT OF INTERVAL TRAINING IN SPORTS

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Sports for Life

In modern society, life has become complex due to various reasons. The modern way of life has lowered people's biological fitness levels. People lead sedentary lives, as machines have made their life easy and comfortable. Without adequate physical exertion, man has become a storehouse of unreleased tension. Modern man in the electronic and computer age tends to become complacent and forgets the need of physical training for his survival. He, due to his luxurious, easy and comfortable life, has become an easy prey to various fatal diseases.

One of the most beautiful and valuable things that God has created on earth is human life. It is the responsibility of human beings to protect and maintain human life in order to achieve higher goals and objectives and live a happy and meaningful life. This can be made possible by paying due attention to health and fitness. So scientists researchers and health experts have devoted their precious time to the fields of health and fitness.

It is a known fact that adding regular physical activity to one's daily routine will improve health and well-being. Physical activity does not necessarily need to be strenuous for a person to enjoy benefits to health. Of course, by increasing the amount of physical activity, one will increase the amount of health benefits. Sports in the modern world have become extremely competitive. It is not the mere participation that brings victory to an individual. Life in sports is affected by various factors, such like Physiology, Biomechanics, Sports Training, Sports Medicine, Sociology and Psychology. The coaches, trainers, physical education personnel and doctors have been doing their best to improve the performance of the players of their country. Athletes and players of all the countries are also trying hard to bring laurels and medals for their countries in Internati competitions.

Training

The word 'training' has been a part of hu language since ancient times. It denotes the pr of preparation for some task. This process invar extends to a number of days and even month years. There is, however, some disagreement am sports coaches and also sports scientists regard the exact meaning of this word. Some exp exceptionally belonging to sports medic understand sports training as basically do physical exercises.

Sports Training

Sports training aims at improving the sp performance. The sports performance, as any type of human performance is not the prod one single system or aspect of human perso On the contrary, it is the product of the personality of the sports person.

Sports' training in its typical and most effectiv is a pedagogically organized process charact by all the main traits of a strictly directed p of teaching, upbringing and selfeducation system of exercises, also so arranged as to r 5 maximum developing effect in the condit full control of the process of perfection cons the methodological foundation of sports tra

The athlete's training is a multi-sided proc the expedient use of aggregate factors (m methods and conditions), which influenc development of an athlete and ensures the nec level of preparedness.

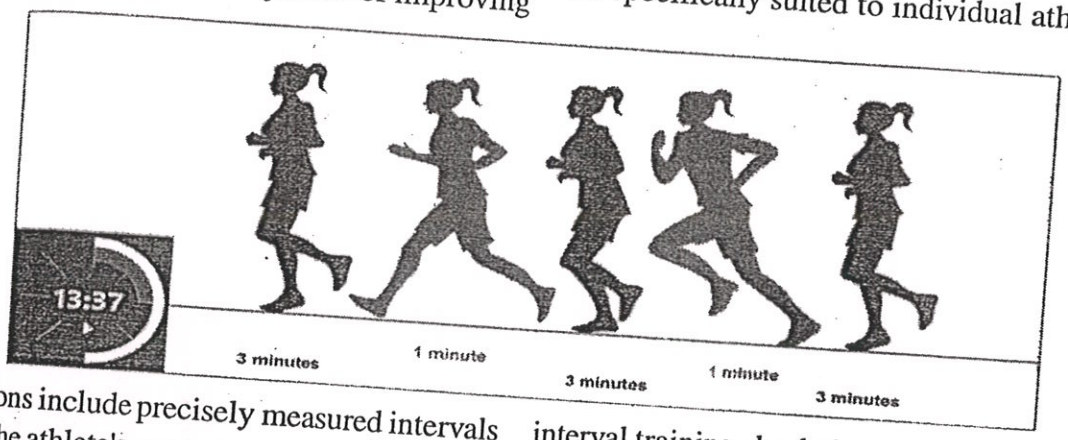
Interval Training

Interval training has been the basis for a training for several years. The first form of i

training, called "Fartlek" involved alternating short and fast bursts of intensive exercise with slow, easy activity. Fartlek was casual, unstructured training which suits its English translation 'speed play'.

Interval training is a method of training where a person increases and decreases the intensity of his workout between aerobic and anaerobic training. Interval training in Sweden, where it originated, is known as Fartlek training (Swedish for "speed play"). The protocol for interval training is to push one's body past the aerobic threshold for a few moments and then return to one's aerobic conditioning level with the objective of improving your performance (speed, strength, and endurance). The aerobic threshold is the intensity where one's body switches from burning a greater percentage of fat to a greater percentage of carbohydrate and is generally 85% of one's maximum heart rate (train below 85% and its aerobic; train above 85% and its anaerobic).

The interval programmes of today have become highly sophisticated methods of structured training for athletic performance enhancement. Physiologists and trainers have designed interval programmes that are specifically suited to individual athletes.



These sessions include precisely measured intervals that match the athlete's sport, event and current level of conditioning. Often the appropriate intensity and duration of the intervals are determined by the results of anaerobic threshold testing (AT) that 7 includes measuring the blood-lactate of an athlete during intense exercise. Interval training works both the aerobic and the anaerobic system.

During the high intensity effort, the anaerobic system uses the energy stored in the muscles (glycogen) for short bursts of activity. Anaerobic metabolism works without oxygen. The byproduct lactic acid, which is related to the burning sensation felt in the muscles during high intensity work. During the high intensity interval, lactic acid builds up and the athlete enters oxygen debt. During the recovery phase the heart and lungs work together to pay back" this oxygen debt and break down the lactic acid. It is in this phase that the aerobic system takes control, using oxygen to convert stored carbohydrates into energy.

interval training also helps prevent the injuries often associated with repetitive endurance exercise. They allow one to increase his training intensity without overtraining or burn-out. In this way, adding intervals to his work-out routine is a good way to cross -train.

Types of Interval Training

Interval training manipulates four variables: time (or distance), intensity, recovery period and number of repetitions. With so many possible combinations of these four elements, the potential for variety is nearly unlimited. Possibly the greatest use of interval training lies in its ability to target individual energy systems and physiological variables, improving specific aspects of clients' fitness levels.

- Aerobic (Cardiovascular) Intervals
- Anaerobic Capacity Intervals
- Anaerobic Power Intervals

Aerobic (Cardiovascular) Intervals

One of the best methods for improving the heart's ability to pump blood and oxygen to the

active muscles is interval training using work periods lasting 3-5 minutes and recovery periods equal to or slightly shorter than the work periods (see the sidebar "Sample Interval Workouts"). The cardiovascular adaptations associated with interval training increase clients' VO2max, raising their aerobic ceiling. Since VO2max is achieved when maximum stroke volume and heart rate are reached, each work period should be performed at an intensity that elicits maximum heart rate.

Anaerobic Capacity Intervals

Anaerobic capacity refers to the ability to regenerate energy (ATP) through glycolysis. Work periods lasting 30 seconds to 2 minutes target improvements in anaerobic capacity by using anaerobic glycolysis as the predominant energy system. These short, intense work periods with recovery intervals two to four times as long as the work periods increase muscle glycolytic enzyme activity. As a result, glycolysis can regenerate ATP more quickly for muscle contraction and can improve the ability to buffer the muscle acidosis that occurs when there is a large dependence on oxygenindependent (anaerobic) metabolism.

Anaerobic Power Intervals

Anaerobic power refers to the ability to regenerate ATP through the phosphagen system. Work periods lasting 5-15 seconds target improvements in anaerobic power by using the phosphagen system as the predominant energy system. These very short, fast sprints with 3- to 5-minute recovery intervals that allow for complete replenishment of CP in the muscles increase fast-twitch motor unit activation and the activity of creatine kinase, the enzyme responsible for breaking down creatine phosphate.

Benefits of Interval Training

Interval training increases muscle mass, heart rate recovery, strength, power, speed, and Post Exercise Caloric Expenditure (PECE). Studies show that anaerobic interval training is far more effective in creating PECE than aerobic exercise by 38 percent. From a fat metabolism standpoint, interval training increases lean muscle tissue as opposed to decreasing lean muscle tissue with aerobic train An increase in lean muscle tissue will speed up trainee's metabolism as well as improve mobilization and utilization. Interval trai increases the trainee's anaerobic or lactic threshold. As his VO2 max increases, he wi able to exercise at higher heart rates wit experiencing the pain of lactic acid accumula in the muscles.

This will allow him to expend more en (calories) in a shorter period of time. Inte training promotes the recruitment of Type II mus fibers to do aerobic work. It also induces chan in skeletal muscle oxidative enzyme activi similar to those observed in endurance train Interval training also increases mitochondrial and number. The muscle mitochondria are wh oxidation takes place to utilize fuel sources such glycogen and fat. Interval training takes less ti

The average bout of interval training is th minutes as opposed to sixty minutes for aer exercise. The average frequency for interval trai is three times per week as opposed to four t times a week for aerobic exercise. This time sa feature of interval training allows time for training (i.e. weight training).

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A STUDY- EFFECT OF EXERCISE ON MENTAL HEALTH

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Introduction

We often talk about the mind and body as though they are completely separate - but they aren't. The mind can't function unless your body is working properly - but it also works the other way. The state of your mind affects your body. There is a substantial body of evidence that shows a positive relationship between physical activity and mental health and illness. People who are engaged in sports activities have a better feeling about their body image and physical health. Cross-sectional studies show that regular physical activity is associated with better mental health and emotional well-being and lower rates of mental disorders. Physical fitness exercises help cure panic, reduce depression symptoms, increase emotional responses in depressed people, decrease anxiety, cure psychosomatic disorders, obsession and psychosis, increase life expectancy and improve the quality of life. Because of today's lifestyle and eating habits, relaxed work environment rich as well as poor people also are struggling with various mental and physical disorders / sickness, like high blood pressure, diabetes, cancer, heart diseases, hypertension, etc. For betterment and maintaining standard of life every human being has to maintain his/ her mental health sound. Physical Fitness and its components are related with mental health. Self-image and life satisfaction are truly responsible for good mental health. It helps to improve positive approach towards self and others. And it is been proved that physical activity helps an individual in maintaining his/ her mental state. Research has proved that mental health is improved by regular low, medium level physical activity. People exercising for regular succession find improvement in their self actualization, self image and their physical fitness .In today's generation, lack of exercise has become very serious health issue associated with mental and Physical health. Through participation in sports and other physical activity self image can be improved and personality becomes dynamic. Also self confidence, high social cooperation and coordination can be achieved. By exercising physical activity anxiety can be reduced and increases emotional response of people suffering from anxiety. It helps in making an individual free from physical and mental fitness related disorders Also it helps to improve Quality life span. Therefore, the aim of this research is to study the effect of physical fitness as a factor influenced by sport and other bodily activities on the mental health of non-patients.

Effect of Exercise on Various Componeents of Mental Health

Sharper memory and thinking.

Exercise helps memory and thinking through both direct and indirect means. The benefits of exercise come directly from its ability to reduce insulin resistance, reduce inflammation, and stimulate the release of growth factors-chemicals in the brain that affect the health of brain cells, the growth of new blood vessels in the brain, and even the abundance and survival of new brain cells. The same endorphins that make you feel better also help you concentrate and feel mentally sharp for tasks at hand. Exercise also stimulates the brain cells and helps prevent age-related decline.

Emotions

We start with regular exercise of any physical activity then it becomes our habit with regular exercising any kind of physical activity. It helps to achieve good living standard and good habits. Regular exercising fills our life with positive attitude and strengthens our emotional attitude. Physical

exercise is related to continuous positive emotional state of an individual's mind. Research work carried out in this field proved that physical activity and mental health are closely associated with each other. 'META' describes that aerobic exercise provides boost to the mental and physical energy level. Which required performing day today work. In our daily routine sometime we come across intensive fatigue, partially or complete failure, anxiety, depression etc. Through exercising regular physical activity we can lower the intensity of such elements. Experimental test promotes positive effect of medium intensity level exercise in maintaining good mental health.

Self Image

As per experts self assessment is the best index of an individual's mental health. It has been proved from 399 non clinical tests, positive impact of regular exercise can be seen as self image, self concept can be positively improved and level of anxiety (depression) can be reduced. Study shows that regular exercise is beneficial for self awareness and self image. Also to change negative self image in to positive. And also it has been proved that in less time cluster of aerobic exercise and resistance training method helps to improve self-image. It is been studied in supervisory training programme implemented executed for obese adolescents, they found their improvement in their self image and also approach of others towards them was positively improved.

Sleep

Research shows that out of adult population 30 percent people are suffering from sleep disorder. And also found that exercising physical fitness activity done in adequate presence of light it helps in sound sleep. Also in personal study it is been observed that through exercise quality and depth of sleep is improved. Therefore people who are suffering from sleeping disorder by exercising any physical activity regularly they can improve their quality of sleep. Stress and Tension

Study shows that regular physical activity can minimize or control the anxiety level of stress or tension. To avoid / reduce mental or physical stress people generally found smoking or drinking but it won't help. And it's bad reaction can be observed Exercise is the only healthy way of overcoming any sort of stress and anxiety. By exercising regular physical activity we will be able to maintain our health sound and can improve positive response to mental stress and control it.

Quality of life

Physical activity is closely associated with overall physical, mental, spiritual, health and our quality of life depend upon all this aspects. There are total 8 components on which quality of life is chararactarized. Vitality Social work, mental health, emotional health pain, physical work, health limitations. Research has proved that physical activity is benefitted for the people suffering from mental disorder. High level physical activity helps adolescents to balance their mental health related state positively.

Sadness

Medical field has proved that mental challenge and stress are the two mild levels of mental disorders and through exercise one can overcome from it. Research shows that exercise is a perfect way of mental stress healing. Therefore physical activity is a n easier way to keep away sadness rather than smoking, Alcohol consumption, taking medical and or any psychiatric treatment. Also study shows that people who are actively doing Physical activity from last two or more years are physically and mentally fit.

Importance of Physical Exercise to Maintain the Mental Fitness.

Various research being carried out regarding curing various serious physical or mental disorder, minimum three time per week 30 minutes workout is suggested by the medical Practitioners. 'DOSE' study suggests that 30 Minutes Exercise for 5 or more days in a week, it helps in lowering the

desperation/mental stress. Aerobic and anaerobic physical training beneficial for overall health.

Conclusion

In this paper relation between physical activity and mental health is studied. It is also observed that Physiology and Psychology this two different subjects are closely related with each other. Also for curing mental health physical activity are being suggested. And high level physical fitness enables an individual to improve and or maintain his / her mental health and to pursue a good standard of living. Physical fitness can be enhanced by regular sporting and other physical moderate activities. Once physical fitness, as a factor influenced by sport, is improved, society's mental health can be expected to be attained. Since sport, as a tool in managing tension, can reduce the effects of tenseness, increase positive emotions and since it can enhance people's physical and mental health and, as a result, their happiness in life. As mental disorders increase the risk of chronic physical conditions, and tend to recur across the lifespan, exercise can be useful for both mental and physical health, and may maintain well-being and prevent recurrences of poor mental health

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Available online at www.ijpcr.com
International Journal of Pharmaceutical and Clinical Research 2016; 8(1): 65-68

ISSN- 0975 1556

Research Article

Comparision on Lipid Profile Level and Prevalence of Hypertension Among Rural and Urban Post-Menopausal Women

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Available Online:31st December, 2016

ABSTRACT

Introduction: Many Study shows that approximately one in two women develops Coronary heart disease and one in three dies from it. The difference between modern lifestyle in urban areas and the traditional way of life in rural areas affect the population's health. As a result of several factors, including a lower level of estrogen, postmenopausal women are at increased risk for a number of health conditions, such as osteoporosis and heart disease. The U. S. Preventive Services Task Force. (USPSTF) strongly recommends routinely screening women 45 years and older for lipid disorders and treating abnormal lipid levels in persons who are at increased risk of Coronary heart disease`Aim: To compare lipid profile level and prevalence of hypertension among rural and urban postmenopausal women. Setting and Participants: In this comparative study 500 postmenopausal women in the age group of 45-60 years were randomly selected from rural and urban area (250 in each group) in Tamil Nadu, India. Rural subjects were selected from Somangalam region which is located in Kancheepuram district. Urban subjects were selected from Perambur region, Chennai. Subjects were personally interviewed regarding the intake of medicines for hypertension and blood pressure was also measured to know about the prevalence of hypertension. Blood samples were collected and tested in the laboratory for lipid profile levels using standardized methods. Result: By applying statistical technique (ANOVA) on lipid profile values, it was found that serum triglycerides, low density lipoprotein and total cholesterol were significantly higher in urban subjects than the rural subjects. The High density lipoprotein lipid level was significantly higher in rural than urban subjects. Percentage of prevalence of hypertension was also comparatively higher in urban subjects. Conclusion:The present study concluded that except HDL values , the mean Lipid profile level was comparatively higher above the normal levels among urban subjects.The prevalence of hypertension was comparatively more in urban postmenopausal women than the rural subjects

Key words: Rural and Urban Postmenopausal women, Hypertension,Lipid profile levels..

INTRODUCTION

During the transition to menopause, women may experience vasomotor, urogenital, psychosomatic, and psychological symptoms, as well as sexual dysfunction. The prevalence of each of these symptoms related to menopause varies across ethnic and socioeconomic groups, and between rural and urban women (Malacara, et al., 2002)[1]. After menopause, a woman's risk for coronary artery disease increases. Cardiovascular diseases remain the first cause of death in women (Boudghene F et al., 2015)[2]. Study also shows that approximately one in two women develops Coronary heart disease and one in three dies from it (Hoffman BL et al., 2015)[3]

Hypertension is by far the most important risk factor that affects women in the early postmenopausal years. About 30 to 50% of women develop hypertension before the age of 60 and the onset of hypertension can cause a variety of symptoms that are often attributed to menopause. (Wassertheil-Smoller S et al., 2000)[4]. In the Women's Health Study it was shown in almost 40,000 healthy women (≥45 years) that an elevated blood pressure increases Cardiovascular risk and that hypertension is a strong predictor for the development of type II diabetes (Conen D et al., 2007)[5]. Despite the high prevalence of hypertension in middle-aged women, less than half of the patients receive adequate treatment, especially in the older age group when the risk of Coronary heart disease morbidity and mortality is highest. (Oparil S. 2007)[6]. This study aimed to compare the lipid profile level and prevalence of hypertension between rural and urban postmenopausal women.

MATERIALS AND METHODS

Quantitative approach was adopted for this Comparative study.The study was conducted in rural Somangalam village in Kanchipuram district. Somangalam is a Village in Kunnattur Taluk in Kanchipuram District of Tamil Nadu State, India. Around six villages are nearby Somangalam. Urban Perambur is a locality in the northern region of the metropolitan city of Chennai in Tamilnadu state, India. Free medical camps for women where organized in both the areas on Saturdays and

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Sundays for a period of one month in each area. About 398 women in rural area and 431 women in urban area attended the camp among them 500 postmenopausal women age between 45-60 years where selected from rural and urban area(250 from each group) by random sampling method.

The independent variables included rural and urban postmenopausal women, and the dependent variable included lipid profile and hypertension. Inclusion criteria for the sample selection comprises of postmenopausal women age between 45-60 years. With the brief introduction of the study, informed consent was obtained from all the study participants. Participants had to be seated for at least 5 min before the measurement of Blood Pressure. Parameters were recorded twice on the left arm with five minutes interval between the two measurements, using sphygmomanometer. The average of the two measures was used. To define high levels of blood pressure the recent criteria recommended by the WHO were used; hypertension: SBP ≥ 140 mm Hg and/or DBP ≥ 90 mm Hg, or use of blood pressure lowering drugs..The blood samples from the subjects were collected after an overnight fast between 7-9.30 am by qualified personnel from reputed blood testing laboratory using standardised equipments and it was analysed for lipid profile levels.

Ethical Considerations

Permission to carry out this study was obtained from local authorities of that respective area. With brief introduction of the study, informed consent was obtained from all the study participants.

Data Analysis

The results of the variables were statistically analysed and compared using percentile and Analysis of Variance (ANOVA) to find out the difference between the two groups. (Clarke & Clarke, 1972)[7]. Data analysis and results are tabulated below.

Results On Serum Triglycerides

Table I shows the serum triglycerides results of rural and urban postmenopausal women

The mean value was 159.2 for rural group and 163.4 for urban group, respectively. The obtained 'F' ratio of 10.58 was higher than the table 'F' ratio of 3.86. Hence the serum triglycerides was significant at 0.05 level of confidence with degree of freedom 1 and 498 is 3.86 between the rural and urban groups.

The mean value of serum triglycerides of urban respondent was higher than the rural postmenopausal women and was statistically significant.

Results On Serum High Density Lipoprotein

Table II shows the serum High density lipoprotein results of rural and urban postmenopausal women

The mean value was 53.5 for rural group and 45.05 for urban group , respectively. The obtained 'F' ratio of 186.6 was higher than the table 'F' ratio of 3.86. Hence the serum high density lipoprotein was significant at 0.05 level of confidence with degree of freedom 1 and 498 is 3.86 between the rural and urban groups.

The mean value of serum High density lipoprotein of rural subjects was higher than the urban subjects and was statistically significant.

Results On Serum Low Density Lipoprotein

Table III shows the serum low density lipoprotein results of rural and urban postmenopausal women

The mean value was 132.2 for rural group and 137.7 for urban group, respectively. The obtained 'F' ratio of 10.29 was higher than the table 'F' ratio of 3.86. Hence the serum low density lipoprotein was significant at 0.05 level of confidence with degree of freedom 1 and 498 is 3.86 between the rural and urban groups.

Results On Total Cholesterol

Table IV shows the serum total cholesterol results of rural and urban postmenopausal women**.**

The mean value was 197.5 for rural group and 210.47 for urban group, respectively. The obtained 'F' ratio of 10 was greater than the table 'F' ratio of 3.86. Hence the total cholesterol level was significant at 0.05 level of confidence with degree of freedom 1 and 498 between the rural and urban groups. The mean value of total cholesterol of urban subjects was greater than the rural postmenopausal women and it was statistically significant.

Results On Prevalence Of Hypertension

Table IV shows the prevalence of hypertension among rural and urban postmenopausal women**.**

The above table shows the prevalence of hypertension was 39.2 percent (98 numbers) in rural postmenopausal women and 58.8 percent (147 numbers) among urban postmenopausal women. Hypertension was comparatively more prevalent in urban subjects.

DISCUSSION

The results of the present study revealed that prevalence of hypertension and lipid profile levels were comparatively more among urban postmenopausal women than rural subjects. The mean value of serum triglycerides level was higher than the normal value of ≤160 mg /dl(Harrison ,1991)[8] in urban groups. Whereas the mean value of serum triglycerides level in rural groups was within the normal range.There was significant difference between both the groups.

The normal value of serum HDL level is 40-60 mg /dl (Srilakshmi.B ,2011)[9]. Mean value of HDL in both the groups was within the normal range.Though both the groups had normal range of HDL values significant difference was observed between them.

The mean value of serum LDL level was higher than the normal value of < 130mg/dl (Harrisons ,1991)[8] in both the groups.Significant difference was also observed between both the groups.

Mean value of serum total cholesterol was greater than the normal value of < 200mg/dl (Harrisons.1991)[8] in urban postmenopausal women.Rural subjects had borderline mean value just below the normal value.There was significant difference between rural and urban postmenopausal women in their total cholesterol level.

Researches also shows that Rural-urban differences in metabolic profiles are noted in most developing countries (Popkin BM,2006)[10]. These differences may be due to demographic transition (shift to low fertility, low mortality, and higher life expectancy) and epidemiologic transition (from widely prevalent infectious diseases to a

Table 1: Computation of Analysis of Variance on Serum Triglycerides level among Rural and Urban Postmenopausal women (Scores in mg/dl)

Mean of Rural	Mean of Urban	SV	DF	SS	MS	OF	Table Value
159.2	163.4	B	1	2242.96	2242.96	10.58*	3.86
		W	498	105560.91	211.96		

* significance at 0.05 level of confidence

Table 2: Computation of Analysis of Variance on High Density Lipoprotein among Rural and Urban Postmenopausal Women (Scores in mg/dl)

Mean of Rural	Mean of Urban	SV	DF	SS	MS	OF	Table value
53.56	45.05	B	1	9048.3	9048.3	186.63*	3.86
		W	498	24145	48.483		

* significance at 0.05 level of confidence

Table 3: Computation of Analysis of Variance on Serum Low Density Lipoprotein among Rural and Urban Postmenopausal Women (Scores in mg/dl)

Mean of Rural	Mean of Urban	SV	DF	SS	MS	OF	Table value
132.23	137.76	B	1	3819.8	3819.8	10.29*	3.86
		W	498	184744	370.97		

* significance at 0.05 level of confidence

Table 4: Computation of Analysis of Variance on Total Cholesterol among Rural and Urban Postmenopausal Women (Scores in mg/dl)

Mean of Rural	Mean of Urban	SV	DF	SS	MS	OF	Table value
		B	1	20775	20775	10*	3.86
197.58	210.47	W	498	956919	1921		

* significance at 0.05 level of confidence

Table 5: Percentage Of Prevalence Of Hypertension Between Postmenopausal Women(Scores in percentage)

S.No	Health Problems	Rural women	
		Number	P
1	Hypertension	98	3

pattern of high prevalence of chronic life style related non communicable diseases), as these countries become more resourceful economically (socioeconomic transition, shift of people from the rural to the urban area). (Mosley WH et al 1994)[11]. These factors are responsible for significant changes in dietary and physical activity patterns (nutrition and lifestyle transitions, and stress) leading to an increased burden of cardiovascular diseases (Misra A et al.,2008)[12]

The study findings are consistent with study done by Martínez JAet al 2013 [13] among rural and urban postmenopausal women and concluded that Urban menopausal women had a higher prevalence of cardiovascular and osteoporosis risk factors than rural women. Berg, et al., 2004[14] also demonstrated higher total cholesterol, LDL-C and triglycerides in menopausal transition and postmenopausal women. A similar observation was also made by Carr, et al., 2000[15] in postmenopausal Caucasian.

Conway Joan M et al 1995[16] study also shows that Total cholesterol was significantly higher in urban than in rural Subjects. The difference between urban and rural areas regarding the feeding habits could have an impact on lipid metabolism. Urbanization usually involves varying degrees of modernization and westernization which have an impact on dietary habits. The urban environment entails important changes in lifestyles, economic activities, exposure to marketing and reference group influences. All these impinge on traditional diets and lead to shifts in food consumption patterns (Conway Joan M et al., 1995)[16]

Result of this study shows that prevalence of hypertension was more in urban subjects than rural postmenopausal women. The study findings are consistent with study done by Midha T et al 2009[17] to know the prevalence of hypertension in a north Indian population and concluded that the prevalence of hypertension was 32.8% in the urban population and 14.5% in the rural population. Hirokawa K et al 2014[18] study also concluded that Cardiovascular hyper reactivity could play a role in higher risks of cardiovascular diseases in postmenopausalwomen.

SUMMARY AND CONCLUSIONS

This comparative study on lipid profile level and the prevalence of hypertension between rural and urban postmenopausal women concluded that Lipid profile results-Triglycerides, HDL, LDL and Total cholesterol levels were significantly better in rural postmenopausal women than the urban postmenopausal women.The prevalence of hypertension was also higher among urban postmenopausal women. The difference between modern lifestyle in urban areas and the traditional way of life in

rural areas may affect the population's health. The difference between urban and rural areas regarding the feeding habits could have an impact on lipid metabolism. (Lissock CN et al.,2011)[18]. To improve postmenopausal health status regular health checkup,Lifestyle modification, Nutritional education and counselling are highly essential to prevent Cardiovascular diseases .

ACKNOWLEDGEMENT

I would like to thank the paramedical staffs and trained assistants for their help. Sincere gratitude to all the subjects for their participation and co-operation.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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2017-18

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Indian Journal of Engineering & Materials Sciences
Vol. 26, February 2019, pp. 51-58

Wear properties of SiC_p and TiO_{2p} reinforced aluminium metal matrix composites

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Received 26 December 2016; accepted 29 June 2018

Aluminum matrix hybrid composites are finding numerous applications owing to improved mechanical and wear resistance and consequently are superior substitutes for single reinforced composites. Prediction of wear rate gains impulsion in current engineering development to appraise the existence of sliding components in advance to circumvent enormous economic losses that incur due to wear. In this regard the present work deals with the preparation of aluminium alloy (Al6061-T6) with silicon carbide (SiC) and titanium oxide (TiO_2) composites by stir casting liquid metallurgy route. The incorporation of SiC and TiO_2 in the composite is varied from 2.5 to 15 wt%. Wear test, hardness and microstructural studies are conducted on the cast Al6061/SiC and Al6061/TiO_2 metal matrix composite (MMC) and hybrid Al6061/2.5 wt% TiO_2/2.5 to 15 wt% SiC. Pin-on-disc is used to assess the wear resistance of the prepared composites. Al6061/2.5wt%TiO_2/7.5wt%SiC hybrid composite exhibited higher hardness, lower wear co-efficient. The predicted wear co-efficient are in close agreement with the experimental values. The microstructure of the worn out specimen is examined by scanning electron microscope. The experimental results indicate a significant effect of SiC and TiO_2 particles on enhancing the wear resistance of Al6061 composites and influenced the microstructure and hardness of the composites.

Keywords: Metal matrix composites (MMC), Stir casting, Silicon carbide, Titanium oxide, Pin-on-disc

A composite material or a composite is a combination of distinct constituents which are present to a reasonable extent possessing dissimilar properties resulting in the variation of the composite property as a whole. Metal matrix composites have numerous benefits when compared with monolithic metals in the form of higher specific modulus, higher specific strength, enhanced properties at higher temperatures, reduced coefficient of thermal expansion and improved wear resistance[1]. In many applications, the broadly selected base alloy for metal matrix composites (MMCs) is aluminium, because of its high strength to weight ratio, ecological confrontation and high stiffness. Aluminium alloy 6061 is more comprehensively used among the 6000 series aluminium alloys as a matrix material for preparation of metal matrix composites due to their better formability characteristics. However, they posses poor wear and seizure resistance[2,3]. The addition of high strength and high modulus refractory particles to a ductile metal matrix results in the formation of a material whose mechanical properties are equidistant between the matrix alloy and the ceramic reinforcement[4]. The ceramic reinforced aluminium-MMCs (Al-MMC) are found to possess better wear resistance when compared with the unreinforced alloys[5]. In recent times, extensive study on Al-SiC composites has been made as SiC contributes to superior wear resistance and improved mechanical properties. Addition of SiC reinforcement to the base aluminum metal increases strength to the composite[6].

The improvement in wear resistance characteristics of Al alloy-SiC particles reinforced composite is a strong function of reinforcement content and size[7]. The presence of SiC makes the composites more difficult to machine due to brittleness. Addition of metal oxides like TiO_2 reduces the brittleness due to SiC leading to widened engineering applications. Use of TiO_2 as a reinforcement in aluminium alloys has gained less attention in spite of its higher modulus and hardness characteristics leading to superior corrosion resistance[8]. A significant improvisation in wear resistance and hardness characteristics were achieved with Al6061 alloy and TiO_2 reinforcement. Hardness, density and wear rate were improved with SiC and TiO_2 reinforcements with Al alloy[9,10]. The structure

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345-5-Y- 2017-18
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ISSN: 2321-676X

STAR Research Journal

Available online at www.starresearchjournal.com (Star International Journal)

YOGA

UGC Journal No: 63023

EFFICACY OF VINYASA YOGA WITH AND WITHOUT MANTRA CHANTING ON SELECTED COGNITIVE VARIABLES AMONG CHILDREN WITH CEREBRAL PALSY

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Abstract

The study was designed to find out the efficacy of Vinyasa yoga with and without Mantra chanting on selected cognitive variables among cerebral palsy affected children. It was hypothesized that there would be significant differences in cognitive variables such as memory attention due to the influences of Vinyasa yoga with and without Mantra chanting. To achieve the purpose of the study, 45 male children with cerebral palsy from Chennai city aged between 8 and 12 years were selected randomly and they were divided into three groups namely experimental group I, experimental group II and control groups of 15 subjects each. experimental group I underwent practice of Vinyasa yoga with Mantra chanting , experimental group II underwent practice of Vinyasa yoga without Mantra chanting for the period of 22 weeks, five days per week for the maximum of an hour in the morning. The control group was not exposed to any specific training but they participated in the regular activities. The pre-test and post-test were conducted before and after the training for all the three groups. The cognitive variables memory and attention were assessed by the MMSE(Mini Mental State Examination) Questionnaire. The data pertaining to the variables collected from the three groups before and after the training period were statistically analyzed by using Analysis of Co-Variance (ANCOVA) to determine the significant difference and tested at 0.05 level of confidence. The results of the study proved that the two experimental groups had significant improvement in memory and attention due to the influence of Vinyasa yoga practice with and without Mantra chanting than the control group. Among the experimental groups Vinyasa yoga with mantra chanting had better significant improvement than Vinyasa yoga without mantra chanting.

Keywords: Cerebral palsy, Vinyasa Yoga, Mantra Chanting, Memory, Attention.

INTRODUCTION

CEREBRAL PALSY

The word "Cerebral refers to the brains cerebrum which is the part of the brain that regulates motor function."PALSY' describes a paralyses of voluntary movement in certain body parts. Cerebral Palsy refers to a group of Neurological disorder that appear in infancy or yearly childhood and permanently affect body movement and muscle co-ordination. The term cerebral refers to brain and palsy refers to the impairment or loss of motor function A study by the centres for the disease control &prevention shows the average prevalence the cerebral palsy is 3.3 children /1000 lives..

VINYASA YOGA

The word "vinyasa" can be translated as "arranging something in a special way" like yoga poses for example.. Vinyasa is also the term used to describe a specific sequence of poses. Vinyasa is a Sanskrit term often employed in relation to certain styles of yoga, that usually refers transition between two different positions. Nyasa—denotes to place and Vi -denotes in a special way. The main concept of vinyasa is originated from the basic sequences of Sri Krishnamacharya (1888- 1989) . Yoga poses elaborately explained and enlightened by Srivatsa Ramaswami who is the disciple of Sri Krishnamacharya. According to Srivatsa Ramaswami the Sanskrit word Vinyasa comes from a prefix "Vi" which means variations, and a suffix "Nyasa" which means "within prescribed parameters".**(Srivatsa Ramaswmi 2005)**

MANTRA CHANTING

Mantras are sacred sound syllabels from the vedic tradition. For thousands of years they have been refined to impart healing powers for spiritual development and total rejuvenation of mind and body. The mantras are energy based sounds and thought based waves. Likened to flames of fire they energies PRANA the life force and eventually quieten the mind. Mantras are means of purifying the mind .Each Mantra is a store house of infinite devine power and all mantras are equally powerful. Mantras also work according to one's karma and positive and negative energy that were accumulated. Repetition of Mantras set up vibrations that activate the chakras whereby there is an even flow of beneficial energy in the body. Mantras can be used in Single or in combination with others for the healing process.**(Vijayakumar 2004)**

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STAR Research Journal

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PHYSICAL EDUCATION

UGC Journal No: 63023

EFFECT OF ASTANGA YOGA WITH AND WITHOUT SUPERBRAIN YOGA ON SELECTED BEHAVIOURAL AND COGNITIVE PARAMETERS AMONG URBAN SCHOOL STUDENTS WITH LEARNING DISABILITIES

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Abstract

The study was designed to find out the effect of Astanga yoga with and without Super brain yoga on selected behavioral and cognitive parameters among urban school students with learning disabilities. It was hypothesized that there would be significant difference in behavioural parameter such as Temperament and cognitive parameters such as study skills due to the influences of Astanga yoga with and without Super brain yoga. To achieve the purpose of the study, 90 male students with learning disability from Chennai city aged between 10 to 13 years were selected randomly and they were divided into three groups namely experimental group I, experimental group II and control groups of 30 students each. Experimental group I underwent practices of Astanga yoga with Super brain yoga, Experimental group II underwent practices of Astanga yoga without Super brain yoga for the period of 16 weeks, five days per week for the maximum of an hour in the morning. The control group was not exposed to any specific training but they participated in the regular activities. The pre- test and post-test were conducted before and after the training for all the three groups. The behavioral parameter Temperament was assessed by TS-MM Scals and cognitive parameter such as study skills was assessed by M.K.Kanchana Questionnaire. The data pertaining to the parameters collected from the three groups before and after the training period were statistically analyzed using Analysis of Co-Variance (ANCOVA) to determine the significant difference and tested at 0.05 level of confidence. The results of the study proved that the two experimental groups had significant improvement in Temperament and study skill due to the influence of Astanga yoga with and without Super brain yoga than the control group. Among the experimental groups Astanga yoga with Super brain yoga had better significant improvement than Astanga yoga without Super brain yoga.

Keywords: Learning disabilities, Astanga Yoga, Super brain Yoga, Temperament, Study skill.

INTRODUCTION

LEARNING DISABILITIES

Learning disabilities are neurologically-based processing problems. These Processing problems can interfere with learning basic skills such as reading, writing and/or math. They can also interfere with higher level skill such as organization, time planning, abstract reasoning, long or short term memory and attention. It is important to realize that learning disabilities can affect an individual's life beyond academics and can impact relationships with family, friends and in the workplace. Since difficulties with reading, writing and math are recognizable problems during the school years, the signs and symptoms of learning disabilities are most often diagnosed during that time. A learning disability cannot be cured or fixed; it is a lifelong challenge. However, with appropriate support and intervention, people with learning disabilities can achieve success in school, at work, in relationships, and in the community. **Sonia Sumar. (1998).**

ASTANGA YOGA

Yoga represents the way of life which endows perfect health, physical, mental, moral and spiritual. What is ignoble in man is sublimated to what the most noble in him. To achieve this great art and science of life, a comprehensive practical system of self-culture has been formulated. This system, through the development of one's body, mind and psychic potencies, ultimately leads to physical strength and further on to spiritual consciousness.

The eight limbs of Astanga yoga are:

1. Yama : Self Discipline or Self Restraint.
2. Niyama : Social Discipline or Code of Conduct.
3. Asana : Physical posture.
4. Pranayama : Control of Prana or Life force.
5. Pratyahara : Withdravel of the senses.
6. Dharana : Focusing or concentration.
7. Dhyana : Meditation.
8. Samadhi : Super consciousness.

GregorMaehle. (2015).

SUPER BRAIN YOGA

Super brain Yoga is a scientifically validated

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International Journal of Computational Research and Development (IJCRD)
Impact Factor: 5.015, ISSN (Online): 2456 - 3137
(www.dvpublication.com) Volume 3, Issue 1, 2018

INFLUENCE OF ASTANGA YOGA WITH AND WITHOUT SUPER BRAIN YOGA PRACTICES ON SELECTED SOCIO-PSYCHOLOGICAL PARAMETERS AMONG URBAN SCHOOL BOYS WITH LEARNING DISABILITIES

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Cite This Article: S. Pattabi & Dr. S. Selvalakshmi, "Influence of Astanga Yoga with and Without Super Brain Yoga Practices on Selected Socio-Psychological Parameters among Urban School Boys with Learning Disabilities", International Journal of Computational Research and Development, Volume 3, Issue 1, Page Number 31-35, 2018.

Abstract:

The study was to find out the effect of Astanga yoga with and without Super brain yoga on selected socio-psychological parameters among urban school boys with learning disabilities. It was hypothesized that there would be any significant differences in socio-psychological parameters such as attitude and social adjustment due to the influences of Astanga yoga with and without Super brain yoga. To achieve the purpose of this study 90 school boys from Chennai urban schools aged between 10 to 13 years were selected randomly and they were divided into three groups namely experimental group I, experimental group II and control groups of 30 subjects each, experimental group I underwent practice of Astanga yoga with Super brain yoga, experimental group II underwent to practice of Astanga yoga without Super brain yoga for the period of 16 weeks, five days per week maximum of 75 min. in the morning. The control group was not exposed to any specific training but they participated in regular activities. The pre-test and post-test were conducted before and after the training for all the three groups. The socio-psychological parameters attitude and social adjustment were assessed by using Attitude Test towards Education for Students-S. L. Chopra Questionnaire and Adjustment Inventory for School Students Questionnaire by A. K. P. Sinha, and R. P. Singh for all the three groups. The collected data were statistically were analyzed using Analysis of Co-Varience (ANCOVA) to determine the significant difference and tested at 0.05 level of confidence. The results of the study proved that the two experimental groups had significant improvement in attitude and social adjustments due to the influence of Astanga yoga practice with and without Super brain yoga than the control group. Among the experimental groups Astanga yoga with and without Super brain yoga practice than the control group. Among the experimental groups Astanga yoga with Super brain yoga practice had better significant improvement than Astanga yoga without Super brain yoga practices.

Key Words: Learning Disabilities, Astanga Yoga, Super Brain Yoga, Attitude & Social Adjustments

Introduction:

Education is the process of bringing about desirable changes in the behavior of the child in terms of knowledge, skill, attitude, values and appreciation. For effective organization of this process the teacher should be in touch with new trends in education and should try out new ideas of programmes and techniques experimentally making historical enquiry into their validity, utility and worth-while-ness under the school condition. The emphasis has to be on qualitative improvement which obviously has not received adequate attention of the education. Agarwal, J. C. (1965).

Learning:

Learning is acquiring new knowledge, behaviors, skills, values, preferences or understanding, and may involve synthesiszing different types of information. The ability to learn is possessed by humans, animals and some machines. Progress over time tends to follow learning curves. Human learning may occur as part of education, personal development, or training. It may be goal-oriented and may be aided by motivation. Birsh, Judith R. (2005).

Learning Disabilities:

Learning disabilities are neurologically-based processing problems. These Processing problems can interfere with learning basic skills such as reading, writing and/or math. They can also interfere with higher level skill such as organization, time planning, abstract reasoning, long or short term memory and attention. It is important to realize that learning disabilities can affect an individual's life beyond academics and can impact relationships with family, friends and in the workplace.

Since difficulties with reading, writing and math are recognizable problems during the school years, the signs and symptoms of learning disabilities are most often diagnosed during that time. A learning disability cannot be cured or fixed; it is a lifelong challenge. However, with appropriate support and intervention, people with learning disabilities can achieve success in school, at work, in relationships, and in the community. Sonia sumar. (1998).

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2017-18

JOURNAL OF PHYSICAL EDUCATION SPORTS AND ALLIED DISCIPLINES

JPESAD

Vol. 9 No. 1 & 2 Jan – July 2018 Peer Reviewed ISSN: 0974-343X
(2 Issues Combined)



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An Assessment of Governance in Indian Olympic Association

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Abstract

This research is aimed to spot the degree of good governance within the Indian Olympic Association (IOA). At the same time, it tried to get the strengths and weaknesses of IOA governance practices so as to spot the opportunities for improvement within the organization. The researcher has developed questions to evaluate the present level of governance of the organization then investigate what space among IOA that has to be improved in parallel with good governance theoretical framework and can offer basic set of recommendations on good governance practices. The analysis indicated that the results of IOA's good governance are dissatisfactory. Two out of the four dimensions, particularly Democratic Process and Check and Balance, of good governance assessment tool managed to attain on top of average. The other two dimensions i.e. Transparency and Solidarity received terribly low scores, which show that these dimensions want the additional effort and also the focus to boost its practices.

Keywords: Sports Governance, Transparency, Democratic Process, Check and Balance, Solidarity.

Introduction

Over the previous couple of decades, the priority regarding good governance of sport had seriously vulnerable the trustworthiness of international sport governing bodies. The expansion of mortifications in sport has ceaselessly accrued that ruined the credibility of the sports and its governing bodies. Also, international sport governing bodies are engulfed in corruption and doping crisis that have seriously vulnerable legitimacy in sports. Among the foremost exposed of those has been the allegations of corruption cases in football's world governing bodies with suspension of FIFA President Sepp Blatter and UEFA President Michel Platini from all football-related activities **(BBC News, 2015)**; the criminal investigation of the previous IAAF President Lamine Diack on suspicion of taking bribes to hide up positive doping tests **(BBC News, 2015)**; and therefore

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the state-sponsored doping and cover-ups in Russia **(Mullen, 2015)** that have urged the International Olympic Committee (IOC) to decision each national and international sport governing bodies to boost up their fight against these problems that have gravely out of action the trustworthiness of sports.

The main aim of this paper is to evaluate the degree of good governance practices that's being enforced in National Olympic Committee in India. Moreover, researchers aims to debate the strengths and weaknesses of IOA governance structures so as to spot the most challenges and opportunities for improvement for the development of IOA further as suggesting an acceptable Good governance framework.

Review of Literature

There are several reasons why good governance principles are significant for sport organizations and why they should come to deal with the issues. The sport itself has transformed over time; it has become more and more commercialized, professionalized, and globalized that led to an increased public and media attention. There are four main reasons that the commercialization of sport has made the impact on the independence of international sport governing bodies, including: (1) the enormous growth of revenue in sports that has incentivized possibility of misbehaviors made by officers; (2) the emerged of sports from its initial amateur status to professionalism; (3) the excessive growth of (international) illegal conducts in sport; (4) the concerning on sustainability in relation to hosting mega sport events that requires huge investments **(Geeraert, 2015, p.14)**. Due to this rapid evolution, the conditions that have to be fulfilled have extremely escalated which is difficult for the existing structures to keep up with fast development and are thus not ready to face the new challenges. These burdens require sport organizations to minimize their risk, while at the same time working in a more professional way. Another factor is the increased media intention, which puts the sport organizations' work in the spotlight and makes it subject to public scrutiny. The respect of good governance principles turns out to be obligatory for sport governing bodies to exchange for the high status of their sports in society. Without standard governance practices in the sport organization, it leads to the withdrawal of sponsorship, the drop in sport participation, and desirable for government interference **(UK Sport, 2004)**.

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Several sport organizations attempted to develop their own definitio sport governance since there is no universal agreement on the concept .The Australian Sports Commission **(ASC, 2012)** defined governance as "the system by which organizations are directed and managed". In addition, the **(Sport and Recreation New Zealand, 2004)** described it as "the process by which the board; sets strategic direction and priorities, sets policies and management performance expectations, characterizes and manages risks, and monitors and evaluates organizational achievements in order to exercise its accountability to the organization and owners". **(Ferkin and Shilbury, 2010)** described sport governance as "the responsibility for the functioning and overall direction of the organization and is a necessary and institutionalized component of all sport codes from club level to national bodies, government agencies, sport service organizations and professional teams around the world". None of the sport organizations, however, can act independently of other agencies in the sporting system.

Research Methodology

After reviewing different literature, it was found that research questions in this study are not comprehensively answered by the existing sport governance framework because there is no sufficient theory or model that reflects the problems under investigation in this study. The research questions of the study are (a) What is the current level of transparency of IOA? (b) What is the current level of democratic processes of IOA? (c) What is the current level of check and balances of IOA? (d) What is the current level of solidarity of IOA? The researcher used document analysis as a research method in order to examine the level of governance practices. Desktop research was conducted for collection of the data for this study. The federations' websites, statutes, internal regulations, and any other relevant available documents were analyzed thoroughly. Scoring took place on the basis of publicly available data. Thus, the researcher basically used the existing assessment tool of Sport Governance Observer survey from Play the Game, as foundation to measure governance in IOA which researcher found appropriate for the evaluation of governance practices in IOA. This assessment tool is being practical in Indian sport system since the organization has similar structures and statutes which make this measurement tool a suitable instrument to be based upon.

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The Sport Governance Observer(SGO) assessment tool was jointly established by Play the Game and Danish Institute for Sports Studies in 2012 and 2013, in collaboration with six renowned European universities and the European Journalism Center. It is a self-evaluation checklist for assessing good governance practices in international sport organizations. The tool is further elaborated by means of a scoring system. Importantly, the Sports Governance Observer is based on basic indicators for good governance. A thorough assessment of good governance practices in ISFs requires an in-depth study on a case-by-case basis. The SGO checklists comprised of four dimensions that considered as the utmost elements with regard to good governance in sport, including transparency and public communication, democratic process, checks and balances, and solidarity. **(Geeraert, 2015, p. 11)** The SGO survey is a combination of four most important dimensions of good governance principles; each dimension consists of the unequal number of indicators (36 in total), including transparency (12 indicators), democracy (10 indicators), checks and balances (7 indicators), and solidarity (7 indicators). Each indicator is quantified by using a below scoring scales:

1. Not fulfilled at all	2. Weak	3. Moderate	4. Good	5. State of the art

The below SGO index formula will be used to synthesized and examined the survey scores:

$$SGO\ index_{fed\ x} = \frac{\left(\frac{\sum_{i=1}^{12} Trans_i}{12} + \frac{\sum_{j=1}^{10} Dem_j}{10} + \frac{\sum_{k=1}^{7} Check_k}{7} + \frac{\sum_{l=1}^{7} Sol_l}{7}\right)}{4} - 1}{4} \times 100$$

Analysis and Discussion

The SGO index of the IOA is 52.6% that accumulated from Transparency (37.5%), Democratic Process (67.55%), Checks and Balances (57.5%), and Solidarity (47.8%). This overall score point clearly indicates that IOA has severe governance problems with transparency.

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Table – I

Sport Governance Observer Index and Sport Governance Observer Score

S.N	Dimension	SGO Scale (on scale from 1-5)	SGO Index
1	Transparency	2.5	37.5%
2	Democratic Process	3.7	67.5%
3	Check and Balance	3.3	57.5%
4	Solidarity	2.9	47.8%
Overall			**52.6%**

Figure-1

Sport Governance Observer Result Chart: IOA

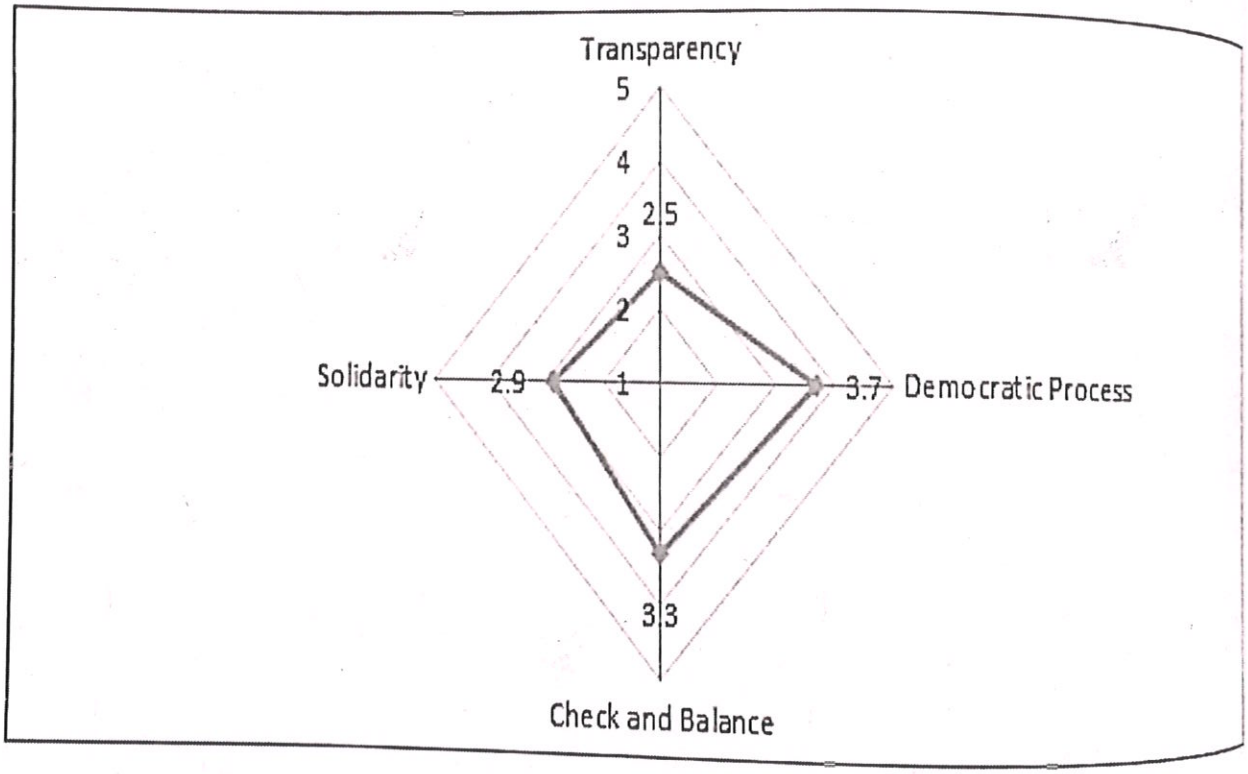

Table 1 & Figure 1: showed that IOA received moderate to weak in two dimensions whereas moderate to good in other two dimensions. Transparency (37.5%) and Solidarity (47.8%) calling for the organization to take extra effort to develop these areas, at the same time not to be careless and ignore area with better score. The organization receives moderate scores in two dimensions namely Democratic Process (67.5%) and Check and Balance (57.5%).

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Conclusion

The Organization is mainly held responsible for maximizing the use of sports for public welfares, so being transparent makes it easier to mark with stakeholders and get further investments into the sports. It can also help to achieve good decisions because everyone has to be open with high responsibility. For that reason, both outcome and working procedure of the organization particularly in resources distribution, should be wide open as much as possible for public scrutiny, which means documents and officials information of the organization should be published on its websites or accessible to the members, media and other stakeholders. Therefore, it is important for Indian sport organizations to have a systematic good governance practices in order to take full advantage of organizational resources. In order to enhance transparency in the IOA, these documents should be published online, (1) Agenda and minutes of its general assembly. (2) Decision-making taken at its EC meeting. (3) Basic biographical information and contact details on their governing body members that includes at least six of the following items: date of birth, position in the organization, nationality, education, professional background, tasks within the organization, current activities in other sport organizations, and official functions and political posts. (4) Information about its member federations that includes founding years, affiliated since, and a number of affiliated athletes in the organizations should be included in addition with existing items; website, email address, president, general secretary. (5) Regulations and reports on remuneration, including per diem payments and bonuses of its members and senior officials. To continually boost sport development throughout the country, it is important to note that it cannot be successfully accomplished without the establishment of stronger institutional structures, which essentially requires mighty leadership commitment. Additionally, effective governance will ensure more effective decision making with the organization demonstrating transparency, accountability and responsibility in the activities undertaken and resources expended.

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3.4.5 - Dr. Preemkumar
2017-18

E-ISSN NO : 2347-856X
ISSN NO : 2348-0653

International Journal of Business and Administration Research Review

Volume No - 3 Issue No - 20 Oct - Dec 2017

Impact Factor 4.729

Peer Reviewed Quarterly Journal



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Research Paper
Impact Factor: 4.729
Refereed, Listed & Indexed

IJBARR
E- ISSN -2347-856X
ISSN -2348-0653

EXPLORING FACTORS THAT INFLUENCE CONSUMERS ON PURCHASE DECISION OF CAR

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Abstract

The Indian economy grows over the past two decades with rising income and fashionable standard of living which have stimulated the car buyers in general and it leads to growth in the Indian automotive industry. Generally, the purchase pattern of consumers changes as time passes. There are several factors that influence consumers while purchasing a car. But, identifying the significant variables that influence them is very important to the marketers as it would help them to evolve strategies for managing those factors effectively. This study focuses on indentifying such factors which greatly influence the car buyers in Chennai city.

Keywords: Consumers Behavior, Purchase Decision, Automotive Industry and Car Buyers.

Introduction

Due to the emergence of globalization and liberalization, there is a stiff competition among the car manufacturers which are focusing their attention in capturing the markets. Customers' attitude has greatly changed over a period of time on purchase of a car because car is no more considered as a luxury product now but it is considered as a comfortable product. So to be a successful car marketer, it is absolutely essential for the company to study the perceptions of the prospective buyers and also try to know the factors for which the consumers give more important while purchasing the car.

Review of Literature

Schiffman and Kanuk (2004) define Consumer behaviour as the behavior that consumers display in searching for, purchasing, using, evaluating and disposing of products and services that they expect will satisfy their needs. Consumer buying behavior incorporates the acts of individuals directly involved in obtaining, using and disposing of economic goods and services including the decision process that precede and determine these acts (Huctings 1995). Lamb, Hair and McDaniel (1992) note that consumer behaviour is a study of the processes the consumer uses to make purchase decisions as well as the use and disposal of the purchased goods or services. It also includes the analysis of factors that influence purchase decisions and good/service usage. Further, it is important to note that consumer behavior is a process and purchase is only one stage in that process.

Problem formulation and Objectives

The purpose of this study is to identify all the factors that influence generally the consumers while purchasing the car in Chennai city and then investigate the significant factors identified through this study.

Research Methodology

This study was conducted in Chennai city during the year 2016. For the purpose of effective data collection, the owners of A2 segment (Compact) brands of car in Chennai city were considered. There were 29 brands of car in A2 segment during the study period. A detailed questionnaire was prepared for the purpose of data collection from the respondents. The sample size of the study was 529 in Chennai city. The SPSS package was used to analyze the data collected from the respondents.

Data Analysis and Interpretation

The factors which influence the car owners have been identified and the same is presented in Table No.1 with scores.

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Table – 2, Distribution of The Respondents By Their Opinion About Important Factors A Car

S. No.	Factors	Very Important	Important	Neutral	Less Important	Least Important
1	Price	76.6	23.4	-	-	-
2	Brand image	32.3	54.1	13.6	-	-
3	Durability	68.8	22.5	8.7	-	-
4	Size	61.2	38.8	-	-	-
5	Design	55.0	29.3	15.7	-	-
6	Speed	34.8	35.0	25.9	4.3	
7	Safety	75.6	21.4	3.0	-	-
8	Driving comfort	47.4	48.3	4.3	-	-
9	Fuel efficiency	65.8	28.7	5.5	-	-
10	After sales service	60.3	39.7	-	-	-
11	Resale value	48.2	41.8	10.0	-	-

(Source: Primary Data)

Factor Analysis for Identifying the Significant Factors

In the correlation matrix table, the correlation (r) is 0.3 and above and Kaiser-Meyer-Olkin value is 0.630. The scree plot shows that the relationship between the variables is linear. Therefore, the primary data is more appropriate for factor analysis and all the factors scale by Principal Component Analysis (PCA).

Table No.2,KMO and Bartlett's Test of Cognitive Factors

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.630
Bartlett's Test of Sphericity	Approx. Chi-Square	3529.333
	D.f	55
	Sig.	.000

(Source: Primary Data)

The Table No. 3 shows that the thumb rule applied to select the number of factors can down the values provided in the first set of columns labeled as Initial eigenvalues. The eigenvalues for each component are listed. In this analysis, the first four factors recorded eigenvalues above 1 that is (2.580, 2.346, 2.084, and 1.333). These four components explained the total of 75.843 percent of the variance.

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ISSN -2348-0653

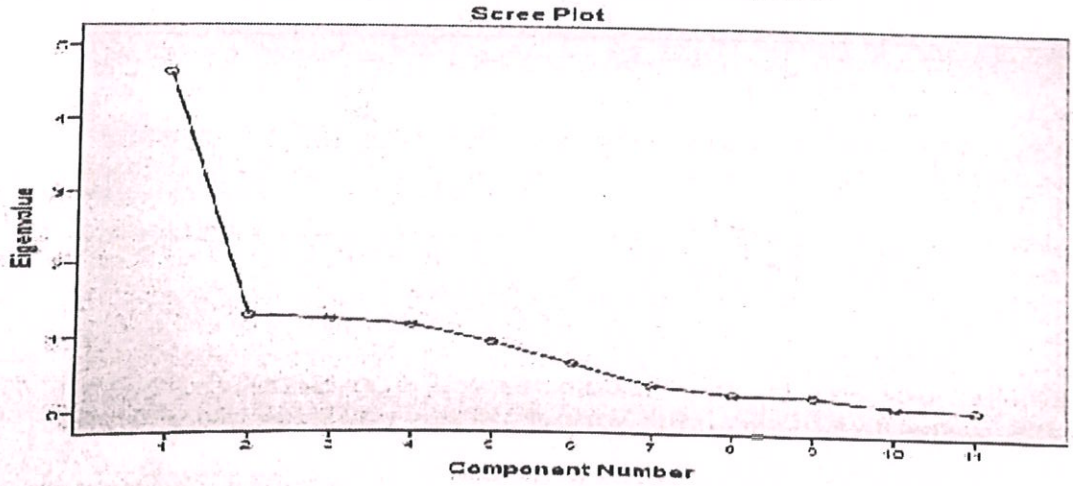
Table No.3,Cognitive Factors Total Variance Explained

Total Variance Explained						
Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.635	42.140	42.140	2.580	23.456	23.456
2	1.292	11.749	53.889	2.346	21.326	44.782
3	1.250	11.362	65.250	2.084	18.943	63.725
4	1.165	10.592	75.843	1.333	12.118	75.843
5	.940	8.542	84.384			
6	.647	5.886	90.270			
7	.368	3.347	93.617			
8	.261	2.376	95.992			
9	.243	2.212	98.204			
10	.115	1.042	99.246			
11	.083	.754	100.000			
Extraction Method: Principal Component Analysis.						

(Source: Primary Data)

The Table No. 3 explains distribution of the variance explained after rotation. Component 1 now explains 23.46 of the variance, Component 2 explains 21.33 percent, Component 3 explains 18.95 percent and Component 4 explains 12.12 percent. The total variance explained (75.85 percent) does not change after rotation, just the way it was distributed between the four components.

Chart – 1,Cognitive factors Total Variance explained



(Source: Primary Data)

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IJBARR
E- ISSN -2347-856X
ISSN -2348-0653

The scree plot applied to plotting each of the eigenvalues of the factors and inspecting the plot to find the point at which the shape of the curve changes the direction and become horizontal. As the result, the factors that contribute the most to the explanation of the variable in the data set.

Table No. 4,Rotated Component Matrix

Factors	Component			
	1	2	3	4
Price	.799			
After sale service	.785			
Size of the car	.655	.340		
Resale value		.821		
Driving comfort		.758		.301
Speed	.505	.736		-.313
Fuel Efficiency	.437	.531	.512	
Brand image			.784	.372
Safety	.499		.730	
Style			.691	-.313
Durability				.845
Extraction Method: Principal Component Analysis.				

(Source: Primary Data)

The rotated component matrix loading of each of the variables on the four factors that are explaind below: items in Component 1 are Price, After Sales Service and Size of the car, the items in component 2 are Resale Value, Driver Comfort, Speed and Fuel efficiency of a car, the items in Component 3 are Brand Images, Safety and style and the item in Component 4 is Durability of a cars

Findings and conclusion of the study

It has been found from the study through factor analysis that the car buyers give much importance to the following factors: firstly, Price, After Sales Service and Size of the car, secondly, Resale Value, Driver Comfort, Speed and Fuel efficiency of a car, thirdly, Brand Images, Safety and style and finally, Durability of cars. Therefore the marketers of the A2 segment (Compact) brands of car to make sure that the price of the car is fair and the after sales service is very good. If they evolve suitable strategies to reach the consumers and make them believe that the price of the car is genuine and the after sales service would be good, they can definitely be competitive in the market.

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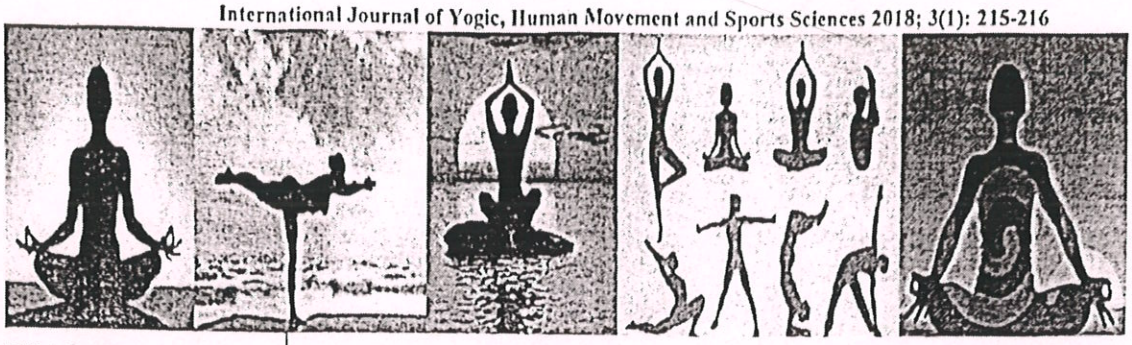
International Journal of Yogic, Human Movement and Sports Sciences 2018; 3(1): 215-216



ISSN: 2456-4419
Impact Factor: (RJIF): 5.18
Yoga 2018; 3(1): 215-216
© 2018 Yoga
www.theyogicjournal.com
Received: 15-05-2018
Accepted: 17-06-2018

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Influence of selected yogic practices and aerobic exercises on selected physiological variables among middle aged diabetics

Dr. P Kanagasabai, Dr. S Manikandan and Dr. C Lakshmanan

Abstract
The purpose of the study was to find out the influence of combination of selected yogic practices and aerobic exercises on selected physiological variables such as cardio respiratory endurance and vital capacity among middle aged diabetics. To achieve this purpose, thirty diabetic patients worked in different places of chidambaram, tamilnadu, were selected as subjects, their aged between 35 to 45 years. The selected subjects were divided into two equal groups of fifteen subjects each, namely experimental group and control group. Experimental group, performed yogic practices and aerobic exercises, after a warm up for 5 minutes underwent their respective training and finished each session with cool down exercises and the sessions lasted for 45 minutes in each day, on alternate days, forming three days a week for eight weeks. Physiological Variables such as Cardio respiratory endurance and Vital capacity were selected as criterion variables and they were tested by using Cooper's 12 minutes run/walk test and spirometer respectively. ANCOVA was used to find out the significant difference if any between the groups. The results of the study showed that there was a significant differences on cardio respiratory endurance and vital capacity between experimental group and control group and also there was a significant improvement on cardio respiratory endurance and vital capacity due to eight weeks of combination of selected yogic practices and aerobic exercises.

Keywords: yogic practices, aerobic exercises, physiological, cardio respirary endurance and vital capacity

Introduction
Yoga strives to increase self-awareness on both physical and psychological level. Psychological problems such as anxiety and stress are an unavoidable reality of life in today's world. You can't beat it entirely, and you can't live without it. The goal of managing these problems isn't to be completely without the physiological and psychological problems.
Sports pervade society to such an extent that it has been described by many as a microcosm of society. Training and conditioning enables an athlete to complete at a higher level and prepares him for other events by getting fit and strong and by improving his fitness. A training individual is in a better state of physical fitness than the individual who follows a sedentary, and inactive life.
Yogic techniques and practices aim at selective as well as wholesome shaping of human body and mind. In this study only pranayama practice is taken into account as a treatment variable. Breath is a life force for the human being. It is believed that the lung functions play a vital role in most of the sports activities.

Methodology
The purpose of the study was to find out the influence of combination of selected yogic practices and aerobic exercises on selected physiological variables such as cardio respiratory endurance and vital capacity among middle aged diabetics. To achieve this purpose, thirty diabetic patients worked in different places of chidambaram, tamilnadu, were selected as subjects, their aged between 35 to 45 years. The selected subjects were divided into two equal groups of fifteen subjects each, namely experimental group and control group. Experimental group, performed yogic practices and aerobic exercises, after a warm up for 5 minutes

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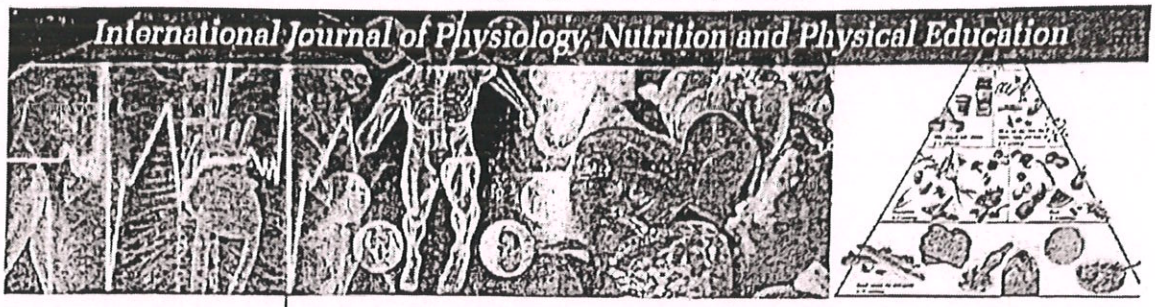

ISSN: 2456-0057
IJPNPE 2018; 3(1): 717-718
© 2018 IJPNPE
www.journalofsports.com
Received: 21-11-2017
Accepted: 25-12-2017

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Efficacy of combination of SAQ drills and plyometric training on selected physiological variables among badminton players

Dr. P Kanagasabai, Dr. S Manikandan and Dr. C Lakshmanan

Abstract
The purpose of the study was to find out the efficacy of combination of SAQ drills and plyometric training on selected physiological variables among badminton players. To achieve this purpose, thirty male badminton players were selected as subjects, their aged between 18 to 24 years, they are studying in the various departments of Annamalai University, Chidambaram, Tamil Nadu. The selected subjects were divided into two equal groups of fifteen subjects each, namely Combination of SAQ drills and plyometric training group and control group. The experimental group trained for three alternative days in a week for eight weeks with three sets per exercise per session at 60 to 80% with a progressive increase in load with the number of weeks. Physiological variables such as Breath holding time and Vital capacity were selected as criterion variables and they were tested by using Stop watch and Wet spirometer respectively. ANCOVA was used to find out the significant difference if any between the groups. The results of the study showed that there was a significant improvement on selected physiological variables such as breath holding time and vital capacity due to eight weeks of combination of SAQ drills and plyometric training as compared to control group.

Keywords: SAQ drills, plyometric training, breath holding time and vital capacity

Introduction

SAQ (Speed, Agility, Quickness) training and conditioning enables an athlete to compete at a higher level and prepares him for other events by getting fit and strong and by improving his skills.

Plyometric training can take many forms, including jump training for the lower extremities and medicine ball exercises for the upper extremities. All the exercises are progressive in nature, with a range of low to high intensity in each type of exercises. Plyometric training is used for the lower body, upper body and core to enhance speed of movement in more specific skills. Plyometric training helps athletes learn greater balance, co-ordination, quickness, agility, speed and power.

Plyometric movements are performed in a wide spectrum of sports.

In establishing the aim of plyometric training we must proceed from the definition of the general concept of training. We have stated that plyometric training is a means of achieving higher standard performances in athletics.

Methodology

The purpose of the study was to find out the efficacy of combination of SAQ drills and plyometric training on selected physiological variables among badminton players. To achieve this purpose, thirty male badminton players were selected as subjects, their aged between 18 to 24 years, they are studying in the various departments of Annamalai University, Chidambaram, Tamil Nadu. The selected subjects were divided into two equal groups of fifteen subjects each, namely combination of SAQ drills and plyometric training group and control group.

The selected subjects had undergone the Combination of SAQ drills and plyometric training for eight weeks, with three days per week in alternate days. After 10 to 15 minutes of warm-up the subjects underwent SAQ drills followed by plyometric training programme and the

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3.4.5 PE J 2017-18

International Journal of Academic Research and Development
ISSN: 2455-4197
Impact Factor: RJIF 5.22
www.academicsjournal.com
Volume 3; Issue 2; March 2018; Page No. 1709-1710

Efficacy of speed agility quickness drills on selected bio-motor abilities among university athletes

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Abstract
The purpose of the study was to find out the effect of SAQ drills training on selected bio-motor abilities among university athletes. To achieve this purpose, thirty male athletes (Jumpers, Throwers and Sprinters) were selected as subjects, their aged between 18 to 24 years, they are studying in the various faculties of Annamalai University, chidambaram, Tamil Nadu. The selected subjects were divided into two equal groups of fifteen subjects each, namely SAQ drills group and control group. The experimental group trained for three alternative days in a week for eight weeks with three sets per exercise per session at 60 to 80% with a progressive increase in load with the number of weeks. Speed and agility were selected as criterion variables and they were tested by using 50 meters dash and shuttle run respectively. ANCOVA was used to find out the significant difference if any between the groups. The results of the study showed that there was a significant difference on speed and agility between experimental group and control group.

Keywords: SAQ drills, plyometric training, BIO-MOTOR abilities, speed and agility

Introduction
Sports have become an important part of Nation's cultural as well as of other cultures throughout the world. Sports pervade society to such an extent that it has been described by many as a microcosm of society. Training and conditioning enables an athlete to complete at a higher level and prepares him for other events by getting fit and strong and by improving his skills. A training individual is in a better state of physical fitness than the individual who follows a sedentary, and inactive life.

SAQ (Speed, Agility, Quickness) training and conditioning enables an athlete to compete at a higher level and prepares him for other events by getting fit and strong and by improving his skills.

Training is used for the lower body, upper body and core to enhance speed of movement in more specific skills. SAQ training helps athletes learn greater balance, co-ordination, quickness, agility, speed and power.

SAQ movements are performed in a wide spectrum of sports. In establishing the aim of plyometric training we must proceed from the definition of the general concept of training. We have stated that plyometric training is a means of achieving higher standard performances in athletics.

Methodology
The purpose of the study was to find out the effect of SAQ drills training on selected bio-motor abilities among university athletes. To achieve this purpose, thirty male athletes were selected as subjects, their aged between 18 to 24 years, they are studying in the various faculties of Annamalai University, Chidambaram, Tamil Nadu. The selected subjects were divided into two equal groups of fifteen subjects each, namely SAQ drills group and control group. The experimental group trained for three alternative days in a week for eight weeks with three sets per exercise per session at 60 to 80% with a progressive increase in load with the number of weeks. Speed and agility were selected as criterion variables and they were tested by using 50 meters dash and shuttle run respectively. ANCOVA was used to find out the significant difference if any between the groups.

Experimental Design and Statistical Procedure
The experimental design used for the present investigation was random group design involving 30 subjects for training effect. Analysis of Covariance (ANCOVA) was used as a statistical technique to determine the significant difference, if any, existing between pretest and posttest data on selected dependent variables separately and presented in Table-I.

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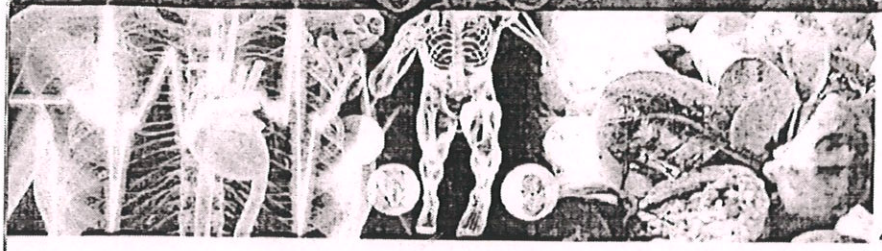

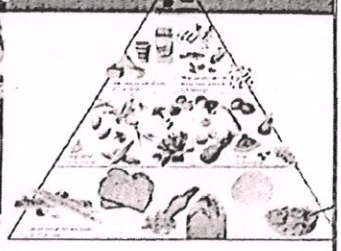

Peer Reviewed Journal, Refereed Journal, Indexed Journal

ISSN: 2456-0057, Impact Factor: RJIF 5.43

Publication Certificate

This certificate confirms that "**Dr. S Manikandan**" has published manuscript titled "**Efficacy of combination speed agility quickness drills and small sided games on selected bio-motor abilities among the new college football players**".

Details of Published Article as follow:

Volume	:	3
Issue	:	2
Year	:	2018
Page Number	:	457-458

Certificate No.: 4-2-181
Date: 01-07-2018

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International Journal of Physiology, Nutrition and Physical Education
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Sports University
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International Journal of Physiology, Nutrition and Physical Education



ISSN: 2456-0057
IJPNPE 2018; 3(2): 457-458
© 2018 IJPNPE
www.journalofsports.com
Received: 18-05-2018
Accepted: 20-06-2018

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Efficacy of combination speed agility quickness drills and small sided games on selected bio-motor abilities among the new college football players

U Mahaboob Basha and Dr. S Manikandan

Abstract
The purpose of the study was to find out the effect of SAQ drills training and SSG (small sided games) on selected bio-motor abilities among new college football players. To achieve this purpose, thirty male football players were selected as subjects, their aged between 18 to 24 years, they are studying in the various departments of The New College, Chennai, Tamil Nadu. The selected subjects were divided into two equal groups of fifteen subjects each, namely SAQ drills and SSG group and control group. The experimental group trained for three alternative days in a week for eight weeks with three sets per exercise per session at 60 to 80% with a progressive increase in load with the number of weeks. Speed and agility were selected as criterion variables and they were tested by using 50 meters dash and shuttle run respectively. ANCOVA was used to find out the significant difference if any between the groups. The results of the study showed that there was a significant difference on speed and agility between experimental group and control group.

Keywords: SAQ Drills, SSG, Bio-Motor Abilities, Speed and agility

Introduction
Sports have become an important part of nations cultural as well as of other cultures throughout the world. Sports pervade society to such an extent that it has been described by many as a microcosm of society. Training and conditioning enables an athlete to complete at a higher level and prepares him for other events by getting fit and strong and by improving his skills. A training individual is in a better state of physical fitness than the individual who follows a sedentary and inactive life. Small-sided games are games with a small number of players on each side, for example 3 v 3 or 5 v 5. The key point is that because there are fewer players, each player gets more touches of the ball, and there are many additional benefits
SAQ (Speed, Agility, Quickness) training and conditioning enables an athlete to compete at a higher level and prepares him for other events by getting fit and strong and by improving his skills. Training is used for the lower body, upper body and core to enhance speed of movement in more specific skills. SAQ training helps athletes learn greater balance, co-ordination, quickness, agility, speed and power.
SAQ movements are performed in a wide spectrum of sports. In establishing the aim of plyometric training we must proceed from the definition of the general concept of training. We have stated that plyometric training is a means of achieving higher standard performances in athletics.

Methodology
The purpose of the study was to find out the effect of SAQ drills and SSG training on selected motor fitness abilities among new college football players. To achieve this purpose, thirty male football player were selected as subjects, their aged between 18 to 24 years; they are studying in the various faculties of The New College, Chennai. The selected subjects were divided into two equal groups of fifteen subjects each, namely SAQ drills and SSG group and control group.

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The experimental group trained for three alternative days in a week for eight weeks with three sets per exercise per session at 60 to 80% with a progressive increase in load with the number of weeks. Speed and agility were selected as criterion variables and they were tested by using 50 meters dash and shuttle run respectively. ANCOVA was used to find out the significant difference if any between the groups.

Experimental Design and Statistical Procedure

The experimental design used for the present investigation was random group design involving 30 subjects for training effect. Analysis of Covariance (ANCOVA) was used as a statistical technique to determine the significant difference, if any, existing between pretest and posttest data on selected dependent variables separately and presented in Table I.

Table 1: Existing between pretest and posttest data on selected dependent variables separately and presented

Variables	Test		SAQ drills and SSG Training Group	Control Group	Source of Variance	SS	df	Mean Square	'F' Ratio
Speed	Pre test	Mean	7.24	7.17	Between	0.03745	1	0.03745	0.520
		S.D	0.26	0.28	Within	2.017	28	0.07202	
	Post test	Mean	6.69	7.12	Between	1.391	1	1.391	13.807
		S.D	0.22	0.39	Within	2.821	28	0.101	
	Adjusted Post test	Mean	6.65	7.15	Between	1.823	1	1.823	48.517
					Within	1.014	27	0.03757	
Agility	Pre test	Mean	10.93	10.99	Between	0.033	1	0.033	0.742
		S.D	0.252	0.162	Within	1.259	28	0.04495	
	Post test	Mean	10.73	10.96	Between	0.385	1	0.385	22.049
		S.D	0.123	0.141	Within	0.489	28	0.0175	
	Adjusted Post test	Mean	10.73	10.96	Between	0.336	1	0.336	20.307
					Within	0.446	27	0.01653	

(The table value required for significant at .05 level with df 1 and 28; and 1 and 27 are 4.20 and 4.215 respectively).

Results

The pretest mean of experimental group and control group on speed (7.24 ± 0.26 Vs 7.17 ± 0.28) resulted in a 'F' ratio of 0.52. The posttest mean of experimental group and control group (6.69 ± 0.22 Vs 7.12 ± 0.39) resulted in a 'F' ratio of 13.807. The adjusted posttest mean of experimental group and control group (6.65 Vs 7.15) resulted in a 'F' ratio of 48.517. The results of the study indicate that there was a significant difference between experimental group and control group on speed.

The pretest mean of SAQ drills and SSG group and control group on agility (10.93 ± 0.25 Vs 10.99 ± 0.16) resulted in a 'F' ratio of 0.742. The posttest mean of experimental group and control group on agility (10.73 ± 0.123 Vs 10.96 ± 0.141) resulted in a 'F' ratio of 22.049. The adjusted posttest mean of SAQ drills and SSG group and control group on agility (10.73 Vs 10.96) resulted in 'F' ratio of 20.307. The results of the study indicate that there was a significant difference between experimental group and control group on agility.

Discussion

The result of the study indicates that the SAQ drills and SSG training group had significantly improved the selected dependent variables namely speed and agility. However, control group did not show any improvement on the selected variables as it was not involved in any of the specific training means. The result of the study in consonance with the findings of plyometric training has produced significant improvement on speed and agility. Athletes stops abruptly and changes direction quickly, to do this, he drops his center of gravity lows, leans away from the direction of run; plants the feet and this they keeps his body under control, by offsetting the centrifugal force, he is ready to push of in the desired direction. It is inferred from the results of the present study that all the dependent variables were significantly improved due to the influence of SAQ drills and SSG programme.

Conclusion

It is concluded that the SAQ drills and SSG training program has resulted in significant improvement on selected Bio-Motor abilities such as speed and agility among university athletes.

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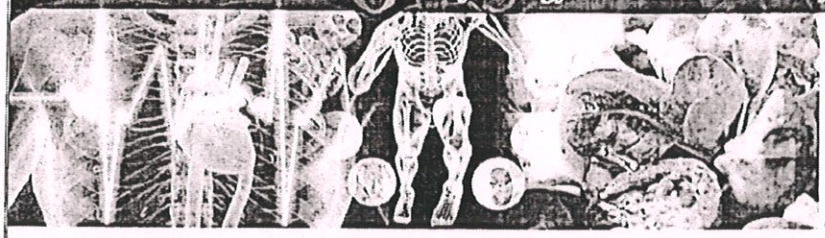

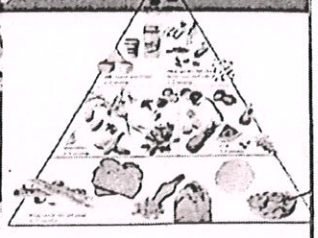

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ISSN: 2456-0057, Impact Factor: RJIF 5.43

Publication Certificate

This certificate confirms that **"Dr. S Manikandan"** has published manuscript titled **"Efficacy of combination of aquatic and plyometric training on selected physiological variables among badminton players".**

Details of Published Article as follow:

Volume	:	**3**
Issue	:	**1**
Year	:	**2018**
Page Number	:	**37-38**

Certificate No.: **4-2-178**
Date: **01-01-2018**

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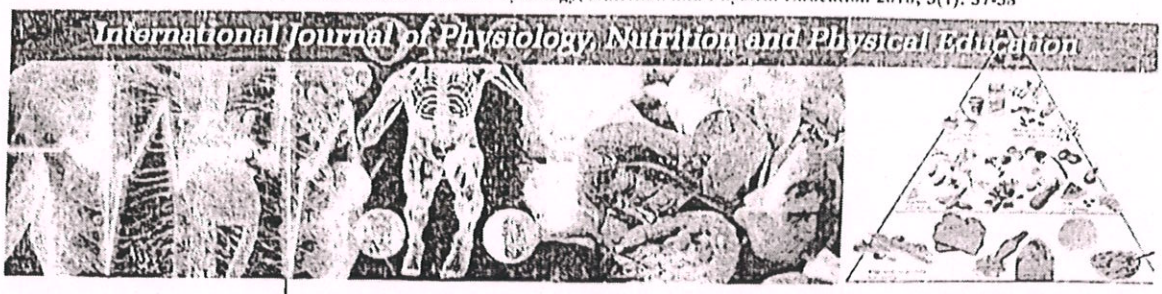

ISSN: 2456-0057
IJPNPE 2018; 3(1): 37-38
© 2018 IJPNPE
www.journalofsports.com
Received: 14-11-2017
Accepted: 18-12-2017

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Efficacy of combination of aquatic and plyometric training on selected physiological variables among badminton players

KP Sajeed and Dr. S Manikandan

Abstract
The purpose of the study was to find out the efficacy of combination of aquatic and plyometric training on selected physiological variables among badminton players. To achieve this purpose, thirty male badminton players were selected as subjects, their aged between 18 to 24 years; they are studying in the various departments of Calicut University, Lakshadweep. The selected subjects were divided into two equal groups of fifteen subjects each, namely Combination of aquatic and plyometric training group and control group. The experimental group trained for three alternative days in a week for eight weeks with three sets per exercise per session at 60 to 80% with a progressive increase in load with the number of weeks. Physiological variables such as Breath holding time and Vital capacity were selected as criterion variables and they were tested by using Stop watch and Wet spirometer respectively. ANCOVA was used to find out the significant difference if any between the groups. The results of the study showed that there was a significant improvement on selected physiological variables such as breath holding time and vital capacity due to eight weeks of combination of aquatic and plyometric training as compared to control group.

Keywords: Aquatic training, plyometric training, breath holding time and vital capacity

Introduction
Aquatic training and conditioning enables an athlete to compete at a higher level and prepares him for other events by getting fit and strong and by improving his skills. "Aqua training is starting to become a buzzword in fitness, and I'm not talking about your traditional water aerobics classes,"

Plyometric training can take many forms, including jump training for the lower extremities and medicine ball exercises for the upper extremities. All the exercises are progressive in nature, with a range of low to high intensity in each type of exercises. Plyometric training is used for the lower body, upper body and core to enhance speed of movement in more specific skills. Plyometric training helps athletes learn greater balance, co-ordination, quickness, agility, speed and power. Plyometric movements are performed in a wide spectrum of sports.

In establishing the aim of plyometric training we must proceed from the definition of the general concept of training. We have stated that plyometric training is a means of achieving higher standard performances in athletics.

Methodology
The purpose of the study was to find out the efficacy of combination of aquatic and plyometric training on selected physiological variables among badminton players. To achieve this purpose, thirty male badminton players were selected as subjects, their aged between 18 to 24 years, they are studying in the various departments of Calicut University, Lakshadweep. The selected subjects were divided into two equal groups of fifteen subjects each, namely combination of aquatic and plyometric training group and control group.

The selected subjects had undergone the Combination of aquatic and plyometric training for eight weeks, with three days per week in alternate days. After 10 to 15 minutes of warm-up the subjects underwent aquatic followed by plyometric training programme and the subjects performed under water exercises for four weeks after that they performed four weeks

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3.4.5 PE J 2017-18

International Journal of Physiology, Nutrition and Physical Education





Peer Reviewed Journal, Refereed Journal, Indexed Journal

ISSN: 2456-0057, Impact Factor: RJIF 5.43

Publication Certificate

This certificate confirms that **"Dr. S Manikandan"** has published manuscript titled **"Effect of interval training and skills performance on selected motor fitness variables among football players"**.

Details of Published Article as follow:

Volume	:	3
Issue	:	2
Year	:	2018
Page Number	:	355-356

Certificate No.: 4-2-179
Date: 01-07-2018

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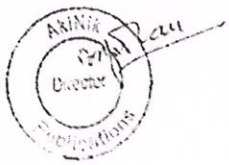

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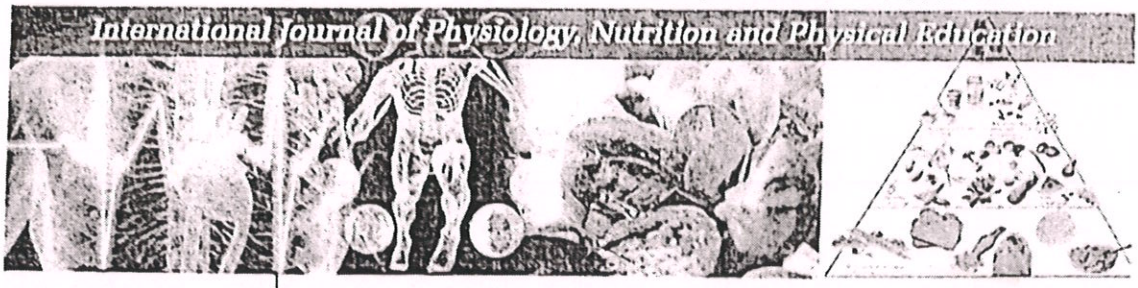

ISSN: 2456-0057
IJPNPE 2018; 3(2): 355-356
© 2018 IJPNPE
www.journalofsports.com
Received: 11-05-2018
Accepted: 17-06-2018

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Effect of interval training and skills performance on selected motor fitness variables among football players

U Mahaboob Basha and Dr. S Manikandan

Abstract
The purpose of the study was to find out the effects of interval training and skills performance on bio motor abilities such as speed, muscular endurance and cardio respiratory endurance. To achieve this purpose of the study, forty five men students in the various Department, The New College, Chennai, Tamil Nadu, were selected as subjects at random. The selected subjects were divided into three equal groups of fifteen subjects each, such as interval training and skills performance, and control group. The group I underwent interval training programme, Group-II underwent to skills performance for three days per week for twelve weeks. And Group III acted as control group who did not participate any special training programmes apart from their regular sports activities as per their curriculum. The following variable namely speed, muscular endurance and cardio respiratory endurance were selected as criterion variables and it was measured by using standard tests. All the subjects of three groups were tested on selected criterion variable at prior to and immediately after the training programme. The analysis of covariance was used to analyse the significant difference, if any between the groups. The level of significance to test the 'F' ratio obtained by the analysis of covariance was tested at .05 level of confidence, which was considered as an appropriate. The results of the study revealed that there was a significant difference between interval training and skills performance group and control group on speed, muscular endurance and cardio respiratory endurance. And also it was found that there was a significant improvement on selected variables speed, muscular endurance and cardio respiratory endurance due to interval and skills performance.

Keywords: Interval training, skills performance, speed, muscular endurance and cardio respiratory endurance

Introduction

In this modern world, competition is the key factor in each and every field, particularly in the field of sports where yesterday's records are topped and the same may be lower performance of tomorrow.

Training in sports is essentially on education process. The athlete is instructed and educated by the trainers the physical education teachers and coaches. Training depends upon the various aspects and is a positive quality closely related to exercise and good health habits. It is an important and valuable pulse in modern society. For the last few decades, research has been conducted to develop a better training method to improve motor fitness components.

Interval Training Work should be done with sufficient speed and 30 minutes duration so that the heart rates go up to 140 beats/minutes. After this there should be a recovery period and when the heart rate comes down to 90 – 100 beats per minute, the work should be started again. Continuous Running, for the purpose of this study continuous running is defined as running at constant paces without any recovery pause in between keeping the heart rate between 100 – 120 beats per minute for a given period of 20 minutes

Sports is an athletic activity requiring skill or physical prowess and often of a competitive nature as racing. The sports of the modern day has become more competitive oriented and exhibition of high skill to achieve higher performance in any field of activity. The competition has led to the research and innovation apart from skill, coaching, training and execution of skill and techniques. The biological and anatomical chemistry of the sportsmen place a very important role.

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Methodology

The purpose of the study was to find out the effects of interval training and skills performance on motor fitness abilities such as speed, muscular endurance and cardio respiratory endurance. To achieve this purpose of the study, forty five men students in the various Departments, The New College, Chennai, Tamil Nadu, were selected as subjects at random. The selected subjects were divided into three equal groups of fifteen subjects each, such as interval training and skills performance, and control group. The group I underwent interval training programme, Group-II underwent to skills performance for three days per week for twelve weeks. And Group III acted as control group who did not participate any special training programmes apart from their regular sports activities as per their curriculum. The following variable namely speed, muscular endurance and cardio respiratory endurance were selected as criterion variables and it was measured by using standard tests. All the subjects of three groups were tested on selected criterion variable at prior to and immediately after the training programme. The analysis of covariance was used to analyse the significant difference, if any between the groups. The level of significance to test the 'F' ratio obtained by the analysis of covariance was tested at .05 level of confidence, which was considered as an appropriate. The results of the study revealed that there was a significant difference between interval training and skills performance group and control group on speed, muscular endurance and cardio respiratory endurance. And also it was found that there was a significant improvement on selected variables speed, muscular endurance and cardio respiratory endurance due to interval and skills performance.

Training Programme

Interval Training

Work should be done with sufficient speed and 30 minutes duration so that the heart rates go up to 140 beats/minutes. After this there should be a recovery period and when the heart rate comes down to 90 – 100 beats per minute, the work should be started again.

Skills Performance in football

For the purpose of this study skills performance is defined as skills at football without any recovery pause in between keeping the heart rate between 100 – 120 beats per minute for a given period of 20 minutes.

Results and Statistical Technique

The analysis of covariance was used to analyse the significant difference, if any between the groups. The level of significance to test the 'F' ratio obtained by the analysis of covariance was tested at .05 level of confidence, which was considered as an appropriate.

Conclusions

- The following are the findings of the study:
- The speed was significantly improved after the interval training and skills performance when compared with the control group.
- There was a significant improvement after the interval training and skills performance on muscular endurance when compared with the control group.
- There was a significant improvement in cardio-respiratory endurance after the skills performance when compared with the interval training and control groups.

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3.4.5 PE J 2017-18

ISSN: 2278-4853 Vol 7, Issue 2, February 2018. Spl-1 Impact Factor: SJIF =4.708

Asian Journal of Multidimensional Research (AJMR)

(Double Blind Refereed & Reviewed International Journal)

UGC APPROVED JOURNAL

COMPARISON OF SELECTED MOTOR FITNESS COMPONENTS BETWEEN MEN BASKETBALL AND HANDBALL PLAYERS

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ABSTRACT

The purpose of the study was find out the comparison of selected motor fitness components between men basketball and handball players. To achieve the purpose of the study investigator selected 25 Basketball players and 25 Handball players from Tamil Nadu Physical Education and Sports University at Chennai. Their ages ranges from 18 to 25 years. They were randomly selected from Basketball players and Handball players. After analyzing the various factors associated with the presented study.The following motor fitness components such as speed, agility.Speed was measured 50 meters dash test, agility was measured Semo agility test. The collected data were analysed statistically by indepent 't' test used. From the analysis of data it was proved that there is significant difference agility. That there was no significant difference speed between men basketball and handball players.

KEYWORDS: *Speed And Agility.*

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International Journal of Advanced Research and Development

Peer Reviewed Journal, Refereed Journal, Indexed Journal

ISSN: 2455-4030, Impact Factor: RJIF 5.24

Publication Certificate

This certificate confirms that **"Dr. K Rajesh Kumar"** has published manuscript titled **"Effect of continuous running and stair climbing on strength endurance among university badminton players"**.

Details of Published Article as follow:

Volume	:	**3**
Issue	:	**2**
Month	:	**Mar-Apr**
Year	:	**2018**
Page Number	:	**1425-1426**
Certificate No.	:	**3-4-40**
Published Date	:	**01-03-2018**

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International Journal of Advanced Research and Development
ISSN: 2455-4030
Impact Factor: RJIF 5.24
www.advancedjournal.com
Volume 3; Issue 2; March 2018; Page No. 1425-1426

Effect of continuous running and stair climbing on strength endurance among university badminton players

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Abstract
The aim of this research is to find out the effect of continuous running and stair climbing on strength endurance among university badminton players. For this purpose, randomly selected thirty badminton players from various faculties of Annamalai University were divided into three groups, continuous running, stair climbing, and control group. Continuous running group performed their specific training program with variation in the training program and Stair climbing exercise group after a warm up for 5 minutes underwent climbing stairs having 18 steps with vertical height of 3 meters with variation of slow, medium, high, medium and slow speed walk and sprints alternatively and finished each session with cool down exercises and the sessions lasted for 40 minutes in each day, on alternate days, forming three days a week. Statistical analysis of pre and post test means through ANCOVA and Scheffe's post hoc test proved that there was significant improvement in selected endurance variable such as strength endurance due to continuous running and stair climbing training especially among handball players.

Keywords: continuous running, stair climbing and strength endurance

Introduction
Continuous running and Stair climbing trainings are suitable exercises to burn fat and improves the condition of heart and lungs. They are creative, fun and very challenging patterns of movement, that is. on and off stair case can challenge the legs. ıoot steps and arms also.

Stair climbing training is a suitable exercise to burn fat and improves the condition of heart and lungs. "Physical Fitness provides capacity for doing all types of activities" Willgoose (1961) [2]. Currently there is wide interest to identify the most effective methods of training for strength and endurance development and this is of special significance for physical education programmes in schools and colleges. Training is usually defined as systematic process of repetitive, progressive exercise or work involving the learning process and acclimatization. (Lawrence Gray Kumar, 2002) [7].

Moritz CT, and Farley CT. (2006) found that humans simultaneously adjust leg compression magnitude and timing, as well as mechanical work output, to conserve center of mass dynamics on damped surfaces, hence runners may use similar strategies on natural energy-dissipating surfaces such as sand, mud and snow for improved strength endurance.

Methodology
The purpose of this research is to find out the effect of continuous running and stair climbing on strength endurance among male university badminton players To achieve the purpose pre and post test random group research design was adapted and thirty badminton players from various faculties of Annamalai University, Chidambaram, Tamilnadu, were randomly selected and their age group was between 18 to 23 years. The were divided into three groups (n = 10) as Group I, Group II and Group III. in which Group I underwent Continuous running and Group II underwent stair climbing for a period of eight weeks and Group III acted as control group. Continuous running group performed their specific training program with variation in the training program and Stair climbing exercise group after a warm up for 5 minutes underwent climbing stairs having 18 steps with vertical height of 3 meters with variation of slow, medium, high, medium and slow speed walk and sprints alternatively and finished each session with cool down exercises, and the sessions lasted for 40 minutes in each day, on alternate days, forming three days a week.

The investigator selected criterion variables Strength endurance, assessed by Bent knee sit ups, as endurance variables. The collected data prior to and after completion of the experimental period on selected variables were statistically examined by applying Analysis of Covariance (ANCOVA). In all the cases to test the significance, 0.05 level of confidence was fixed. Since three groups were involved, whenever significant results were found, Scheffe's post-hoc test was used to find out the significant difference between the paired means of groups.

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Results

Table 1: Results on Calculation of Analysis of Covariance on Strength Endurance

Calculation of Analysis of Covariance on Strength Endurance								
	Continuous Running Group	Stair Climbing Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	39 10	40 80	40 70	Between	18 2	2	9 10	0 60
				Within	412 6	27	15 28	
Post Test Mean	44.40	43 10	41.50	Between	42 2	2	21 10	1 34
				Within	423 8	27	15 70	
Adjusted Post Test Mean	45 40	42 55	41 04	Between	94 5	2	47 25	15 24*
				Within	80 6	26	3 10	
Mean Diff	5 30	2.30	0 80					

Required $F_{(0.05)(2,27)} = 3\ 354$, $F_{(0.05),(2,26)} = 3\ 369$ *Significant

Table 2: Scheffe's Post Hoc Analysis Results

Post Hoc Analysis for Strength Endurance				
Stair Climbing Group	Sand Dune Running Group	Control Group	Mean Difference	Reqd. C.I
45.40	42 55		2 85*	2 04
45 40		41 04	4 36*	2 04
	42.55	41 04	1 51	2 04

*Significant

Discussion

The results presented in Table 1 and 2 proved that continuous running has significantly improved strength endurance, as measured by bent knee sit ups than stair climbing and control groups. While comparing between the treatment groups, it was found that continuous running is better than stair claiming.

Conclusion

- It was concluded that the Continuous running and Stair Climbing programs has resulted in significant improvement on selected criterion variable as compared to control group.
- It was concluded that continuous running can be better utilized for improving endurance variables than stair climbing, especially among badminton players.

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3.4.5 PE J 2017-18

International Journal of Advanced Research and Development

Peer Reviewed Journal, Refereed Journal, Indexed Journal

ISSN: 2455-4030, Impact Factor: RJIF 5.24

Publication Certificate

This certificate confirms that "Dr. K Rajesh Kumar" has published manuscript titled "**Effect of continuous running and stair climbing on strength endurance among university badminton players**".

Details of Published Article as follow:

Volume	:	3
Issue	:	2
Month	:	Mar-Apr
Year	:	2018
Page Number	:	1425-1426
Certificate No.	:	3-4-40
Published Date	:	01-03-2018

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International Journal of Advanced Research and Development
ISSN: 2455-4030
Impact Factor: RJIF 5.24
www.advancedjournal.com
Volume 3; Issue 2; March 2018; Page No. 1425-1426

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Dr. K Rajesh Kumar[1], Dr. S Manikandan[2], Dr. S Velkumar[3]

[1, 3] Assistant Professor, Department of Physical Education, Tamil Nadu Physical Education and Sports University, Chennai, Tamil Nadu, India
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Keywords: continuous running, stair climbing and strength endurance

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The investigator selected criterion variables Strength endurance, assessed by Bent knee sit ups, as endurance variables. The collected data prior to and after completion of the experimental period on selected variables were statistically examined by applying Analysis of Covariance (ANCOVA). In all the cases to test the significance, 0.05 level of confidence was fixed. Since three groups were involved, whenever significant results were found, Scheffe's post-hoc test was used to find out the significant difference between the paired means of groups.

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Results

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	Continuous Running Group	Stair Climbing Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	39.10	40.80	40.70	Between	18.2	2	9.10	0.60
				Within	412.6	27	15.28	
Post Test Mean	44.40	43.10	41.50	Between	42.2	2	21.10	1.34
				Within	423.8	27	15.70	
Adjusted Post Test Mean	45.40	42.55	41.04	Between	94.5	2	47.25	15.24*
				Within	80.6	26	3.10	
Mean Diff	5.30	2.30	0.80					

Required $F_{(0.05)(2,27)} = 3.354$, $F_{(0.05),(2,26)} = 3.369$ *Significant

Table 2: Scheffe's Post Hoc Analysis Results

Post Hoc Analysis for Strength Endurance				
Stair Climbing Group	Sand Dune Running Group	Control Group	Mean Difference	Reqd. C.I
45.40	42.55		2.85*	2.04
45.40		41.04	4.36*	2.04
	42.55	41.04	1.51	2.04

*Significant

Discussion

The results presented in Table 1 and 2 proved that continuous running has significantly improved strength endurance, as measured by bent knee sit ups than stair climbing and control groups. While comparing between the treatment groups, it was found that continuous running is better than stair claiming.

Conclusion

- It was concluded that the Continuous running and Stair Climbing programs has resulted in significant improvement on selected criterion variable as compared to control group.
- It was concluded that continuous running can be better utilized for improving endurance variables than stair climbing, especially among badminton players.

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International Journal of Physical Education, Sports and Health

Online ISSN Number: 2394-1693
Print ISSN Number: 2394-1685
CODEN Number: IJPEJB

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International Journal of Physical Education, Sports and Health

Peer Reviewed Journal, Refereed Journal, Indexed Journal

P-ISSN: 2394-1685 | E-ISSN: 2394-1693 | CODEN: IJPEJB, Impact Factor: Impact Factor (RJIF): 5.38

Publication Certificate

This certificate confirms that **"Dr. P Kumaravelu"** has published manuscript titled **"Effect of yoga on selected physiological and haematological variables among irregular menstrual women"**.

Details of Published Article as follow:

Volume	:	**5**
Issue	:	**1**
Year	:	**2018**
Page Number	:	**79-81**

Certificate No.: **5-1-2**
Date: **01-01-2018**

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345 PE J 2017-18

P-ISSN: 2394-1685 E-ISSN: 2394-1693 CODEN: IJPEJB Impact Factor (RJIF): 5.38
Printed Journal Indexed Journal Refereed Journal Peer Reviewed Journal
Index Copernicus ICV 2016: 75.07

International Journal of Physical Education, Sports and Health

Volume 5 Issue 1 Jan-Feb 2018



Published By
Tirupati Journal Solutions
New Delhi (India)

Scanned by CamScanner

Year: 2018, Volume: 5, Issue: 1
P-ISSN: 2394-1685 | E-ISSN: 2394-1693 | CODEN: IJPEJB
Impact Factor: Impact Factor (RJIF): 5.38
Online Available at www.kheljournal.com

International Journal of Physical Education, Sports and Health

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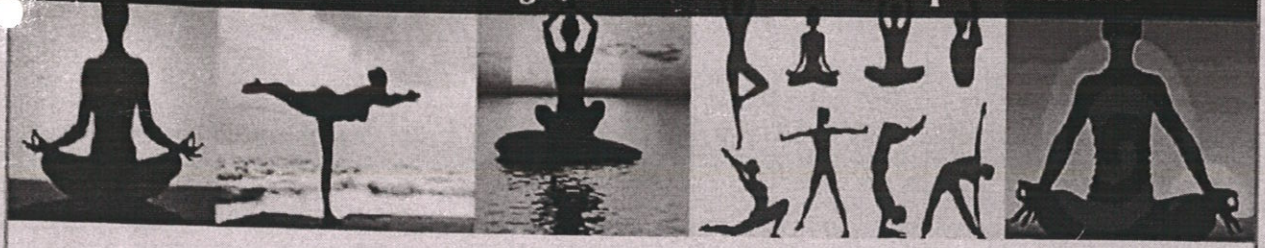

Peer Reviewed Journal, Refereed Journal, Indexed Journal

ISSN: 2456-4419

UGC Approved Journal. UGC Journal No.: 44407

Publication Certificate

This certificate confirms that **"Dr. P Kumaravelu"** has published manuscript titled **"Impact of circuit resistance training on leg strength among University players from different discipline"**.

Details of Published Article as follow:

Volume	:	3
Issue	:	1
Year	:	2018
Page Number	:	158-159

Certificate No.: **2-2-40**
Date: **01-01-2018**

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THE YOGIC JOURNAL

International Journal of Yogic, Human Movement and Sports Sciences

ISSN: 2456-4419, Impact Factor: RJIF 5.18, Index Copernicus ICV 2016: 56.47
UGC Approved Journal

Volume 3 Issue 1 Jan - Jun 2018









Published By
AkiNik Publications, New Delhi

Scanned by CamScanner

Year: 2018, Volume: 3, Issue: 1
ISSN: 2456-4419
Online Available at www.theyogicjournal.com

International Journal of Yogic, Human Movement and Sports Sciences

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ISSN: 2456-0057, Impact Factor: (RJIF): 5.43

UGC Approved Journal. UGC Journal No.: 44404

Publication Certificate

This certificate confirms that **"Dr. P Kumaravelu"** has published manuscript titled **"Effect of prescribing and monitoring direct and indirect physical activity on selected health related fitness and cardio respiratory variables among obese school boys"**.

Details of Published Article as follow:

Volume	:	3
Issue	:	1
Year	:	2018
Page Number	:	707-716

Certificate No.: **3-1-61**
Date: **01-01-2018**

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ISSN: 2456-5067
UGC Approved Journal

Impact Factor: RJIF 5.24
www.sportsjournal.in

International Journal of Yoga, Physiotherapy and Physical Education

Online and Print Journal Indexed Journal Refereed Journal Peer Reviewed Journal

VOLUME 3 ISSUE 2 MAR-APR 2018









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Published By
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Scanned by CamScanner

Year: 2018, Volume: 3, Issue: 2
ISSN: 2456-5067
Impact Factor: RJIF 5.24
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Peer Reviewed Journal, Refereed Journal, Indexed Journal

ISSN: 2456-4419

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Details of Published Article as follow:

Volume	:	**3**
Issue	:	**1**
Year	:	**2018**
Page Number	:	**160-161**

Certificate No.: **2-2-41**
Date: **01-01-2018**

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3.4.5 PE J 2017-18

International Journal of Physical Education, Sports and Health

Online ISSN Number: 2394-1693
Print ISSN Number: 2394-1685
CODEN Number: IJPEJB

Indexed Journal **Refereed Journal** **Peer Reviewed Journal**

International Journal of Physical Education, Sports and Health

Peer Reviewed Journal, Refereed Journal, Indexed Journal

P-ISSN: 2394-1685 | E-ISSN: 2394-1693 | CODEN: IJPEJB, Impact Factor: Impact Factor (RJIF): 5.38

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This certificate confirms that **"Dr. P Kumaravelu"** has published manuscript titled **"Comparison of selected motor ability variables among football players of different positional play"**.

Details of Published Article as follow:

Volume	:	**5**
Issue	:	**1**
Year	:	**2018**
Page Number	:	**101-107**

Certificate No.: **5-1-1**
Date: **01-01-2018**

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3-4-5-J-PSY-2017-18
PSY

Physical Education & Sports Research Journal

Certificate of Publication

ISSN No. 2277-3665 Impact Factor : 5.3149(UIF)

International Recognition Research Journal

This is to certify that our editorial, advisory, and review board accepted research paper of Dr./Shri./Smt:- Lakshman Kumar M. and Ahmed, Shahin Topic:-Role Of Life Skills Education And Youth Evelopment In Sports.College:-Dept. of Sports Psychology and Sociology, Tamil Nadu Physical Education and Sports University, Chennai. The research paper is Original & Innovative, it is done double blind peer revieved. Your article is published on 01.09.2017

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social agents (peers, parents and coaches) are crucial components of how people learn life skills through their involvement in sport. In particular, peer interactions appeared to be the most meaningful aspects of youth sport participation (Nicholas L. Holt et al, 2009).

The development of life skills has been most effectively researched and practiced within organized youth activities (e.g., Larson et al., 2006). One context of organized youth activity that has been considered particularly effective in transferring life skills to young people is sport. Historical records demonstrate the value that sport has always been considered to play in personal development. "The moral value of exercises and sports far outweigh the physical value" (Plato ,1920). Even today the assumption that sport builds character is a foundation of the Olympic movement (Olympic Charter, 2004). This value placed on sport has allowed sport to permeate almost every salient social sphere (e.g., family, media, education, economy, religion) and be connected to the larger ideologies of our culture (Coakley & Pike, 2009). These ideologies allow individuals to make sense and give meaning to the world around them as well as identifying what is considered important and right within a particular cultural milieu. Danish (2002) noted that sport is a particularly salient context for youth development. He argued that sport has always been more than a game and can contribute to the personal growth of young people. Gould etal (2007) found that successful coaches integrated the development of life skills into their coaching.

In fact, these coaches recognised the teaching of life skills as an integral part of sport and aimed to provide specific strategies that targeted their development and transference. Danish and colleagues (Danish, Taylor, Hodge, & Heke, 2004) have also noted the need for young people to be continually exposed to the positive and deliberate strategies that specifically target the transference of life skills.

The recognition that life skills development through sport needs to be deliberate, systematic, continual, with explicit strategies to encourage transference has led to the development of a number of programs aimed to develop life skills. Sports can provide a valuable vehicle for teaching life skills when these lesions are learned and transferred. Youth should believe that the sport skills learnt in the sports arena can and do become used in other settings, and similarly life skills learned also can be used in sports. For transferability to take place, one should believe that they have skills and qualities that are of valued in other settings. To excel in sports, the use of the body from the neck down alone is not required, but there is a lot more as they must plan, set goals, make decisions, seek out instruction, and manage their arousal levels as a routine part of their athletic participation.

Life skills are taught not caught (Hodge, 1988), they must intentionally be acquired, practiced and perfected throughout the athletic experience and outside the sport arena. Psychologists, Physical educators through their education and training can make sure skilled athletes develop the necessary work ethic and life skills to be successful by stressing the importance of constant improvement, rather than just winning.

Sport skill to be considered a life skill, it must be successfully transferred and applied beyond sport. Life skills transfer as an ongoing process whereby he/she continually interacts and interprets his/her environments to produce positive or negative life skills transfer outcomes.

By emphasizing these life skills and by talking about how these characteristics lead to success in and out of the sports arena, parents and coaches can teach athletes that success is not all about physical ability, it's about how well they combine this ability with their attitude. Like anything else, life skills take work to develop. While there are many life skills that can be taught through sport, it is up to the adults involved to use "teachable moments" to ensure that athletes learn these skills and develop them for success outside of sport.

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International Online Physical Education & Sports Research Journal
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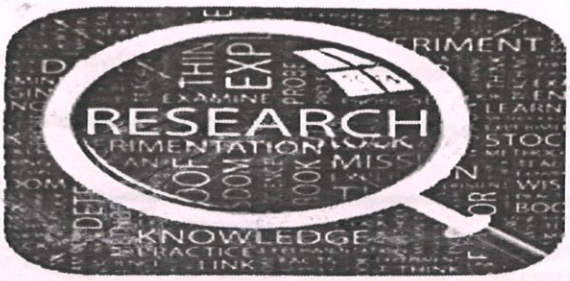
ISSN NO:- 2277-3665 Impact Factor : 5.3149(UIF) Vol.- 6, Issue - 9, September -2017



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ISSN: 2277-3665 IMPACT FACTOR : 5.3149(UIF) VOLUME - 6 | ISSUE - 9 | SEPTEMBER - 2017

ACADEMIC SPORTS SCHOLARS

ROLE OF LIFE SKILLS EDUCATION AND YOUTH DEVELOPMENT IN SPORTS

Lakshman Kumar M.[1] and Ahmed, Shahin[2]

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ABSTRACT :



Life skills learned during high school sport are being transferred for use at various stages across the lifespan (Kelsey Kendellen, 2014). Danish and Donohue (1995), defined life skills as the skills and attitudes learned during sport participation and their application to daily life. Life skills enhance the development of the psychological skills that are required to deal with the challenges of everyday life (Papacharisis, Goudas, Danish, & Theodorakis, 2005). These skills can be physical, behavioral, or cognitive (Danish & Donohue, 1995). Life skills are similar to physical skills in that they can be learned through demonstration and practice. Many skills learned in sports can be transferred to daily life such as the ability to perform under pressure, solve problems, meet deadlines, set goals, communicate, handle success and failure, work with a team, and receive feedback. Being equipped with life skills will not only improve the athletes` current athletic experience, satisfaction and performance, but these skills will inevitably have a positive effect on their school-, private- and working lives. It further needs to be emphasized that being an athlete is not a occupation that will last a life time, and thus it is essential to equip athletes with skills that will enable them to eventually move on to another career.

KEYWORDS: *Life Skills, Psychological Skills.*

INTRODUCTION

The healthy development of youth is a fundamental building block of our society. Efforts to promot positive personal growth and optimal functioning in young people permeate almost every salient social spher including the family, education, religion, media, economics, and sport. Young people struggle to gain the skills tha will help them become active, productive citizens in their nation's economy and workforce. Life skills program use games and sports to teach young people conflict resolution, time management, decision-making, teamwork an communication skills that can be readily applied to their daily lives. The skills that they learn will last a lifetime an prepare them for the future.

The World Health Organisation (1999) proposed a definition of life skills, referring to the psychosocial skil and abilities that can be practiced to promote desirable qualities, such as self-esteem, and sociability. As predominant driver in the field, Danish et al (1995) defined life skills as those skills that enable us succeed with the environments in which we live.

Within their definition, life skills may be behavioural (e.g., communicating effectively with peers ar adults) or cognitive (making effective decisions, interpersonal (e.g., being assertive) or intrapersonal (e.g., settir goals) life skills that are required to deal with the demands and challenges of everyday life (Hodge & Danish, 1999)

Sport can provide an educational context for acquiring life skills but highlight that interactions with k

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B.A.S - J - PSY - 2017-18

Vol. VIII
Number-1

ISSN 2319-7129
Special Issue Jan.-Feb. 2018

EDU WORLD

A Peer Reviewed Journal of Education & Humanities

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Mindfulness Based Cognitive Therapy for Irritable Bowel Syndrome - A Case Study

Srividhya S.* and Shahin Ahmed**

ABSTRACT

Irritable Bowel Syndrome (IBS) is a common disorder of the intestines that leads to crampy pain, gassiness, bloating and changes in bowel habits. Some people with IBS have constipation (difficult or infrequent bowel movements), others have diarrohea (frequent loose stools, often with an urgent need to move the bowels) and some people experience both. It affects 5–11% of the population in most countries.

Irritable Bowel Syndrome has been considered as a bio-psychosocial disorder that could results from the interaction of multiple systems including central nervous system, altered intestinal motility, increased sensitivity of the intestine and psychological factors. Psychological factors such as stressful life events, maladaptive behaviors and dysfunctional cognitions can play a crucial role in IBS. "Cognitive Behavior Therapy (CBT) is a psychological intervention that can target both dysfunctional cognitions as well as maladaptive behaviors and is proven to be efficacious and durable treatment for anxiety, depression, obssessional fear and rituals." It has also been a widely utilized psychological intervention in several chronic medical conditions including IBS. However, there is a paucity of studies on its effectiveness for IBS in Indian scenario. CBT is the most widely-studied psychotherapy treatment for IBS and there is a strong evidence base to support the use of CBT as a first-line treatment in this patient population.

Keywords: IBS, CBT, anxiety, stress, abdominal pain, gastroenterology, bowel habits.

INTRODUCTION

In this paper I shall explore the case study of one of my clients in practicum. The case study represents the work of sessions which was spread across 12 weeks. I have highlighted what I consider the salient aspects in terms of the theories and techniques of therapy used in the case.

CASE REPORT

Ms B.S, a 45 year-old married woman educated upto graduation from middle socioe-conomic status, a home maker and a mother of two grown up daughters was referred to the psychologist. The client was presented with complaints of frequent abdominal pain and disturbed bowel habits for the past 5 years. The pain would get exacerbated after eating anything liquid, solid or semi solid and reduce only after prolonged visits to the toilet due to constipation. In order to control pain and associated bowel habits the client started eating less and also avoided eating at public places due to the fear of getting abdominal pain and needing to defecate. On a typical day she would use the

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toilet 10-15 times. Gradually she had marked impairment in her regular functioning due to lack of time which ultimately resulted in stressful environment at home. She used to feel helpless as she was unable to complete her household chores on time due to more time spent in the toilet and worry about her gastroenterological condition. There was no past history of physical, neurological or psychiatric illness. Personal history revealed ongoing stressors due to the sexual abuse by one of the family member in the recent past the thought of which aggravated her symptoms of anxiety and stress which seemed to be the precursor of IBS. The client had fairly good support from her immediate family members yet she had not revealed anyone about the trauma. She was noted to have worries regarding the past that led to the health issues and anxious effect during mental status examination. She had been visiting gastroenterologists and was diagnosed to be suffering from IBS. She was on pharmocological intervention as prescribed but had experienced no significant improvement for the past 5 years. She later approached the psychologist for intervention. At the time of initiating the intervention the client was not on any medication. Initially doubt surfaced her mind if her condition be improved without any non-medical intervention. However, she was co-operative for the therapy and her motivation for undergoing psychological intervention improved following socialization to CBT model and building of a therapeutic alliance.

The client received 12 sessions of CBT. The client was exposed to mindfulness based cognitive therapy as the literature provided evidences of significant reductions in irritable bowel habits which increased the health related quality of life.

Initial Phase: Sessions 1-4

The client was explained the rationale of introducing mindfulness including the principles underlying the therapeutic model integrating cbt. The cognitive behavioral model for treating IBS focuses primarily on the following components: (1) Psychoeducation about the stress response and its relationship to GI symptoms; (2) Building insight into cognitive and behavioral responses to IBS symptoms and/or fear of symptoms; and (3) Modifying those responses to decrease distress related to IBS and decrease physical reactivity to stress. The mindfulness technique involved training in intentionally attending to present-moment experience and non-judgmental awareness of body sensations and emotions. A hierarchy of anxiety related events was presented. On occurrence of minor sensations of discomfort she would use the toilet to experience some temporary relief.

Middle Phase: Sessions 5-9

Therapist assisted meditation was gradually reduced from 30 minutes to 15 minutes. The client was encouraged to talk about the stimuli associated with anxiety. Initially she was anxious and fearful about the very thought of which might cause discomfort and lead to abdominal pain. However with mindfulness exercises and mental imagery she was put to relaxed state of mind to get rid of flash of traumatic episode. Though she reported to have pain in the beginning and tightness in neck and shoulder, slowly the pain evaded following progressive muscle relaxation techniques and thereby experienced a reduction in anxiety towards the end of the session. After 5 sessions she became comfortable with the process and reported significant reduction in abdominal sensations. She was assigned home work to monitor her thoughts and to record the same in thought record sheet and to alternate the thought with the most pleasant ones to alleviate the anxiety linked IBS. The client reported the frequency of visit to toilet reduced to 6-8 times. After 8 sessions she was able to tolerate mild pain discomfort without using the toilet and her bowel improved significantly to 3-4 times in a day.

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JOURNAL OF PHYSICAL EDUCATION SPORTS AND ALLIED DISCIPLINES

Vol. 9 No. 1 & 2 Jan – July 2018 (2 Issues Combined) Peer Reviewed ISSN: 0974-343X



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Role of Physical Activity on the Span of Attention on Preteen Boys with Learning Disabilities

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Abstract

Physical activity plays an important role in the health, well-being and quality of life. Aim of the study was to find the effect of physical activities on the attention span of preteen male children. It was hypothesized that exposure to physical activity would improve the attention span of preteen boys with learning difficulties. The sample of 50 boys selected from the age group 9-12 years were randomly divided into two groups- Experimental group and Control group, with 25 in each group Physical activities interventions were given over a seven-week period with duration of 45 minutes for every session. The Number Cancellation Test was used to test the attention span of the subjects. Statistical analysis was conducted using Analysis of Variance (ANOVA) to examine if there was a marked difference between the mean values within the group and between the groups for the post-test. From the above analysis, it can be inferred that the Experimental Group with the intervention of physical activity indicated a significant improvement in the attention of male children with learning difficulties.

Keywords: physical activity, attention span, preteen boys, learning disabilities.

Introduction

Physical activity has benefits at every age, in particular, it helps kids keep their heart and lungs strong and healthy, become more flexible, develop strong bones, maintain a healthy body weight, lower the risk of several diseases and health problems, improve their mood and self-esteem, do better in school, and feel better about their bodies. The type and purpose of active play undergoes continuous change all through the different stages of childhood. While infants usually use play to begin and hone voluntary motor control, pre-school children use play as a type of exercise. Running, climbing and other such activities not only serve to develop their muscles, strength, general movement and endurance but are also helpful in cognitive and emotional development.

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Regulation of arousal, development of a sense of mastery, enhanced social cognitions (negotiation, hierarchy and emotional awareness) and gains in spatial cognition are all potential mechanisms through which physical play (exercise and rough and tumble) may influence cognitive outcomes. There is also evidence that active, playground-type breaks can help young children concentrate better at subsequent sedentary tasks. Such activities improve learning on three levels: It optimizes your mindset, by improving alertness, attention, and motivation.

Physical activity plays an important role in the health, well-being and quality of life. It also helps to prevent chronic diseases like cancer, Type 2 diabetes and heart disease later in life. Physical inactivity is the fourth leading risk factor for global mortality. Increasing levels of physical inactivity are seen worldwide. Globally, 1 in 3 adults is not active enough. However, given a supportive environment, increasing levels of physical activity bring health benefits across age groups. In 2013, WHO Member States agreed to reduce physical inactivity by 10% by 2025 in the framework of the "Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013-2020".

Attention is a basic component of our biology, present even at birth. Our orienting reflexes help us determine which events in our environment need to be attended to, a process that aids in our ability to survive. When it comes to studying or learning, one of the most important ingredients is focus and attention. Attention is the process or act of concentrating on one or more environmental factors that your five senses experience.

A learning disability is a neurological disorder. In simple terms, a learning disability results from a difference in the way a person's brain is "wired." Children with learning disabilities are as smart as or smarter than their peers. But they may have difficulty reading, writing, spelling, reasoning, recalling and/ or organizing information if left to figure things out by themselves or if taught in conventional ways.

Review of Literature

Beron W. Z. Tan.et al (2013) examined the effects of physical activity on the attention span and health-related Quality of Life (HRQoL) of autism spectrum disorder (ASD) children in Singapore. Male participants (N = 12) aged 2-6 years, diagnosed with ASD were randomly assigned to either physical activity

or non-physical activity group. In the physical activity group, participants were administered 8 tri-cycling sessions; both groups of participants were measured for their attention span, and their parents completed the HRQoL questionnaires. Results indicate that as the exercise increases, the physical activity group demonstrated increasingly longer duration of attention span. These results extend the findings that physical activity enhances cognition of ASD children and support its consideration into the early intervention programs.

Buchele Harris H. et. al. (2018) study examined the effects of 4-week, daily 6-minute Coordinated-Bilateral Physical Activity (CBPA) breaks in the classroom on attention and concentration in school-aged children (n=116) in fifth grade from two elementary schools. They were assigned to three groups: two intervention groups (n= 60) and one control group (n = 56). All three groups were pre and post-tested with the d2 Test of Attention (d2 test). One intervention group (n = 31) took part in six minutes of daily classroom-based CBPA, five days per week for four weeks without CBPA breaks. A 2 × 3 ANOVA was conducted, followed by the post hoc comparisons. The CBPA showed significant increases in processing speed (F1 = 6.876, p = .010), focused attention (F1 = 10.688, p = .002), concentration performance (F1 = 26.46, p = .000), and attention span (F1 = 14.090, p = .000) over the control group. These indicated improved attention and concentration due to daily brief coordinated-bilateral activities.

Objective

To find out the effect of physical activities on the attention span of male children with difficulties in learning.

Hypothesis

It was hypothesized that exposure to physical activity would improve the attention span of preteen boys with learning difficulties.

Methodology

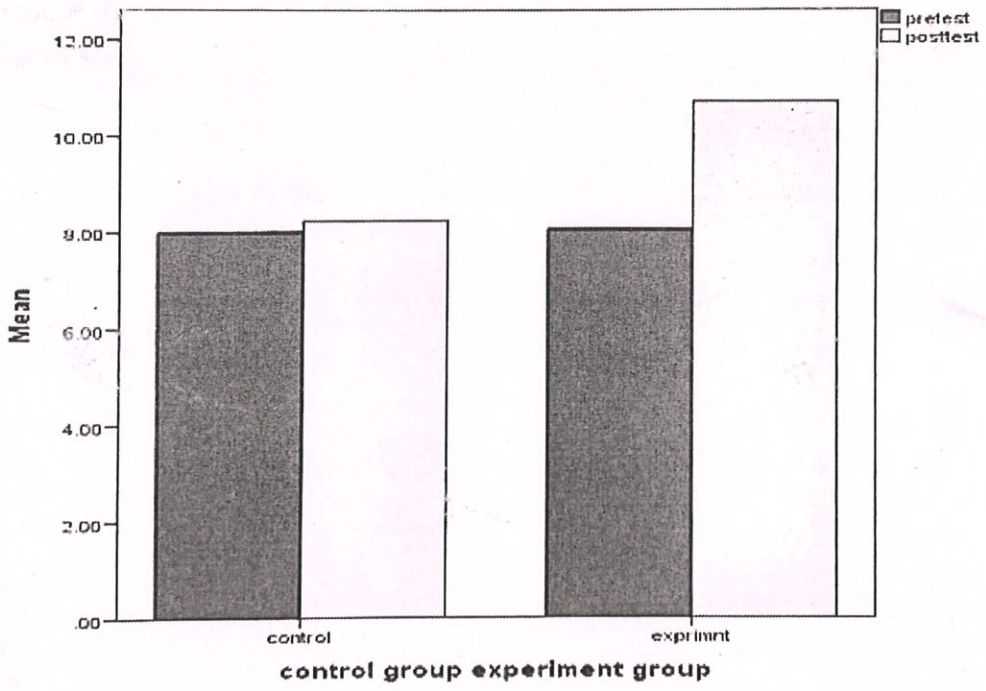
The purpose of the study was to find out the effect of physical activity on the attention span among boys with difficulties in learning. The researcher screened 70 children with Developmental Pathological Checklist (DPCL) for Children to find children with learning difficulties and studied the relationship. The sample

of 50 boys was selected from the age group 9-12 years. All the boys were from a similar socio-economic background of a middle-class to upper-middle-class background. The selected subjects were randomly divided into two groups- Experimental group and Control group, with 25 in each group. Physical activities interventions were given over a seven-week period with duration of 45 minutes for every session. The Number Cancellation Test was used to test the attention span of the subjects. The number cancellation task worksheet consisted of an array of random numbers 1-9 in 36 rows and 24 columns. The average of two trials was taken as the index of attention. Therefore, a higher score indicated a higher attention span.

Results and Discussions

The arithmetic average or mean takes into account all of the available information in computing the central tendency of a frequency distribution.

Figure-I
Pre-test and post-test mean scores for Control Group and Experimental Group



The above graph showed that the pre-test mean score of the Experimental Group on the level of Attention was 8.0000 and that of the Control Group was 8.0400. The post-test mean score showed a significant difference with the values at 10.70 for the Experimental Group and 8.22 for the Control Group. This established that there was no significant difference between the Experimental Group and Control Group, indicating that the process of assigning subjects to the group by randomization was ideal.

Statistical analysis was conducted using Analysis of Variance (ANOVA) to examine if there was a marked difference between the mean values within the group and between the groups for the post-test.

The Basic Descriptive Statistics of a single variable-Attention span in the demographic samples of the control group (n=25) and the experimental group (n=25).

ANOVA Table[a]

			Sum of Squares	df	Mean Square
pretest * control group experiment group	Between Groups	(Combined)	.020	1	.020
	Within Groups		11.460	48	.239
	Total		11.480	49	
posttest * control group experiment group	Between Groups	(Combined)	76.880	1	76.880
	Within Groups		33.040	48	.688
	Total		109.920	49	

ANOVA Table[a]

			F	Sig.
pretest * control group experiment group	Between Groups	(Combined)	.084	.773
	Within Groups			
	Total			
posttest * control group experiment group	Between Groups	(Combined)	111.690	.000
	Within Groups			
	Total			

The physical activity intervention resulted in different mean values of the attention span in preteen boys was found to be $F(1, 48) = 111.69$, $p = .000$. This implies that the physical activity intervention is effective in enhancing attention span of pre-teen boys' sample.

Conclusion

From the above analysis, it can be inferred that the Experimental Group with the intervention of physical activity indicated a significant improvement in the attention of male children with learning difficulties. This inference was drawn based on the pre-test value of was 8.00 and post-test value of 10.70 corresponding to the Experimental Group. In comparison, the pre-test value 8.04 and post-test value of 8.22 obtained for the Control Group indicates that though there was an improvement in the Control Group, it was not as marked as that of the Experimental Group with the intervention of physical activity. This study is in line with Tabatha A, et.al (2007). Physical activity provides a fun-filled medium of intervention to enhance attention span in children with difficulties in learning.

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3.45-J- EPN-2018-19 2017

International Federation of
Physical Education, Fitness and
Sports Science Associations

www.ifpefssa.org

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ISSN 2231-3265
(Online and Print)

International Journal of Health, Physical Education & Computer Science in Sports

UGC APPROVED JOURNAL

A Peer Reviewed (Refereed) International Research Journal

Published by :
Indian Federation of Computer Science in Sports
www.ijhpecss.org & www.ifcss.in

Volume - 29 No. 1
QUARTERLY
January 2018 to March 2018

Publication Impact Factor I2OR 4.005
ISRA Journal Impact Factor 5.115
Index Journal of

J-Gate
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ISSN 2231-3265
International Journal of Health, Physical Education and Computer Science in Sports
Volume No.29, No.1pp51-54
Publication Impact Factor 5.115(UGC Approved Journal)
A Peer Reviewed (Refereed) International Research Journal

Effects Of Resistance, Suryanamaskar And Combined Training With Almond Supplementation On Low Density Lipoprotein And Blood Glucose Among Overweight School Children

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Abstract
The purpose of the study was to find out the effects of Resistance, Suryanamaskar and Combined Training with almond supplementation on low density lipoprotein and blood glucose among overweight school children. To achieve the purpose of this study, sixty (N=60) overweight school children were selected from Sri Iyappa Matriculation Higher secondary school, Shozhanganallur in Chennai district, Tamil Nadu, India were selected as subject at random and their age group ranged between 11 to 14 years. Female Overweight school children selected for this research. The selected sixty overweight school children were divided into four equal groups consisting of fifteen (n=15) subjects each. The selection of control and experimental groups were done at random. Experimental Group I underwent resistance training with almond supplementation for three days per week. Experimental Group II underwent suryanamaskar training with almond supplementation for three days per week. Experimental Group III underwent combined training with almond supplementation for three days per week and group IV acted as Control Group. Subjects who were in the control group were not exposed to any experimental training and supplementation for the period of 12 weeks. Low density lipoprotein and blood glucose were selected as dependent variables and independent variables are resistance training, suryanamaskar,combined training and almond supplementation. The data was collected before and after the experimental treatment period. Analysis of Covariance (ANCOVA) and Scheffe's post hoc test was used in this study. It was concluded that low density lipoprotein and blood glucose level was significantly decreased due to the influence of twelve weeks of resistance, suryanamaskar and combined training with almond supplementation comparing to the control group.
Key Words: Low density lipoprotein, Blood glucose, Resistance training, Suryanamaskar training, combined training.

Introduction

Obesity has reached epidemic proportions in India, according to some studies 5% of the population are affected by morbid obesity. As many as 135 million Indians are currently battling obesity and tackling related health issues. In developing countries such as India, especially in urban populations, childhood obesity is emerging as a major health problem. Studies from metropolitan cities in India have reported a high prevalence of obesity among affluent school children. Overweight in children and adolescents are gradually becoming a major Public health problem leads to major risk factors for number chronic diseases, including diabetes, cardiovascular diseases and cancer.

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ISSN 2231-3265
International Journal of Health, Physical Education and Computer Science in Sports
Volume No.29, No.1pp55-59
Publication Impact Factor 5.115(UGC Approved Journal)
A Peer Reviewed (Refereed) International Research Journal

Effects Of Resistance, Suryanamaskar And Combined Training With Almond Supplementation On Selected Serum Electrolytes Among Obese School Children

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Abstract
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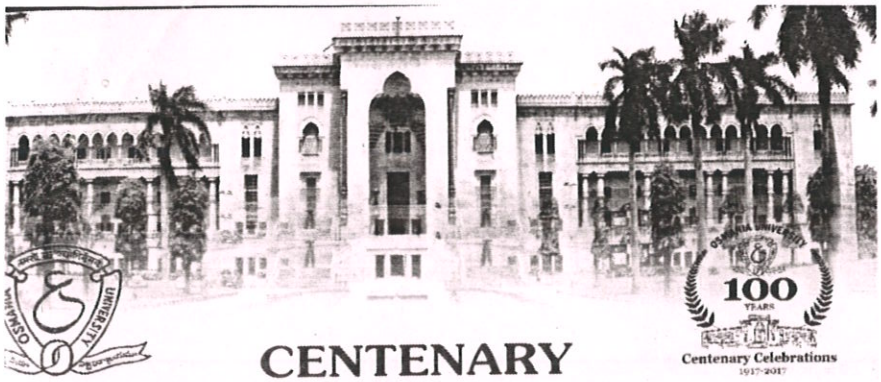
Key words: serum sodium, serum pottasium, Resistance training, Suryanamaskar training, combined training.

Obesity

Obesity is characterized by obese and fatness. It is due to over eating and caloric abundance. It commonly occurs in school children and an adolescent population. Obese is the result of imbalance between calorie intake and calorie expenditure as energy. The intake of food will be higher, but the expenditure of energy will be lesser because of lesser physical work. The unspent calories become converted into fat accumulated in the body as fat.



3.4.5-J-EPN - 2014-18

ISSN 2231-3265
(Online and Print)

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International Journal of Health, Physical Education & Computer Science in Sports

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PROCEEDINGS OF THE

INTERNATIONAL CONFERENCE ON PHYSICAL EDUCATION, FITNESS AND SPORTS SCIENCE 2017

Volume - 27 No. 2
QUARTERLY
July 2017 to September 2017

IFCSS

International Federation of Physical Education, Fitness and Sports Science Associations

Published by : Indian Federation of Computer Science in Sports
www.ijhpecss.org & www.ifcss.in

A Peer Reviewed (Refereed) International Research Journal

Organized by : Department of Physical Education, Osmania University, Hyderabad, T.S. India

Publication Impact Factor I2OR 3.565
ISRA Journal Impact Factor 3.579
Index Journal of

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ISSN 2231-3265
International Journal of Health, Physical Education and Computer Science in Sports
Volume No.27, No.2.pp 302-304
Journal Impact Factor 3.565 (UGC Approved Journal)
A Peer Reviewed (Refereed) International Research Journal

Effect Of Different Packages Of Yogic Practices On Mental Health, Plasma Glucose, Self Esteem Cortisol, High Density Lipoproteins, Anxiety Variables Among Overweight Female In Chennai

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Meaning Of Yoga: Yoga is the "Union of the individual self with the universal self" **(Iyengar, 2001).** Yoga means the union or communication or unity with our inner being. "Asana" means a state of being in which we can remain steady, calm, quiet and comfortable with our physical body and mind. **Meaning of CORTISOL:** Cortisol, known more formally as hydrocortisone (INN, USAN, BAN), is a steroid hormone, more specifically a glucocorticoid, produced by the zona fasciculata of the adrenal cortex **(Scott, 2011).**

Statement Of The Problem: The purpose of the study was to find out the effect of different packages of yogic practices on selected lipid profile status, physiological and psychological variables among overweight middle aged women.

Selection Of Variables: the following variables were selected. Mental Health, Plasma glucose, Self esteem, Cortisol, High density lipoproteins, Anxiety, INDEPENDENT VARIABLES-Experimental group I – Yogic package,Experimental group II - Yogic package,Group III – Control group

Selection Of Subjects: Forty five overweight middle aged women were randomly selected as subjects from Chennai City, Tamil Nadu. The subject's age ranged between 40 to 50 years. The subjects were randomly divided into FOUR groups such as experimental group I, experimental group II and control group and each group contains fifteen subjects.

Experimental Design: The study was formulated as a true random group design consisting of a pre test and post test. The middle aged overweight women (N=45) were randomly assigned to three equal groups of fifteen each. The groups were assigned as experimental group - I (Yogic practices), experimental group - II (Yogic practices) and control group respectively. Pre and post tests were conducted for all the 45 subjects on selected lipid profile status, physiological and psychological variables before and after the experimental period of twelve weeks. The two experimental groups were treated with their respective yogic programme for one hour per day for five days a week for a period of twelve weeks.

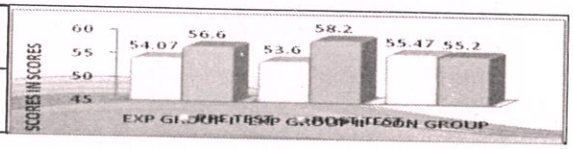
Statistical Procedure: Analysis of co-variance statistical technique was used to test the adjusted post test mean differences among the experimental groups and control group. If the adjusted post test result was significant, then the Scheffe's post hoc test was used to determine the significance of the paired mean differences **(Thirumalaisamy, 1998).**

TABLE I -COMPUTATION OF ANALYSIS OF COVARIANCE ON MENTAL HEALTH

Means	Exp Group I	Exp Group II	Control	SV	SS	df	MS	Obtained 'F'
Pre test	54.07	53.60	55.47	B	28.31	2	14.16	1.04
				W	574.27	42	13.67	
Post test	56.60	58.20	55.20	B	67.60	2	33.80	3.79*
				W	374.40	42	8.91	
Adjusted pos test	56.79	58.67	54.52	B	124.81	2	62.40	17.09*
				W	149.72	41	3.65	

TABLE I(a)-COMPUTATION OF SCHEFFE'S POST HOC TEST ORDERED ADJUSTED FINAL MEAN DIFFERENCE OF MENTAL HEALTH

Experimental Group II	Experimental Group I	Control Group	MD	CI
58.69	56.79	-	1.90*	1.77



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ISSN 2231-3265
International Journal of Health, Physical Education and Computer Science in Sports
Volume No.27, No.2.pp 305-307
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Comparative Study On The Immediate Effects Of Deep Breathing Exercises With Pep Device Verses Incentive Spirometry With Epap On Preventing Pulmonary Complications Following Cardiac Surgical Patients

*V. Kiran, **Dr. R. Venkatesan
*Professor in Physiotherapy, Narayana Medical College and Hospital, Nellore
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ABSTRACT :*Background:* The initial days following Cardiac surgery is a crucial period as it imposes a high risk of pulmonary complications and morbidity. In an effort to increase lung volume following surgery, various deep breathing manoeuvres have been implemented as a main component in the care of the postoperative patient. The rationale for Deep Breathing Exercises with PEP and Incentive Spirometry is that they prevent postoperative complications (PPC), thereby improving cardiorespiratory function. Various studies to substantiate the effectiveness of Deep Breathing Exercises with PEP devices and Incentive Spirometry on preventing pulmonary complications following cardiothoracic surgery have been done. The need to study immediate effects of both techniques is yet to be studied. ***Methodology:*** 30 subjects undergoing CABG and fulfilling the inclusion criteria were selected for the study. They were randomly assigned into two groups: Group A and Group B having 15 subjects each. Group A received Deep Breathing Exercises with a positive expiratory pressure (PEP) device and Group B received Incentive Spirometry with Expiratory Positive Airway Pressure (EPAP). ***Results:*** The value of F = 45.729 to find the difference in PEFR in Group B is significant (p=0.00). It has been found that PEFR increased significantly after application of incentive spirometer with EPAP to the patients after 4th day. On Day 4, t = 3.750, which is significant (p = 0.001) implying that deep breathing exercise with PEP device is more effective to increase PEFR as compared to incentive spirometer with EPAP. ***Conclusion:*** PEP device is more effective than Incentive Spirometry with EPAP in preventing postoperative complications following cardiothoracic surgery. It can be inferred that deep breathing exercise with PEP device is more effective than incentive spirometer with EPAP in improving SPO2 and PEFR in both the groups.

INTRODUCTION

Cardiac surgery is the routine procedure for the treatment of patients who present with symptoms of myocardial ischemia, and expenditure accounts for more resources in cardiovascular medicine than any other single procedure Cardiac surgery is performed daily on a worldwide basis in patients with coronary artery disease. A majority of cardiac surgeries are performed for ischemic coronary artery disease. Cardiac surgery is commonly performed via median sternotomy. The procedure is done by taking a graft from the saphenous vein or internal mammary artery (IMA) and placed proximal and distal to the lesion[3] With advanced research and technologies available in the healthcare system, complex cardiovascular disorders are treated and managed better. Pulmonary complications such as atelectasis and pleural effusion occurring after cardiac surgery is a major problem and a significant cause of postoperative morbidity[4] Patients undergoing cardiac surgery often develop atelectasis and severe reduction in lung volumes and oxygenation in the early postoperative period [5,6] The initial postoperative phase is the most vulnerable period, but decrease in pulmonary function persists for several months after surgery. Impaired ventilator mechanics decreased lung compliance and increased effort of breathing is prominent .The significantly reduced lung volumes contribute to impaired gas exchange. Various studies have documented arterial hypoxaemia and decreased diffusion capacity in the early postoperative period. The postoperative complications increase with age, obesity, smoking and pre-existing lung diseases. The other factors such as site of surgery, duration of anaesthesia and postoperative risk factors, such as immobilization, analgesia, emergency procedures and inadequate preoperative education are also reported to contribute to an increased risk

Chest physiotherapy has long been a standard component of postoperative care, with the aim of preventing or reducing complications such as impaired pulmonary function, atelectasis, pneumonia, sputum retention and gas exchange impairments

ISSN 2231-3265
International Journal of Health, Physical Education and Computer Science in Sports
Volume No.27, No.2.pp 308-310
Journal Impact Factor 3.565 (UGC Approved Journal)
A Peer Reviewed (Refereed) International Research Journal

A Study To Find Out The Persons Who Lack Flexibility By Using Modified Sit And Reach Test Among Middle Aged Overweight Men

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ABSTRACT:
Purpose: The purpose of this study was to determine whether the overweight persons really lack flexibility of their body. Due to overweight the body posture gets altered and poses a serious health hazard which includes lack of flexibility of the muscles. [Subjects and Methods] Thirty (n = 30) overweight middle aged male subjects were selected based on the BMI who scored more than 25 and who had not been into regular exercising and lack flexibility were identified. All were basically screened out for their lifestyle and work related factors. All the samples were put into flexibility test by using modified sit and reach test. All the subjects were asked to repeat the test for three times and the distances covered were taken an average. Based on their scores, the person who lacked flexibility was identified. [Results] The results were calculated using three set of values recorded using modified sit and reach test and is measured in centimeters. The average score was taken into consideration for finding out the person who lacks flexibility. Out of thirty samples, nineteen (19) were found to lack flexibility with a very low score based on the test who could cover only about 05 – 10 cms distances. Six (06) had covered about 10 – 15 cms and five (05) with more than 15 cms. A high negative correlation of -0.9315 has shown the evidence of getting lack of flexibility in persons having higher BMI. [Conclusion] This study showed that person who was identified as overweight based on BMI, were found to be lacking of their body flexibility mainly of back muscles and hamstring muscles. It is concluded that BMI is useful in identifying overweight people and modified sit and reach test is a valid tool in indentifying the lack of flexibility in them.
Key words: Overweight, BMI, Lack of Flexibility, Modified Sit and Reach Test

Introduction:

Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. Being overweight is having more body fat than is optimally healthy. Being overweight is especially common where food supplies are plentiful and lifestyles are sedentary. The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended. Globally, there has been an increased intake of energy-dense foods that are high in fat; and an increase in physical inactivity due to the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization. Changes in dietary and physical activity patterns are often the result of environmental and societal changes associated with development and lack of supportive policies in sectors such as health, agriculture, transport, urban planning, environment, food processing, distribution, marketing, and education. Excess weight has reached epidemic proportions globally, with more than 1 billion adults being either overweight or obese in 2002. In 2013 this increased to more than 2 billion. Increases have been observed across all age groups. A healthy body requires a minimum amount of fat for proper functioning of the hormonal, reproductive, and immune systems, as thermal insulation, as shock absorption for sensitive areas, and as energy for future use. But the accumulation of too much storage fat can impair movement, flexibility, and alter the appearance of the body. Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m^2). Statistics shows that, in 2014, more than 2.2 billion adults aged 18 years and older were overweight. Of these over 600 million adults were obese. Overall, about 13% of the world's adult population (11% of men and 15% of women) was obese in 2014. In 2014, 39% of adults aged 18 years and over (38% of men and 40% of women) were overweight. The worldwide prevalence of obesity more than doubled between 1980 and 2014. In 2016, an estimated 41 million children under the age of 5 years were overweight or obese. Once considered a high-income country problem, overweight and obesity are now on the rise in low- and middle-income countries, particularly in urban settings. In India, the number of children who are overweight or obese has nearly doubled from 5.4 million in 1990 to 10.6 million in 2015. Nearly half of the children under 5 who were overweight or obese in 2014 lived in Asia. Overweight and obesity are linked to more deaths worldwide than underweight. Overweight is one of the predisposing factors for serious health hazard such as Muscular laxity, Joints degeneration, loss of flexibility,

3.4.5-5- EPN-2017-18

International Federation of
Physical Education, Fitness and
Sports Science Associations

IFCSS

ISSN 0975-7732

ASIAN JOURNAL OF PHYSICAL EDUCATION & COMPUTER SCIENCE IN SPORTS

Volume 17 No. 1
HALF YEARLY
July 2017 to December 2017

A Peer Reviewed (Refereed)
International Research Journal

UGC APPROVED JOURNAL
(Sr. 5855)

Journal Impact Factor 3.441
Index Journal of

J-Gate
Largest E-Journal Gateway

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Published by :
Indian Federation of Computer Science in Sports
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ISSN 0975--7732
Asian Journal of Physical Education and Computer Science in Sports
UGC Approved Journal
Volume No.17, No.1.pp53-56
Journal Impact Factor 3.441
A Peer Reviewed (Refereed) International Research Journal

Effect of Different Packages of Yogic Practices on Mental Health, Plasma Glucose, Self Esteem Cortisol, High Density Lipoproteins, Anxiety Variables among Overweight Female in Chennai

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Meaning Of Yoga: Yoga is the "Union of the individual self with the universal self" **(Iyengar, 2001).** Yoga means the union or communication or unity with our inner being. "Asana" means a state of being in which we can remain steady, calm, quiet and comfortable with our physical body and mind.

Meaning of CORTISOL: Cortisol, known more formally as hydrocortisone (INN, USAN, BAN), is a steroid hormone, more specifically a glucocorticoid, produced by the zona fasciculata of the adrenal cortex **(Scott, 2011).**

STATEMENT OF THE PROBLEM: The purpose of the study was to find out the effect of different packages of yogic practices on selected lipid profile status, physiological and psychological variables among overweight middle aged women.

SELECTION OF VARIABLES: the following variables were selected. Mental Health, Plasma glucose, Self esteem, Cortisol, High density lipoproteins, Anxiety, INDEPENDENT VARIABLES-Experimental group I – Yogic package,Experimental group II - Yogic package,Group III – Control group

SELECTION OF SUBJECTS: Forty five overweight middle aged women were randomly selected as subjects from Chennai City, Tamil Nadu. The subject's age ranged between 40 to 50 years. The subjects were randomly divided into FOUR groups such as experimental group I, experimental group II and control group and each group contains fifteen subjects.

EXPERIMENTAL DESIGN: The study was formulated as a true random group design consisting of a pre test and post test. The middle aged overweight women (N=45) were randomly assigned to three equal groups of fifteen each. The groups were assigned as experimental group - I (Yogic practices), experimental group - II (Yogic practices) and control group respectively. Pre and post tests were conducted for all the 45 subjects on selected lipid profile status, physiological and psychological variables before and after the experimental period of twelve weeks. The two experimental groups were treated with their respective yogic programme for one hour per day for five days a week for a period of twelve weeks.

STATISTICAL PROCEDURE: Analysis of co-variance statistical technique was used to test the adjusted post test mean differences among the experimental groups and control group. If the adjusted post test result was significant, then the Scheffe's post hoc test was used to determine the significance of the paired mean differences **(Thirumalaisamy, 1998).**

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3.4.5-J-2017-18

JOURNAL OF PHYSICAL EDUCATION SPORTS AND ALLIED DISCIPLINES

JPESAD

Vol. 9 No. 1 & 2 Jan – July 2018 Peer Reviewed ISSN: 0974-343X
(2 Issues Combined)



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Effect of Randori and Uchikomi Training on Anxiety among Junior State Level Judokas

S. Uma Shankar, Ph.D. Research Scholar, Department of Advanced Training and Technology, and

R. Subramanian, Professor and Head, Department of Advanced Training and Technology, Tamilnadu Physical Education and Sports University, Chennai-127

Abstract

Judo is an art of attack and defense. It involves variety of holds, throws, arm locks, foot movements, direction change, and so on. Randori training is a free exercise training which is practiced under conditions of actual contest. It includes throwing, choking, holding the opponent down, and bending or twisting of the arms. Uchikomi training is repetition training and is used in Judo to refer to the repeated practice of a throwing motion up to the point where the throw would actually be executed. The purpose of the study was to determine the effect of randori and uchikomi training on anxiety among junior state level judokas. To achieve the purpose of the study, forty five judokas were randomly selected from Tamil Nadu state junior state championship in the age group of 18 to 21 years. They were assigned into three groups of which one group participated in randori training, second group participated in uchikomi training and the third group served as control group. The training programme was scheduled for three days a week and each training session consist of 45 minutes including warm up and cool down exercises. Analysis of covariance (ANCOVA) statistical technique was used to test the adjusted post-test mean differences among randori training and uchikomi training groups and the adjusted post-test result was significant, the scheffe's post-hoc test was used to determine the significance of the paired mean differences. Randori training made significant reduction on anxiety among junior state level judokas due to the six weeks of randori training. It was concluded that randori training can be better utilized for controlling anxiety than uchikomi training among junior state level judokas.

Keywords: Randori Training, Uchikomi Training, anxiety.

Introduction

Judo had its origin in the ancient Japanese art of jujutsu, a system of hand-to-hand combat. (Nadamala Gangadhara Reddy, 2009).

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Judo involves variety of holds, throws, arm locks, foot movements, direction change, and so on. But the training, to begin with, starts with certain basic principles of postures and methods of grasping opponent's jacket, gradually running into throwing techniques (Nage-Wasa), grappling techniques (Katame-Wasa), attacking the vital points of the body (Ate-Waza) etc. (Kamlesh M L., 2016). Sports' training is continuous process of perfection, improvement and creation of means and methods of improving sports performance and factors of performance (Hardayal Singh, 1987). The sports training aims at achieving high performance in sports competition. In order to achieve high performance, sports' training is done in a planned and systematic manner. Sports' training is based on systematic facts and principles. In the field of games and sports, that process which helps in preparing sports-persons to participate in competitions and tournaments of various levels is known as sports training. All the learning influences and processes that are aimed at enhancing sports performance are important parts of sports training (Aneja O P., 2015). Training is a systematic process of repetitive, progressive exercise or work, involving also learning process and acclimatization (Arnheim Daniel D., 1985).

Anxiety is one of the common personality disturbances. Anxiety is a normal reaction to a given situation. Anxiety can be called as nervousness. It is a troubled state of mind uneasiness. Nervousness can be experienced at various levels of intensity.

Purpose of the study

The purpose of the study was to determine the effect of randori and uchikomi training on anxiety among junior state level judokas.

Hypothesis

It was hypothesised that there would be significant reduction due to randori training on anxiety than uchikomi training among junior state level judokas.

Methodology

To achieve the purpose of the study, forty five judokas were randomly selected from Tamil Nadu state junior state championship in the age group of 18 to 21 years. They were assigned into three groups of which one group participated in

randori training, second group participated in uchikomi training and the third group served as control group.

The study was formulated as a true random group design, consisting of a pre-test and post-test. The subjects (n=45) were randomly assigned into three equal groups of fifteen judokas each. The groups were Experimental group I assigned as randori training group, group II assigned as uchikomi training group and control group as group III respectively. Pre –test was conducted for all the forty five subjects on anxiety. The experimental groups participated in their respective randori and uchikomi training for a period of six weeks. The post-test was conducted on anxiety after six weeks of randori and uchikomi training.

The investigator administered Taylor Manifest Anxiety Scale to measure anxiety. It has subsequently been used as a general indicator of anxiety as a personality trait. True-false responses are used for each item, and the replies indicating anxiety are counted, giving a score from 0 to 50 with the higher the score representing a higher level of anxiety. Pre –test and post –test scores were statistically examined by applying Analysis of Covariance (ANCOVA) and scheffe's Post –hoc test was used due to significant results were found. The level of confidence was fixed at 0.05 level to test the significance.

Results and Discussion on Anxiety

Table-I

Calculation of Analysis of Covariance of Anxiety

Test	Randori Training Group	Uchikomi Training Group	Control Group	Sources of Variance	Sum of Squares	df	Mean squares	Obtained F-ratio
Pre – test Mean	29.31	27.42	26.69	B	53.23	2	26.63	2.33
				W	477.26	42	11.41	
Post – test Mean	26.43	25.85	28.16	B	50.91	2	25.48	2.46
				W	432.96	42	10.30	
Adjusted post – test Mean	25.27	26.10	29.16	B	118.93	2	58.97	19.39*
				W	125.97	41	3.06	
Mean Diff	2.88	1.57	1.47					

Table F-ratio at 0.05 level of confidence for 2 and 41 (df) = 3.22, 2 and 42 df = 3.22 * : Significant

Table I shows the analysed data on anxiety. The pre-test means of anxiet were 29.31 for randori training group, 27.42 for uchikomi training group an 26.69 for control group. The obtained F-ratio 2.33 was lesser than the tabl F-ratio 3.22. Hence the pre-test was insignificant at 0.05 level of confidence fo the degrees of freedom 2 and 42.

The post-test means were 26.43 for randori training group. 25.85 fo uchikomi training group and 28.16 for control group. The obtained F-ratio 2.4 was less than the table F-ratio 3.22. Hence, the post-test was insignificant at 0.0 level of confidence for the degrees of freedom 2 and 42.

The adjusted post-test means were 25.27 for randori training group, 26.1 for uchikomi training group and 29.16 for control group. The obtained F-rati 19.39 was greater than the table F-ratio 3.22. Hence the adjusted post-test wa significant at 0.05 level of confidence for the degrees of freedom 2 and 41. Th mean difference of randori training group, uchikomi training group and contr group were 2.88, 1.57 and 1.47 respectively.

Table-II
Calculation of Scheff's Post – Hoc Test Analysis of Anxiety

Control Group	Randori Training Group	Uchikomi Training Group	Mean Difference (MD)	C.I Value
29.16	25.27		3.89*	
29.16		26.10	3.06*	1.66
	25.27	26.10	0.83	

* : Significant randori uchikomi

Table II shows the scheffe's post-hoc test of ordered adjusted final mea difference of anxiety for different groups. The differences between the contr group and randori training group was 3.89, control group and uchikomi trainin group was 3.06 and randori training group and uchikomi training group wa 0.83. Hence, the first and second group comparisons were significant and thir comparison was insignificant.

The analysis of covariance of anxiety indicated that there was significar reduction on anxiety among junior state level judokas due to the six weeks randori training.

Further findings of the study showed that the control group did not reduce the anxiety. However, the randori training group had more effect on the reduction of anxiety than the uchikomi training group and control group.

The findings of this study are in agreement with the theoretical knowledge cited in respect of randori and uchikomi training.

Conclusion

It was concluded that there would be significant reduction due to randori training on anxiety than uchikomi training among junior state level judokas.

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JOURNAL OF PHYSICAL EDUCATION SPORTS AND ALLIED DISCIPLINES

JPESAD

Vol. 9 No. 1 & 2 Jan – July 2018 Peer Reviewed ISSN: 0974-343X
(2 Issues Combined)



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Further findings of the study showed that the control group did not reduce the anxiety. However, the randori training group had more effect on the reduction of anxiety than the uchikomi training group and control group.

The findings of this study are in agreement with the theoretical knowledge cited in respect of randori and uchikomi training.

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* * * * *

Impact of Small Sided Games on Kicking and Dribbling Abilities of Inter Collegiate Soccer players

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R. Subramanian, Professor and Head, Department of Advanced Training and Coaching, TNPESU

Abstract

The study was designed to investigate the impact of small sided games on kicking and dribbling abilities of inter collegiate Soccer players. Thirty men football players who participated in the inter faculty tournaments at Annamalai University were selected as subjects and segregated into two groups of fifteen subjects each as experimental group and control group following random procedure. The experimental group underwent small sided games training over a period of Eight weeks where as control group did not participate in any of the training except their regular play. Kicking and Dribbling were assessed before and after the experimental period by using kicking and dribbling tests respectively. ANCOVA was used to analyze the collected data. The results of this study showed that there was a significant difference between experimental group and control group on kicking and dribbling,

Keywords: Soccer, Kicking, Dribbling, Analysis of Co variance (ANCOVA).

Introduction

Soccer is by far the world's most popular game. Millions play the game and hundreds of millions are entertained by it, either at football grounds or through television. Soccer is a game which calls for strenuous, continuous thrilling action and therefore, appeals to the youth worldwide. The skills involved in the game are simple, natural and yet are highly stimulating and satisfying to any one who participates in the game". Football as it is popularly called in India is a game where the foot is used much more than any part of the body. Bernard Shaw's comment underlines this reality that "Footballers think with their feet".

Kicking, foot dribbling, trapping and punting are examples of striking skills using the feet. These striking skills involve applying a force to an object with the foot or leg, and require good eye–foot coordination. Striking with the feet can include: kicking a stationary or moving object, like a small can or a ball; tapping

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a ball under control, as in soccer dribbling and trapping; and punting, which is kicking a ball while it is in the air. These fundamental striking skills are used in sports like soccer, rugby union and rugby league.

The game of soccer is full of challenges and counter challenges between the contesting teams. Many unforeseen situations evolve during the game. The most important factor of soccer is influenced by the stress of competitiveness in each conflicting situation. Performance of a team depends on the talents of the individual players and the understanding between the team mates and above all, the attitude of players towards the interest of the team. Good soccer mainly depends on the quality of players. Success in competitive sports depends largely on the athlete's skill and motivation.

Soccer practitioners require many attributes to become successful players. Few players possess 'natural ability' in all areas. Indeed, the vast majority of players undergo training programmes, in some or all attributes, to improve their ability on the field. Muscle strength training, combined with technical training, improves a player's power-output during explosive activities in a match. Performance in soccer means to exert one's physical fitness and athletic skills which are required in the game. Better physical fitness and better athletic skills bring about a better performance in the game. Team sports like soccer make it even harder to determine what areas of fitness are required.

For soccer we see speed as the ability to accelerate quickly. The speed of play in today's game is said to be quicker than ever. While elite soccer players are by no means Olympic sprinters, all other things being equal, faster players have a marked competitive edge. Soccer, like any sport, places a lot of uneven demands on the body. Soccer is the total sport, and a well-thought-out soccer training program must reflect that. Soccer is one of the few sports demands speed and other speed factors. It makes roughly equal amounts of explosive force and strength endurance. Strength endurance is essential for soccer - and like power, perhaps more essential than all-out strength. At some point in your soccer training routine you should focus on developing strength endurance. Soccer is one of the few sports demands roughly equal amounts of explosive force and strength endurance. The best players in the world are useless on the sidelines (Reilly, 2005).

Methodology

To achieve the purpose of the study, thirty men football players studying various engineering courses and who participated in the Inter faculty tournaments were selected as subjects from Faculty of Engineering and Technology, Annamalai University, Chidambaram, Tamilnadu. Their age ranged between 19 and 23 years and were divided into two equal groups of fifteen subjects each as experimental group and control group. The experimental group underwent small sided games training over a period of twelve weeks where as control group did not participate in any of the training except their regular play. The selected soccer kicking and dribbling abilities were assessed by using kicking and dribbling tests respectively. The collected data were statistically analyzed for significant difference, if any, by applying analysis of covariance (ANCOVA). In all cases 0.05 level was fixed as confidence interval to test the significance.

Analysis of Data

Kicking

The analysis of covariance on kicking of pre and post test scores of small sided group and control group have been analyzed and presented in Table I.

Table - I
Analysis of Covariance on Kicking of Small Sided Games and Control Groups

Test	SSG	Control	Source of variance	Sum of Squares	df	Mean squares	'F' ratio
Pretest Mean SD	47.60	47.20	Between	1.228	1	1.228	1.016
	1.169	1.024	Within	33.84	28	1.209	
Posttest Mean SD	50.86	47.69	Between	75.36	1	75.36	**47.172***
	1.483	0.997	Within	44.73	28	1.598	
Adjusted Posttest Mean	50.64	49.91	Between	53.96	1	53.96	**301.33***
			Within	4.835	27	0.179	

** Significant at .05 level of confidence.*

(The table values required for significance at .05 level of confidence for degree of freedom 1 and 28 and 1 and 27 are 4.20 and 4.21 respectively)

The table-I, shows that the pre-test mean value of kicking for small sided games and control group are 47.60 and 47.20 respectively. The obtained "F" ratio of 1.016 for pre –test scores which were less than the required table value of 4.20 for significance with df 1 and 28 at 0.05 level of confidence. The post-test mean value of kicking for small sided games and control group are 50.86 and 47.69 respectively. The obtained "F" ratio of 47.172 for post –test scores which were higher than the required table value of 4.20 for significance with df 1 and 28 at 0.05 level of confidence. The adjusted post-test mean value of kicking for small sided games and control group are 50.64 and 47.91 respectively. The obtained "F" ratio of 301.33 for adjusted post –test scores which were more than the required table value of 4.21 for significance with df 1 and 27 at 0.05 level of confidence.

The results of the study showed that there was a significant difference between the adjusted post test means of small sided games group and control group on kicking.

Dribbling

The analysis of covariance on dribbling of pre and post test scores of small sided group and control group have been analysed and presented in Table II.

Table - II
Analysis of Covariance on Dribbling of Small Sided Games and Control Groups

Test	SSG	Control	Source of variance	Sum of Squares	df	Mean squares	'F' ratio
Pretest Mean SD	17.68	17.72	Between	0.013	1	0.13	0.168
	0.255	0.304	Within	2.206	28	0.074	
Posttest Mean SD	17.24	17.64	Between	1.18	1	1.18	16.74*
	0.215	0.308	Within	1.986	28	0.071	
Adjusted Posttest Mean	17.26	17.62	Between	0.967	1	0.967	132.12*
			Within	0.198	27	0.007	

** Significant at .05 level of confidence.*

(The table values required for significance at .05 level of confidence for degree of freedom 1 and 28 and 1 and 27 are 4.20 and 4.21 respectively)

The table-II, shows that the pre-test mean value of dribbling for small sided games and control group are 17.68 and 17.72 respectively. The obtained "F" ratio of 0.168 for pre –test scores which were less than the required table value of 4.20 for significance with df 1 and 28 at 0.05 level of confidence. The post-test mean value of dribbling for small sided games and control group are 17.24 and 17.64 respectively. The obtained "F" ratio of 16.74 for post –test scores which were higher than the required table value of 4.20 for significance with df 1 and 28 at 0.05 level of confidence. The adjusted post-test mean value of dribbling for small sided games and control group are 17.26 and 17.62 respectively. The obtained "F" ratio of 132.12 for adjusted post –test scores which were more than the required table value of 4.21 for significance with df 1 and 27 at 0.05 level of confidence.

The results of the study showed that there was a significant difference between the adjusted post test means of small sided games group and control group on kicking.

Results and Discussion

There was a significant difference existed between small sided games group and control group due to twelve weeks of experimental training on kicking and dribbling.

In high performance sports it has been well documented that the maximum benefits are achieved when the training stimuli are similar to competitive demands (Bompa, 1983). In order to reproduce the physical, technical and tactical requirements of real match play coaches often use Small Sided Games in their training programs.

Small Sided Games started as an optimal task to optimize training time by fulfilling the broad range of fitness requirements without compromising skill performance and decision-making. Therefore, they are used extensively to improve physical fitness levels and also technical and tactical performance in a wide variety of soccer codes.The inclusion of match- specific activities such as passing, heading, tackling, etc. in small-sided games will make the training stimulus more specific to the demands of the sport (Rampinini et al., 2007) and hence increase the efficiency of training. The evaluation of the technical demands of different small-sided games is therefore an important consideration of such drills.

The intensity of these soccer-specific training drills with the ball can be affected or manipulated to provide different physical, technical and tactical responses by several factors, such as, the number of players involved, the size and the shape of the pitch, the duration of exercise and rest periods, the rules of the game, coach encouragement, the availability of balls or by the way of scoring points. A better understanding of the influence of modifying those variables on Small Sided Games will assist coaches in controlling the training process with players. **(Hill-Haas et al., 2009)**

Conclusion

The results proved that the impact of small sided games will improve the dribbling and kicking performance efficiently for college level soccer players.

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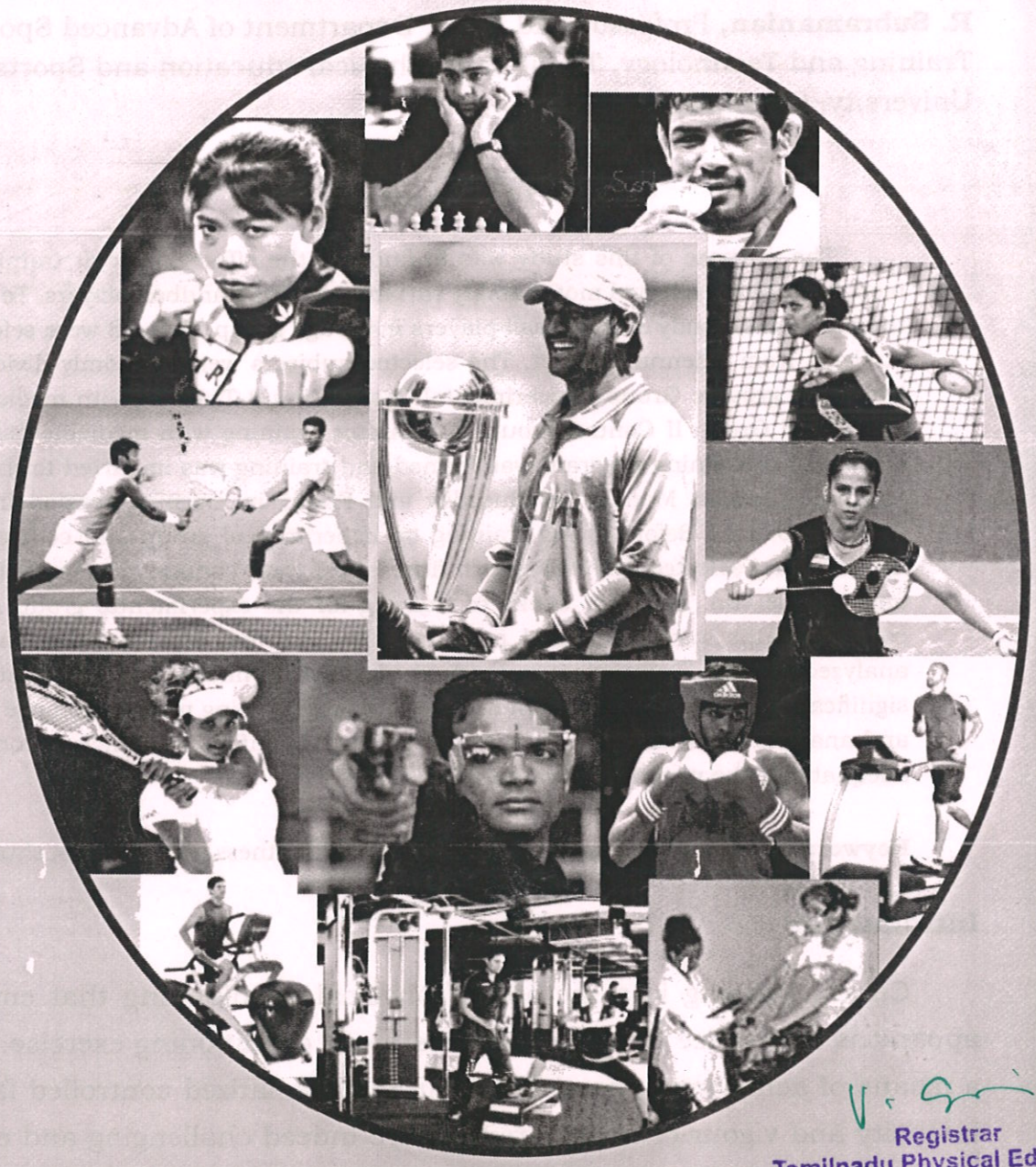
JOURNAL OF PHYSICAL EDUCATION SPORTS AND ALLIED DISCIPLINES

JPESAD

Vol. 9 No. 1 & 2 Jan – July 2018 Peer Reviewed ISSN: 0974-343X
(2 Issues Combined)



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Effect of Circuit Training on Selected AAHPER Youth Fitness Test Variables among Handball Players

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Abstract

The purpose of this study was to find out the effect of circuit training with medicine ball on selected motor ability variables among handball players. To achieve the purpose of study 30 handball players in an age group 16 to 18 were selected as subjects from Chennai district. The selected subjects were randomly divided into two equal groups. Group I experimental Group Circuit Training with medicine ball group and Group II Control group. For Circuit Training with medicine ball group a 6 weeks of training program was framed and training was imparted to the group for three days on Monday, Wednesday and Friday in morning session from6.30 a.m to 8.00a.m. Before giving training on experimental group and control group the following selected AAPHER youth fitness test were conducted namely Pull ups and shuttle run. After six weeks of training for the experimental group and the control groups were conducted post test also. Pre test and Post test data were analyzed through a statistical method. The level of significance chosen to study the significance of difference between means obtained by using mean difference method and analysis of variance was set at 0.05% level of confidence, which is considered adequate for the purpose of the study.

Keywords: Handball, circuit training, AAPHER youth fitness test, pull ups, shuttle run.

Introduction

Circuit training is a method of physical conditioning that employs both apparatus resistance training and calisthenic conditioning exercise. It provides a means of achieving optimal fitness in a systematized controlled fashion. The intensity and vigour of circuit training are indeed challenging and enjoyable to the performer. This system produces positive changes in motor performance, general fitness, muscular power, endurance and speed. Circuit the trained first has to analyze what he specifically can devise circuits to develop strength, power, skill under stress, stamina, endurance excreta. He should also consider

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the aim and objectives of the conditioning programme, the number of player to be involved, their age, sex, experience facilities and equipment on hand and as well as the amount of time that can be spared. Circuit training program consists of a number of 'station' where a given exercise is performed usually within a specified time. Once the exercise is completed at one station, the trainee moves rapidly to the next station, performing another exercise also within a prescribed time period.

The circuit is completed once the exercises at all stations and performed. The exercise out the various stations consists mainly of weight resistance exercise, but running, swimming, cycling calisthemis and stretching exercise may also be included. Circuit training, therefore may be designed to increase muscular endurance, flexibility and if running swimming or cycling is involved to increases cardio respiratory endurance as well. Circuits are designed to consists of between 6 and 15 stations requiring a total time of between 54 and 20 minutes to complete. Usually, each circuit is performed several times in on training session. Only 15 to 20 seconds rest should be allowed between stations. For the weight resistance stations, the load should be adjusted so that the working muscles are noticeably fatigued after performing as many repetitions as possible with in a designated times periods (30 seconds). The load should be increased periodically to ensure progressive over load. In addition, the sequence of exercises should be arranged so that no two consecutive stations consists exercise involving the same muscle group. Training frequency should be 3 days per week, with duration of at least 6 weeks.

AAHPER Youth Fitness Test

In 1958, the research committee of American Alliance for Health, Physical Education and Recreation constructed a Youth Physical Fitness Test Battery for the motion wide use for assessing the fitness level of American Youth (Hunsicker, 1958). Subsequently extensive data were collected and the national norms were revised (AAHPER, 1965). The following table represents the test items of presently used AAHPER youth fitness test battery which was taken to test Motor Fitness Variables of the players. Pre-test and Post test data was collected for statistical analysis in this study.

Methodology

To achieve the purpose of the study, thirty handball players were selected as subjects from Chennai district, Tamilnadu. Their age ranged between 16 to 18 years and were divided into two equal groups of fifteen subjects each as experimental group and control group. The experimental group underwent circuit training with medicine ball exercises over a period of six weeks where as control group did not participate in any of the training except their regular play. The selected AAHPER test such as pull ups and shuttle run abilities were assessed. The collected data were statistically analyzed for significant difference, if any, by applying analysis of t - ratio. In all cases 0.05 level was fixed as confidence interval to test the significance.

Table -I
Difference of Pre-Test And Post-Test Mean and 'T' Ratio Of Pull-Up Test

Group	Pre-test mean	Post-test mean	Mean difference	Std deviation	't' Ratio
Circuit training	10.06	11.00	0.91	0.393	-16.430
Control group	10.03	9.40	-0.63	0.800	5.640

Table value t of 1.98 (2.57) Degree of freedom at level 0.05

Table-1 indicates that in Circuit Training Group, Pre Test Mean was found 10.06 and Post Test Mean was found 11.00.While mean difference was -0.91 and Standard Deviation was 0.393. Calculated "t" ratio of Circuit Training Group was-16.430, which was significant when compared with table value "t" 2.57. Control Group Pre Test Mean was found 10.03 and Post Test Mean was 9.40. While mean difference was --0.63 and Standard Deviation was 0.800. Calculated "t" ratio was5.640 which was significant when compared with table value T 2.57. From above table it was discovered that Pre Test and Post Test of the Circuit Training Group was found significant in comparison to Pre Test and Post Test of Control Group.

Table -II
Difference of Pre-Test and Post-Test Mean and 't' Ratio of Shuttle Run test

Group	Pre-test mean	Post-test mean	Mean difference	Std deviation	't' Ratio
Circuit training	12.36	12.64	-0.27	0.173	-11.837
Control group	11.30	11.36	-0.05	0. 216	-2.054

Table Value t of 1.98 (2.57) Degree of freedom at level 0.05

Table-2 indicates that in Circuit Training Group, Pre Test Mean was found 12.36 and Post Test Mean was found 12.64 While mean difference was -0.27 and Standard Deviation was 0.173. Calculated "t" ratio of Circuit Training Group was -11.837, which was significant when compared with table value t 2.57 Control Group Pre Test Mean was found 11.30 and Post Test Mean was 11.36. While mean difference was -0.05 and Standard Deviation was 0.216. Calculated "t" ratio was-2.054 which was found not significant when compared with table value "t" 2.57.From above table it was discovered that Pre Test and Post Test of the Circuit Training Group was found significant in comparison to Pre Test and Post Test of Control Group.

Conclusion

The results proved that the effect of Circuit training with medicine ball will improve significantly the handball players ability such as Pull-ups and shuttle run effectively.

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JOURNAL OF PHYSICAL EDUCATION SPORTS AND ALLIED DISCIPLINES

JPESAD

Vol. 6, 7&8 No. 2, 1&2 July 2015 – July 2017 (5 Issues Combined) ISSN: 0974-343X



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Relationship of Selected Speed and Strength Variables of Indian Male Long Jumpers in Relation to Performance

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Abstract

The purpose of the study was to see certain speed and strength variables of long jumpers in relation to performance level. Thirty two male long jumpers of different level were taken as subjects for study. 10m fly run, 5 hops from six strides Run up, standing broad jump, 12 stride long jumps and full approach jump performance was recorded to study the full approach long jump performance in relation to speed and strength level of jumpers. The results indicate that 10 meter acceleration phase has Non significant relationship with long jump performance at the value of 0.162. Whereas standing broad jump with the value of 0.673, 5 hops from six strides Run up at the value of 0.624, standing broad jump, 12 stride long jump at the value of 0.786, show high correlation between strength and long jump performance at p<.001

Keywords: Speed, Strength, Performance.

Introduction

The long jump is an event of different styles. Among jumping events the long jump seems to be easy, but it is in fact a combination of different athletic skills. Quickness, speed and strength, flexibility, rhythm are the basic requirement for a good jumper. Long jumping begins with sprinting to the take-off point and finishes with high degree of flexibility and balance for an effective landing in to the pit.

According to **Jarver (1972)** long jump starts with a run -up aiming to accumulate maximum horizontal speed. The jumper attempts to approach the take-off board with extreme accuracy before becoming air borne with a minimum loss of momentum. **Bosen (1972)** reported that this event requires a run up of sufficient length to develop maximum controllable speed combined with effective sprinting at the take off. **Fred (1972)** stated that approach speed in the long jumping is important but he is also stated that the 100M sprint time is not

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comparable with the result of long jumping because the long jumper speed requirement is decisive at a distance between 40M to 50M. Further he noted that higher the speed of approach run which jumper can maintain at the takeoff without a loss in the momentum, the better will be the resultant conversion of the approach speed at the take off. **Doherty (1984)** is of the belief that the practice organization for long jump should consider at least five factors i.e speed, power, skill, tendon, and tissue toughness and speed endurance. **Pfaff (1996)** pointed out that the tests for elastic strength such as timed hopping over the barriers and alternate bounding provide valid prediction.

Methodology

The main objective of the present study was to determine the relationship of speed and strength variables with Long jump performance. The study was conducted on 32 male log jumpers of National level. The age, height and weight of the subjects were recorded. After that the following fitness test were conducted on the jumpers for the assessment of their fitness level:

Speed

1. 10m flying run(seconds)
2. Last 10m in full approach(seconds)

Explosive Strength

1. Half Squad(kg)-Explosive strength

Explosive Strength

1. Standing broad jump(meters)
2. 5 Hops from 6 strides(meters)
3. Long jump from 12 strides(meters)

Sprint Endurance

1. 150m sprint (seconds)-sprint endurance

The data was analyzed by statistical package SPSS (version 19) for the calculation of Mean, SD. Multi Co-relation was applied to find out statistical relationships between the performance and fitness variables.

Results and Discussion

Table-I

Mean and SD Values of Physical Parameters of the Long Jumpers

Sl No	Parameter	Mean	SD
1	Age (Years)	22.53	±3.068
2	Height (Cm)	175.59	±6.690
3	Weight (Kg)	69	±7.878

Table-II

Mean and SD Values of Fitness Parameters of the Long Jumpers

Sl No	Parameter	Test	Mean	SD
1	Speed	10m flying run	1.0235	±0.09
		Last 10m in full approach (seconds)	1.0885	±0.12
2	Explosive Strength	Half Squad (kg)	211.5	±52.2
		Standing broad jump	3.124	±0.165
		5 Hops from 6 strides	19.1215	±2.268
			2.268471	
		Long jump from 12 strides	6.8875	±0.540
3	Sprint Endurance	150m sprint	16.6125	±0.716
4	Performance Variable	Long Jump	4.8575	±0.44

Table-III

Multi Co-Relations between Fitness and Performance Variable

	10m fly	Last 10m	150m	SBJ	5 hops from 6 strides	Jump from 12 strides	Jump from 16 strides	Maximum Half squat
	1							
10m fly	.923**	1						
Last 10 m	.695**	.748**	1					
150m	-.801**	-.837**	-.638**	1				
Sbj	-.419	-.532*	-.707**	.460*	1			
Jump from 12 strides	-.872**	-.913**	-.743**	.807**	.501*	1		
Jump from 12 strides	-.725**	-.832**	-.603**	.868**	.344	.743**	1	
Jump from 16 strides	.342	.446*	.110	-.286	-.039	-.365	-.349	1
Max Half squat	.139	.048	.643	.221	.871	.113	.131	

The 'r' values between long jump performance and selected speed and trength parameters are presented in table 3.

'erformance and 10m fly

'r' value presented in table shows a non-significant negative co relation etween 10 m fly and long jump performance with a value of 0.162.

erformance and Last 10m speed of approach run

The "r" value of last 10m approach run with long jump perfomance 0.805p<0.01) shows statistically significant correlation. It shows that nprovement in last 10 m approach run timing leads to improvement in long mp performance. Similar results were reorted by Siris (1983), Lohmn and voss, 987), Bauersfeld et al .(1992). Muraki (1979).

erformance and 150m sprint

It is evident from the achieved 'r' value that 150m sprint time shows a gnificant correlation with long jump performance (-0.681). As per the norms

published by Bossy (1982) we found that Indian long jumpers have poor speed over 150m distance in comparison to international long jumper.

Performance and Standing broad jump

The correlation of standing broad jump with long jump performance shows highly significant value of 0.673 at $p<0.01$ level. Henson (1983), Siris et al (1983), Czingon (1990), Jonathon et al (1990), observed that standing broad jump test for leg power have influence on long jump performance.

Performance and 5 Hops from 6 strides

The found 'r' value (0.624) of 5 Hops from 6 strides is significantly higher than the table value. Henson (1983), Siris et al (1983), Tschiene (1980), Czingon (1990), Jonathon et al (1990), observed that 5 hops from 6 strides test performance have positive impact on long jump performance. Johnson (1980) concluded hoping and bounding as most advantageous for long jumpers and multiple jump can be used to improve jumping force.

Performance and jump from 12 strides

The results presented in the table 2 shows highly significant relationship with long jump performance and the achieved 'r' value is 0.786 at $p<0.01$ level. Doherty (1971) pointed out that the distance covered by jumper is strongly influenced by momentum gain through run up and it is converted in to forward –upward force by applying it on the take-off board.

Performance and Maximum Half Squat

The long jump performance correlation with half squad is found to be highly significant at 0.628 $p<0.01$ level. The achieved Half squat mean value were found to be higher in comparison to international norm prepared by Bossy (1982). On the basis of results presented in table 3 can conclude that the performance in long jump is determined by leg strength ability and speed endurance and acceleration over short distance does not show relationship with competition performance

Conclusion

The result of the study shows that:

1. The standing broad jump has significant correlation with Long jump performance.

2. Jump from 12 strides shows highly significant correlation with long jump performance.
3. Maximum half squat show significant correlation to the long jump performance.
4. Result proves that speed and strength are important parameters for long jump performance.
5. 10m fly and 150m has not significant correlation with long jump performance.

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JPESAD

Vol. 6, 7&8 No. 2, 1&2 July 2015 – July 2017 (5 Issues Combined) ISSN: 0974-343X



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Effect Of Small Sided Games Training On Explosive Power And Flexibility Among State Level Men Football Players

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Abstract

The purpose of this study was to determine the Effect of Small Sided Games Training on explosive power and flexibility among State Level Men Football Players. The research was conducted on a sample of 30 State Level Men Football players and their age ranged between 18 and 25 years. They were randomly divided into two groups: those undertaking Small Sided Games training (n=15) and a control group (n=15). The subjects took part in Small Sided Games training for five days a week for six weeks. The subjects' explosive power and flexibility were assessed before and after the completion of the Small Sided Games training. The result shows that after the six weeks of the Small Sided Games training proved significant variation were found in the subjects' explosive power and flexibility in the experimental group. The Small Sided Games training proved to be a useful training modality for football players and in terms of explosive power and flexibility.

Keywords: Explosive power, Flexibility and Small sided games.

Introduction

Small-sided games (SSGs) are played on reduced pitch areas, often using modified rules and involving a smaller number of players than traditional football. Small-sided games are very popular not only in adult soccer players but also in young players and their use begins from an early age. Due to the smaller pitch and the less number of participants during small-sided games, each player comes into contact with the ball and deals with common game situations more often (Capranica et al., 2001).

The level of intensity in small-sided games can be varied by changing a number of factors, such as playing with or without a ball or goalkeeper, pitch size, type of opposition, use of support players, length of game, number of ball touches, availability of balls, length of training and breaks, use of small or large goals or restriction to specific zones. As a rule, the level of intensity increases if the pitch size reduces or if there are no goalkeepers, more players are introduced, play is restricted to zones, or where there are multiple balls, the goals are small

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The physical qualities that are specific to footballers are strength, speed, endurance, agility and flexibility, qualities that ensure brief, intense and repeated exertions throughout the match and allow players to express themselves in every game situation. Explosive power is the ability to exert a maximal force in as short a time as possible, as in accelerating, jumping and throwing implements (Peter and Carl, 2006). A person's flexibility refers to the ability of his joints to move through a full range of motion (Paige, 2008).

Markovic, et al. (2007) support for the use of sprint training as an applicable training method of improving explosive performance of athletes in general. Ali Mohammad Safania, RostamAlizadeh and Maryam Nourshahi, (2011) recommended to employ specific training in preparatory programs (especially, during in-season), because such training, in a similar amount of time improve the same physical fitness factors of amateur soccer players and they are applicable in soccer players. Juarez, et al., (2011) suggesting that the jumping and kicking performances of top-class young soccer players were significantly affected after 20 minutes treadmill running at 80% of their individual maximum heart rate. Hoff (2005) suggested Strength training to produce neural adaptations has been effective in changing not only strength in terms of "one-repetition maximum", but also sprinting velocity and jumping height, in elite soccer players without any change in body mass. Perez-Gomez, et. al (2008) concluded that 6 weeks of strength training combining weight lifting and polymeric exercises results in significant improvement of kicking performance as well as strength, power and flexibility related to success in football.

The present study conducted to reveal the influence of small sided games training programme explosive power and flexibility which are contributed to the increase the performance of football players. The present, training sessions are focused on enhancing physical fitness variables namely explosive power and flexibility through small sided games training.

Methodology

The purpose of the study was to determine the effect of small sided games training on explosive power and flexibility among state level men football players. In the present study 30 men student were selected by random sample from Chennai. The subject chosen for this study were divided randomly into two equal groups called one control and one experimental groups consisting of 15 players in each group. Their age ranged from 18 to 25 years. The investigator explained to them the purpose, importance of the experiment and the procedure to be employed and the testing procedure was also explained to them in detail.

Six weeks of small sided games training were given to the experimental groups. The control group was allowed to do their regular work. The experimental groups underwent the training programme as per the training schedule prepared by the investigator. The training programme was held five days in a week for 6 weeks. The tests selected for the study were standardized tests and most suitable for the present study. The investigator was present with subjects of the control group and the experimental groups during the experimentation of the pre test and the post test. The data collected were statically examined for significant differences, if any by applying analysis of covariance (ANCOVA). In all the cases, 0.05 level of confidence was used to test the significance, which was considered as appropriate.

Results

Table - I

Results of Ancova Between Small Sided Games Training and Control Groups on Explosive Power and Flexibility

Variables	Test	Control Group	Small Sided Game Group	SV	SS	df	MS	F
Explosive Power	Pre test	53.73	54.47	between	56.03	1	56.033	1.27
				within	1232.67	28	44.02	
	Post test	55.20	61.73	between	320.13	1	320.13	7.52*
				within	1191.33	28	42.55	
	Adjusted	56.47	60.46	between	114.00	1	114.00	25.45*
				within	120.94	27	4.48	
	Mean gain	-1.47	-5.27					
Flexibility	Pre test	20.93	21.67	between	4.03	1	4.033	1.37
				within	82.27	28	2.94	
	Post test	21.60	26.47	between	177.63	1	177.63	62.69
				within	79.33	28	2.83	
	Adjusted	21.86	26.20	between	134.75	1	134.75	98.02
				within	37.12	27	1.37	
	Mean gain	-0.67	-4.80					

The table values required for significance at .05 level of confidence for degree of freedom 1 and 28 and 1 and 27 are 4.20 and 4.21 respectively

In table I, the results of the ANCOVA for explosive power and flexibility are presented. In analysis of covariance, the final means are adjusted for differences in the initial means and the post test means of small sided games group and control group on explosive power and flexibility are tested for significance. From

re given to the experimental groups. gular work. The experimental groups ne training schedule prepared by the neld five days in a week for 6 weeks. dardized tests and most suitable for present with subjects of the control g the experimentation of the pre test re statically examined for significant ovariance (ANCOVA). In all the cases, he significance, which was considered

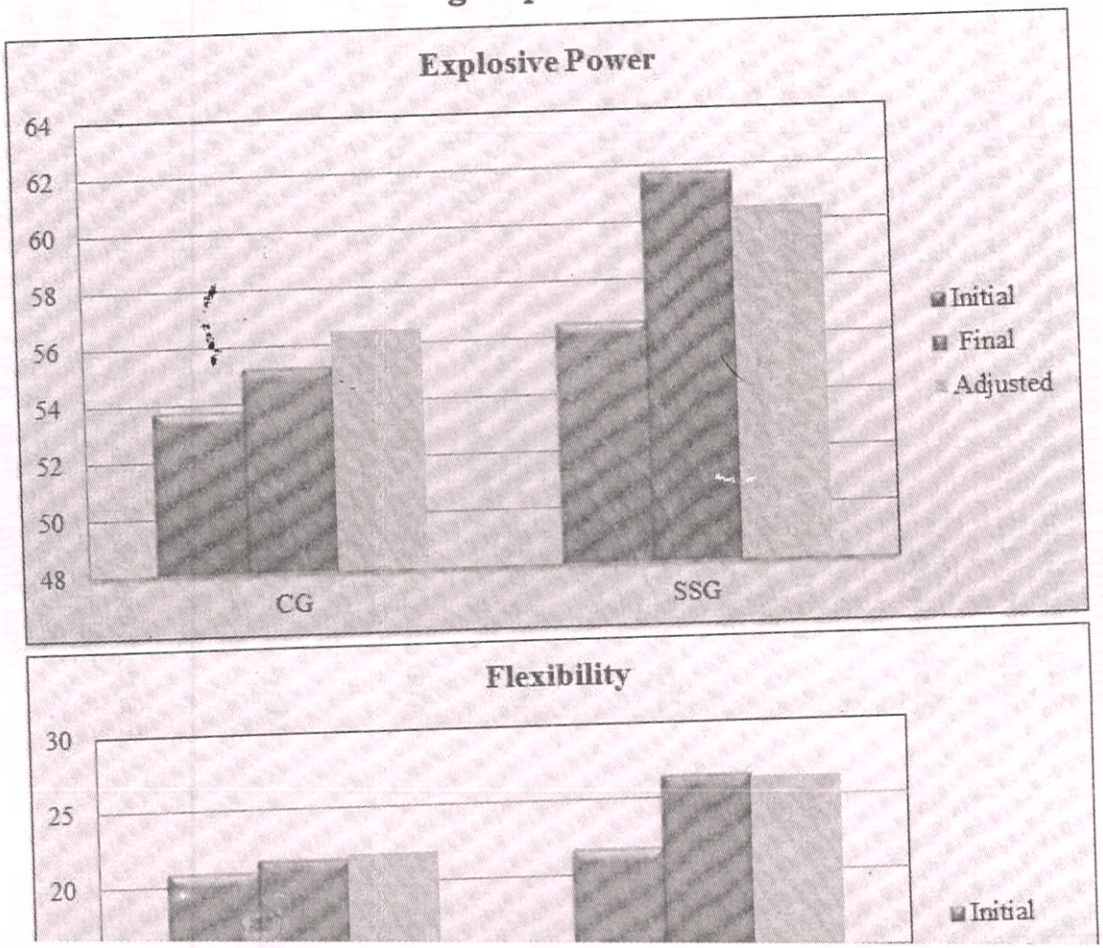
ed Games Training and r and Flexibility

SS	df	MS	F
.03	1	56.033	1.27
2.67	28	44.02	
.13	1	320.13	7.52*
33	28	42.55	
	1	114.00	25.45*
	27	4.48	
	1	4.033	1.37
		2.94	
		177.63	62.69
		2.83	
		134.75	

the table it can be seen that the calculated F value of 7.52 for explosive power and 62.69 for flexibility between groups is greater than the table value 4.21 indicating that it is significant for the degrees of freedom (1, 28) at 0.05 levels. The calculated F value indicated that there are significant differences in speed and agility between the groups because of the training effect of small sided games training.

Figure - 1

Bar diagram showing the Initial and Final Adjusted Mean Values of Explosive Power and Flexibility between Control and Small sided games groups



Conclusions

There was a significant difference existed between small sided games group and control group due to six weeks of experimental training on Explosive power and flexibility. Among the two groups, small sided games group significantly improved the Explosive power and flexibility than that of Control group.

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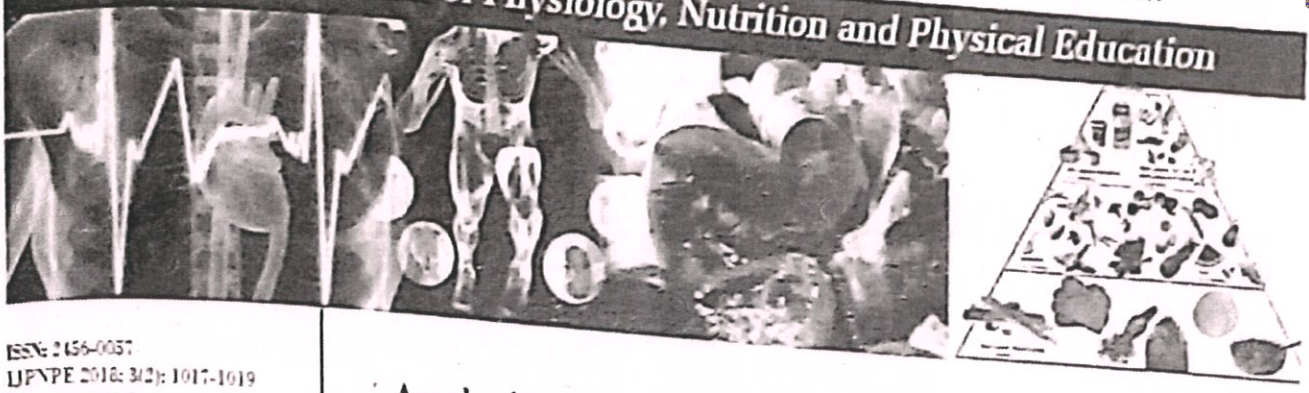
International Journal of Physiology, Nutrition and Physical Education



ISSN: 2456-0057
IJPNPE 2018; 3(2): 1017-1019
© 2018 IJPNPE
www.journalofsports.com
Received: 07-05-2018
Accepted: 09-06-2018

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Analysis of anthropometric peculiarities among fast and spin bowlers in the cricket academy of Tamil Nadu cricket association

K Govindasamy, P Thangamuthu, Dr. J Anitha, Dr. C Lakshmanan and M Marithangam

Abstract
The purpose of the study was to find [illegible] bowlers in the academies of Tamil Nadu [illegible] YMCA cricket academy players were [illegible] age group of 16 to 23 years. [illegible] subjects each. The groups were [illegible] manner. All the thirty subjects were [illegible] arm girth relaxed, arm girth flexed, waist girth and calf girth. [illegible] for selected variable was tested by independent [illegible] The level of significance was fixed at 0.05. Analysis of data revealed that [illegible] bowler group and fast bowler group for arm girth [illegible] not significant. The data does indicated that the [illegible] group for anthropometric variables height, weight and waist girth are significant.

Keywords: Anthropometric, girth measurement, spin bowler, fast bowler, cricket players

Introduction
Cricket is one of the best and favorite games for everyone, from children to their grandparents. It has been the most entertaining game since long years back. Cricket can be played both socially and competitively, by males and females of all ages. While competitive Cricket is mostly played on a pitch on an oval field, Cricket just for fun can be played in backyards, parks, streets or on the beach. For millions of cricket fans it's their world, their home.

Fast Bowlers Characteristics
The common principles for good bowling are correct grip, smooth and economical run-up, well balanced delivery action making full use of height and body, fluent follow through action. The importance of bowling reflects on the results. The team that is not good in bowling will have a lesser chance of winning the match. The following are different types of bowling namely inswing, outswing, in cutter.

Fast bowlers, some times known as pace bowlers, is one of the two main approaches to bowlers in bowling the sport of cricket. Practitioners are usually known as fast bowlers fast men, pace bowlers, although some times the label refers to the specific fast bowling technique the bowler prefers, such as swing bowlers or seam bowler.

Fast bowling success is greatly influenced by the way the ball is delivered. Perhaps the main objective of the teacher or cricket coach should be to develop a 'good technique' in young fast bowlers. Thus, a thorough understanding of all the components of 'good technique' in the bowling action is necessary. Then, the underlining personal characteristics and flair of the young bowler, together with the proper mechanics of fast bowling, can be integrated to develop techniques which suit that particular individual. In this chapter, the bowling action is divided into a number of different sections to dissect the mechanical features of fast bowling.

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Spin Bowlers Characteristics

Leg cutter, off spin, leg spin, googly, top spin, reverse swing, slower and chinaman The main aim of spin bowling is to bowl the cricket ball with rapid rotation so that when it bounces on the pitch it will deviate from its normal straight path, thus making it difficult for the batsman to hit the ball cleanly. The speed the ball travels is not critical, and is significantly slower than that for fast bowling A typical spin delivery has a speed in the range 70-90 km/h (45-55 mph).

Spin bowling is divided into four different categories, depending on the particular physical technique used. There is virtually no overlap between the two basic biomechanical techniques of wrist spin and finger spin. Off break –Right-handed with finger spin technique. Left arm orthodox spin – Left-handed with finger spin technique. Leg break – Right-handed with wrist spin technique. Left-arm unorthodox spin – Left-handed with wrist spin technique Depending on technique, a spin bowler uses either predominant wrist or finger motion to impart spin to the ball around a horizontal axis that is at an oblique angle to the length of the pitch. This sort of spin means it is also possible for the Magnus effect to cause the ball to deviate sideways through the air, before it bounces. Such deviation is called drift. The combination of drift and spin can make the ball's trajectory complex, with a change of direction at the bounce. This variety of trajectories achievable by a spin bowler can bewilder inexperienced or poor batsmen.

Spin bowlers are generally given the task of bowling with an old, worn cricket ball. A new cricket ball better suits the techniques of fast bowling than spin bowling, while a worn one grips the pitch better and achieves greater spin. Spin bowlers are also more effective later in a game, as the pitch dries up and begins to crack and crumble. This again provides more purchase for the spinning ball and produces greater deviation.

Materials and methods

To achieve the purpose of the study fifteen fast bowlers and fifteen spin bowlers will be selected from YMCA cricket academy, Chennai weekly two days Saturday and Sunday The age of the subjects ranged from 18 to 23 years Anthropometric measurements (level 1) suggested by International society of the Advancement of Kinanthropometry (ISAK) were selected as variables.

Table 1: Selection of Variables and Selection of Test Items

Variables	Test		Unit Of Measurement
Anthropometric measurement	1	Weight	Kilogram
	2	Height	Centimeter
	3	Arm girth	Centimeter
	4	relaxed	Centimeter
	5	Arm girth	Centimeter
	6	flexed	Centimeter
	7	Waist girth	
	8	Calf girth	

Statistical analysis

Independent t-test data was used to assess the between group differences. The level of $p \leq 0.05$ was considered significant.

Table 2: Significance of Difference between Mean Scores and Standard Deviations and Obtained 'T' Value of Fast And Spin Bowlers on Their Anthropometric VARIABLE Weight Presented In Table

Group	Mean	SD	Mean Difference	t-Value
Spin Bowler	62.06	±6.58	6.33	3.201*
Fast Bowler	55.73	±3.95		

Significant at 0.05 level (28 degrees of freedom 2.048)

It is observed from the table-2 that mean value of spin bowler group and fast bowler group for weight was 62.06 and 55.73 respectively, whereas the standard deviation (SD) was ±6.58 and ±3.95. The critical value of 't' at 95% probability level is higher (6.33) than observed value of 't' (3.201). The data does indicated that the difference between spin bowler group and fast bowler group for weight are significant.

Table 3: Significance of Difference between Mean Scores and Standard Deviations and Obtained 'T' Value of Fast And Spin Bowlers on Their Anthropometric Variable Height Presented In Table

Group	Mean	SD	Mean Difference	t-Value
Spin Bowler	1.566	±2.58	6.93	6.338
Fast Bowler	1.635	±3.35		

Significant at 0.05 level (28 degrees of freedom 2.048)

It is observed from the table-3 that mean value of spin bowler group and fast bowler group for height was 1.566 and 1.635 respectively, whereas the standard deviation (SD) was ±2.58 and ±3.35. The critical value of 't' at 95% probability level is higher (6.93) than observed value of 't' (6 338). The data does indicated that the difference between spin bowler group and fast bowler group for height are significant.

Table 4: Significance of Difference between Mean Scores and Standard Deviations and Obtained 'T' Value of Fast And Spin Bowlers on Their Anthropometric Variable Arm Girth Relax Presented In Table

Group	Mean	SD	Mean Difference	t-Value
Spin Bowler	27.16	±2.13	0.39	0.523
Fast Bowler	27.56	±1.97		

Significant at 0.05 level (28 degrees of freedom 2.048)

It is observed from the table-4 that mean value of spin bowler group and fast bowler group for arm girth relax was 27.16 and 27.56 respectively, whereas the standard deviation (SD) was ±2.13 and ±1.97. The critical value of 't' at 95% probability level is higher (0.39) than observed value of 't' (0.523). The data does indicated that the difference between spin bowler group and fast bowler group for arm girth relax not significant.

Table 5: Significance of Difference between Mean Scores and Standard Deviations and Obtained 'T' Value of Fast and Spin Bowlers on Their Anthropometric Variable Arm Girth Flexed Presented In Table

Group	Mean	SD	Mean Difference	t-Value
Spin Bowler	29.05	±2.34	0.42	0.552
Fast Bowler	29.47	±1.77		

Significant at 0.05 level (28 degrees of freedom 2.048)

It is observed from the table-5 that mean value of spin bowler group and fast bowler group for arm girth flexed was 29.05 and 29.47 respectively, whereas the standard deviation (SD)

was ±2.34 and ±1.77. The critical value of 't' at 95% probability level is higher (0.42) than observed value of 't' (0.552). The data does indicated that the difference between spin bowler group and fast bowler group for arm girth flexed not significant.

Table 6: Significance of Difference between Mean Scores and Standard Deviations and Obtained 'T' Value of Fast And Spin Bowlers on Their Anthropometric Variable Waist Girth Presented In Table

Group	Mean	SD	Mean Difference	t-Value
Spin Bowler	74.62	±4.15	5.03	2.780*
Fast Bowler	79.65	±5.65		

Significant at 0.05 level (28 degrees of freedom 2.048)

It is observed from the table-6 that mean value of spin bowler group and fast bowler group for waist girth was 74 62 and 79.65 respectively, whereas the standard deviation (SD) was ±4.15 and ±5.65. The critical value of 't' at 95% probability level is higher (5.03) than observed value of 't' (2.780*). The data does indicated that the difference between spin bowler group and fast bowler group for waist girth not significant.

Table 7: Significance of Difference between Mean Scores and Standard Deviations and Obtained 'T' Value of Fast And Spin Bowlers on Their Anthropometric Variable Calf Girth Presented In Table

Group	Mean	SD	Mean Difference	t-Value
Spin Bowler	35.28	±2.10	0.28	0.405
Fast Bowler	35.56	±1.55		

Significant at 0.05 level (28 degrees of freedom 2.048)

It is observed from the table-7 that mean value of spin bowler group and fast bowler group for calf girth was 35.28 and 35.56 respectively, whereas the standard deviation (SD) was ±2.10 and ±1.55. The critical value of 't' at 95% probability level is higher (0.28) than observed value of 't' (0.405). The data does indicated that the difference between spin bowler group and fast bowler group for calf girth not significant.

Conclusion

1. It was observed from the anthropometric variables finding that there was no significant different between the spin bowlers and fast bowlers on arm girth flexed, arm girth relaxed and calf girth.
2. It was observed from the anthropometric variable finding that, there was a significant different between spin bowlers and fast bowlers on height, weight and waist girth.

Recommendations

In this course of study the investigator faced several problems and therefore the following recommendations are made for further investigation.

1. Anthropometric measurements provide an important role in identification of sports talents.
2. Anthropometric peculiarities can be recommended for other sports and games.
3. Research may be conducted to see weather the longer periods of analysis was more effect.
4. This study may be conducted on subjects of different age groups, sex and different sports and games.

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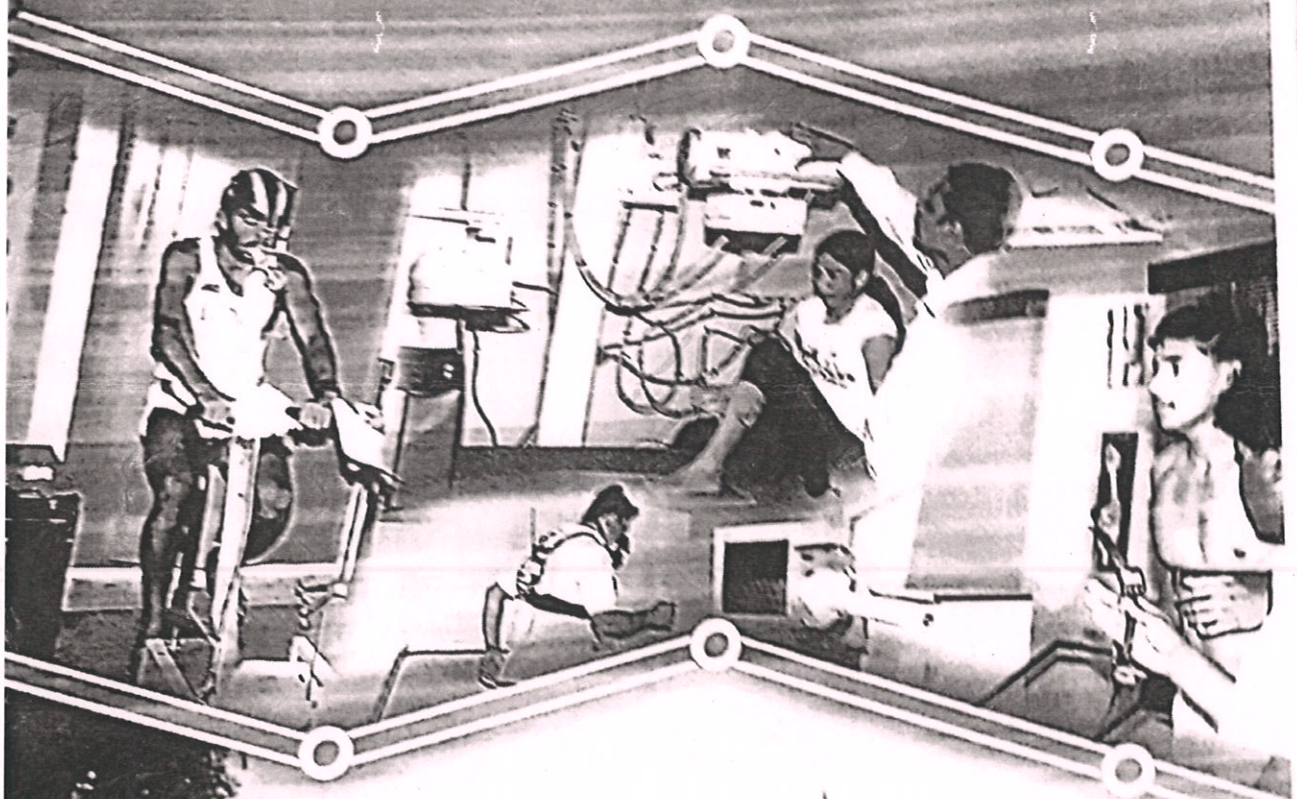
2017-18

Sports Research

quarterly

Vol. 7 No.3

July 2017





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Corrigendum
The Volume number of this issue is No. 6 in stead of No. 7, Error is Regretted.

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Effect of Pranayama on Selected Cardio Respiratory Parameters among Inter Collegiate Athletes

Dr. V. Gopinathan[1]

ABSTRACT

The purpose of the present study was to find out the effect of Pranayama practices on selected Cardio Respiratory parameters among Inter Collegiate Athletes. For this purpose, 30 Inter Collegiate athletes were selected as subjects from the College and they were divided randomly in to two equal groups with 15 each as experimental and control group. Both the group undergone usual athletic training in the evening two hours and in addition experimental group undergone pranayama practices daily morning 60 minutes and the control group not given pranayama practice. The training period for this study was 6 weeks in a schedule of 5 days in a week. The pre and post test were conducted prior and after the training programme on the selected cardio respiratory parameters of resting heart rate, breath holding time and respiratory rate. The collected data's were statistically analyzed by using ANCOVA to find out the significant difference between the groups, if any. The significant level was fixed at 0.05 levels. It was concluded from the result of the study that the experimental group done the pranayama practices had significant impact on the selected Cardio Respiratory parameters of resting heart rate, breath holding time and respiratory rate among inter collegiate athletes. Further the mean value indicated that the experimental group considerably reduced the resting heart rate and respiratory rate and increased the breath holding time than control group.

KEYWORDS

Pranayama, Resting Heart Rate, Breath Holding Time and Respiratory Rate

INTRODUCTION

Pranayama is the practice of breath control. The word prana refers not only to breath, but also to air and life itself.
Christy Turlington

Pranayama is an ancient Yoga technique, which makes use of voluntary regulation of breathing and calms the mind. It differs from other forms of exercises as it mainly focuses on the sensations in the body. Pranayama thus acts directly on the various functions of the body and affords benefits in a positive way. Regular, slow and forceful inspiration and expiration for a longer duration during the Pranayama practice, leading to strengthening of the respiratory muscles. It impact on the efficiency of

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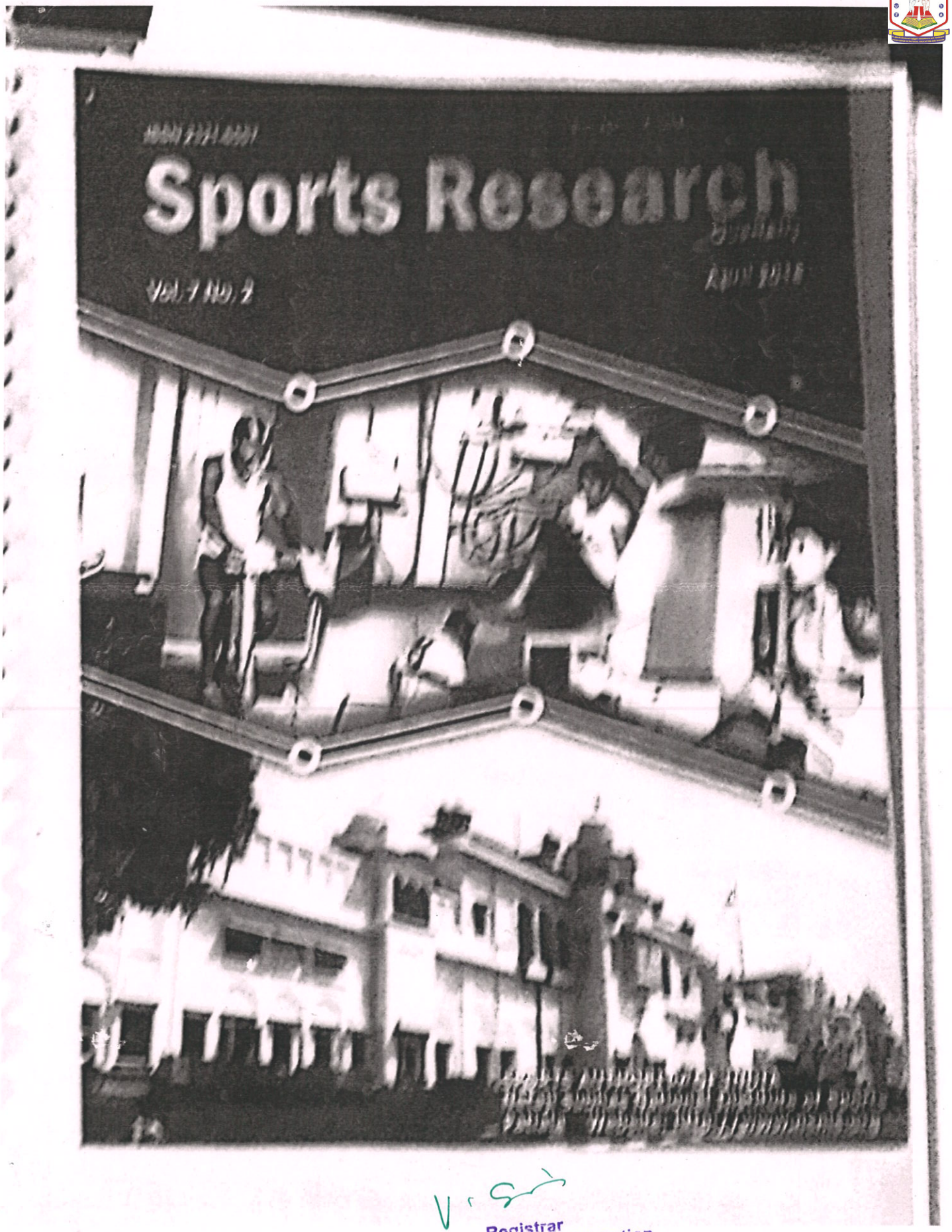

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Effect of Psychological Skills Training on Mental Toughness and Mental Health among Athletes

Dr. P. Gopinathan*

STRACT

The purpose of the present study was to find out the effect of psychological skills training on mental toughness and mental health among athletes. For achieving the purposes of the study, total of 30 subjects were selected as samples from the college; those who participated inter collegiate athletics competitions. Their age group between 18 to 25 years and the selected subjects were divided into two groups equally, with 15 each as control and experimental group. All the selected subjects were under graduate men students studying various courses in arts and science college and they used to take training in an athletics academy. In addition to the athletic training the experimental group underwent psychological skills training for eight weeks, in a schedule of weekly three days, with one hour session each. Analysis of covariance (ANCOVA) was used as a statistical tool. The statistical findings of the study revealed that the experimental group that had done the psychological skills training significantly improved the mental toughness and mental health qualities of athletes.

Keys words: *Mental Toughness, Mental Health, Psychological Skills Training*

TRODUCTION

Psychological skills training (PST) an important training as like physical aining to enhance psychological alities. Research has proved that PST n contribute 50-90% of athletics rformance. PST methods include al-setting, self-talk, imagery, mental hearsal, and relaxation.

'Psychological skills training (PST) fers to the systematic and consistent actice of mental or psychological ills for the purpose of enhancing rformance, increasing enjoyment, or hieving greater sport and physical tivity self-satisfaction' (Weinberg & ould, 2007). Psychological skills are learned and developed through using PST methods (Weinberg & Gould, 1999).

PST is as important to the athlete as physical training; and in most sports, success comes from utilizing and maximizing a combination of technical, tactical, physical, and psychological abilities (Orlick, 2000). Mental toughness is having the psychological edge that allows one to perform at peak maximum effort and efficiency during the demands that are placed on them during training, practice, or competition. Specifically, when the demands are greatest or the conditions become adverse. Mentally tough

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2016 - 2017 - 2018

JOURNAL OF PHYSICAL EDUCATION SPORTS AND ALLIED DISCIPLINES

Vol. 6, 7&8 No. 2, 1&2 July 2016 – July 2017 (5 Issues Combined) ISSN: 0974-343X



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Comparative Analysis of Self Confidence and Self-esteem between Inter Collegiate and Inter University Athletes

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Abstract

The purpose of the present study was to compare self-confidence and self-esteem between Inter Collegiate and Inter University Athletes. For achieving the result of the study one hundred athletes were selected in the ratio of fifty each inter collegiate and inter university level athletes. All the selected athletes had participated in inter collegiate and inter university level athletic competitions. Self-confidence was assessed by using Agni Hotri Rekha's Self confidence scale and self esteem was assessed by using Rosenberg's (1965) Self Esteem Scale. Both the questionnaires are standardized. The collected data were statistically analyzed by using t-test. The result of the study showed that the inter university athletes had higher level of self-confidence and self esteem as compared to inter collegiate athletes. Further it stated that there was a significant difference in self-confidence and self esteem among inter collegiate and inter university athletes.

Keywords: self-confidence, self-esteem, inter-collegiate, inter-university

Introduction

Sports psychology is an emerging field within the world of psychology and athletes concentrates on preparing the mind as thoroughly as the body. It is with the ultimate aim to achieve excellence in sports. Self-confidence is a term that is used to describe how secure a person is in his decisions, actions and abilities. It describes the amount of faith a person has in him. Self-confidence reflects how a person views himself. A person's level of confidence is often apparent in every aspect of his being. Confidence shows in a person's speech, body language and mannerisms. Self-confidence is an attitude that is characterized by a positive belief that one can take control of one's life and of one's plans. People who are self-confident are those who acknowledge their capacity to do something and then proceed to do these things. Self-awareness is the key to self-confidence. Self-esteem is a judgment of self-worth" (Bandura, 2006).

Genuine self-confidence is the forerunner of achievements. Self-confidence integrates the powers of mind and body and focuses them towards the goal. A

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Asian Journal of Multidisciplinary Research (AJMR) 2017

E-ISSN: 2395-1710 P-ISSN: 2395-1729
Volume 03- Issue 03-, pp-15-24

Research Paper Open Access

EFFECT OF ISOLATED AND COMBIND STRENGTH TRAINING ENDURANCE TRAINING ON SELECTED BODY WEIGHT AND BODY FAT AMONG WOMEN

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Abstract: *Aim*: The objective of the present study is to identify the effects of ISOLATED AND Combined Strength Training performances on Strength endurance and endurance among college level women. *Methodology*: Twelve weeks of Isolated Training was studied with constant-speed procedure and constant-time procedure. Twelve weeks of Combined Strength Training was studied Strength endurance and endurance. ANCOVA statistical analyses have been used to analyses the performance and outcome of the college level women and Scheffe's post hoc test was used to find out the mean difference of confidence Isolated Training and Combined Strength Training Strength endurance on selected body weight and body fat among college level Women. *Result*: The submaximal-performance effects on Strength F-ratio at 0.05 level of confidence (df)=3.56, (df)=2.70. Significant is better than control group. These effects have been compared for endurance women F-ratio at 0.05 level of confidence for (df)=3.56, (df)=2.70. Significant is better than control group.

Keywords: Strength endurance, endurance, Isolated and Combined Strength Training.

1.0. Introduction

The present study sought to evaluate the inconsistencies previously observed regarding the pre dominance of Isolated and Combined Strength Training for improving fitness. The experimental design initially equated and subsequently maintained the same relative exercise intensity by both groups throughout the programs. Thirty subjects were equally divided into isolatedtraining (isolated training, exercise at 50% to 60% maximal work) or Combined Strength training (30 subject as working group and control group respectively at 100% maximal work) training groups that performed 30 min per day for 3 days in all 12 weeks. Following continuous training and Combined Strength training, exercising work rates were parallel examined both the Combined Strength isolated training. Three equated groups were performed to measure the performance of body weight and body fat;

one group act as control group and another two group act as experimental group. I Combined Strength training and isolated training regimens are used to improved physical fitness. There is conflicting evidence as to which the more effective in improving biochemical, physiological, and performance measures (Cunninghametal. 1979). The purpose of this study were to

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compare the effects of using the same relative work intensities in the two training modes and examine their effect in isolated training and Combined Strength training tests.

2.0. Methodology

2.1. Sample selection

Simple random procedure was used to select the subjects for the present study. To delimit the present study only women of Kerala were selected. Totally, 90 members have been taken as sample size. The sample size was divided into three groups namely: isolated training group, Combined Strength training group and control group.

2.2. Collection of data

A selected package of isolated training and Combined Strength were administered to collect the data. 12 weeks was administered to all three groups. The performance of all groups was administered for only 30 min per day especially for continuously 3 days in all 12 weeks.

2.3 Analysis

ANCOVA and Scheffe's post hoc test were used for the study. The mean, sum of squares, mean square and f-ratio are identified by using the SPSS package and Microsoft version is used to all the tabular columns and figures.

2.4. Selection of Variables

The various scientific literatures have been reviewed, based on the review strength among women in Kerala was selected as variables of the present study.

3.0. RESULTS ON BODY WEIGHT

The statistical analysis comparing the initial and final means of Body weight due to isolated strength training (IST), isolated endurance training (IET), combined strength and endurance (CSE) training and control groups (CG) of college women is presented in Table 1.

Table 1

COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO ISOLATED AND COMBINED STRENGTH TRAINING AND ENDURANCE TRAINING ON BODY WEIGHT

	IST Group	IET Group	CSE Group	Control Group	SOV	Sum of Square	df	Mean Square	Obtained F
Pre Test Mean	60.33	61.40	62.27	60.40	B	37.93	3	12.64	1.82
StdDev	3.06	2.41	2.19	2.80	W	389.47	56	6.95	
Post Test Mean	58.33	58.13	59.27	61.00	B	76.98	3	25.66	3.80*
StdDev	2.99	1.68	2.19	3.02	W	378.00	56	6.75	
Adjusted Post Test Mean	58.93	57.90	58.36	61.54	B	115.05	3	38.35	14.58*
					W	144.65	55	2.63	

IST: Isolated Strength Training; IET: Isolated Endurance Training
CSE: Combined Strength and Endurance Training
SOV: Source of Variance; B: Between W: Within
Required F (0.05), (df 3.56)=2.70

*Significant at 0.05 level of confidence as shown in Table, the pre test mean on Body weight of strength trainings group was 60.33 with standard deviation + 3.06 pre test mean of Endurance training group was 61.40 with standard deviation + 2.41, the pre test mean of combined strength and Endurance training group was 62.27 with standard deviation + 2.19, the pre test mean of control group was 60.40 with standard deviation + 2.80. The obtained F ratio of 1.82 on pre test means of the groups was not significant at 0.05 level as the obtained F value was less than the required table F value of 2.70 to be significant at 0.05 level. This shows that there was no significant difference in means of the groups at initial stage.

The results presented in Table 1, the post test means on Body weight of strength trainings group was 58.33 with standard deviation + 2.99 post test mean of Endurance training group was 58.13 with standard deviation + 1.68, the post test mean of combined strength and Endurance training group group was 59.27 with standard deviation + 1.68, the post test mean of control group was 61.00 with standard deviation + 3.02. The obtained F ratio of 3.80 on post test means of the groups was significant at 0.05 level as the obtained F value was greater than the required table F value of 2.70 to be significant at 0.05 level. This shows that there was significant difference in means of the groups at post experimental stage.

Taking into consideration of the pre test means and post test means, adjusted post test means were determined and analysis of covariance was done. The adjusted mean on Body weight on strength training group was 58.93, Endurance training group was 57.90, combined strength and Endurance training group was 58.36 and control group was 61.54. The obtained F value on adjusted means was 14.58. The obtained F value was greater than the required value of 2.70 and hence it was accepted that there was significant differences among the adjusted means on the Body weight of the subjects.

Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table II.

Post Hoc Analysis on Body weight

ADJUSTED MEANS OF					
IST Group	IET Group	CSE Group	Control Group	Mean Diff	C.I
58.93	57.90			1.03	1.73
58.93		58.36		0.56	1.73
58.93			61.54	-2.62*	1.73
	57.90	58.36		-0.46	1.73
	57.90		61.54	-3.64*	1.73
		58.36	61.54	-3.18*	1.73

IST: Isolated Strength Training; IET: Isolated Endurance Training
CSE: Combined Strength and Endurance Training

Significant at 0.05 level.

The post hoc analysis of obtained ordered adjusted means proved that to be significant at 0.05 level confidence the required confidence interval was 1.73. The following paired mean comparisons were greater than the required confidence interval and were significant at 0.05 level.

Strength trainings Group Vs Control Group (MD: -2.62)

Endurance training Group Vs Control Group (MD: -3.64)

Combined training Group Vs Control Group (MD: -3.18)

The following paired mean comparisons were less than the required confidence interval and were not significant at 0.05 level.

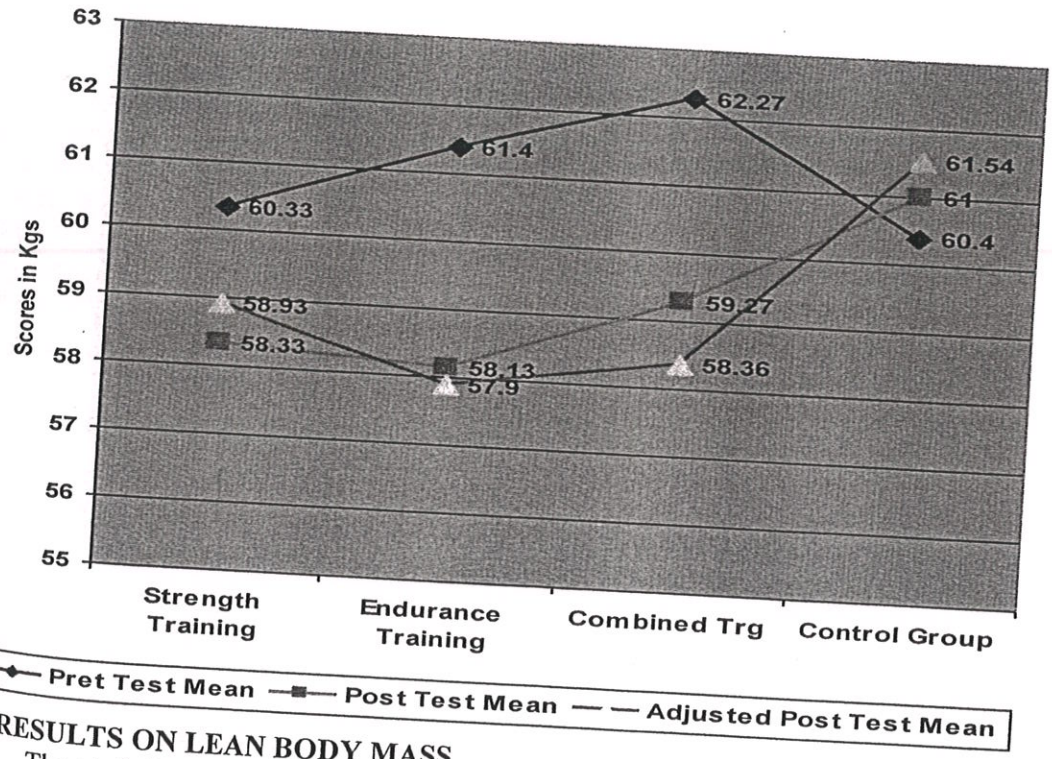
Strength trainings Group Vs Endurance training Group (MD: 1.03)

Strength trainings Group Vs Combined training Group (MD: 0.56)

Endurance training Group Vs Combined training Group (MD: -0.46)

The pre test, post test and ordered adjusted means were presented through line graph for better understanding of the results of this study in Figure 1.

Figure 1 LINE GRAPH SHOWING PRE, POST AND ADJUSTED MEANS ON BODY WEIGHT AMONG COLLEGE WOMEN.



4.0. RESULTS ON LEAN BODY MASS

The statistical analysis comparing the initial and final means of Lean Body Mass due to isolated strength training (IST), isolated endurance training (IET), combined strength and endurance (CSE) training and control groups (CG) of college women is presented in Table III.

Table III-COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO ISOLATED AND COMBINED STRENGTH TRAINING AND ENDURANCE TRAINING ON LEAN BODY MASS.

	IST Group	IET Group	CSE Group	Control Group	SOV	Sum of Square	df	Mean Square	Obtained F
Pre Test Mean	52.96	53.67	52.91	53.14	B	5.57	3	1.86	0.38
StdDev	2.74	1.86	2.37	1.67	W	271.07	56	4.84	
Post Test Mean	52.39	52.75	52.08	53.72	B	22.82	3	7.61	1.67
StdDev	2.72	1.76	2.37	1.99	W	254.95	56	4.55	
Adjusted Post Test Mean	52.57	52.34	52.29	53.75	B	21.01	3	7.00	5.15*
					W	74.73	55	1.36	

IST: Isolated Strength Training; IET: Isolated Endurance Training
CSE: Combined Strength and Endurance Training
SOV: Source of Variance; B: Between W: Within
Required F (0.05), (df 3.56)=2.70
*Significant at 0.05 level of confidence.

As shown in table III, the pre test mean on Lean Body Mass of strength trainings group was 52.95 with standard deviation + 2.74 pre test mean of Endurance training groupwas 53.67 with standard deviation + 1.86, the pre test mean of combined strength and Endurance training group was 52.91 with standard deviation + 2.37, the pre test mean of control group was 53.14 with standard deviation + 1.67. The obtained F ratio of 0.38 on pre test means of the groups as not significant at 0.05 level as the obtained F value was less than the required table F value of 2.70 to be significant at 0.05 level. This shows that there was no significant difference in means of the groups at initial stage.

The results presented in Table III, the post test mean on Lean Body Mass of strength trainings group was 52.39 with standard deviation + 2.72 post test mean of Endurance training group was 52.39 with standard deviation +1.76, the post test mean of combined strength and Endurance training group was 52.08 with standard deviation +1.76, the post test mean of control group was 53.72 with standard deviation +1.99. The obtained F ratio of 1.67 on post test means of the groups was not significant at 0.05 level as the obtained F value was lesser than the required table F value of 2.70 to be significant at 0.05 level. This shows that there was insignificant difference in means of the groups at post experimental stage.

Taking into consideration of the pre test means and post test means, adjusted post test means were determined and analysis of covariance was done. The adjusted mean on Lean Body Mass on strength trainings group was 52.57, Endurance training group was 52.34, combined strength and Endurance

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training group was 52.29 and control group was 53.75. The obtained F value on adjusted means was 5.15. The obtained F value was greater than the required value of 2.70 and hence it was accepted that there was significant differences among the adjusted means on the Lean Body Mass of the subjects.

Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table IV.

Table IV

Multiple Paired Means Comparisons among Isolated and combined Strength training Endurance training and Control Groups and Scheffe's Post Hoc Analysis on Lean Body Mass

ADJUSTED MEANS OF					C.I
IST Group	IET Group	CSE Group	Control Group	Mean Diff	
52.57	52.34			0.23	1.24
52.57		52.29		0.28	1.24
52.57			53.75	-1.18	1.24
	52.34	52.29		0.05	1.24
	52.34		53.75	-1.41*	1.24
		52.29	53.75	-1.45*	1.24

IST: Isolated Strength Training; IET: Isolated Endurance Training
CSE: Combined Strength and Endurance Training
Significant at 0.05 level.

The post hoc analysis of obtained ordered adjusted means proved that to be significant at 0.05 level confidence the required confidence interval was 1.24. The following paired mean comparisons were greater than the required confidence interval and were significant at 0.05 level.

Endurance trainings Group Vs Control Group (MD: -1.41)

Combined training Group Vs Control Group (MD: -1.45)

The following paired mean comparisons were less than the required confidence interval and were not significant at 0.05 level.

Strength trainings Group Vs Endurance training group (MD: 0.23)

Strength trainings Group Vs Combined training Group (MD: 0.28)

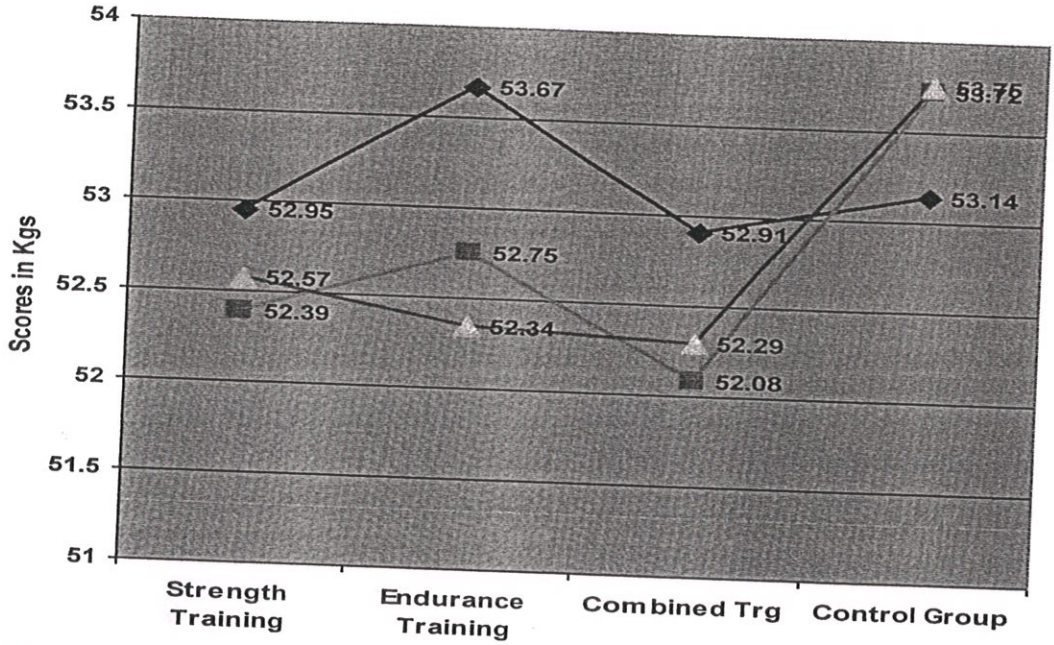
Strength trainings Group Vs Control Group (MD: -1.18)

Endurance training Group Vs Combined training Group (MD: 0.05)

The pre test, post test and ordered adjusted means were presented through line graph for better understanding of the results of this study in Figure 2.

Figure 2-LINE GRAPH SHOWING PRE, POST AND ADJUSTED MEANS ON LEAN BODY MASS AMONG COLLEGE WOMEN.

5.0. RESULTS ON PERCENT BODY FAT



The statistical analysis comparing the initial and final means of Percent Body Fat due to isolated strength training (IST), isolated endurance training (IET), combined strength and endurance (CST) training and control groups (CG) of college women is presented in Table V.

Table V

COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO ISOLATED AND COMBIND STRENGTH TRAINING AND ENDURANCE TRAINING ON PERCENT BODY FAT

	IST Group	IET Group	CSE Group	Control Group	SOV	Sum of Square	df	Mean Square	Obtained F
Pre Test Mean	26.83	26.87	26.76	26.58	B	0.75	3	0.25	0.23
StdDev	1.16	0.95	1.09	0.92	W	60.21	56	1.08	
Post Test Mean	25.53	24.79	24.94	26.39	B	23.64	3	7.88	6.74*
StdDev	1.22	1.11	1.09	0.91	W	65.45	56	1.17	
Adjusted Post Test Mean	25.48	24.70	24.94	26.54	B	29.68	3	9.89	21.60*
					W	25.19	55	0.46	

IST: Isolated Strength Training; IET: Isolated Endurance Training
CSE: Combined Strength and Endurance Training
SOV: Source of Variance; B: Between W: Within
Required F (0.05), (df 3.56)=2.70
*Significant at 0.05 level of confidence.

As shown in table V, the pre test mean on Percent Body Fat of strength trainings group was 26.83 with standard deviation + 1.16 pre test mean of Endurance training group was 26.87 with standard deviation + 0.95, the pre test mean of combined strength and Endurance training group was 2676 with standard deviation + 1.09, the pre test mean of control group was 26.58 with standard deviation + 0.92. The obtained F ratio of 0.23 on pre test means of the groups as not significant at 0.05 level as the obtained F value was less than the required table F value of 2.70 to be significant at 0.05 level. This shows that there was no significant difference in means of the groups at initial stage.

The results presented in Table I, the post test mean on Percent Body Fat of strength trainings group was 25.53 with standard deviation + 1.22 post test mean of Endurance training group was 24.79 with standard deviation +1.11, the post test mean of combined strength and Endurance training group was 24.94 with standard deviation +1.11, the post test mean of control group was 26.39 with standard deviation +0.91, the obtained F ratio of 6.74 on post test means of the groups was not significant at 0.05 level as the obtained F value was lesser than the required table F value of 2.70 to be significant at 0.05 level. This shows that there was insignificant difference in means of the groups at post experimental stage.

Taking into consideration of the pre test means and post test means, adjusted post test means were determined and analysis of covariance was done. The adjusted mean on Percent Body Fat on strength trainings group was 25.48. Endurance training group was 24.70, combined strength and Endurance training group was 24.94 and control group was 26.54. The obtained F value on adjusted means was 21.60. The obtained F value was greater than the required value of 2.70 and hence it was accepted that there was significant differences among the adjusted means on the Percent Body Fat of the subjects. Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table VI.

Table VI

Multiple Paired Means Comparisons among Isolated and combined Strength training, Endurance training and Control Groups and Scheffe's Post Hoc Analysis on Percent Body Fat

ADJUSTED MEANS OF					C.I
IST Group	IET Group	CSE Group	Control Group	Mean Diff	
25.48	24.70			0.78*	0.72
25.48		24.94		0.54	0.72
25.48			26.54	-1.06*	0.72
	24.70	24.94		-0.24	0.72
	24.70		26.54	-1.84*	0.72
		24.94	26.54	-1.59*	0.72

IST: Isolated Strength Training; IET: Isolated Endurance Training
CSE: Combined Strength and Endurance Training
Significant at 0.05 level.

The post hoc analysis of obtained ordered adjusted means proved that to be significant at 0.05 level confidence the required confidence interval was 0.72. The following paired mean comparisons were greater than the required confidence interval and were significant at 0.05 level.

Strength trainings Group Vs Endurance training Group (MD: 0.78)

Strength training Group Vs Control Group (MD: -1.06)

Endurance training Group Vs Control Group (MD: -1.84)

Combined training Group Vs Control Group (MD: -1.59)

The following paired mean comparisons were less than the required confidence interval and were not significant at 0.05 level.

Strength trainings Group Vs Combined training group (MD: 0.54)

Endurance training Group Vs Combined Group (MD: -0.24)

The pre test, post test and ordered adjusted means were presented through line graph for better understanding of the results of this study in Figure 3.

Figure 3-**LINE GRAPH SHOWING PRE, POST AND ADJUSTED MEANS ON PERCENT BODY FAT AMONG COLLEGE WOMEN.**

5.0 Conclusion

In the present study, the effects of 12 week of exercise (isolated strength training and isolated endurance training, combined strength endurance training), were studied FF in college level women. The data shows that there is a significant deference in the due to body weight and lean body mass among college level women.

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2017-18 Lilly

Asian Journal of Applied Research (AJAR) 2017

E-ISSN: 2395-1702 P-ISSN: 2395-0382
Volume 03- Issue 03-, pp-30-36

Research Paper Open Access

EFFECT OF CONTINUOUS TRAINING AND INTERVAL TRAINING ON SELECTED FLEXIBILITY AND MUSCULAR STRENGTH AMONG COLLEGE LEVEL MEN BOXERS

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Abstract:

Aim: The objective of the present study is to identify the effects of continuous training and interval training performances on flexibility and muscular strength among college level boxers. *Methodology*: Twelve weeks of continuous training was studied with constant-flexibility and muscular strength procedure and constant-time procedure. Twelve weeks of interval training was studied ANCOVA statistical analyses have been used to analyses the performance and outcome of the men boxers and Scheffe's post hoc test was used to find out the mean difference of confidence continuous training and Interval training. *Result*: The submaximal-performance effects on flexibility F-ratio at 0.05 level of confidence for 2 and 87 (df) =3.06, 2 and 86 (df)=3.06. Significant is better than control group. These effects have been compared for muscular strength boxers F-ratio at 0.05 level of confidence for 2 and 87(df)=3.06, 2 and 86 (df)=3.06. Significant is better than control group.

Keywords: flexibility, muscular strength, continuous and interval training.

I.0. Introduction

The present study sought to evaluate the inconsistencies previously observed regarding the pre dominance of continuous and interval training for improving fitness. The experimental design initially equated and subsequently maintained the same relative exercise intensity by both groups throughout the programs. Thirty subjects were equally divided into continuous training (continuous training, exercise at 50% to 60% maximal work) or interval training (30 subject as working group and control group respectively at 100% maximal work) training groups that performed 30 min per day for 3 days in all 12 weeks. Following continuous training and interval training, exercising work rates were parallel examined both the interval training and continuous training. Three equated groups were performed to measure the performance of flexibility and muscular strength; one group act as control group and another two group act as experimental group.

Interval training and continuous training regimens are used to improved physical fitness. There is conflicting evidence as to which is the more effective in improving biochemical, physiological, and performance measures (Cunninghametal, 1979). The purpose of this study were to compare the effects of using the same relative work intensities in the two training

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modes and examine their effect in continuous training and Interval training tests.

2.0. Methodology

2.1. Sample selection

Simple random procedure was used to select the subjects for the present study. To delimit the present study only male boxers of Tamil Nadu were selected. Totally, 90 members have been taken as sample size. The sample size was divided into three groups namely: continuous training group, interval training group and control group.

2.2. Collection of data

A selected package of continuous training and interval training were administered to collect the data. 12 weeks was administered to all three groups. The performance of all groups was administered for only 30 min per day especially for continuously 3 days in all 12 weeks.

2.3 Analysis

ANCOVA and Scheffe's post hoc test were used for the study. The mean, sum of squares, mean square and f-ratio are identified by using the SPSS package and Microsoft version is used to all the tabular columns and figures.

2.4. Selection of Variables

The various scientific literatures have been reviewed, based on the review flexibility and muscular strength among college level boxers in Tamil Nadu was selected as variables of the present study.

3.0. COMPUTATION OF ANALYSIS OF COVARIANCE AND POST HOC TEST RESULTS OF FLEXIBILITY

The statistical analysis comparing the initial and final means of flexibility due to Continuous training and interval training among college level boxers is presented in Table 1.

Table 1

ANCOVA RESULTS ON EFFECT OF CONTINUOUS TRAINING AND INTERVAL TRAINING COMPARED WITH CONTROLS ON FLEXIBILITY

	CONTINUOUS TRAINING	INTERVAL TRAINING	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F
Pre Test Mean	14.37	15.17	14.90	Between	9,96	2	4.98	1.90
				Within	227.83	87	2.62	
Post Test Mean	18.57	17.23	15.57	Between	135.56	2	67.78	18.31*
				Within	322.10	87	3.70	
Adjusted Post Test Mean	18.81	17.04	15.52	Between	159.09	2	79.54	26.67*
				Within	256.45	86	2.98	

Mean Diff	4.20	2.07	0.67					

Table F-ratio at 0.05 level of confidence for 2 and 87 (df) = 3.06 and 86 (df)=3.06.*Significant

As shown in Table 1, the obtained pre-test means of Flexibility on Continuous training group was 14.37, Interval training group was 15.17 and control group was 14.90. The obtained pre-test F value was 1.90 and the required table F value was 3.06, which proved that there was no significant difference among initial scores of the subjects.

The obtained post-test means of Flexibility on Continuous training group was 18.57, Interval training group was 17.23 and control group was 15.57. The obtained post-test F value was 18.31 and the required table F value was 3.06, which proved that there was significant difference among post-test scores of the subjects.

Taking into consideration of the pre-test means and post-test means adjusted post-test means were determined and analysis of covariance was done and the obtained F value 26.67 was greater than the required value of 3.06 and hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table 2.

Table 2

Multiple Comparisons of Paired Adjusted Means and Scheffe's ConfidenceInterval Test Results on Flexibility

MEANS				
Continuous training Group	Interval training Group	Control Group	Mean Difference	Required C 1
18.81	17.04		1.76*	1.10
18.81		15.52	3.29*	1.10
	17.04	15.52	1.52*	1.10

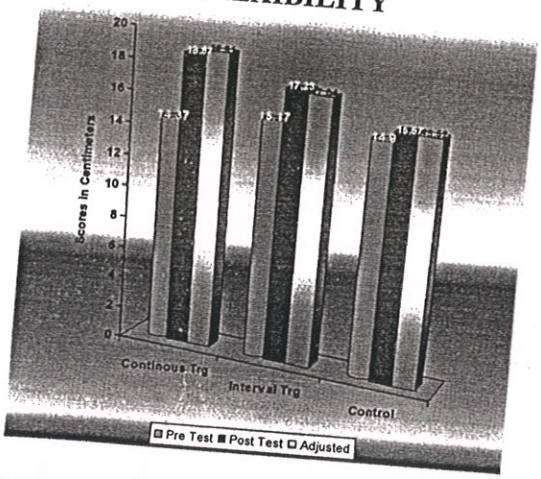
*Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between Continuous training group and control group (MD: 3.29). There was significant difference between Interval training group and control Group (M.D: 1.52). There was significant difference between treatment groups, namely, Continuous training group and Interval training group. (MD: 1.76).

The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure 1.

Figure 1

BAR DIAGRAM SHOWING PRE TEST, POST TEST AND ORDERED MEANS ON FLEXIBILITY



3.1.DISCUSSIONS ON FINDINGS ON FLEXIBILITY

In order to find out the effect of Continuous training and Interval training on Flexibility the obtained pre and post-test means were subjected to ANCOVA and post hoc analysis through Scheffe's confidence interval test.

The effect of Continuous training and Interval training on Flexibility if presented in Table 1. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 26.67 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to post hoc analysis and the results presented in Table 2 proved that there was significant difference between Continuous training group and control group (MD:3.29) and Interval training group and control group (MD: 1.52). Comparing between the treatment groups, it was found that there was significant difference between Continuous training and Interval training group among college level boxers.

Thus, it was found that continuous training was significantly better than interval training and control group in improving Flexibility of the college level boxers.

4.0 RESULTS ON MUSCULAR STRENGTH

The statistical analysis comparing the initial and final means of muscular strength. Due to Continuous training and Interval training among college level boxers is presented in Table 3.

Table 3- ANCOVA RESULTS ON EFFECT OF CONTINUOUS TRAINING AND INTERVAL TRAING COMPARED WITH CONTROLS ON MUSCULAR STRENGTH

	CONTINUOUS TRAINING	INTERVAL TRAINING	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F
Pre Test Mean	33.20	30.93	31.87	Between	77.87	2	38.93	2.88
				Within	1176.13	87	13.52	
Post Test Mean	36.10	35.93	31.73	Between	367.36	2	183.68	11.48*
				Within	1392.43	87	16.00	
Adjust	34.94	36.96	31.86	Between	393.86	2	196.93	57.83*

ed Post Test Mean				Within	292.88	86	3.41	
Mean Diff	2.90	5.00	-0.13					

Table F-ratio at 0.05 level of confidence for 2 and 87 (df) = 3.06,2 and 86 (df)=3.06.
*Significant

As shown in Table 3, the obtained pre-test means on Muscular strength on Continuous training group was 33.20, Interval training group was 30.93 and control group was 31.87. The obtained pre-test F value was 2.88 and the required table F value was 3.06, which proved that there was no significant difference among initial scores of the subjects.

The obtained post-test means on Muscular strength on Continuous training group was 36.10, Interval training group was 35.93 and control group was 31.73. The obtained post-test F value was 11.48 and the required table F value was 3.06, which proved that there was significant difference among post test scores of the subjects.

Taking into consideration of the pre-test means and post-test means adjusted post-test means were determined and analysis of covariance was done and the obtained F value 57.83 was greater than the required value of 3.06 and hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval text. The results were presented in Table 4.

Table 4. Multiple Comparisons of Paired Adjusted Means and Scheffe's Confidence Interval Test Results on Muscular strength

MEANS				
Continuous training Group	Interval training Group	Control Group	Mean Difference	Required C 1
34.94	36.96		-2.02*	1.18
34.94		31.86	3.08*	1.18
	36.96	31.86	5.10*	1.18

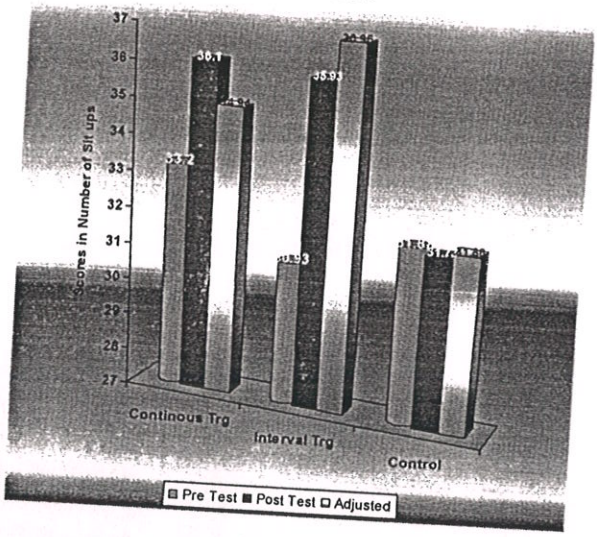
*Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between Continuous training group and control group (MD: 3.08). There was significant difference between Interval training group and control group (MD: 5.10). There was significant difference between treatment groups, namely, Continuous training group and Interval training group. (MD: -2.02).

The ordered adjusted means were presented through bar diagram for better

understanding of the results of this study in Figure 2.

Figure 2
BAR DIAGRAM SHOWING PRE TEST, POST TEST AND ORDERED ADJUSTED MEANS ON MUSCULAR STRENGTH



4.2. DISCUSSIONS ON FINDINGS ON MUSCULAR STRENGTH

In order to find out the effect of Continuous training and Interval training on Muscular strength the obtained pre and post-test means were subjected to ANCOVA and post hoc analysis through Scheffe'ss confidence Interval test.

This effect of Continuous training and Interval training on Muscular strength is presented in Table 3. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 57.83 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to post hoc analysis and the results presented in Table II proved that there was significant difference between Continuous training group and control group (MD: 3.08) and Interval training group and control Group (MD: 5.10). Comparing between the treatment groups, it was found that there was significant difference between Continuous training and Interval training group among college level boxers.

Thus, it was found that Interval training was significantly better than Continuous training and control group in improving Muscular strength of the college level boxers.

5.0 Conclusion

In the present study, the effects of 12 week of exercise (continuous training and interval training), were studied in college level men boxers. The data shows that there is a significant increase in the performance of flexibility and muscular strength sports training of the college level male boxers.

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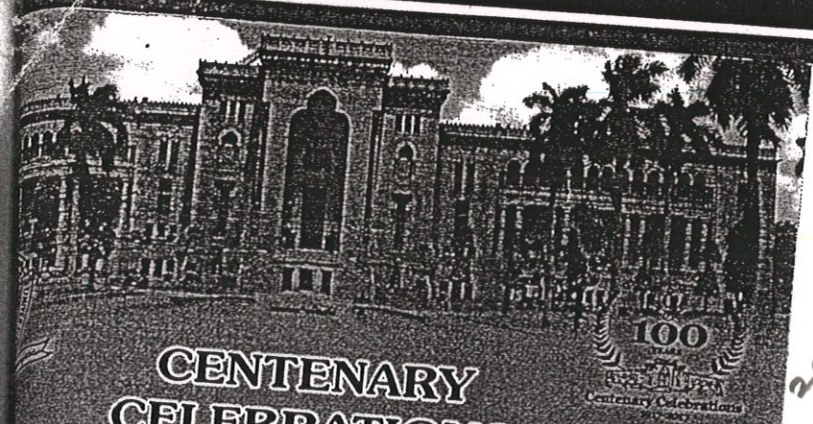

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APPROVED JOURNAL

ISSN 2231-3265
(Online and Print)

2017-18

PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON PHYSICAL EDUCATION, FITNESS AND SPORTS SCIENCE 2017

Volume - 27 No. 2
QUARTERLY
July 2017 to September 2017

IFCSS

International Federation of Physical Education, Fitness and Sports Science Associations

Published by : Indian Federation of Computer Science in Sports
www.ijhpecss.org & www.ifcss.in

Organized by : Department of Physical Education, Osmania University, Hyderabad, T.S. India

Publication Impact Factor I2OR 3.565
ISRA Journal Impact Factor 3.579
Index Journal of

J-Gate
largest E-Journal Gateway

ISRA JIF

I2OR

DRJI

International Journal of Health, Physical Education and Computer Science in Sports
ISSN 2231-3265
Volume No.27, No.2.pp 357-358
Journal Impact Factor 3.565 (UGC Approved Journal)
A Peer Reviewed (Refereed) International Research Journal

Positive & Negative Effect Of Spectators On The Sports Performance

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troduction

pectator impact should be maximal for athletic events that involve individual performances and minimal for ose that involve joint activities in which individual contributions cannot be clearly distinguished by observers neman in football-division of audience impact because it is shared with one's team members). When ividuals are not individually accountable, they may reduce their efforts or "loaf" even in front of spectators. cial support provided by a cohesive team may have a calming effect on athletes or teams in otherwise ighly stressful spectator situations. (Players provide mutual encouragement).As the number of spectators creases, social impact increases, but as the number of actors or performers increases, the impact of the ectators should be reduced. In most team situations there is a differential with pitchers and quarterbacks etting more spectators attention-thus making them possibly more susceptible to spectator variables.Watching hers, family, peers and role models and learning from their behavior and experiences affects the way we erform and behave on a daily basis. This learning of accepted behavior's, values, rights and wrongs when we e children is known as socialization. Physical Education plays an important role in socialization from a young e. In P. E. demonstration and observation of others performing a skill is a vital way of learning. It has been own that an individual's performance will improve most when the demonstration is from a skilled superior, ch as a teacher or coach. However, demonstrations from unskilled peers also are often effective.

ect Of Spectators

e effect of having others present during performers can be either positive or negative. Performers can suffer n evaluation apprehension, which increases arousal levels which in turn increases heart rate and causes ner detrimental effects. This is linked to Hull's drive theory. The following relates to how this increased rousal can affect performance:

- The presence of an audience increases arousal
- Increases in arousal will trigger the dominant response
- If a skill is well-learned then the response will be correct
- If the skill is new or poorly learned the response will be incorrect
- The negative effects of this social facilitation can be dealt with using the following tips:
- Relaxation techniques
- Imagery
- Explanation and understanding of the way in which audiences can affect individuals
- Encouragement and support from team members
- New skills should be taught in a non-evaluative way

-Theories And Social Facilitation:

viduals are motivated by concerns for self-presentation. people wish to be judged in favorable terms and thus motivated to work hard when observed. Spectators increase subjective or private awareness. When viduals become self-aware, they become aware of discrepancies between ideal or desired performance es and attained performance. This may increase efforts to do well.

e Court Advantage

would expect teams to perform best when they are in front of their home crowds **(Schwartz &Barsky** m). Analyzed 1,880 mlb, 1,092 football, 542 NHL, and 1,485 college basketball games. Home advantage - seball (53%), football (60%), basketball (64%) hockey (64%). **Baumeister** (1985) in an article entitled "The mpionship Choke" claims that contrary to conventional wisdom, the home field sometimes can be a dvantage. Especially when a championship is at stake.Surveyed World Series results beginning with 1924 year that the current scheduling practice began with games 1,2, 6,7 at one teams ball park, 3, 4, 5 at the m). Excluded 4 game sweeps, since home field effects would be more evident with closely matched teams ated 10 series-leaving 49). To get some idea of what is happening to performance - he looked at fielding foul shooting (two performance statistics that are somewhat independent of the opposing team's mance).In baseball, home teams make 2X as many errors in final games as in games 1 or 2. Visitor's g tends to improve slightly. In basketball, during games 1 - 4 both teams have about the same foul

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shooting percentage. In the final game, the visitor's percentage stays constant, while the home team drops several percentage points. It appears then that the final game disadvantage seems to be a function of the home team "choking." Baumeister has argued that the home crowd can increase an individual's self-consciousness, which disrupts the automatic quality of skilled actions (opposite of "flow"). Playing for the championship in front of the home crowd would likely increase one's level of self-consciousness, but not necessarily affect a visiting team.

Directive Effects Of An Audience

Audience acts to reward and punish certain behaviors of the players, coaches, and officials by their actions. (Cheers, boos, and no reactions).**Greer (1983)** -Found that sustained booing in basketball games facilitated the overall performance level of the home team and inhibited the performance of the visiting team. The strongest effect involved increased rule violations called on the visiting team, suggesting a possible impact both on the behavior of the visiting team, and on the referees. Home court effects seem to be most potent for sports where the crowds are closer to the players and action is more continuous

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COMBINED EFFECT OF PLYOMETRIC TRAINING AND SKILL TRAINING ON THE DEVELOPMENT OF FITNESS RELATED PARAMETERS AND SKILL PERFORMANCE VARIABLES AMONG MALE SOCCER PLAYERS

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ABSTRACT

To study the effect of combination of plyometric training and skill training on the development of Soccer Kicking ability, anaerobic capacity and skill performance of Male Soccer players, sixty male Soccer players (18-25 yrs) were selected from various colleges in Chennai, Tamilnadu. The subjects were divided as the Experimental group-1 (n=20, PLYOSKILL group) performed the plyometric and skill training, Experimental group-2 (n=20; SKILL group) performed the Skill Training alone, Experimental group:-3 (n=20, CONTROL group) did not perform any training. Pre-test values of Kicking ability, anaerobic capacity and playing ability were 14.3± .69, 780.9 ± 54.12, 4.6 ± .59, for PLYOSKILL group, 14.27± .69, 780.9 ± 54.1, 4.6 ± .59 for Skill group and 14.27± .67, 780.95 ± 52.9, 4.7±.656 for Control group respectively. After 12 week of training programme the physical variables and playing ability were significantly improved at (P<=0.05 level). The post test values of Soccer Kicking ability, anaerobic capacity and game playing ability were 16.4 ± .59, 818.2 ± 44.2, 6.7± .55 for PLYOSKILL group, 15.02 ± .59, 800.2 ± 28.25, 6.0± .72 for skill group and 14.22 ± .73, 775.80 ±49.47, 4.75± .638 for control group respectively. The study shows that combination of plyometric training and skill training were significantly developed Soccer Kicking ability, anaerobic capacity and skill performance variables among male Soccer players.

INTRODUCTION

Soccer is a team sport that requires great skill and can be very rewarding when played properly. Certainly considered to be both a competitive and leisurely activity, it can be played by school teams, professional players and families. Normally, each team in a Soccer match consists of 11 players. However, the health benefits of playing with fewer people on each team increases with the larger area for which each player is responsible.

A well-structured Soccer training program requires explosive power, stamina and speed and agility around the court. Skill training alone won't develop the physical traits necessary to play to the athlete's full potential (Gabbett T *et al* 2006).Therefore the objectives of this study was to examine the combined effect of plyometric training and skill training on the development of Kicking ability, anaerobic capacity and skill performance among Male Soccer players.

METHODS

Subjects: Sixty male Soccer players were randomly selected from various colleges representing inter collegiate level tournaments as subjects for this study.

Protocol: The subjects were divided in to Experimental group:-1 (n=20, PLYOSKILL group) performed the plyometric and skill training, Experimental group:-2 (n=20; SKILL group) performed the Skill Training alone, Experimental group:-3 (n=20, CONTROL group) did not perform any kind of training.

Testing: The test items selected were highly standardized, appropriate and ideal for the selected variables. Kicking Ability was measured by McDonald Soccer test, anaerobic capacity was measured by using margaria kalaman test and playing ability was assessed by subjective rating. Test administration was done before and after 12 weeks of training regimen.

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TRAINING PROGRAMME

Experimental group – 1 :-Training Programme for Plyometric with skill training group

Mon	Tue	Wed	Thu	Fri	Sat
Warm-up 10min	Warm-up 10min	Warm-up 10min	Warm-up 10min	Warm-up 10min	Warm-up 10min
Plyometric drills	Skill performance drills Heading, Free Kick, Corner Kick, Goal Kick, Half Valley and Full volley Kick.	Plyometric drills	Skill performance drills Heading, Free Kick, Corner Kick, Goal Kick, Half Valley and Full volley Kick.	Plyometric drills	Skill performance drills Heading, Free Kick, Corner Kick, Goal Kick, Half Valley and Full volley Kick.
Warm-down 10min	Warm down – 10 minutes	Warm-down 10min	Warm down – 10 minutes	Warm-down 10min	Warm down – 10 minutes

Experimental group – 2 :-Training Programme for skill training group

STATISTICAL ANALYSIS

A paired sample of student's t-test was used to determine the significance of the mean differences between the pre-test to post-test values of a variable in the same group. Analysis of variance (ANOVA) was used to know the significant differences among the group. Statistical significance was accepted as $p \leq 0.05$ level of confidence.

RESULTS

Significance Of Mean Gains /Losses Between Pre And Post Test Of Plyometric With Skill Training Group

Variables	Pre test mean ±SD	Post test mean± SD	M. D	Standard Error DM	't'-ratio
Kicking ability	14.3± .69	16.4 ± .59	2.1	.18532	11.6*
Anaerobic capacity	780.9 ± 54.12	818.2 ± 44.2	37.3	4.89	7.6*
Playing ability	4.6 ± .59	6.7± .55	2.1	.208	10.3*

** Significant (Table value 2.093 at 0.05 level of confidence)*

Significance Of Mean Gains /Losses Between Pre And Post Test Of Skill Training Group

Variables	Pre test mean ±SD	Post test mean± SD	M. D	Standard Error DM	't'-ratio
Kicking ability	14.27± .69	15.02 ± .59	0.75	.233	3.2*
Anaerobic capacity	780.9 ± 54.1	800.2 ± 28.25	19.3	8.75	2.2*
Playing ability	4.6 ± .59	6.0± .72	1.4	.222	6.2*

** Significant (Table value 2.093 at 0.05 level of confidence)*

Significance Of Mean Gains /Losses Between Pre And Post Test Of Skill Control Group

Variables	Pre test mean ±SD	Post test mean± SD	M. D	Standard Error DM	't'-ratio
Kicking ability	14.27± .67	14.22 ± .73	0.05	.080	.623
:Anaerobic capacity	780.95 ± 52.9	775.80 ±49.47	-5.0	4.99	1.031
Playing ability	4.7±.656	4.75± .638	0.05	.05	1.00

Table value 2.093 at 0.05 level of confidence

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DISCUSSION

The scheduling of combined plyometric training and skill training on the development of Kicking ability, anaerobic capacity and skill performance variables among male volleyball players have produced significant development on Kicking ability, anaerobic capacity and skill performance.

RECOMMENDATION

The coaches and physical education personnel may plan the training schedule for Soccer players in such a way that combining of plyometric and skill training will bring better performance and therefore combining plyometric and skill training improves Soccer performances.

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3.4.5.J ST 2018-19

JASC: Journal of Applied Science and Computations ISSN NO: 1076-5131

Computational Fluid Dynamic Analysis on Structural and Flow Parameters of Aircraft Winglets in Boeing 737-800 Aircraf

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Abstract—**Aerodynamic drag force breakdown of a standard air craft indicates that elevate prompted drag can amount to as much as 40% of total drag at cruise conditions and 80-90% at take-off configuration. One way of reducing lift induced drag is by using wingtip devices which is also known as Winglets. By applying several types of winglets already in use we study their influence on aircraft performance. For our consideration we chose Boeing 737-800 model Aircraft. Initially, Structural analysis of wings and Winglets is made. Moreover, the usage of higher multi goal layout optimization software program such as Computational Fluid Dynamics with an surest one parameter winglet configuration is decided which can minimize pull and maximize raise. From the results obtained, various winglet of Boeing 737-800 have been compared and concluded the winglet that will support optimal flight.**

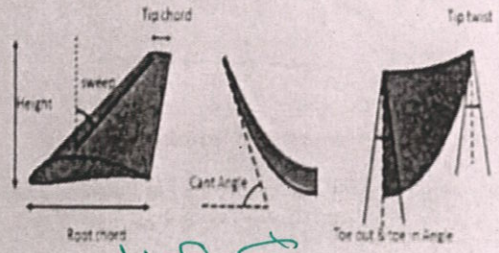
Keywords— Winglet, Computational fluid dynamics, Drag reduction, Lift induced drag

I. INTRODUCTION

The major feature of aerodynamics is design of airfoil. At zero angle of attack Asymmetric airfoils generate lift, while a symmetric airfoil suit frequently as in an aerobatic airplane for inverted flight. In the region near a wingtip to increase the range of angles of attack and to avoid spin–stall a symmetric airfoil can be used.

Schemes have been devised to define airfoils – an example is the NACA system. Various airfoil generation systems are also used. An example of a general purpose airfoil that finds wide application, and predates the NACA system, is the Clark-Y. Today, airfoils can be designed for specific functions using inverse design programs such as PROFOIL, XFOIL and Aerofoil.

The term WINGLET was previously used to describe an additional lifting surface on an aircraft, like a short section between wheels on fixed undercarriage. Winglet on KC-135 Strato tanker with attached tufts showing airflow during NASA tests in 1979–1980 Gulfstream V model winglet flutter tests at NASA Langley transonic wind tunnel. Richard Whitcomb's research in the 1970s at NASA first used winglet with its modern meaning referring to near-vertical extension of the wing tips. The upward angle (or cant) of the winglet (Fig no.9), its inward or outward angle (or toe), as well as its size and shape are critical for correct performance and are unique in each application.



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Journal of Xi'an University of Architecture & Technology

Issn No : 1006-7930

EFFECT OF YOGIC AND RECREATIONAL TRAINING ON AGILITY STRESS AND RESTING PULSE RATE AMONG INFORMATION TECHNOLOGY PROFESSIONALS

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ABSTRACT

The purpose of the present study was to find out the effect of yogic and recreational training on agility, stress and resting pulse rate among information technology professionals. To achieve the purpose of the study, the investigator selected 90 subjects. They were selected from the information technology professional, Chennai City, Tamil Nadu. Their age ranged between 25and 30 years. The randomly assigned in to three groups namely Experimental group-I yogic training , Experimental group-II recreational training, and a Control Group (CG). Each group consists of 30subjects.The following variables on namely agility stress and resting pulse rate were selected for the study. They were tested with Shuttle run, standardized Stress Questionnaire developed by Everyly and Girdano's and Digital Heart Rate Measuring Machine. The training period was six weeks. The Analysis of Covariance (ANACOVA) and post hoc test was used to assess the collected data. From the analysis of data it was proved that there was a significant reduction in the timing of agility, level of stress and resting pulse rate by both forms of experimental namely the yogic training and recreational training among information technology professionals.

KEYWORDS: Yogic Training, Recreational Training, Agility, Stress, Resting Pulse Rate and Information Technology Professional.

INTRODUCTION

The yoga is to devise ways and means of helping the body and mind to maintain their state of balance. Yoga helps one to achieve better emotional and intellectual concentration.

"Yoga is a system of integrate education of the body, the mind and the inner spirit. It is a way to attain salvation and to get oneself freed from the cycle of birth and death. It's main purpose is the elimination of the forces harmful to the soul. (Swami Vishnu Devananda, 1988)

Recreation is an essential part of human life and finds many different forms which are shaped naturally by individual interests but also by the surrounding social construction. Recreational activities can be communal or solitary, active or passive, outdoors or indoors, healthy or harmful, and useful for society or detrimental. A significant section of recreational activities are designated as hobbies which are activities done for pleasure on a regular basis. A list of typical activities could be almost endless including most human activities.

India's software exporting industry is one of the world's successful information technology industries. Begun in 1974, it employed 345,000 persons in 2004 and earned revenue of $12.2 bn, equal to 3.3% of global software services spending. As we shall show, the industry originated under untypical conditions. Local markets were absent and government policy toward private enterprise was hostile. These conditions influenced the industry's origins. The industry was begun by Bombay-based conglomerates which entered the business by supplying global IT

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Issn No : 1006-7930

EFFECT OF ASHTANGA VINYASA SURYA NAMASKAR PRACTICES ON STRENGTH AND BALANCE AMONG ADOLESCENCE MALE

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ABSTRACT

Today adolescence is in growing age they have lack of physical and mental fitness such as speed, strength, flexibility, balance, stress, anxiety, depression etc. The Ashtanga Vinyasa Surya Namaskar practices (AVSN) is the most popular contemporary style of yoga it helps the adolescence to improve their physical and mental fitness variables. The purpose of the study was to find out the "effect of Ashtanga Vinyasa Surya Namaskar A & B (AVSN) practices on strength and balance among adolescence male". To achieve the purpose of the present study, forty adolescence male from Chennai district, Tamil Nadu were selected as subjects at random and their ages ranged from 15 to 19 years. The subjects were further classified at random into two equal groups of 20 subjects each such as Experimental Group and Control Group. Experimental Group underwent Ashtanga Vinyasa Surya Namaskar A & B (AVSN) Practices for thrice in a week for 6 weeks. Control Group (CG) did not participate in any special training apart from the regular day programme. The selected variables such as strength and balance were measured by using push up and Stork Balance Stand Test. The collected data were analyzed statistically through analyze of covariance (ANCOVA) to find a significant difference. The results of the study showed that strength and balance were significantly improved due to Ashtanga Vinyasa Surya Namaskar A & B (AVSN) practices among adolescence male.

KEYWORDS: Ashtanga Vinyasa Suryanamaskar.

INTRODUCTION

"Yoga is not an ancient myth buried in oblivion. It is the most valuable inheritance of the present. It is the essential need of today and the culture of tomorrow."

Swami Satyananda Saraswati (2002)

Ashtanga yoga is based on the Antaranga yoga of Patanjali yoga system, it gives a practical and easy approach to reach higher states of consciousness. This is the most systematic method for attaining the highest state of meditation. The one who follows this type of yoga system which brings them into wisdom, control, harmony and equanimity, which embraces the accumulation of knowledge, esoteric, experience, arusing of psychic powers, philosophy and meditation. Ashtanga yoga which is consist of eight fold system such as yama, niyama, asana, pranayama, prathyahara, dharana, dhyana, and samadhi **(krishan kumar suman, 2015)** The word Vinyasa, means flow because of the poses run together in smooth way, and it's a broad classification that encompasses many different types of yoga, including Ashtanga and power yoga **(Anna Pizer, 2019).**

STATEMENT OF THE PROBLEM

The purpose of the study was to find out effect of ashtanga vinyasa surya namaskar practices on strength and balance among adolescence male.

HYPOTHESIS

It was hypothesized that there would be significant improvement on strength and balance due to ashtanga vinyasa surya namaskar practices among adolescence male.

3.H.5_J-Y- 2018-19

Journal of Xi'an University of Architecture & Technology Issn No : 1006-7930

EFFECT OF SIMPLIFIED KUNDALINI YOGA WITH AND WITHOUT VARMA THERAPY ON BLOOD SUGAR FASTING AND BLOOD SUGAR POST PRANDIAL AMONG DIABETES MEN

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ABSTRACT

The purpose of the present study was to find out the the effect of Simplified Kundalini yoga with and without varma therapy on blood sugar fasting and blood sugar post prandial among diabetes men. To achieve the purpose of the study, the investigator selected 90 subjects. They were selected various hospital at Chennai, Tamil Nadu. The randomly assigned in to three groups namely Experimental group-I Simplified kundalini yoga with varma therapy, Experimental group-II Simplified kundalini yoga without varma therapy, and a Control Group (CG). Each group consists of 30subjects.The following variables on namely blood sugar fasting and blood sugar post prandial were selected for the study.They were tested with measured through Lab test. The training period was eight weeks. The Analysis of Covariance (ANACOVA) and post hoc test was used to assess the collected data. From the analysis of data it was proved the Blood Sugar (Fasting) and Blood Sugar (Post Prandial) were significantly reduced by both forms of experimental roups namely the Simplified Kundalini yoga with Varma Therapy and Simplified Kundalini yoga without Varma Therapy among diabetes men. The Simplified Kundalini yoga with Varma Therapy was found better in reducing The Blood Sugar (Fasting) and Blood Sugar (Post Prandial) than the Kundalini yoga without Varma Therapy group.

KEYWORDS: Simplified Kundalini yoga, varma therapy, Blood Sugar Fasting, Blood Sugar Post Prandial, diabetes men.

INTRODUCTION

Kundalini Yoga is a systematic and integrated practice for body and mind and its thrust is to make a man creative. The general idea prevailing about Kundalini, in both the East and the West, is of a mysterious and fabulous power lying dormant in men, which, when roused to activity, can confer amazing psychic gifts and transhuman states of consciousness on the successful initiates. The belief is current in India and elsewhere that those, in whom the energy vivifies the seventh centre in the brain, are transmogrified and attain unlimited dominance over the forces of nature. This belief is fostered by the high claims made in the ancient literature on Kundalini-Yoga about the infinite possibilities for the elevation and deification of those who propitiate this divine power. The ascent of Kundalini from Cakra* to Cakra is attended, it is said, with progressively increasing psychic powers until in the seventh centre the mortal becomes one with supreme Reality, or Lord Shiva, the Creator, Preserver, Destroyer of the three worlds. The Yogi, it is averred, gains limited powers of domination over men, fascination for women and sovereignty over the forces of nature.

The Subtle energy that functions in the body is known as varmam. That is, Varmam is the manifestation of the subtle energy of the five elements (Pancha Bootha), Gases, Naadis, Vaasi and Kundalini. Those places where this energy resides and activates both body and life are

3.4.5.-S-X-2018-19

Journal of Xi'an University of Architecture & Technology Issn No : 1006-7930

EFFECT OF YOGIC PRACTICES ON BODY MASS INDEX AMONG OBESE WOMEN

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ABSTRACT

The purpose of the present study was find out the effect of yogic practices on body mass index (BMI) among obese women. To achieve the purpose of the study 30 obese women was selected from various area in Chennai district at randomly. They were in the age group of 35to 45 years. They were randomly divided into two group and each group contains thirty subjects. Group one acted as experimental group I (yogic practices) and group two acted as control group (no training).The following variables on namely on body mass index were selected for the study. They were tested with Weight in Kilogram / Height in meter^2 test respectively. The training period was six weeks. The analysis of covariance (ANACOVA) was used to assess the collected data. From the analysis of data it was proved that there was body mass index was significantly decreased due to 6 weeks yogic practices among obese women.

KEYWORDS: Body Mass Index (BMI), Obese Women, Yogic Practices

INTRODUCTION

The word yoga comes from the Sanskrit root yuj which means to join or attach or union. Yoga is an ancient Indian art of physical and mental disciplines. It is also associated to meditative practices for physical and mental fitness. There are many braches in yoga is also practiced as exercise the defines asana –postures are practiced as forms of exercise. Obesity is excessive body weight. The Imposes strain on the body and various physiological system such as BMI, BP, heart, circulatory and respiratory systems ect. The BMI is a statistical measurement derived from your height and weight. Although considered to be a useful way to estimate healthy body weight . It does not measure percentage of body fat. The BMI measurement can sometimes be misleading - a muscleman may have a high BMI but have much less far than an unfit person whose BMI is lower However In general, the BMI measurement can be a useful indicator the average person.

BMI Table for Adults

This is the World Health Organization's (WHO) recommended body weight based on BMI values for adults. It is used for both men and women, age 18 or older.

Category	BMI range - kg/m^2
Severe Thinness	< 16
Moderate Thinness	16 – 17
Mild Thinness	17 - 18.5
Normal	18.5 – 25
Overweight	25 – 30

3.4.5- J- Y- 2018-19

The International journal of analytical and experimental modal analysis ISSN NO: 0886-9367

EFFECT OF VETHATHRI MAHARISHI SIMPLIFIED PHYSICAL EXERCISES ON SELECTED BIOCHEMICAL VARIABLES AMONG MIDDLE AGED TYPE 2 DIABETIC HOMEMAKERS

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ABSTRACT

The present study was designed to find out the Effect of Vethathiri Maharishi's Simplified Physical Exercises on selected Biochemical Variables among middle aged type2 diabetic homemakers. It was hypothesized that there would be significant differences in Biochemical Variables such as Blood Sugar among type2 diabetic homemakers due to the influences of Practice of Vethathiri Maharishi's Simplified Physical Exercises. To achieve the purpose of the study, 40 Type2 Diabetic Homemakers from Chennai city aged between 35 and 45 years were selected randomly and they were divided into two groups namely experimental and control groups of 20 subjects each. Experimental Group underwent Practice of Vethathiri Maharishi's Simplified Physical Exercises for the period of 12 weeks, six days per week for the maximum of an hou in the morning. The control group was not exposed to any specific training but they participated in the regular activities. The pre-test and post-test were conducted before and after the training for both the groups. The blood sugar were measured by using Blood test. The data pertaining to the variables collected from the two groups before and after the training period were statistically analyzed by using analysis of covariance (ANCOVA) to determine the significant difference and tested at 0.05 level of significance. The results of the study showed that blood sugar reduced significantly as a result of Practice of Vethathiri Maharishi's Simplified Physical Exercises. Hence, the hypothesis was accepted at 0.05 level of confidence. The conclusion is that the practice of Vethathiri Maharishi's Simplified Physical Exercises helped to reduce the blood sugar among type2 diabetic homemakers.

KEYWORDS : Simplified Physical Exercise, Type2 Diabetes.

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3.45.J-X-2018-19

The International journal of analytical and experimental modal analysis ISSN NO: 0886-9367

EFFECT OF SURYANAMASKAR PRACTICES WITH AND WITHOUT PRANAYAMA ON SELECTED COGNITIVE VARIABLES AMONG MIDDLE SCHOOL BOYS

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ABSTRACT

The study was designed to find out the effect of suryanamaskar with and without pranayama practices on selected cognitive variables among school children. It was hypothesized that there would be significant differences in cognitive Variables such as study skill and memory due to the influences of Suryanamaskar with and without Pranayama practices. To achieve the purpose of the study, 45 male children from Chennai city aged between eight and twelve years were selected randomly and they were divided into three groups namely Experimental group I, Experimental group II and control groups of 15 subjects each. Experimental Group I underwent practice of Suryanamaskar only, Experimental Group II underwent practice of Suryanamaskar with Pranayama practices for the period of 12 weeks, six days per week for the maximum of an hour in the morning. The Control group was not exposed to any specific training but they participated in the regular activities. The pre-test and post-test were conducted before and after the training for all the three groups. The data pertaining to the variables collected from the three groups before and after the training period were statistically analyzed by using analysis of covariance (ANCOVA) to determine the significant difference and tested at 0.05 level of confidence. The results of the study showed that the two experimental groups showed significant improvement in study skill and memory due to the practice of Suryanamaskar with Pranayama. Hence, the hypothesis was accepted at 0.05 level of confidence.

Key words; Suryanamaskar, Pranayama

INTRODUCTION

Yoga is a physical, mental and spiritual practice which is originated in ancient India. Many studies have tried to determine the effectiveness of yoga as a complementary intervention for many chronic diseases. The result of these studies suggested that yoga may reduce risk factors and helps to improve physical, physiological and psychological healing process. So yoga can be used as an alternate therapeutic tool for maintaining health, to recover from illness and also for some incurable diseases. Surya Namaskar is also refers to style of "Sun Salutation". Without the Sun there will be no life on the Earth. Surya Namaskar or Sun Salutation is a very ancient technique of paying respect or expressing gratitude to the Sun that is the source of all forms of life on the planet. The solar plexus (located behind the naval, which is the central point of the human body) also known as the second brain, is said to be connected to the Sun. This is the main reason why the ancient rishis recommended the practice of Surya Namaskar. The regular practice of Surya Namaskar enhances the solar plexus which increases one's creativity and intuicitive ability. The twelve steps or postures involved in Surya Namaskar are as follows:

1. Pranamasana (Prayer pose)

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3.4.5 - J - Y - 2018-19

International Journal of Ayurveda and Pharmaceutical Chemistry

e ISSN 2350-0204 www.ijapc.com

Acceptance letter

Manuscript No.: **MNAPC-11-1-31**

Title: **Effect of Yogic Practices and *Panchakarma* Therapy on Clinical Variables among Men with Low Back Pain**

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Dear Author

We are pleased to inform you that the editorial board has accepted your manuscript for publication in the next issue of International Journal of Ayurveda and Pharmaceutical Chemistry, Int J Ayu Pharm Chem **Vol. 11, Issue 1, 2019**.

The next issue will be released on **10th July 2019** please check for the updates on the website for the same.

We thank you for sharing your research work and valuable time with us.

Warm Regards,

Chief Editor

International Journal of Ayurveda and Pharmaceutical Chemistry

e-ISSN 2350-0204

3.4.5-J-Y- 2018-19

CIKITUSI JOURNAL FOR MULTIDISCIPLINARY RESEARCH

An ISO : 7021 - 2008 Certified Journal

ISSN NO: 0975-6876 / web : http://cikitusi.com/ / e-mail : submitcikitusi@gmail.com

Address : # B11 - 157, Katraj-Dehu Road, Pune, Maharastra - 412101

CERTIFICATE OF PUBLICATION

Certificate ID: CJMR/783

This is to certify that the paper entitled

" EFFECT OF YOGIC PRACTICES ON SELECTED OPHTHALMOLOGICAL VARIABLES AMONG SCHOOL BOYS WITH MYOPIA "

Authored by

J.Hari Krishnan

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Tamil Nadu Physical Education and Sports University, Melakottaiyur, Tamil Nadu

Has been published in

CJMR JOURNAL, VOLUME 6, ISSUE 5, MAY - 2019

Dr. K. M. Pandey
Editor-In-Chief
CJMR
www.cikitusi.com

International Organization for Standardization
7021-2008

DOI:16.10089/ CJMR

Registrar
Tamilnadu Physical Education and Sports University
Chennai

UGC Journal. No. 45489 ISSN NO – 2321-5488 Impact Factor – 5.7
Vol: 6 Issue: 12 April 2019
9 - EOI10.11229/researchdirections/April19/09

IMPACT OF YOGIC PRACTICES ON STUDY SKILLS AND STRESS AMONG SCHOOL GIRLS WITH LEARNING DISORDER

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Abstract
The purpose of the study was to find out the impact of yogic practices on study skills and stress among school girls with learning disorder. To achieve the purpose of the study selected 30 school girls randomly from a school at Chennai district. Their age ranged from 10 to 13 years. The subjects were divided into two equal groups namely, experimental group and control group. After analyzing the various factors associated with the presented study, the following variables study skills and stress were selected for study and was measured through questionnaires namely M.Kanchana(1986) and Latha Sathish (1998). The selected subjects underwent eight weeks yogic practices from monday to friday per week. The collected data were analysed statistically by analysis of covariance (ANCOVA) and 0.05 was fixed as the level of significance. From the analysis of data it was proved that there was significant improvement on study skills and stress among school girls with learning disorder due to yogic practices.

Key words: Yogic practices, Learning Disorder, Study Skills, Stress

Yoga

"Yoga is an ancient Indian traditional system of medicine solving body and mind issues, which has no negative side effects. Yoga helps in improving learning skills such as memory, attention, concentration, etc.

Learning Disorder (Learning Disability)

"A learning disability is present when a child does not manifest general mental sub normality, does not show an impairment of visual or auditory functions, is not prevented from pursuing educational tasks by unrelated psychological disorders and none the less, manifests the important impairment in academic results." **(Alan O. *Ross (1977).***

Study Skills

"Study Skills are the strategies that enables student to make the most efficient use of time, resources, and academic potential of the student. Developing and improving the study skills can help, to make more efficient use of the study time get more work done in the lesser time. To make our learning easier, and help retain what student have learned for longer life. To feel the work and efforts involved effectively and efficiently". **Rita o Donoghue (2006)**

2.4.5-J-Y- 2018-19

International Journal of Computational Research and Development (IJCRD)
Impact Factor: 5.015, ISSN (Online): 2456 - 3137
(www.dvpublication.com) Volume 3, Issue 1, 2018

EFFICACY OF VINYASA YOGA WITH AND WITHOUT MANTRA CHANTING ON SELECTED CEREBRO MUSCULAR VARIABLES AMONG CHILDREN WITH CEREBRAL PALSY

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Cite This Article: Dr. S. Selvalakshmi & K. Subbulakshmi, "Efficacy of Vinyasa Yoga with and Without Mantra Chanting on Selected Cerebro Muscular Variables Among Children with Cerebral Palsy", International Journal of Computational Research and Development, Volume 3, Issue 1, Page Number 9-12, 2018.

Abstract:

The study was designed to find out the Efficacy of Vinyasa yoga with and without Mantra chanting on selected cerebro muscular variables among cerebral palsy affected children. It was hypothesized that there would be significant differences in cerebro muscular variables such as visual perception and proprioception due to the influences of Vinyasa yoga with and without Mantra chanting. To achieve the purpose of the study, 45 male children with cerebral palsy from Chennai city aged between 8 and 12 years were selected randomly and they were divided into three groups namely Experimental group I, Experimental group II and control groups of 15 subjects each. Experimental Group I underwent practice of Vinyasa yoga with mantra chanting, Experimental Group II underwent practice of Vinyasa yoga without Mantra chanting for the period of 22 weeks, five days per week for the maximum of an hour in the morning. The Control group was not exposed to any specific training but they participated in the regular activities. The pre-test and post-test were conducted before and after the training for all the three groups. The cerebro muscular variables visual perception and proprioception were assessed by the Eye hand coordination and hot cold temperature tests respectively. The data pertaining to the variables collected from the three groups before and after the training period were statistically analyzed by using analysis of covariance (ANCOVA) to determine the significant difference and tested at 0.05 level of confidence. The results of the study proved that the two experimental groups had significant improvement in visual perception and proprioception due to the influence of Vinyasa yoga practice with and without Mantra chanting than control group. Among the experimental groups Vinyasa yoga with mantra chanting had better significant improvement than Vinyasa yoga without mantra chanting.

Key Words: Cerebral palsy, Vinyasa Yoga, Mantra Chanting, Visual perception, Proprioception

Introduction:

Cerebral Palsy: The word "Cerebral refers to the brains cerebrum which is the part of the brain that regulates motor function."PALSY' describes a paralyses of voluntary movement in certain body parts. Cerebral Palsy refers to a group of Neurological disorder that appear in infancy or yearly childhood and permanently affect body movement and muscle co-ordination. The term cerebral refers to brain and palsy refers to the impairment or loss of motor function A study by the centres for the disease control &prevention shows the average prevalence the cerebral palsy is 3.3 children /1000 life berth..

Vinyasa Yoga: The word "vinyasa" can be translated as "arranging something in a special way" like yoga poses for example. Vinyasa is also the term used to describe a specific sequence of poses. Vinyasa is a Sanskrit term often employed in relation to certain styles of yoga that usually refers transition between two different positions. Nyasa—denotes to place and Vi -denotes in a special way. The main concept of vinyasa is originated from the basic sequences of Sri Krishnamacharya (1888- 1989). Yoga poses elaborately explained and enlightened by Srivatsa Ramaswami who is the disciple of Sri Krishnamacharya. According to Srivatsa Ramaswami the Sanskrit word Vinyasa comes from a prefix "Vi" which means variations, and a suffix "Nyasa" which means "within prescribed parameters".

Mantra Chanting: Mantras are sacred sound syllables from the vedic tradition. For thousands of years they have been refined to impart healing powers for spiritual development and total rejuvenation of mind and body. The mantras are energy based sounds and thought based waves. Likened to flames of fire they energies PRANA the life force and eventually quieten the mind. Mantras are means of purifying the mind .Each Mantra is a store house of infinite devine power and all mantras are equally powerful. Mantras also work according to one's karma and positive and negative energy that were accumulated. Repetition of Mantras set up vibrations that activate the chakras whereby there is an even flow of beneficial energy in the body. Mantras can be used in Single or in combination with others for the healing process.

Visual Perception: It is the ability to interpret the surrounding environment by processing information that is contained in visible light. The resulting perception is also known as eyesight, sight or vision. (Kathleen M. Galotti 2008)

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INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH VOLUME 8, ISSUE 12, DECEMBER 2019 ISSN 2277-8616

Core Stability Training On Muscular Endurance Among Novice Badminton Players

Dr.S.Sivamani, Dr. S.Thirumalai Kumar, Dr.S. Manikandan, & Dr.A. Manoj Kumar.

Abstract: Core stability training is a structure of training to increase an endurance and neuromuscular control. Its role to improving the fitness level of strengthening body core muscles as well as core stability training on muscular endurance among novice badminton players. The current research report was to discover Core-stability training on Muscular Endurance among novice badminton players. Thirty badminton men players were selected from Adukalam Badminton Academic, Pondicherry and the participant level age categories in between 17 to 22 years. The total numbers of participant 30 numbers were categorized into two groups and were erratically assigned as Experimental and Control group. The Experimental group undergone Muscular-endurance training programme and Control group doesn't involves any sort of training programme. Muscular endurance was assessed by push-ups. The data was collected the fore and after eight weeks of training programme. Further this result reveals there is no significance were found and increased in the core stability Muscular-endurance was analysis for control group in the present study.

Index Terms : Badminton, Core stability training, Fatigue, Injury prevention, Muscular Endurance, Novice, Skeletal structure.

1. INTRODUCTION

Core-stability describes the position and locomotion of the upper limbs of the body and its potential to control the muscles. This involved muscles deep within the skeletal muscles which connect part of upper limbs into the deltoid muscle, Pectoralis major and minor, Triceps, the Ulnar Muscles, Serratus Anterior, Abdominal Muscles, Coracobrachialls and Traperius. It assist in the maintenance of good posture provide the foundation for arm and shoulder power. A multi-dimensional training programmed done on a unique to enhance human performance and function strength and power [7]. Core stability main function is to maintain good physic then support to protect the rib cage, shoulder and skeletal structure from extreme ranges of movement and from the excessive or shoulder power acting on the body [1]. "Core training as any training focused at the upper part of the body." The muscles ability to continue to perform without fatigue its called Muscular endurance [2]. Core stability training is an essential component of sports performance and plays a key role in injury prevention [4]. The primary function of body core muscles is to stabilize the upper part of the body, thereby providing a strong foundation for movements of arms and shoulder [9]. For Novice Badminton players fitness become an important factor in deciding to compete in major competition. Expert performer process information at a deeper, more tactical level, while novice performer process events in the environmental or surface features of a games situation.

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The performers have specialized search and retrieval abilities from game situations and long-term memories, while novice performers do not have these abilities or the game experiences to draw from in their long-term memories. The performers will have high success at performing skills correctly during games, perform effortlessly and more automatically, show greater consistency and adaptability in performing movement patterns and better at monitoring their own performance as well as detecting and correcting errors [6]. A player must to hold endurance is important because badminton matches last between 30 and 90 minutes, which 30 percent to 45 percent of the total time on court is actual competition [10]. Power and Strength is also an important factor in badminton even though the rackets weight less than 4 ounces. In addition, shoulder and leg strength is important for lunging to the net and jumping backward in the court to hi clear and smashes powerful. Players who are in excellent physical condition develop confidence and feel comfortable playing long rallies and smash that require a great deal of running, jumping and lunging [3].

2. MATERIALS AND METHODOLOGY

2.1 Participants

The study was conducted on 17 to 21 years age ranged thirty novice's badminton players from Adukalam Badminton Academic, Pondicherry. They randomly assigned into two groups. Experimental group of 15 Numbers and another group as control group 15 Numbers. They followed an incessant whole body / top to bottom training program that involved training all major muscle group alternative days per week using training for 8 weeks.

2.2 Procedures

Prior to workout, subjects performed a standardized series of stretching and flexibility exercises. To minimize risk injury, a 10-15 minutes warm-up and warm down schedule was followed before and after exercises. Subjects engaged in a supervised, core stability training program for 45 minutes alternative days in a week. The subject's muscular endurance was assessed by push-ups before and after the eight week training programme. The core stability training group shown experienced a significantly greater

improvement muscular endurance then control group. Further the result shows significance difference between the groups in Muscular-endurance among novice badminton players.

3. Statistical analysis

SPSS 20.0 programme was used in the analysis of the data obtained through the research. 't' test was applied to determine significant within and between group differences. Significance levels was pointed a $p<0.05$.

3.1 Results

Investigation from this study of Mean values and Standard deviation, 't' value of in muscular endurance values took place before and after the experimental and control groups values are presented in table - I.

Table – I

	Group	Mean	S.D	't' Ratio
Muscular Endurance	Experimental	35.61	0.954	12.08*
	Control	29.85	2.251	

*Level of significant at 0.05 level. (Table value 2.92)

It is evident from Table – I, that the calculated't' value 12.08 is higher than the table 2.I2 at 0.05 level of significance. Hence the stated hypothesis is accepted. The muscular endurance mean scores of experimental group (M=35.61) had better when compared with control group (M=29.85)

There is inferred that a major deviation in Muscular-endurance amongst Experimental group and Control group. The Muscular-endurance scores between Experimental group and Control group are represented using graphical presentation in Figure. I

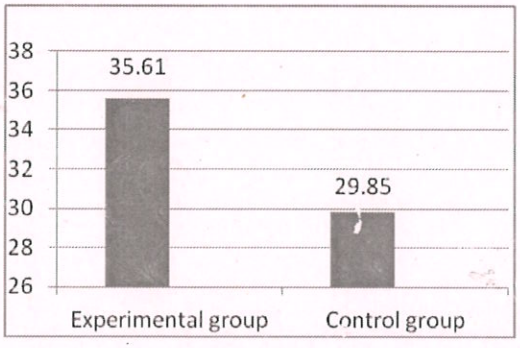

Figure – I

Graphical bar diagram shows mean scores value (Muscular Endurance)

4. DISCUSSION

The objectives the research analysis was to figure out the Core-stability training programme on muscular endurance ended eight weeks in order to improve the core Muscle-endurance capacity of novice Badminton players. The current results show that eight of core stability training has significant improvements in Muscular-endurance pushups tested. Hence, no significance were found and increased in the core Muscular-endurance was analysis for control group in the present study.

5. CONCLUSION AND RECOMMENDATION

Due to 8 weeks training programme the muscular endurance among the novice badminton players as improved significantly based on the improvement the shoulder and arm power further recommended further research for using core stability training programme in various surface. Also this research recommended major games like basketball, football, hockey, kabaddi, handball and tennis. The coaches can include the same set of training as part their training schedule to develop.

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3.4.5 Journal Scopus Dr. STK Dec. 2019

INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH VOLUME 8, ISSUE 12, DECEMBER 2019 ISSN 2277-8616

An Eight Weeks Soccer Training Programme On Sprint

Dr. A. Manoj Kumar, Dr. S. Thirumalai Kumar, Dr. S. Manikandan & Dr. S. Sivamani

Abstract: Soccer is the most popular sports all time, which was played all over the world by all age group. Elders using their experience and become a coach or a manager. Youngsters become a professional soccer player once they achieve their peak level. Players need to perform well by using Speed in form sprint with or without ball. Hence, this study investigates the sprint performance in soccer due to eight weeks of soccer training programme. For which the researcher selected Twenty U-20 male soccer players from Bimbo Soccer Club, Nagercoil playing 2nd division League took part in this programme, they were informed at the being of the programme about the benefits and the encouragements in their participation. The players were matched in to two groups: Training group and Control Group. The study protocol taken place in the SMRV Higher Secondary School Soccer Ground under the guidance of the three Soccer Experts. Players were filled consent form prior to this research. All Players were performed Speed Test 50 Mtrs dash Standardized Test before and after the stipulated training programme. Players were familiar with the test and even though they were familiar they performed under the supervision of the Soccer Experts. 'T' Test was used to find out the outcome of this training programme. After the statistical treatment it was observed that the eight weeks training programme outshined the sprinting performance in soccer players compare to control group.

IndexTerms: Intensity, Soccer, Soccer Club, Speed, Sprint, Statistical treatment, Training Protocol.

1. INTRODUCTION

The development of soccer players both technically and physically depends on the gradual improvement in basic abilities related to commitment in competition experiences and other related soccer training protocols. [4] The Soccer Training programmes usually consists of Warm Up, Specific Conditioning with ball and without ball, sprinting and jumping. Developing these attributes will be a very big confront in soccer, [2] Further, it is declared that soccer training protocol in peak area obtain rational developments to the players on experiential traditional strength training. Soccer involves many repeated high intensity efforts. One method to train this ability is to perform repeated sprint training, in which short sprints are conducted with a defined rest period. [1]

Numerous studies stated that Sprint is one of the most essential parts in soccer with or without ball. Many soccer related activities and training exercises (shooting & passing) involve short, fast efforts. To be effective, these should involve bouts of less than 10 seconds and have a work to rest ration of 1:2 to 1:5. Training of this type has been shown to improve speed and minimize fatigue between repeated rapid bouts, providing a crossover to some of the aerobic adaptations [3]. Sprint is key component in the modern game. Components of speed can be broken down into acceleration, maximum speed and agility. Small sided games stress agility: therefore, sprint training will concentrate on developing basic linear speed, using maximum sprints and overload, or over-speed training. [5]

Hence, the main reason of this research was to identify the sprint performance in soccer among soccer players after performing eight week training programme. Planning Soccer training programme for soccer players should be divided in to three stages: Transition, Preparation and In Season. Each of these has Specific goals and requires different levels of training variation. [3].

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- *Dr, S. Sivamani, Assistant Director, Department of Physical Education, AMET University, Chennai*

2. METHODS

2.1 SUBJECTS

Twenty U-20 male soccer players from Bimbo Soccer Club, Nagercoil playing 2nd division League took part in this programme, they were informed at the being of the programme about the benefits and the encouragements in their participation.

The players were matched in to two groups: Training group and Control Group. The study protocol taken place in SMRV Higher Secondary School Soccer Ground, Nagercoil under the guidance of the three Soccer Experts.

2.2 STUDY DESIGN

In this research two groups namely Experiment and Control Group were divided equally consist of 10 players each. The duration of this study last up to eight weeks both morning and evening except Sunday. (Rest Day)

All Players were performed Speed Test 50 Mtrs dash Standardized Test before and after the stipulated training programme. Players were familiar with the test and even though they were familiar they performed under the supervision of the Soccer Experts.

2.3 TRAINING PROGRAMME OF EIGHT WEEKS

Outline of Training Programme over an Eight Weeks Period

Table:1

I, II and III Week	IV, V & VI Week	VII & VIII Week
Warming Up		
General Endurance 7 v 7 to 10 v 10	Specific Endurance 3 v 3 to 6 v 6	Specific Endurance 1 v 1 & 2 v 2
Sprint 40 % Intensity (25 Mtrs, 50 Mtrs)	Sprint 30 % Intensity (50 Mtrs & 75	Sprint 10 % Intensity (75 Mtrs, 100

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	Mtrs)	Mtrs)
Normal 11 v 11 Game for 45 Minutes		
Cool Down		

The Prescribed Training programme in Table:1 was followed by all the players in Experimental Group. After the training programme was concluded the Speed was conducted and taken for Statistical analysis.

3. STATISTICAL TREATMENT

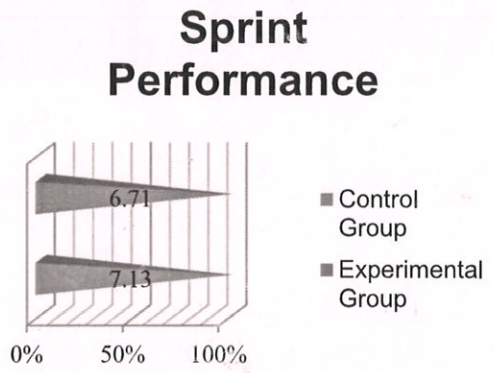
To analysis the obtained score SPSS.17.0 IBM Software was used. The mean score of Sprint Performance was given in Table- 2

Table-2

	Groups	Mean Score	SD	S. Error	't' Value	'P' Value
Sprint Performance	Experimental Group	6.71	0.933	0.528	10.22*	0.000
	Control Group	7.13	1.222	0.735		

* Significant at 0.05 level.

It was marked from the Table 2 that the calculated 't' value 10.22 is higher than the table value 2.48 at 0.05 level of significance. Further the Sprint Performance scores in Experimental Group (6.71) was much better that the Control Group (7.13).



Mean Scores on Sprint Performance

4. DISCUSSION

This study investigated the sprint performance of soccer players by training eight weeks soccer training programme. Due to the Eight Weeks Soccer Training Programme the sprint performance in soccer players significantly improved compare to control group.

5. CONCLUSION AND RECOMMENDATION

It was concluded that due to the eight weeks training programme the sprinting performance in soccer players got outshined compare to control group. This training programme involves numerous soccer drills and Speed related training with different intensity. This helps the soccer players to develop large number in sprinting performance with and without ball. Coaches and Managers in Soccer field maximize the Sprint performance often in their particular training programme to enhance and to motivate the players performance in Competition period. Further it was recommended that this kind of soccer training programme helped the players as well as the Managers.

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3.4.5.-J - ST- 2018-19

International Journal of Mechanical Engineering and Technology (IJMET)
Volume 10, Issue 06, June 2019, pp. 241-247. Article ID: IJMET_10_06_019
Available online at http://www.iaeme.com/ijmet/issues.asp?JType=IJMET&VType=10&IType=6
ISSN Print: 0976-6340 and ISSN Online: 0976-6359

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WEAR STUDIES ON THE HEAT TREATED AL6061-μSIC AND AL6061-NSIC METAL MATRIX COMPOSITES

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ABSTRACT

Metal matrix composites (MMCs) have a potential for enhanced wear conflict in excess of the unreinforced aluminum alloy and are the most capable in achieving enhanced mechanical properties. In the present investigation, composites of Aluminum 6061(Al6061) matrix material is reinforced with micron size Silicon carbide (μSiC) reinforcement with 5, 10 and 15 weight percentages (wt.%) and nano size SiC (nSiC) with 0.5, 1.0 and 1.5 wt.% are fabricated by stir casting technique. The stir casted composites are further heat treated and the specimens are prepared as per ASTM standards to conduct hardness and wear tests. The fabricated and heat treated nano composites showed enhancement in hardness and wear resistance more than the micro composites. The microstructure of the worn out specimen are examined by scanning electron microscope. Taking into contemplation all the factors, it can be concluded that aluminum based composite with 1.0% by weight nano SiC reinforcement acquire superior wear resistance properties as compared to micro SiC reinforced aluminum metal matrix composites.

Keywords: Aluminum Metal Matrix Composites, μSiC, nSiC, Stir casting, Wear test, Hardness.

Cite this Article K.R.Padmavathi and R. Ramakrishnan, Wear Studies on the Heat Treated Al6061-μsic And Al6061-Nsic Metal Matrix Composites, International Journal of Mechanical Engineering and Technology, 10(6), 2019, pp. 241-247.
http://www.iaeme.com/IJMET/issues.asp?JType=IJMET&VType=10&IType=5

1. INTRODUCTION

Metal matrix composites have a possibility for augmented wear resistance above the unreinforced alloy and are the leading, shows potential in achieving increased mechanical properties [1]. Metal matrix composite are promising new materials for current engineering application having high specific strength, stiffness and their high temperature stability and

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ISSN 2231-3265
(Online and Print)

International Journal of Health, Physical Education & Computer Science in Sports

A Peer Reviewed (Refereed) International Research Journal

Volume - 32 No. 1
QUARTERLY
October 2018 to December 2018

Published by :
Indian Federation of Computer Science in Sports
www.ijhpecss.org & www.ifcss.in

Publication Impact Factor I2OR 4.005
ISRA Journal Impact Factor 5.115
Index Journal of

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3.4.5 PE - J 2018-19

JOURNAL OF PHYSICAL EDUCATION SPORTS AND ALLIED DISCIPLINES

JPESAD

Vol. 9 No. 1 & 2 Jan – July 2018 Peer Reviewed ISSN: 0974-343X
(2 Issues Combined)



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3.4.5. Dr. Ramakrishnan
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A Novel Approach to Monitor and Maintain Database About Physiological Parameters of (Javelin) Athletes Using Internet of Things (IoT)

G. Elumalai & R. Ramakrishnan

Wireless Personal Communications
An International Journal

ISSN 0929-6212

Wireless Pers Commun
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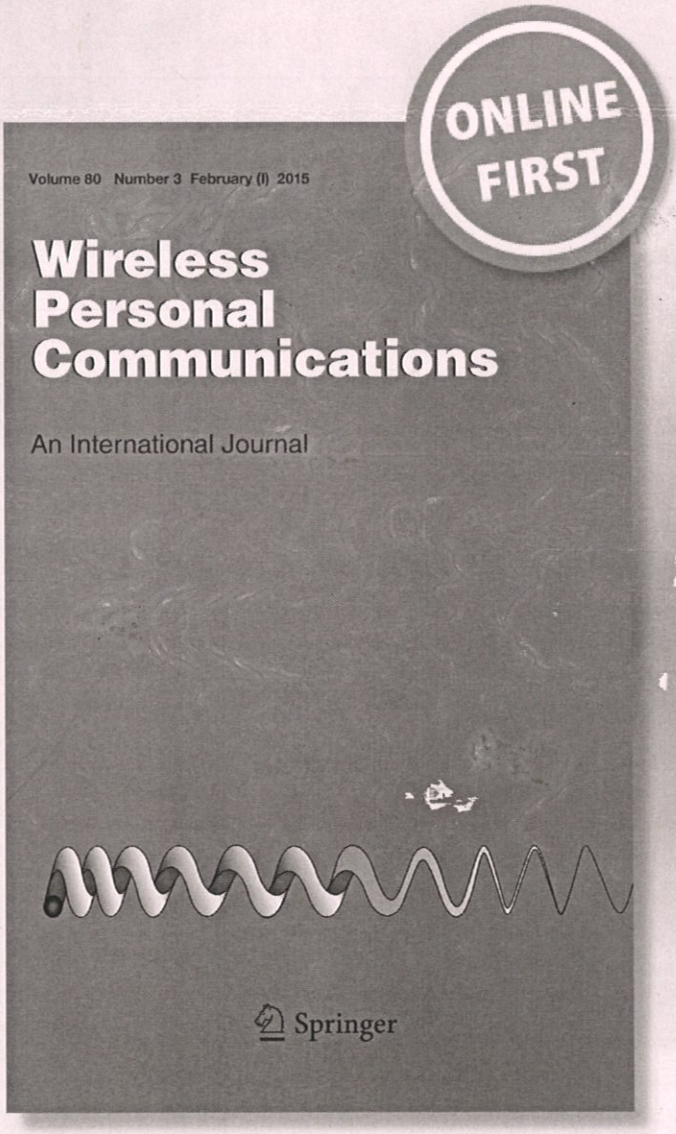

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A Novel Approach to Monitor and Maintain Database About Physiological Parameters of (Javelin) Athletes Using Internet of Things (IoT)

G. Elumalai[1] · R. Ramakrishnan[1]

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Abstract
Real time monitoring of physiological parameters is very important to safeguard Athlete's life time from severe life-threatening diseases and injuries during training and competitions. Now a day, sensors play a pivotal role in sports for online monitoring of physiological and movement parameters. To improve the performance of athletes, continuous monitoring of physiological parameters and providing feedback are more important. This study mainly concentrates on javelin throw, which is one of the track and field events. Due to poor training and lack of best coaches, javelin athletes do not shine in the Olympics. Javelin athletes have to balance both physiological and movement parameters to achieve maximum distance while throwing the javelin. We design a hardware using sensors and Arduino controller to monitor physiological parameters such as blood pressure, heart rate and electrocardiogram. Using SQL database and internet of things the measured parameters are stored in web server for further analysis and providing feedback to athletes. The aim of this study is to bridge the gap between Engineering and sports technology and provide a collaborative platform for the sharing of knowledge, so that both Coaches and athletes can get the benefited.

Keywords Sensors · Arduino · Node MCU · Physical parameters · Javelin athletes · SQL database · IoT · ROSOTO

1 Introduction

In the past few decades, wireless sensor network (WSN) has been very popular in various fields such as health care, smart agriculture, weather forecasting, real-time athletes monitoring etc. For smart work and also for corrective measure, Sensor network has recently attracted a lot in sports for online monitoring of athletes and providing

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Published online: 29 October 2019

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feedback for continuous improvement in performance while training due to constant miniaturization of electrical devices [1, 2]. A tremendous research has been done in the wireless sensor network and is used in many areas from military to Sport (Fig. 1).

Ancient Greece developed javelin throw event which was inspired by hunting and war. The javelin throw is one of the popular track and field events; javelin spear about 2.5 m (8 ft 2 inches) length is thrown. The javelin throwing is an event of both the men's decathlon and the women's heptathlon. The size, shape, minimum weight and center of gravity of the javelin are all different based on age and gender. To achieve maximum distance in the javelin throw, the athlete will have to balance psychological, physiological [3] and inertial (or) movement Parameters. To improve the performance training is the greatest need for athletes. More training is not enough for improving the performance of the athletes if they are not given feedback on which aspect they are lagging.

In psychology, the stress of cut-throat competitions can cause athletes to react both physically and mentally in a manner that can negatively affect their performance abilities. They may become tense, they break into a cold sweat, their heart rates race and they worry about the outcome of the competition and find it hard to concentrate on the task at hand. In most of the sports events, concentration, confidence, control, and commitment are generally considered the main mental qualities to achieve success. These four parameters are called simply 4c's required for better performance of athletes.

The 4c's are:

Concentration: to be able to maintain focus.
Confidence: to believe in one's abilities.
Control: to be able to maintain emotional control regardless of distraction.
Commitment: to be able to continue working in agreed goals.

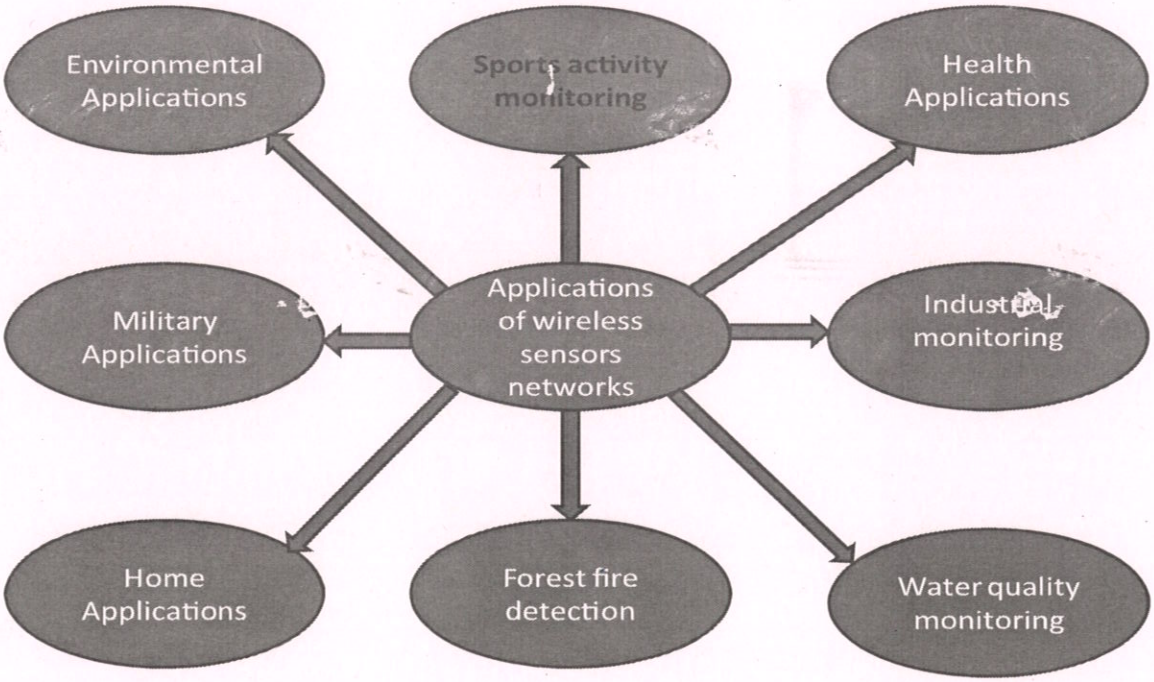

Fig. 1 Applications of wireless sensor network

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The psychology is another weapon in the athlete's armory in gaining the winning edge. As regards movement parameters, to achieve the maximum distance of throw, the following Biomechanical parameters [4] are required:

The angle of releasing javelin.
The height of releasing javelin.
The speed of releasing javelin.

The optimum release angle for a world-class javelin thrower may be $33° \pm 7°$ [5], the parameter that has the greatest effect on the potential distance is the speed of release of the javelin. In physiology, the biological parameters such as heart rate, blood pressure, body temperature and electro cardio gram (ECG) also affect the performance of the athletes while in action. Among these three parameters, heart rate and blood pressure cause the greatest effect on performance. This study mainly focuses on the physiological parameters and also providing feedback to the athlete concerned based on only heart rate and blood pressure, because ECG indirectly reveals the heart rate. In PQRS complex of ECG, the time between R–R is similar to heart rate pulse per minute. This study proposes a monitoring system with Arduino microcontroller through which the physiological parameters are acquired and analyzed. NodeMCU with Wi-Fi facility is used for communication [5, 6].

The package of SIP Event and Key Press Markup Language (KPML) by using the several internet control protocols are proposed in [7]. These are employed for remotely controlling appliances or devices in the home location. This method reduces the necessity of additional hardware for controlling machines. KPML offers a proficient, consistent protocol for the monitoring of consumer devices remotely by using several internet protocols. In [8], the law of aerodynamics is strictly followed for javelin flight, even though due to some factors involved to mislead the javelin while throw. Les Hatton in 2007, describes a freely downloadable accurate view of the physics and dynamics of javelin flight. He design a mathematical model and states about how throwing parameters can be optimized for a given conditioning of wind direction and force.

2 Proposed System

The proposed system consists of three stages: Hardware development, WebApp development, and Mobile App development. Blood pressure, Heart rate, and ECG sensors are used for monitoring physiological parameters of athletes. The sensors are placed on the athlete's body that measure BP, Heart rate, and ECG. They receive data from the athletes, and feed them into (input) the micrc controller and everything is displayed in the LCD monitor. The displayed data are transmitted to the cloud server through the internet providing module (Wi-Fi module) for further analysis and providing feedback to athletes and coaches through mobile App [9]. Figure 2 shows the basic block diagram of the proposed system.

2.1 Hardware Development

1. Sensors
2. Arduino Uno
3. Node MCU
4. RFID card reader

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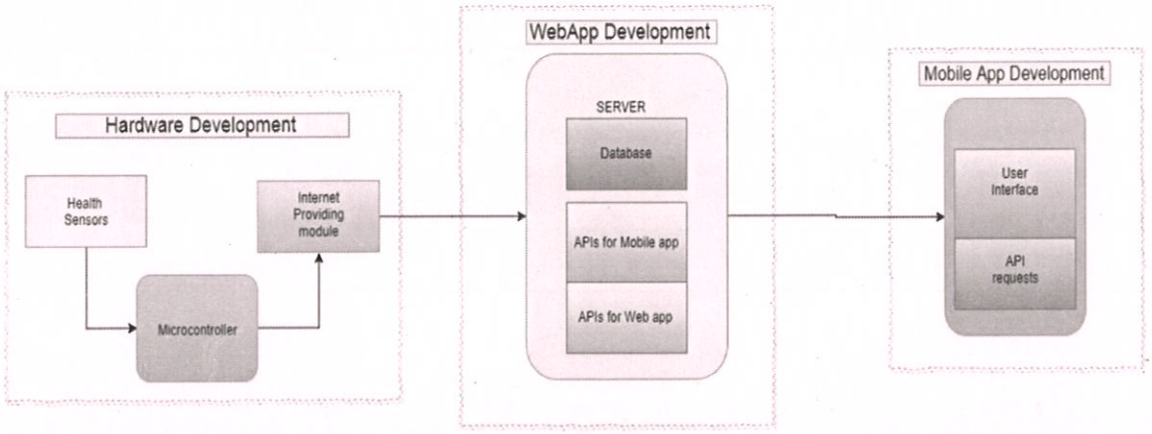

Fig. 2 Block diagram of the proposed system

5. LCD display

The prototype of the proposed system shown in Fig. 3. In this prototype, AD8232 sensor is used to measure ECG and CK200 sensor is used to measure both blood pressure and heart rate. Arduino Uno microcontroller is used to receive the physiological signals from the sensors' output and communicate the data to the cloud through the Wi-Fi device [10] which is Node MCU. The communication protocol used here is UART with Baud rate 9600.

2.2 Web App Development

Real-time Sports Training (ROSOTO) is the system which has both web server and mobile App for monitoring and maintaining database of physiological parameters for javelin throw athletes.

The SQL Data base is used for managing data held in a relational database management system. The data received from the sensor [11] is stored in the data base for further analysis and also for providing feedback to the player concerned through his or her corresponding e-mail id of the athlete or player. From the data base the coach receives the entire real-time data of the player anywhere in the world through web server by logging in using the email id and makes a decision about his or her trainees (player). Similarly, the player also receives his or her physiological data through web server by logging in using the e-mail id. Feedback is thus provided to the players concerned through the mail facility for improving his or her performance in future. Web address to access ROSOTO system is https://rosoto.000webhostapp.com (Fig. 4).

2.3 Mobile App Development

In the ROSOTO system, both the coach and the player are having separate Mobile APP (Fig. 5) for login with individual email id and see the real-time data. Each and every player

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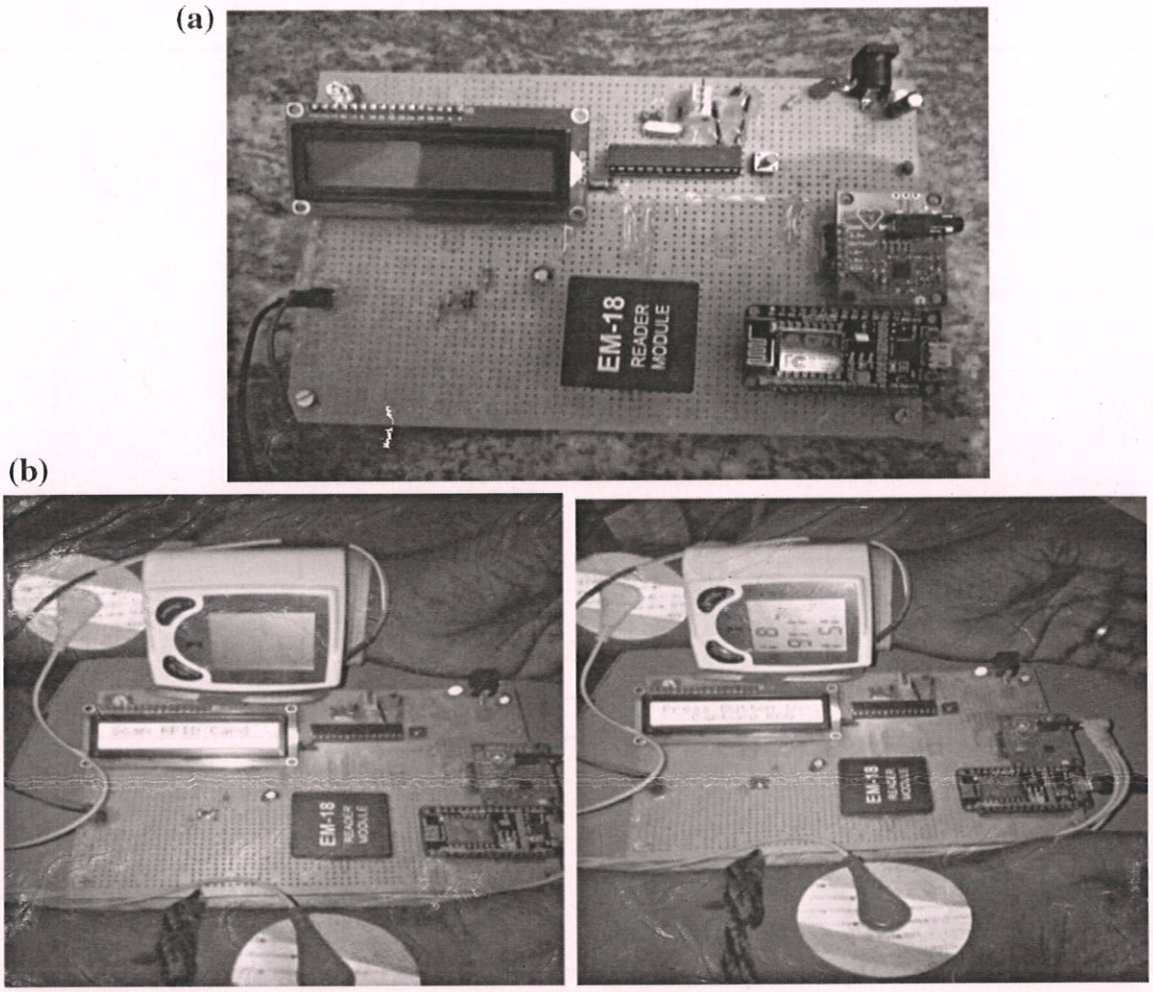

Fig. 3 **a**, **b** Hardware set-up for ROSOTO system

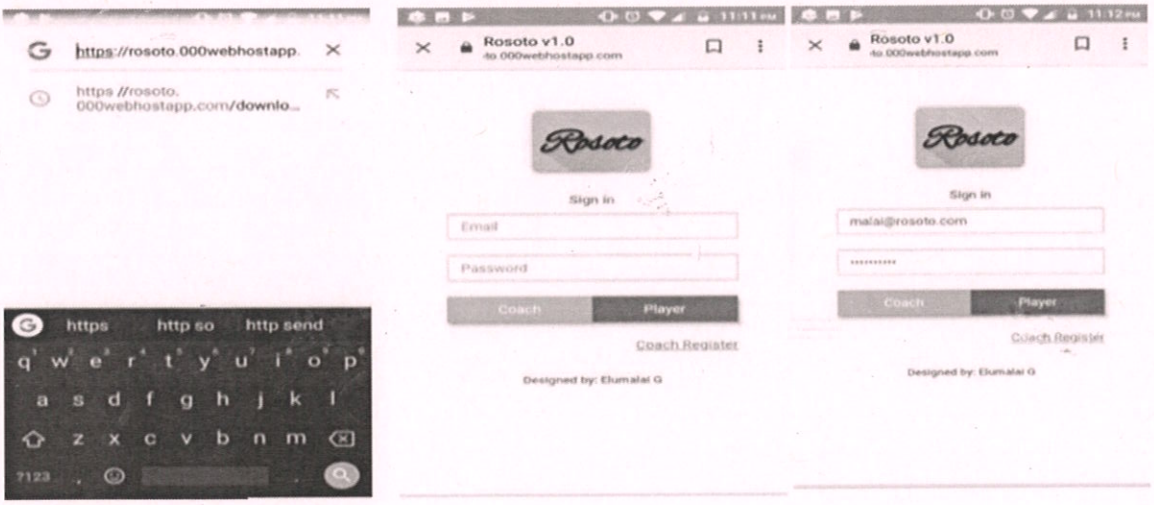

Fig. 4 Web server page for coach and player login

has the separate rosoto code. If a player wants to change the coach for better training, then they can do so by using the rosoto code and the player is linked with another coach with all their previous data without any loss of information. For Coach App both register and Sign in option are available but for player only sign in option is available.

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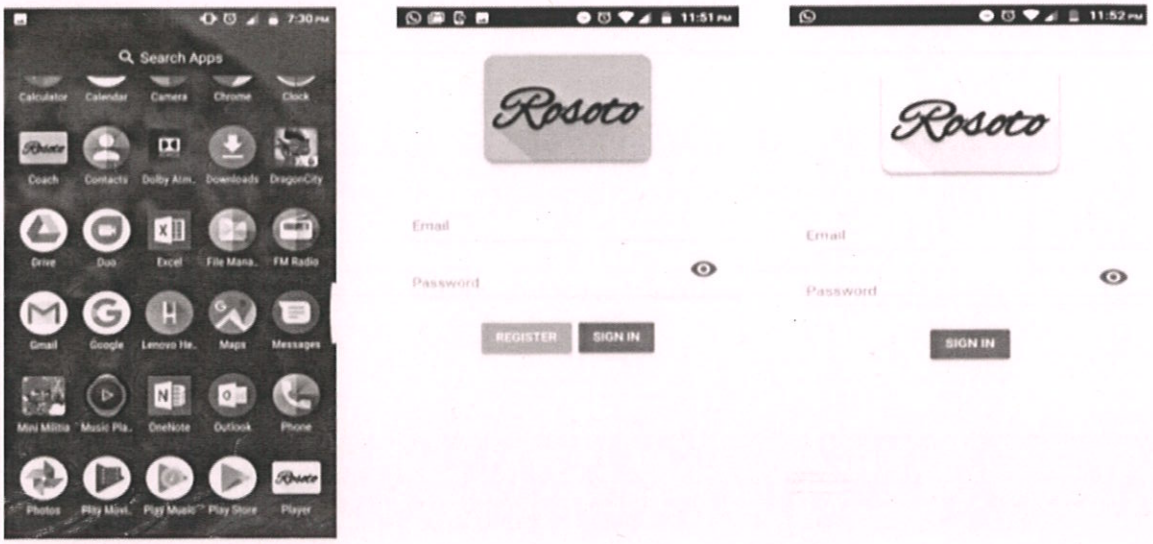

Fig. 5 Mobile app for coach and player login

2.4 Data Flow Graph

Initially, the Coach will log in and register his or her profile first and then he or she will add the profile about each and every player in his or her database. For each player profile requires name, e-mail id, date of birth, age, player level, height, weight, RFID, and photo. Players are sensed by RFID and then the hardware is ready for receiving physical data from athlete's body through sensors. The sensed data are sent to cloud through Wi-Fi router [7]. Here Node MCU is used for Wi-Fi communication. Once the data are stored and compared with the threshold values, feedback is given to the corresponding players through emails. The player can see the present values through the mail and if the player wants to see all the previous data for improving the performance, then they have to login through mobile App or through a web server. Figure 6 shows the entire data flow process form athletes to the cloud and how the data are accessed both by the coach and the player.

2.5 Flowchart

Initially, once the power supply is switched ON, then LCD displays the message as "ROSOTO welcomes you" and then scans RFID (Fig. 7). It states that the hardware is ready for measuring the data.

First, the player shows his or her RFID towards card reader EM-18. The range of card reader is 5 cm to 10 cm and it reads the card number and verifies with data base; if the card is matched, it shows the message "Card holder name"; otherwise Unknown RFID. It shows that the Wi-Fi is connected with cloud. Next, it shows the message

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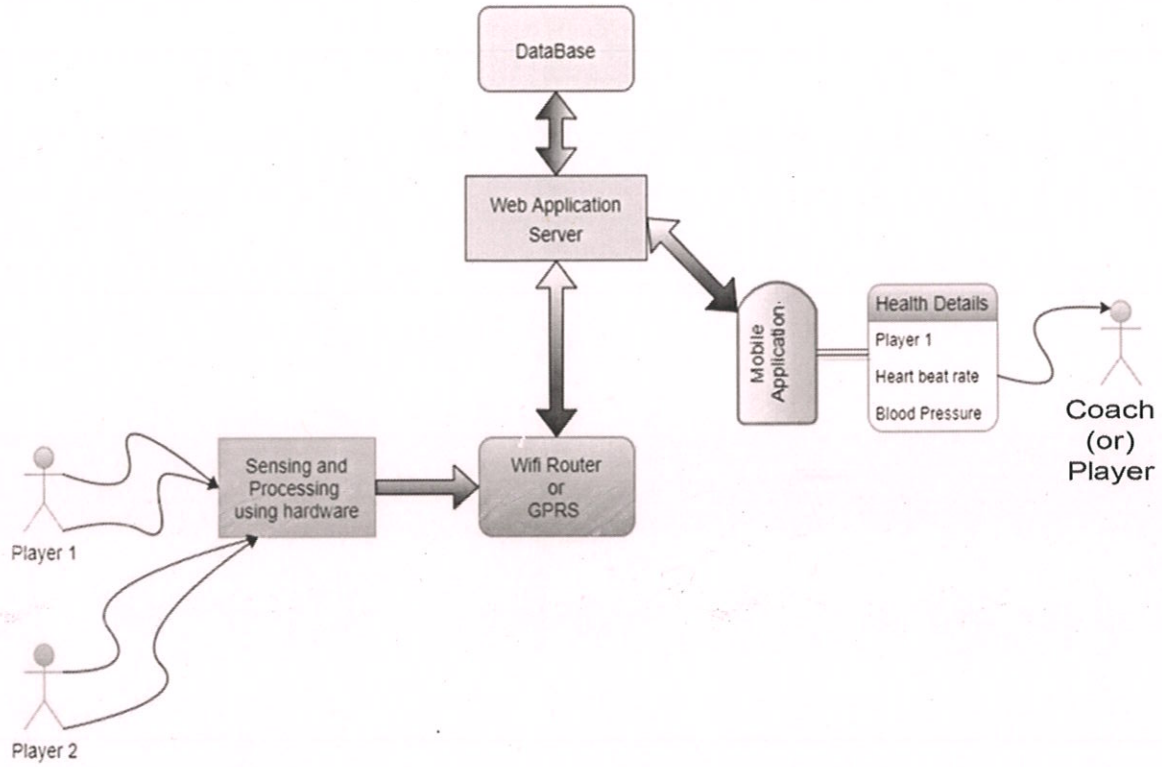

Fig. 6 Data flow graph

"PRESS BUTTON TO CAPTURE BP"; then the BP sensor is switched on; the values are measured and the display device with the sensor shows the BP, i.e., diastolic and systolic pressure values in the LCD monitor. If it is ok, the press button is pressed to upload the data. Now the hardware shows the message "PRESS BUTTON TO CAPTURE ECG". Once the ECG data is captured then it shows upload data. Once the data are successfully uploaded, the display shows "Scan RFID card" it is ready for next measurement. In the same way, each and every athlete or player checks his or her physiological parameter status during the training period.

3 Result and Discussion

To improve the performance of athletes, each and every day monitoring of physiological parameters of athletes before going to training is very important. The sensors are connected to athlete's hand in the appropriate places. Physiological data are received from the sensors and are uploaded to cloud server through Wi-Fi communication. The sensed data are compared with stored (reference) values by Machine learning algorithm which is written in the cloud

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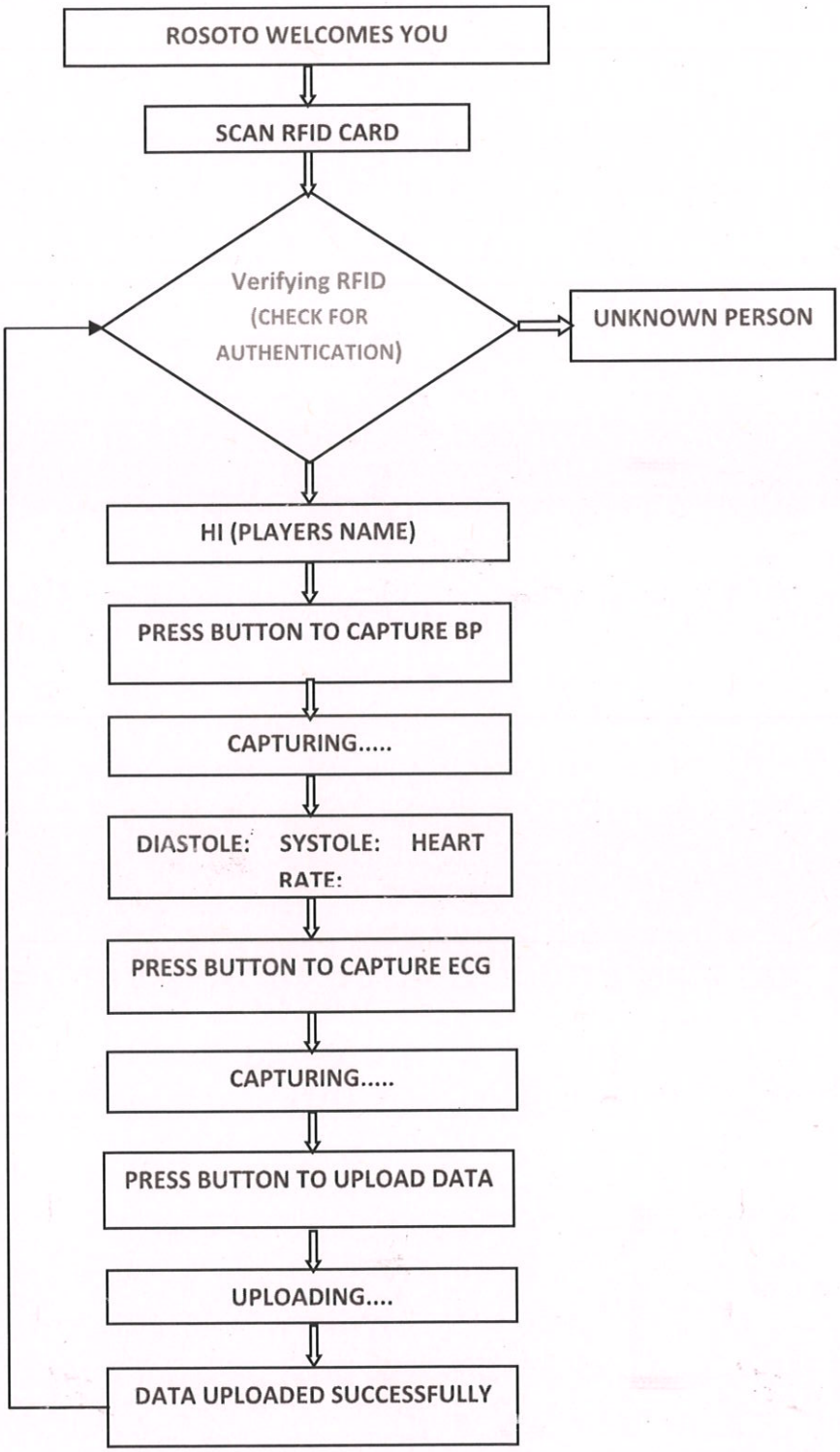

Fig. 7 Flow chart showing the entire operation of hardware

and feedback is provided to the athletes (players) through their mail for improving the performance in future (Figs. 8, 9, 10, 11).

If the Coach needs to analyze the improvement in players, he or she may login through either web server or mobile App and in the same way; player may analyze the performance

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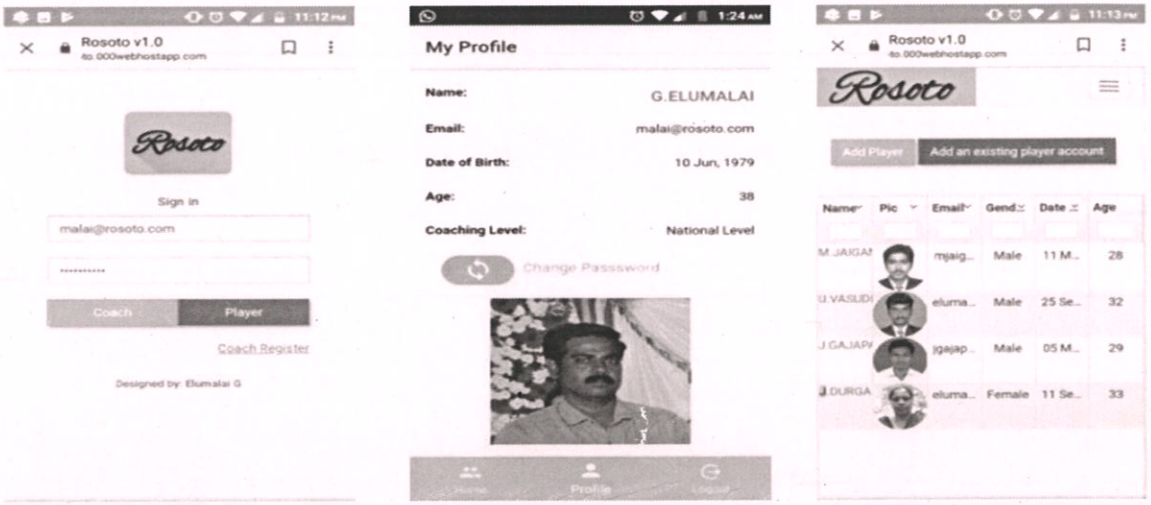

Fig. 8 Coach login page, coach profile and coach database

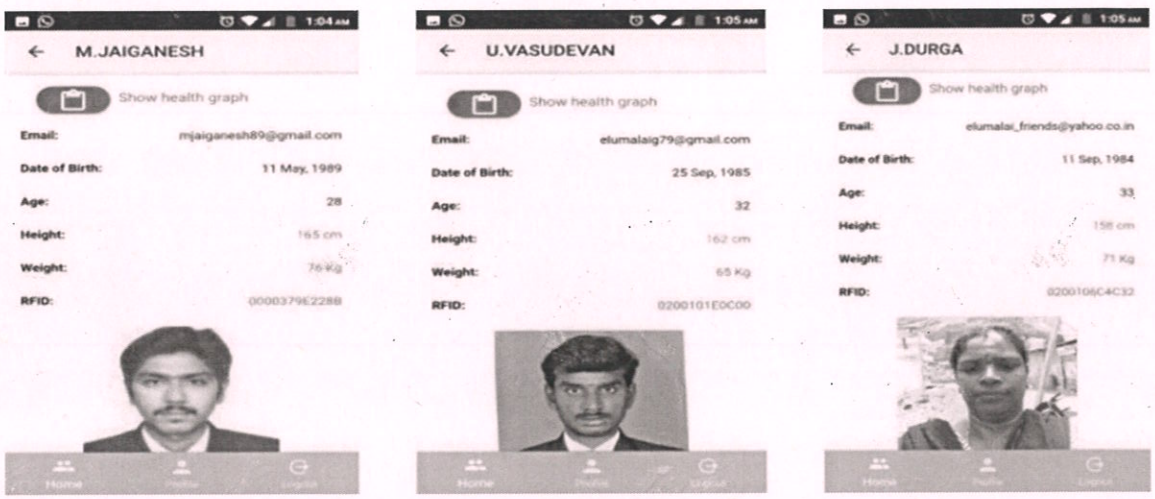

Fig. 9 Athletes profile page

and contemplate upon improvement. The machine learning algorithm performs the comparison of heart rate and blood pressure for athletes, obtained from the sensor data with a set of reference values stored in the cloud and provides feedback for further improvement of performance [12, 13]. The reference Heart rate and Blood pressure values stored in the cloud are listed in Tables 1, 2 and 3.

The feedback is given to the athletes through e-mail for further development of performance. The feedback given to athletes is as shown in Fig. 12. The graph below shows about the health parameters of athletes.

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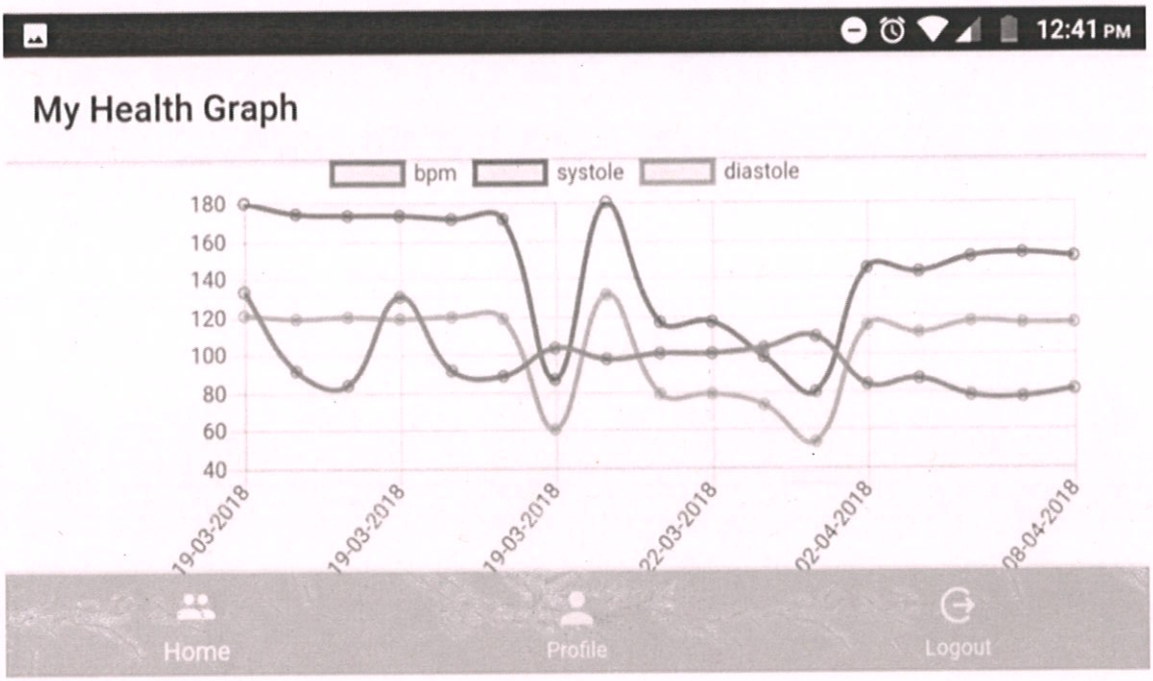

Fig. 10 Players or athletes health graph shows only about BP and heart rate

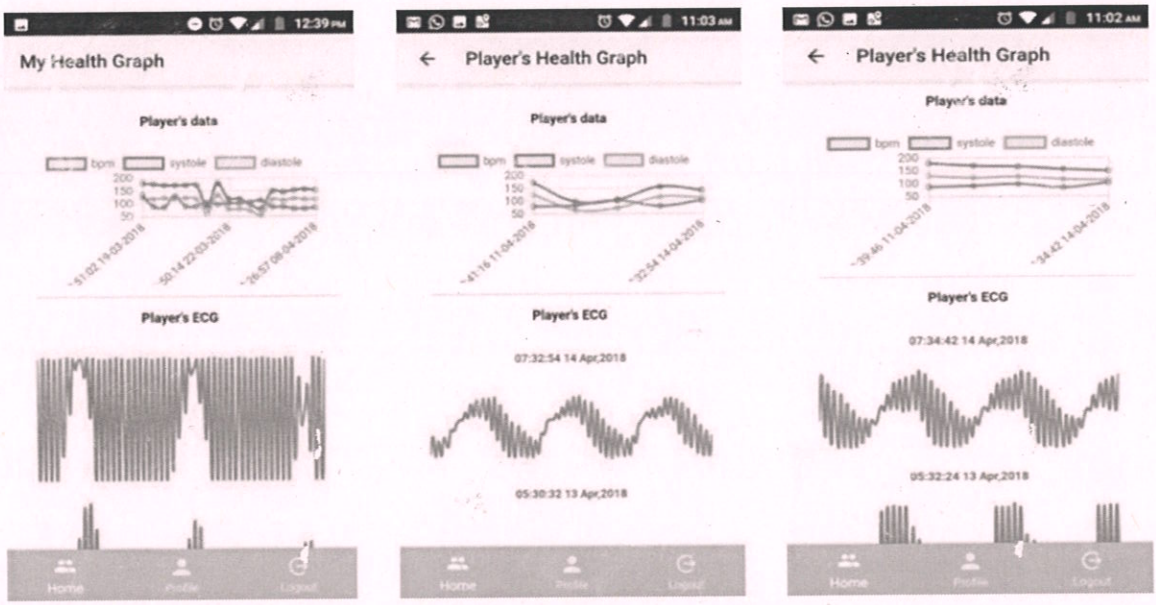

Fig. 11 Players or athletes health graph shows BP, ECG and heart rate

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Table 1 Heart rate range for the different age groups of men

For men athletes						
Age	18–25	26–35	36–45	46–55	56–65	65+
Athlete	49–55	49–54	50–56	50–57	51–56	50–55
Excel's	56–61	55–61	57–62	58–63	57–61	56–61
Good	62–65	62–65	63–66	64–67	62–67	62–65
Above avg	66–69	66–70	67–70	68–71	68–71	66–69
Average	70–73	71–74	71–75	72–76	72–75	70–73
Below avg	74–81	75–81	76–82	77–83	76–81	74–79
Poor	82+	82+	83+	84+	82+	80+

Table 2 Heart rate range for the different age groups of women

For women athletes						
Age	18–25	26–35	36–45	46–55	56–65	65+
Athlete	54–60	54–59	54–69	54–60	54–59	54–59
Excel's	61–65	60–64	60–64	61–65	60–64	60–64
Good	66–69	65–68	65–69	66–69	65–68	65–68
Above avg	70–73	69–72	70–73	70–73	69–73	69–72
Average	74–78	73–76	74–78	74–77	74–77	73–76
Below avg	79–84	77–82	79–84	78–83	78–83	77–84
Poor	85+	83+	85+	84+	84+	84+

Table 3 Blood pressure range for the different age groups of people

Age	Systolic BP (mmHg)			Diastolic BP (mmHg)		
	Mini	Average	Max	Mini	Average	Max
15–19	105	117	120	73	77	81
20–24	108	120	132	78	79	83
25–29	109	121	133	76	80	84
30–34	110	122	134	77	81	85
35–39	111	123	135	78	83	86
40–44	112	125	137	79	83	87
45–49	115	127	139	80	84	88
50–54	116	129	142	81	85	89
55–59	118	131	144	82	86	90
60–64	121	134	147	83	87	91

4 Conclusion and Future Work

Wireless sensor networks can be used in a large variety of research fields. In the present study, we take advantages of this technology to implement an electronics device for javelin throw athletes as well as trainer to help to improve the performance [11]. While we are using wireless sensors to make easier lives for people, we cannot forget the drawbacks

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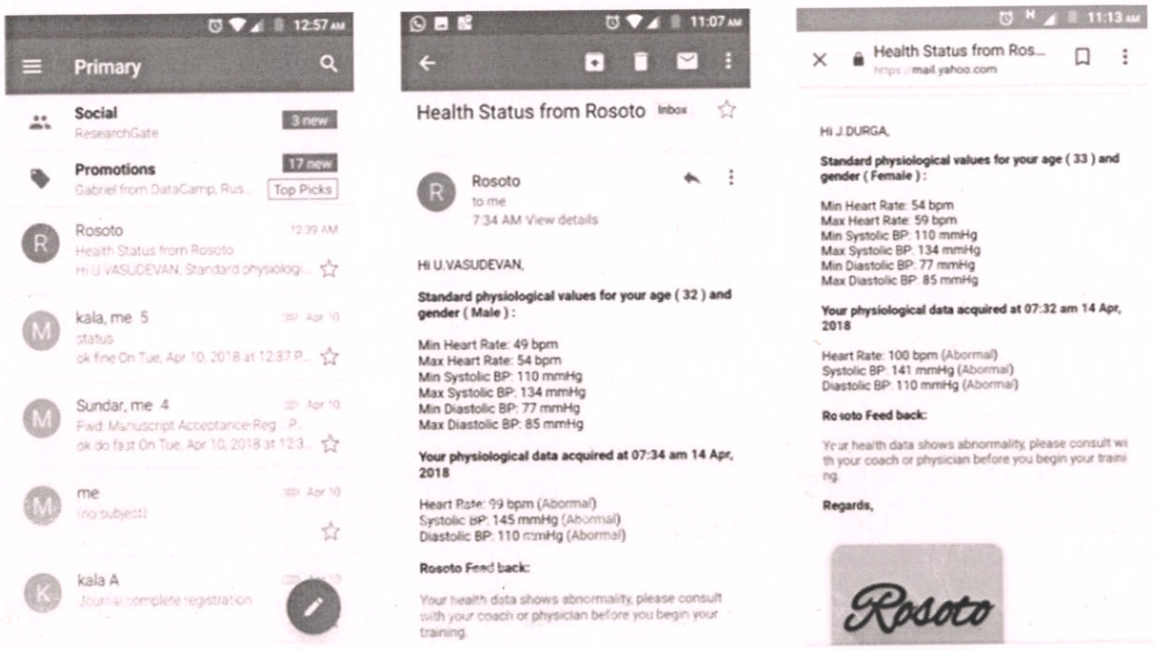

Fig. 12 Feedback from cloud to players or athletes

which may be produced from the network technology, like a hack. Therefore, we must consider the network security at the same time when we use various, wireless sensor technologies. Using the same App we consider the movement parameters to achieve maximum distance in javelin and also analyze the same for various wireless technologies in future.

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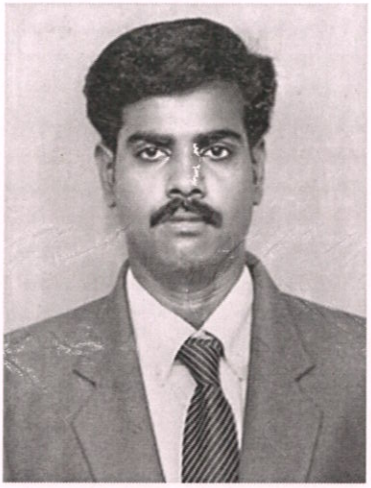

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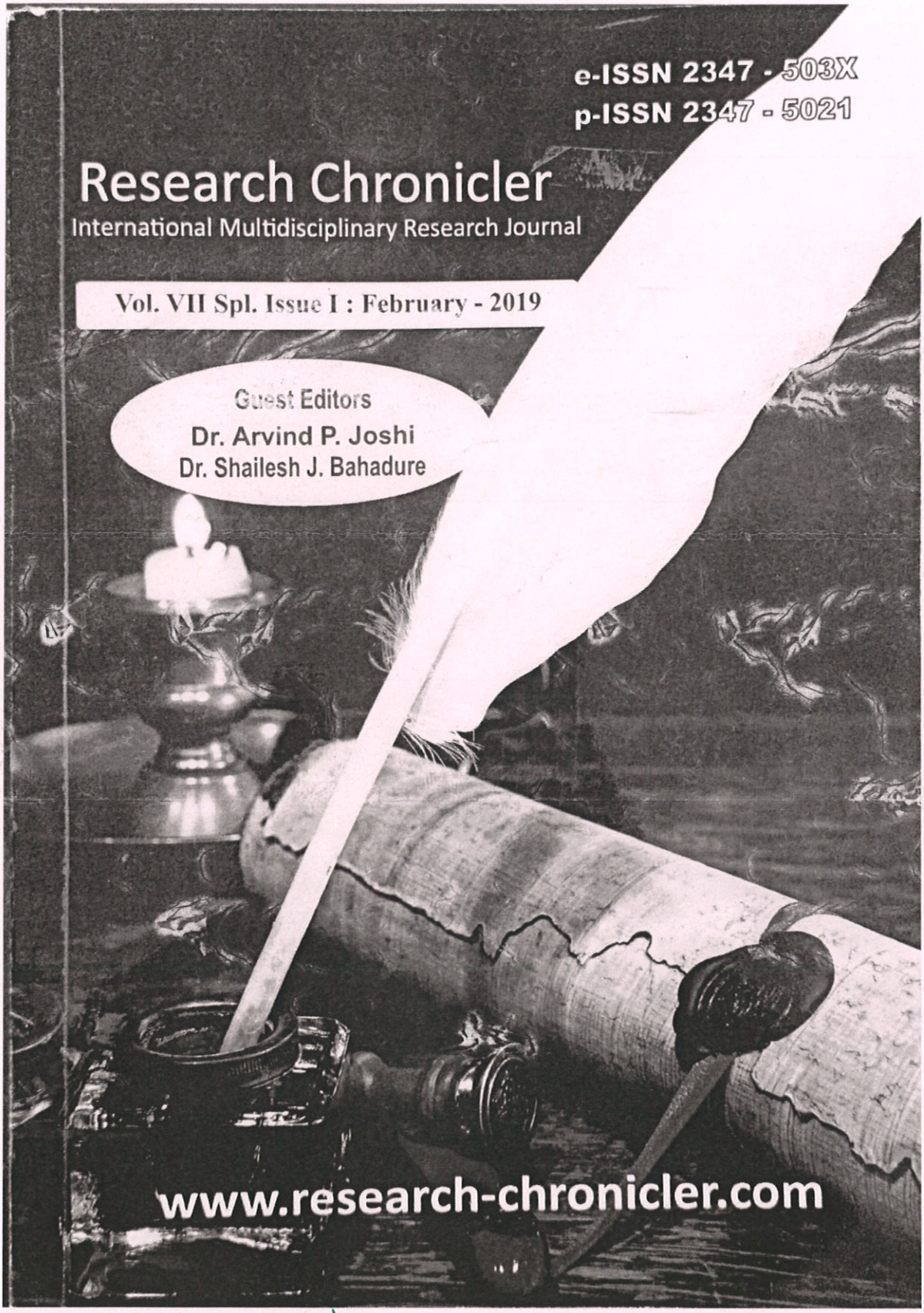

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University Grants Commission, New Delhi Recognized Journal No. 41311
ISSN: Print: 2347-5021 www.research-chronicler.com ISSN: Online: 2347-503X

Role of Cognitive Behavioural Therapy in Building Resilience and Quality Of Life among Athletes with Disability

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Abstract

Athletes constantly endure a broad range of pressure to attain and sustain high performance, psychological resilience is vital in sports. It may be considered as a gauge to determine stress coping ability and, as such, could be an important objective of treatment in depression, anxiety, as well as stress reactions. Resilience encompasses behavioural and cognitive tendencies that reflect patterns of behaviour and character traits that develop in the course of various life experiences. The body and mind are strongly interlinked, and their relationship can have a positive impact on health and quality of life. Emotions and thought patterns can influence imbalances within the body. According to the Disability Discrimination Act (DDA), a disabled person is an individual with a mental or physical impairment that has a significant and prolonged unfavourable effect on his or her ability to perform normal everyday activities. Harnessing psychological resources can build the disabled athletes' ability to choose to be more positive, ability to pull themselves out of rumination, ability to withstand demanding schedules without burnout, etc. Therapies like Cognitive Behavioural Therapy (CBT), Hypnosis, Visual imagery, Meditation and Biofeedback help in striking the balance. CBT, in particular facilitates athletes to control negative emotions, irrational cognitions as well as behaviours effectively. The use of CBT would help athletes to combat dysfunctional feelings, thoughts and emotions as it helps people in all aspects of life (Rizeanu, 2012, 2014). This paper focuses on how CBT helps in accepting the limitations of being differently-abled by building the resilience and improving the quality of life of such athletes.

Athletes constantly endure a broad range of pressure to attain and sustain high performance, psychological resilience is vital in sports. It may be considered as a gauge to determine stress coping ability and, as such, could be an important objective of treatment in depression, anxiety, as well as stress reactions. Resilience encompasses behavioural and cognitive tendencies that reflect patterns of behaviour and character traits that develop in the course of various life experiences. The body and mind are strongly interlinked, and their relationship can have a positive impact on health and quality of life. Emotions and thought patterns can influence imbalances within the body. According to the Disability Discrimination Act (DDA), a disabled person is an individual with a mental or physical impairment that has a significant and prolonged unfavourable effect on his or her ability to perform normal everyday activities. Harnessing psychological resources can build the disabled athletes' ability to choose to be more positive, ability to pull themselves out of rumination, ability to withstand demanding schedules without burnout, etc. Therapies like Cognitive Behavioural Therapy (CBT), Hypnosis, Visual imagery,

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Meditation and Biofeedback help in striking the balance. CBT, in particular facilitates athletes to control negative emotions, irrational cognitions as well as behaviours effectively. The use of CBT would help athletes to combat dysfunctional feelings, thoughts and emotions as it helps people in all aspects of life (Rizeanu, 2012, 2014). This paper focuses on how CBT helps in accepting the limitations of being differently-abled by building the resilience and improving the quality of life of such athletes.

Key Words: Resilience, Quality of Life, Cognitive Behaviour, Disabled Athletes

Adapted sports is increasingly serving as a forum through which individuals including physical and intellectual disabilities are able to participate in the sports that have been modified to meet the needs of persons. However, not all disabled sports are modified; several sports that have been specifically created for persons with a disability have no equivalent in non-disabled sports. The promotion of adapted sports is a largely investigated sport (Barak S, et.al., 2014), Jaarsma EA, et al., (2014). Among the various possibilities of such activities, adapted sports has been shown to be an effective alternative, considering the social, physical, and psychological contributions usually reported by the participants (Blauwet C, Willick SE., (2012) Yazicioglu K, et al., (2012). These benefits have helped the athletes to develop and maintain physical and psychological functioning and a healthy lifestyle. By participation, it has resulted in fewer and less severe secondary health conditions, improvements in feelings of depression and anxiety leading to higher levels of positive mood, the development of physical fitness and physical skills, positive perceptions of physical competence and athletic identity.

Athletes in general and disabled athletes in particular, to constantly endure a broad range of pressure to attain and sustain high performance, psychological resilience is vital in sports. Psychological resilience is regarded as a protection mechanism that functions in the face of negative stress inducers (Masten, 2001; Bonanno, 2004). Resilience may be viewed as a measure of stress coping ability and, as such, could be an important target of treatment in anxiety, depression, and stress reactions. Resilience includes cognitive and behavioural predisposition that indicate the individuals' thought and behavioural patterns that develop in the course of life experience. Resilience is linked with positive effects on physical and mental health even though the debate over its role as a predictor and /or outcome of successful life condition exists.

Resilience is the preference to see unforeseen changes as windows of opportunities rather than seeing them as a misfortune, remaining positive and productive during a crisis. This successful adjustment also implies an "alteration" of the person after a setback, evidently, seen as qualities that maintain objectivity in crisis. The ability to be resilient is to resist conflicts, on the one hand, and generate a behaviour or attitude positive to them, on the other hand (Raffo, G. & Rammsy, C, 2005). Resilient people are energetic, have a positive approach to life and are characterised by a high optimistic

emotionality. In reference to individuals undergoing loss of physical abilities often confront a challenge of having to become accustomed to a new way of life(Magnano, P. Craparo, G (2016)Resilience is related with the degree of acceptance and the level of self-esteem of each person Peterson, C (2000). It has been established that greater levels of resilience in athletes are linked to a higher probability of athletic accomplishments and positive emotional effects (Hosseini and Besharat, 2010). Unfortunately, the research found on resilience in people with physical disabilities was theoretical (White et al, 2008) or used other forms of assessment (Quale and Schanke, 2010), making a comparison of the results difficult. The latter study accounts that optimists who had been exposed to an event which left physical setbacks/sequellae have more resilience than pessimists (Quale and Schanke, 2010). Individuals with a physical disability may develop good levels of resilience in response to the challenges presented by their athletic activity.

Quality of life describes a person's general self-assessment or biased assessment of well-being or life fulfilment connected with bodily status and functional abilities, psychological health, happiness, financial and/or occupational status, satisfaction with interpersonal relationships. Contemporary research on the Quality of Life has highlighted that individuals with physical disabilities who are actively involved in adapted sports indicated better perception of these individuals in contrast to their inactive peers (Yazicioglu K, et al,. (2012). Anneken V, et al (2010). Studies on the attributes that reflect a higher Quality of Life perception, increased with the number of training sessions per week (Chatzilelecas E et al (2015) Laferrier JZ, et al (2015).Findings highlighted participation in the high-performance environment and longer periods of practising an adapted sport (V, Columna L, et al(2017). Resilience is the tendency to see unexpected changes as opportunities instead of seeing them as adversity, maintaining commitment and control. However, it is vital to note that, so far, the investigations of factors that influence Quality of Life perception among differently-abled athletes have been carried out considering individuals engaged in only one sport (Chatzilelecas E, et al 2015) Columna L, et al, 2017) or through grouping different sports into a large sample group (Laferrier JZ, 2015). Studies have proven that sports people with physical disabilities have a positive outlook on the quality of their lives. Alriksson- Schmidt et al (2007) believe that resilience works as a protective factor in persons with physical disability and thus contributes positively to the quality of life. According to Anderson (2009) the definition of "athlete" takes on meaning similar to that in able-bodied individuals and the development of an athletic identity is essential in enhancing social interactions and quality of life. People with physical disabilities who participated in adapted sports dealt with criticism, rejection and unfairness in a more objectively. They also had notably higher Quality of Life and Life Satisfaction scores compared to persons with physical disabilities not involved in any adapted sports.

The body and mind are strongly interlinked, and their association can exert a profound

impact on all aspects of health, wellness and quality of life. Emotions and thought patterns can influence imbalances within the body. Therapies like Cognitive Behaviour Therapy (CBT), Hypnosis, Visual Imagery, Meditation and Biofeedback help in striking the balance. CBT aims at improving the well-being and quality of life of the individuals. It is the clients' strengths, capabilities, and resources that are the most important in helping to bring about the change. Cognitive-behavioural techniques are effective in helping athletes to manage illogical cognitions which lead to negative emotions and behaviours. Application of rational emotive therapy in sports helps athletes eradicate dysfunctional thought processes and emotions.

CBT focuses on the personal strengths and adaptive abilities which in turn help in building long-term resilience which is a cornerstone of CBT. Resilience is the ability to persevere, to adapt and to bounce back from challenging circumstances. Resiliency helps us to enjoy life more, influences our overall well-being and helps in accepting ourselves and others better. Resilience enables us to survive the sadness, disappointments and pain that is an invariable part of one's life. In short, resilience greatly contributes to good mental and emotional health and helps us to survive and cope and feel in control even during turbulent times. Building resilience among the athletes with disability increases their self-awareness by teaching them to identify their beliefs and discover their connections to their feelings and behaviour, which serves as an important step in increasing resilience. Padesky and Kathaleen (2012) proposed the model of CBT to build resilience through four steps which include a.) search for strengths b.) construct a personal model of resilience by turning strengths into general strategies c.) apply the personal model of resilience to areas of difficulty and d.) practice resilience.

The mind and body are closely linked, and their relationship can exert a positive influence on health as well as the quality of life. Emotions and thought patterns can influence imbalances within the body. We can consider anxiety, depression, anger, incoherence and fatigue as pessimistic moods and the vigour- inducing constructive engagement, joy, contentment, and pride as optimistic moods which make up the spectrum of mood states (Terry, lane & Nevill, 2005). Therapies like CBT, hypnosis, visual imagery, meditation and biofeedback help in striking the balance. Cognitive behavioural techniques are effective in controlling irrational thoughts, negative feelings and behaviours. Utilising Rational Emotive Behaviour Therapy (REBT) in sports helps athletes eradicate dysfunctional thought processes and emotions, as with people in any other domain (Rizeanu, 2012, 2014).

The role of thinking is very clear in the formation of excitements and behaviours. Also, sports participation of differently-abled persons reflects a positive state of mind, better quality of life perception and life satisfaction. Coping strategies using CBT to enhance self-esteem, self-efficacy, task orientation, optimism and intrinsic motivation are fundamental psychological factors of protection for the development of resilience.

Harnessing psychological, physical, social resources and implementing behavioural techniques can build differently-abled athletes' optimism levels, combat rumination, and endure hectic schedules without burnout and bounce back from adversity.

CBT enables athletes with disabilities to build resilience by fostering optimism, perseverance, internal locus of control, pragmatism and gain perspective of situations. Such traits have been proven to help them to view adversities as challenges and face obstacles head-on. Furthermore, increasing opportunities for differently-abled individuals' to compete in sports improve their quality of life. In conclusion, sports psychology as a whole and CBT, in particular, can be utilized to channelise differently-abled individuals' thought patterns using effective and applied methods.

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3.4.5-J. PSY- 2018-19

Volume - 34 No. 2
QUARTERLY
April 2019 to June 2019

International Federation of Physical Education, Fitness and Sports Science Associations

www.ifpefssa.org

IFCSS

ISSN 2231-3265
(Online and Print)

International Journal of Health, Physical Education & Computer Science in Sports

A Peer Reviewed (Refereed)
International Research Journal

INTERNATIONAL WORKSHOP ON YOGA, PHYSICAL EDUCATION, AND SPORTS SCIENCE 2019

ABSTRACT BOOK

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Published by :
Indian Federation of Computer Science in Sports
www.ijhpecss.org & www.ifcss.in

JOINTLY ORGANIZED BY:
NIZAM COLLEGE, OSMANIA UNIVERSITY, HYDERABAD, TELANGANA STATE, INDIA
INDIAN FEDERATION OF COMPUTER SCIENCE IN SPORTS

Publication Impact Factor I2OR 4.005
ISRA Journal Impact Factor 6.997
Index Journal of

J-Gate
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Emotional Intelligence And Sports Performance

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Abstract

Emotion is an inherent part of the competitive experience (Hanin, 2012; Jekauc D 2018) and is considered as a factor in influencing sport performance. Athletes' ability to identify and understand emotions, and to regulate them in order to achieve optimal performance was brought into the focus of sport psychology (Jekauc D, Brand R, 2017). Reflection of emotion is analogous to the construct of emotional intelligence (EI) (Mayer J.D., Salovey P, 1997). EI is defined as "the ability to perceive and express emotion, assimilate emotion in thought, understand and reason with emotion, and regulate emotion in the self and others". The Emotional Intelligence area has grown exponentially over the past three decades in various disciplines (Keefer K.V.,2018). A large body of studies highlighted the importance of Emotional Intelligence as a predictor in important domains such as academic performance, job performance, leadership, stress, better health, and well-being; and the interest of applied sport psychology in the concept of Emotional Intelligence has also grown substantially. Martinez et al. (2013) reported that initial research into EI in sports stems from 2001 and the role of EI in sports settings has grown constantly. There is no doubt that competitive sport is an emotion-laden environment, as athletes are constantly bombarded with different types of stressors and emotional confrontations inside and outside competition, associated to their athletic performance where it is also a product of relationships and interactions and these are significantly influenced by emotions (Friesen A.P , 2012; McCarthy P.J, 2011). Athletes have to be aware of the feelings of other members (e.g., teammates, coaching staff, opponents, officials, family, fans and sport administrators). They have to communicate and work together to reach their finest performance. The athletes should have the ability to control their emotions by switching themselves on to produce staggering results by being incredibly consistent.

Key Words: Emotion, Emotional Intelligence, Emotion Laden, Athletic Performance

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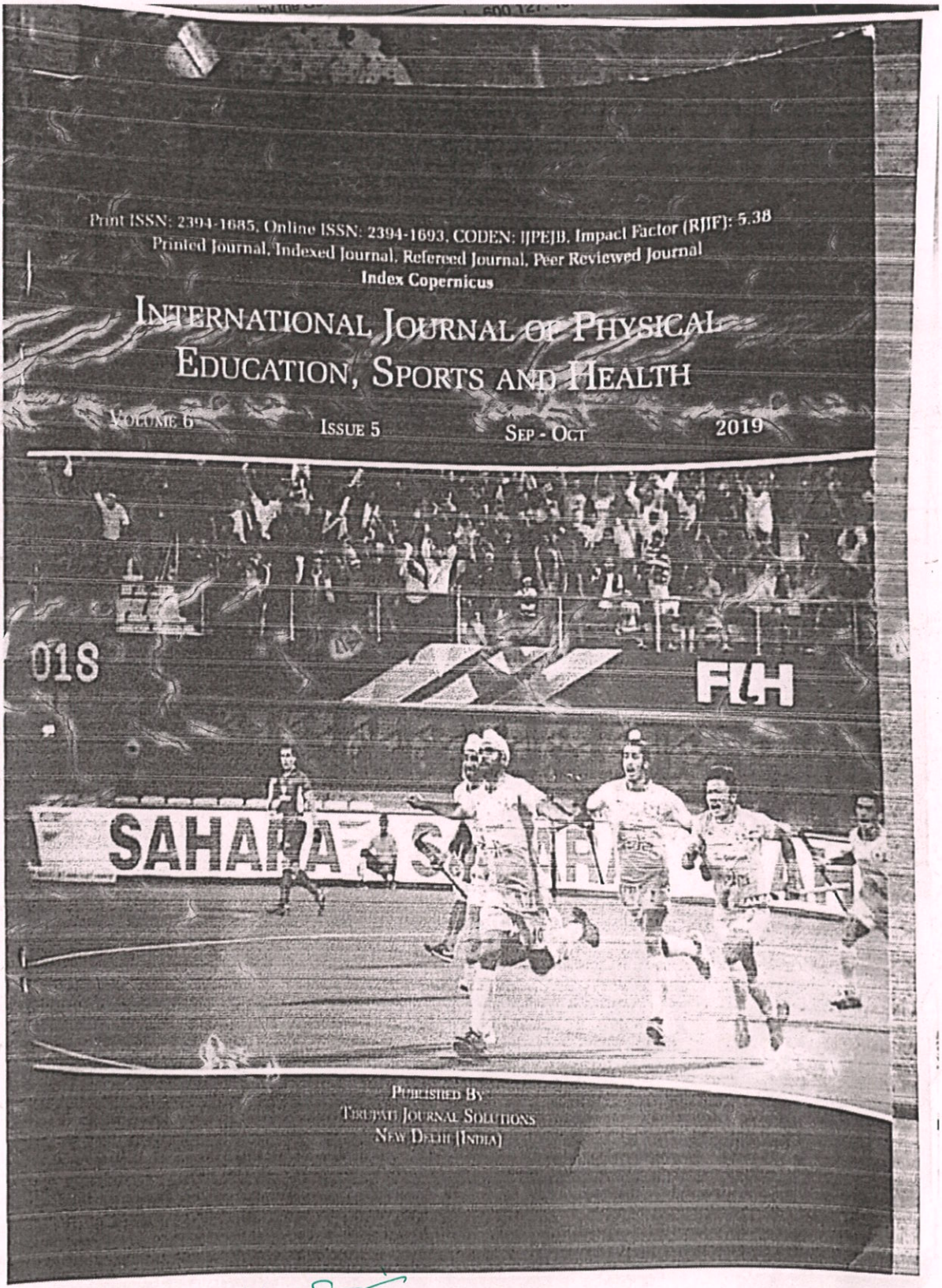

Print ISSN: 2394-1685, Online ISSN: 2394-1693, CODEN: IJPEJB, Impact Factor (RJIF): 5.38
Printed Journal, Indexed Journal, Refereed Journal, Peer Reviewed Journal
Index Copernicus

International Journal of Physical Education, Sports and Health

Volume 6 Issue 5 Sep - Oct 2019

Published By
Tirupati Journal Solutions
New Delhi (India)

Registrar
Tamilnadu Physical Education
and
Sports University
Chennai

ear: 2019, Volume: 6, Issue: 5
ISSN: 2394-1685 | E-ISSN: 2394-1693 | CODEN: IJPEJB
npact Factor (RJIF): 5.38
nline Available at www.kheljournal.com

International Journal of Physical Education, Sports and Health

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International Journal of
Adapted Physical Education & Yoga
Online Journal : www.ijapey.info
Faculty of General & Adapted Physical Education and Yoga (GAPEY)
Ramakrishna Mission Vivekananda Educational and Research Institute (RKMVERI), Coimbatore Campus
(Deemed-to-be-University as declared by Govt of India under Section-3 of UGC Act 1956)
SRKV Post, Periyanaickenpalayam, Coimbatore,Tamil Nadu – 641020, India
International Journal of Adapted Physical Education & Yoga
JAPEY
www.ijapey.info
ISSN : 2455-8958
Open Access Refereed e-Journal

Research article

EFFECT OF CONCURRENT TRAINING ON SELECTED PHYSICAL FITNESS VARIABLES OF UNIVERSITY MEN

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Received 23rd July 2018, Accepted 29th October 2018

Abstract

To achieve the purpose of the present study (N=30) men players were randomly selected from Tamil Nadu Physical Education and Sports University, Chennai, Tamil Nadu. Their age ranged from 22 to 25 years. They were assigned to two group namely experimental group-I with (n=15) boys concurrent training 12 weeks 5 days a week and other group-II with (n=15) acted as control group. Both the groups were tested on physical fitness variables elastic strength and cardio respiratory endurance. The selected criterion variables were measured by elastic strength – bunny hops, and cardio respiratory endurance – 12 minute run/walk test. The prior and after test data collected were treated with dependent 't' test. The level of confidence was fixed at 0.05. The study results showed significant improvement on experimental group of selected criterion variables of elastic strength, and cardio respiratory endurance of university men players. The control group did not show any significant improvement.

***Key Words**: Concurrent Training, Elastic power, Cardio Respiratory Endurance*

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INTRODUCTION

Sports training is a scientifically based and pedagogically organized process which through planned and systematic effect on performance ability and performance readiness aims at sports perfection and performance improvement as well as at the contest in sports competition. Simultaneously training for adaptations associated with resistance and endurance training (RT & ET), otherwise known as concurrent training (CT), is widely debated by fitness professionals and strength coaches alike. CT has been criticized due to the potential for chronic overreaching, as well as the competing adaptations associated when performing RT and ET, concurrently. However if programmed carefully, CT can produce a lean and sculpted physique, while obtaining a high level of fitness as measured by health aspects as well as athletic parameters. Therefore, the purpose of this article is to elucidate the ways in which the adaptations associated with both RT and ET can be maximized when training concurrently **(Hickson RC 1980).** Elastic strength is the ability to exert force quickly and to overcome resistance with high speed of muscle action. High level of elastic strength requires good combination and coordination of high speed and strength of muscle action. The purpose of study was to find out effect of concurrent training on selected physical fitness variables of college men players.

METHODS AND MATERIALS

To achieve the purpose of the present study (N=30) university men players were randomly selected from Tamil Nadu Physical Education and Sports University, *Chennai*,, Tamil Nadu. Their age ranged from 22 to 25 years. They were assigned to two groups namely experimental group-I with (n=15) boys concurrent training 12 weeks 5 days a week and other group-II (n=15) as control group. Both the groups were tested on physical fitness variables elastic strength, and cardio respiratory endurance. The selected criterion variables measured by elastic strength – bunny hops and cardio respiratory endurance – 12 minute run/walk test. The prior and after test data were collected treated with dependent 't' test. The level of confidence was fixed at 0.05.

3.4.5- J-S - 2018-19

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue Vol: 6, No: 2, May 2019

ANALYSIS OF PHYSICAL FITNESS PROFILES OF WORLD BEATERS ATHLETES IN TAMIL NADU

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ABSTRACT

The aim of the study was to analyse physical fitness profiles of World Beaters Athletes in Tamilnadu. 300 school students, consisting of 150 World Beaters Athletes (WBA) boys and 150 WBA girls, studying in different schools, spotted by Sports Development Authority of Tamilnadu (SDAT) as "World Beaters Athlete" and being given specialized coaching and training in academies formed and managed by SDAT were selected. The age group of the subjects selected was between 11 to 13 years. The physical fitness profiles of arm and shoulder strength, agility, speed, long jump and endurance were measured using standard tests. The analysis proved there were significant improvements in strength, power, agility, and endurance the improvement recorded was significant on WBAs boys and girls from WBA studying in VI standard to standard VII and VIII. It was concluded that the high training loads can have an impact on young athletes the fitness profiles of World Beaters Athletes.

Key words: Fitness, Athletes, Profile, Records

INTRODUCTION

Human performance and ability plays a very important role in the productivity and development of the nation. Much hard work, planning and organisation on the part of sports administrators along with strenuous suites of training by the participants themselves are imperative if India is to climb to a higher pedestal of performance in sports and games.

Tamil Nadu has made fair strides in the field of sports. Fall in line with the National Sports Policy, The Government of Tamil Nadu, in order to channelize the enthusiasm of the youth in sports activities, constituted the Sports Development Authority of Tamil Nadu vide G.O.Ms.641, Education (Yl) Department, dated 18 7.92 by merging the erstwhile Department of Sports and Youth Services arid the Tamil Nadu State Sports Development Corporation. This is similar to the pattern of the Sports Authority of India. The Hon'ble Chief Minister of Tamil Nadu is the President of this Authority. The Sports Development Authority of Tamil Nadu, is the apex body, and implements all the policy decisions on sports and youth welfare activities of the Government of Tamil Nadu.

The Government of Tamil Nadu has ordered in G.O. Ms. No. 25, Youth Welfare and Sports Development Department , dated 4.4.2002. The World Beater's Talent Spotting Scheme. The World Beaters' Talent Spotting Scheme, which was formulated to spot talent that can be nurtured and developed to the highest levels of excellence comprises mainly of a battery

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of tests, which will indicate the child's physical fitness and potential to play a particular game or participate in a particular event. To identify the motor qualities such as Speed, Strength, Endurance, Agility and Explosive power and to find out their potential to be future elite sports person. The budding talents are then inducted into the Specialized Academies and are provided with scientific coaching and are prepared for competing in competitions. These talents are mostly from rural areas. These talented young children, who have potential to excel in sports, should be trained in right manner, motivated and nurtured. A Special Scholarship is being awarded to the budding talents at Rs.6000/- per year per student (Rs.500/- per head per month). Thus, a lot of efforts are being made to spot talents and nurture them to be world beaters. The scheme is in existence for the past 12 years and there was no scientific research to analyse the fitness profile and sports performance of these world beaters athletes in Tamilnadu. Hence, this study was undertaken.

REVIEW OF RELATED LITERATURE

Falk B, et.al. (2004) reported that the processes of talent detection and early development are critical in any sport programme. The study identified variables of swimming, ball handling and physical ability, as well as game intelligence, which could assist in the selection process of young water-polo players. A comparison of those players eventually selected to the team and those not selected demonstrated that, 2 years before selection, selected players were already superior on most of the swim tasks (with the exception of breast-stroke and 50-m freestyle), as well as dribbling and game intelligence. This superiority was maintained throughout the 2 years. Two-way tabulation revealed that, based on baseline scores, the prediction for 67% of the players was in agreement with the final selection to the junior national team.

Dávila-Romero C et al. (2015) analysed three sequential stages: identification of fitness and game performance profiles (individual player performance), an assessment of the relationship between these profiles, and an assessment of the relationship between individual player profiles and team performance during play (in championship performance). The results showed a relationship between both types of profile (fitness and individual player performance).

Armstrong and Welsman (2006) reviewed the reviews the habitual physical activity of children and adolescents from member countries of the European Union in relation to methods of assessing and interpreting physical activity. Data are available from all European Union countries except Luxembourg and the trends are very similar. European boys of all ages participate in more physical activity than European girls and the gender difference is more

marked when vigorous activity is considered. The physical activity levels of both genders are higher during childhood and decline as young people move through their teen years. Physical activity patterns are sporadic and sustained periods of moderate or vigorous physical activity are seldom achieved by many European children and adolescents. Expert committees have produced guidelines for health-related physical activity for youth but they are evidence-informed rather than evidence-based and where there is evidence of a relationship between physical activity during youth and health status there is little evidence of a particular shape of that relationship.

Sleivert G, and Taingahue M.(2004) investigated the relationship between sprint start performance (5-m time) and strength and power variables. Thirty male athletes [height: 183.8 (6.8) cm, and mass: 90.6 (9.3) kg; mean (SD)] each completed six 10-m sprints from a standing start. Sprint times were recorded using a tethered running system and the force-time characteristics of the first ground contact were recorded using a recessed force plate. Three to six days later subjects completed three concentric jump squats, using a traditional and split technique, at a range of external loads from 30-70% of one repetition maximum (1RM). Mean (SD) braking impulse during acceleration was negligible [0.009 (0.007) N/s/kg) and showed no relationship with 5 m time; however, propulsive impulse was substantial [0.928 (0.102) N/s/kg] and significantly related to 5-m time (r=-0.64, P<0.001). Average and peak power were similar during the split squat [7.32 (1.34) and 17.10 (3.15) W/kg] and the traditional squat [7.07 (1.25) and 17.58 (2.85) W/kg], and both were significantly related to 5-m time (r=-0.64 to -0.68, P<0.001). Average power was maximal at all loads between 30% and 60% of 1RM for both squats. Split squat peak power was also maximal between 30% and 60% of 1RM; however, traditional squat peak power was maximal between 50% and 70% of 1RM. Concentric force development is critical to sprint start performance and accordingly maximal concentric jump power is related to sprint acceleration.

Ciaran MacDonncha and Rhoda Sohun (2006) compared the physical fitness levels of Iresh adolescents and reported that physical fitness data for males (n = 610) and females (n = 646) from Northern Ireland aged between 15 - 17 years for the following variables: height (males = 1728 cm, females = 1616 cm); weight (males = 63 kg, females = 56 kg); sit-ups in 30s (males = 26 reps, females = 20 reps); sit and reach (males = 22 cm, females = 25 cm); grip strength (males = 42 kg, females = 28 kg); standing long jump (males = 192 cm, females = 148 cm) and body fat percentage (males = 13.5%, females = 23.8%). When a comparison was made between adolescents from Irealnd results demonstrated that large percentage differences exist between mean values for Irish adolescents and Northern Ireland adolescents for the following

variables: sit-ups (30s); sit and reach flexibility and grip strength. The percentage body fat of Irish female adolescents was also greater than their Nothern Ireland counterparts. Healthy body fat values for males and females are 15% and 25% respectively.

The theoretical foundations based on previous researches proved that researches were done to analyse physical fitness status of different group of people, however there was further scope for research to make an analysis on selected physical fitness profiles of World Beaters Athletes in Tamilnadu.

METHOD

SUBJECTS

The present study was confined to the randomly selected 300 (Three hundred) school students studying in different schools, spotted by Sports Development Authority of Tamilnadu (SDAT) as "World Beaters Athlete" and being given specialized coaching and training in academies formed and managed by SDAT. The age group of the subjects selected was between 11 to 13 years. Table I shows the composition of the students selected studying in 6th, 7th and 8th standards and being trained for different events in athletics.

Table I, Showing Number of World Beaters Athletes Selected for this study

S.No	Event	VI Standard		VII Standard		VIII Standard	
		Boys	Girls	Boys	Girls	Boys	Girls
1	50 M Run	10	10	10	10	10	10
2	100 M Run	10	10	10	10	10	10
3	600/800 M Run	10	10	10	10	10	10
4	Shot Put	10	10	10	10	10	10
5	Long Jump	10	10	10	10	10	10
Total		50	50	50	50	50	50

SELECTION OF VARIABLES

Physical Fitness variables Arm and Shoulder strength measured through shot put and explosive power measured through long jump test were selected for this study. The variables were measured for World Beaters Athletes (WBAs) boys and WBAs girls separately.

RESULTS

The results on selected physical fitness profiles on World Beaters Athletes - boys (WBA) of Tamilnadu enrolled in different classes of study is presented in Table II.

B.4.5-J-Sc-2018-19

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue Vol: 6, No: 2, May 2019

INFLUENCE OF DIFFERENT PHASES OF RESISTANCE TRAINING ON SELECTED BIOCHEMICAL VARIABLES OF FOOTBALL PLAYERS

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ABSTRACT

Exercise has beneficial effects on lipoproteins and other biochemical variables. Little is known about how long the effects persist with detraining or whether the duration of benefit is effected by training intensity or training of different phases. Vigorous training, the blood circulation quickness, blood and lymph stream through the muscle, supply the cells with oxygen and nutrition, removing waste products. The heart activity is accelerated exercise and strengthening its own fibers. Different activities can be carried out with different intensities which may have different effect in organism. The aim of this study is to find out the influence of different phases of resistance training on selected biochemical variables of football players. 30 intercollegiate level football players were selected and given resistance training under different phases, conditioning, intensive, in-season, and off season by manipulating the load, intensities and frequencies of selected weight training exercises. Results proved that different phases of training significantly improved HDL and failed to alter total cholesterol, triglycerides and low density lipoprotein. It was concluded that the different phases of training can be utilized for improving HDL by inter collegiate level football players.

Key Words: Resistance Training, Conditioning Phase, Intensive Phase, In-season Phase, Off-season Phase, Low Density Lipoprotein, High Density Lipoprotein, Total Cholesterol and Triglycerides.

INTRODUCTION

Sports training program phases revolve around peaking for major competitions phases generally progress as follows: The first of the phases of training prepares the athlete for more intensive weight training with heavier weight loads. It is referred to as the conditioning phase, the hypertrophy phase, or the starter phase. Fitness training programs typically advance to a more intensive training phase where weight loads are consistently increased until fitness training goals are met under intensive training phase. Then the athlete performs a maintenance or in-season phase in which the athlete stabilize the level of performance which enables for major competition at the right time. The off season phase permits for an active rest so that the athlete can gain recovery in preparation for the next season phase. To phase at the desired level of strength, (Fleck and Kraemer,1996 ; Powers et al.,2006 ; Schmidt and Wrisberg, 2000) different phases of training progress from low intensity and high volume, to high intensity and low volume. In other words, do more repetitions with lighter weights early in training, and fewer repetitions with heavier weights later in training. Testing after each of the phases of training will help one make sound decisions for adjusting the training programme in subsequent phases. This is how one personalize the training programme to promote continuous improvement toward the goals.

Biochemistry is the study of the chemical processes in living organisms. It deals with the structure and function of cellular components such as proteins, carbohydrates, lipids, nucleic acids and other biomolecules. Exercises produces biochemical changes in the

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cardiorespiratory system and other important alterations in body composition such as proteins, carbohydrates, lipids and triglyceride levels (Scharhag,et.al. 2008) There are different exercise programmes which influences the biochemical variables of individuals. Training methods includes weight training, interval training, fartlek training, circuit training, isotonic training, isometric training, isokinetic training. Vigorous training, the blood circulation quickness, blood and lymph stream through the muscle, supply the cells with oxygen and nutrition removing waste products. The heart activity is accelerated exercise and strengthening its own fibers. Different activities can be carried out with different intensities which may have different effect in organism. Thus, training programmes forms different phases.

Cris A. Slentz et.al. (2007) studied inactivity, exercise training and detraining, on plasma lipoproteins and found that physical inactivity has profound negative effects on lipoprotein metabolism. Modest exercise prevented this. Moderate-intensity but not vigorous-intensity exercise resulted in sustained VLDL-triglyceride lowering. Thirty minutes per day of vigorous exercise, like jogging, has sustained beneficial effects on HDL metabolism. Chen PY, et.al. (2010) made a study on effects of an exercise program on blood biochemical values and exercise stage and concluded that the developed exercise program was found to reduce cholesterol levels. Bloomer RJ, et.al. (2009) studied the Postprandial oxidative stress: influence of sex and exercise training status and concluded that higher values were noted for trained compared with untrained subjects. Branth S, et.al. (2008) examined energy metabolism during prolonged, strenuous exercise and found that strenuous energy-demanding work created a metabolic stress-like condition including signs of insulin resistance and deteriorated intracellular glucose availability leading to compromised fuelling of ion pumps, culminating in a disturbed cellular osmoregulation indicated by taurine efflux and cellular swelling. Thus, the review of related literature proved that there was contradicting findings with regard to different training, detraining, prolonged exercise programme on biochemical variables like LDL, HIDL, cholesterol and triglycerides.

The purpose of this research was to find out the influence of different phases of resistance training on selected biochemical variables of football players.

METHOD

To achieve the purpose of this study, 30 men football players, who represented their colleges in intercollegiate level tournaments were selected and tested of their biochemical variables, total cholesterol (TC), triglycerides (TG), low density lipoprotein (LDL) and High density lipoprotein (HDL) through blood samples obtained and scores were obtained through laboratory methods. The subjects underwent resistance training under four phases, namely, conditioning, intensive, in-season and off-season phases. Each phase of training lasted for 3 weeks and the subjects were tested of their biochemical variables through blood samples obtained on completion of each phase of training. The investigator selected five resistance (weight training) exercises, namely, Military Press, Barebell Rows, Squats, Standing Calf Raises and Leg Press and determined the 1 RM for each resistance exercise using Brzycki Formula (Brzycki, 1998). The aim of conditioning phase, was to make the body to adjust to the stress of weight training, for this purpose the subjects were given 40% to 60% of 1 RM with different repetitions. The intensive phase was to gain greater levels of strength, power and other qualities that transfer from weight training to sport skills, hence the subjects were trained with resistance training of 60% to 80% of 1 RM with different repetitions and varied frequencies. The in-season phase aimed at stabilizing the level of performance built during the previous phases and gain a competitive edge for

peaking for major competitions at the right time, hence the subjects were trained with resistance training of 60% to 80% of 1 RM with increased repetitions and varied frequencies. The off-season phase would permit the subjects for an active rest to get recovery in preparation for the next pre-season phase, which would be otherwise called the detraining phase. The obtained data of initial (1st day of the training session), end of the 3rd week (conditioning phase), end of 6th week (intensive phase), end of 9th week (in-season phase) and end of 12th week (off-season phase) on selected criterion variables were subjected to statistical treatment using repeated ANOVA and the results arrived at.

RESULTS

Tab: 1: Results on Repeated Analysis of Variance on Biochemical Variables

Means on Completion of Different Phases					Source of Variance	Sum of Squares	df	Means Squares	F
Initial	Conditioning	Intensive	In-season	Off Season					
Calculation of Repeated Analysis of Variance on Low Density Lipoprotein									
120.77	117.73	112.90	114.37	119.43	Subjects	22046.64	29.00		1.72
					Trials	1331.49	4.00	332.87	
					Residuals	27995.89	145.00	193.08	
					Total	4617.76	149.00		
Calculation of Repeated Analysis of Variance on High Density Lipoprotein									
42.53	44.40	45.23	48.00	44.27	Subjects	-2539.93	29.00		4.03*
					Trials	479.17	4.00	119.79	
					Residuals	4308.17	145.00	29.71	
					Total	1289.07	149.00		
Calculation of Repeated Analysis of Variance on Total Cholesterol									
193.23	190.87	187.60	185.97	189.23	Subjects	60583.86	29.00		0.53
					Trials	956.97	4.00	239.24	
					Residuals	65962.17	145.00	454.91	
					Total	4421.34	149.00		
Calculation of Repeated Analysis of Variance on Triglycerides									
111.27	108.23	105.90	104.77	108.83	Subjects	6723.80	29.00		1.42
					Trials	782.53	4.00	195.63	
					Residuals	20046.33	145.00	138.25	
					Total	12540.00	149.00		

Required $F_{(0.05),(4,145)} = 2.35$ *Significant

Tab 2: Scheffe's Post Hoc Analysis Results on High Density Lipoprotein

Means on Completion of Different Phases					Mean Difference	Reqd C. I
Initial	Conditioning	Intensive	In-season	Off Season		
42.53	44.40				1.87	4.33
42.53		45.23			2.70	4.33
42.53			48.00		5.47*	4.33
42.53				44.27	1.73	4.33
	44.40	45.23			0.83	4.33
	44.40		48.00		3.60	4.33
	44.40			44.27	0.13	4.33
		45.23	48.00		2.77	4.33
		45.23		44.27	0.97	4.33
			48.00	44.27	3.73	4.33

* Significant

DISCUSSIONS

The results presented in Table I proved that the obtained F value of 4.03 on HDL was greater than the required table value of 2.35 with degrees of freedom 4, and 145 at 0.05 level. And it was proved that different phases of resistance training significantly altered the HDL of the football players. Results were subjected to statistical post hoc analysis using Scheffe's confidence interval test and the results presented in Table 2 proved that there was significant difference between initial scores and in-season phase scores as the obtained value of 5.47 was greater than the required confidence interval value of 4.33. The results proved that due to different phases of resistance training, the biochemical variable HDL index was gradually altered at every phase of the training comparing to initial scores. Though there was difference in all the phases comparing to initial scores, the difference between initial and in-season phase alone was significant at 0.05 level (Table 3).

The results on LDL proved that the obtained F value of 1.72 was less than the required table value of value of 2.35 with degrees of freedom 4, and 145 at 0.05 level. Though there was difference in mean differences of LDL under different phases of training, they were not significant. In the same manner, there were no significant differences in total cholesterol and triglycerides.

In this study, the investigator arranged the training schedule as suggested by Powers et al.,2006 ; Schmidt and Wrisberg, 2000 different phases of training progress from low intensity and high volume, to high intensity and low volume, this significantly altered the HDL of the subjects. However, different

phases of resistance training failed to significantly alter LDL, TC and TG. The result of this research is in agreement with the findings of Cris A. Slentz et.al. (2007) , who found thirty minutes per day of vigorous exercise, would have beneficial effects on HDL metabolism. However, the result of the study contradicts to the findings of Chen PY, et.al. (2010) , who concluded the developed exercise program was found to reduce cholesterol levels. This is because of the reason that the findings of Chen (2010) relates to kidney patients and the research involves on trained, intercollegiate level football players. As the Football players, the subjects would have sufficient training and workouts at the initial stage itself and the variations in the means on total cholesterol, triglycerides and low density lipoprotein would have stabilized at the time of off season training period, as the exercise intensity has been gradually increased and decreased in this research.

CONCLUSION

It was concluded that different phases of resistance training can be better utilized for improving HDL of the trained athletes.

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3.4.5-J-Y-2018-19

History Research Journal

ISSN: 0976-5425

Vol-5-Issue-6-November-December-2019

Effect of Yogic Practices with and Without Diet Modifications on Systolic Blood Pressure Among Adult Women with Oligomenorrhea

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ABSTRACT

A periodic discharge of a bloody fluid from the uterus occurring at more or less at regular interval of 28 days in woman from the age of puberty to menopause is known as menstruation. The flow of altered blood along with endometrial and stoma cells, glandular secretion and occasional blood clots occurs for 3 to 5 days through a vaginal passage. Menstruation ceases during pregnancy. Its failure to occur may result from some abnormalities, physical disorders and emotional and hormonal disturbances. From puberty until menopause a women's reproduction system under goes many cyclic changes. The cyclic changes are related to the changes in the endometrium, breast, ovaries, vagina, hormone secretions, and even emotional attitudes. The cyclic reproduction changes of the human female are marked by menstruation, during which some cells, uncoated blood from ruptured blood vessels, other fluids and uterine endometrium are released through the cervix and vagina. Each menstrual cycle occurs about every 28 days and last for 4 – 5 days. The study was undertaken with the aim to observe the effect of yogic practices with and without diet modifications on selected physiological variable as systolic blood pressure among Adult women with oligomenorrhea . For this study totally 45 female students were selected as subjects from Sholinganallur area, Chennai. Their age ranged between 25 to 35 years. They were divided in to three groups. Experimental group I –yogic practices with diet modifications , Experimental group II- yogic practices without diet modifications and group III –control group (no intervention). The data was collected from three groups prior to training and after 12 weeks of yogic practices with and without diet modifications. Analysis of covariance was used to find out the significant difference between the three groups. The level of significance at 0.05%. The results proved that the regular yogic practices and diet modifications helped to significantly reduce the physiological variable systolic blood pressure.

Keywords: Yogic Practices, Diet Modifications, Systolic Blood Pressure.

INTRODUCTION

Oligomenorrhea is infrequent menstruation. More strictly, it is menstrual periods occurring at intervals of greater than 35 days, with only four to nine periods in a year. In the modern era, the origin of yoga is not usually given much importance. While 'yoga' has now become a veritable household word, knowledge of its roots escapes most people, even many of those practising it with regularity."Historically yoga is more than a particular teaching. Yoga, a way of life, a culture and a lifestyle which encompassed not just techniques, practices or ideas, but also eating habits, bathing habits, prayer, social interaction, and work. Yoga included a vast body of 'attitudes toward being', an ingrained sense of morality and ethic and it is the bedrock of the personal – social – cosmic order which developed in that part of the earth known as India. Therefore it is in the ancient Samskrithi (culture) of Bharata that origin of yoga is to be found."- Smt. Meenakshi Devi Bhavanani, "Returning to the Roots; Classical Yoga". Yoga is one of the six orthodox systems of Indian philosophy. It is coordinated and systematized by Patanjali in his classical work, the Yoga Sutras, which consists of 195 terse aphorisms in which it is stated that yoga is a state where all activities of the mind are channelized in one direction or the mind is free from distractions. (B.K.S. Iyengar,).

A balanced diet comprising of diverse and healthy foods is key to promoting good health. After all, we are what we eat - Research continues to prove that eating healthy food promotes good health and unhealthy food habits lead to a diseased body. Foods contain vital nutrients that aid our body's metabolic function. However, a lack of consumption of these nutrients or feeding upon the wrong kinds of food leads to an accumulation of toxins within the body, resulting in chronic diseases in the long run.

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3·4·5-J-Y-2018-19

THINK INDIA JOURNAL

ISSN:0971-1260

Vol-22- Issue-14-December-2019

Effect Of Yogic Practices With And Without Diet Modifications On Stress Among Adult Women With Oligomenorrhea

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ABSTRACT

Menstrual disorder includes irregular periods or dysmenorrhoea (painful periods), anything that interferes with the normal menstrual cycle, causing pain, unusually heavy or light bleeding, or missed periods. Typically, a woman of childbearing age should menstruate every 28 days or so unless she's pregnant or moving into menopause. But numerous things can wrong with the normal menstrual cycle, some the result of physical causes, others emotional. These include amenorrhea, or the cessation of menstruation, menorrhagia, or heavy bleeding, and dysmenorrhea, or severe menstrual cramps. Nearly every woman will experience one or more of these menstrual irregularities at some time in her life. The study was undertaken with the aim to observe the effect of yogic practices with and without diet modifications on selected psychological variable as stress among Adult women with oligomenorrhea . For this study totally 45 female students were selected as subjects from Sholinganallur, Chennai. Their age ranged between 25 to 35 years. They were divided in to three groups. Experimental group I –yogic practices with diet modifications, Experimental group II- yogic practices without diet modifications and group III –control group (no intervention). The data was collected from three groups prior to training and after 12 weeks of yogic practices with and without diet modifications. Analysis of covariance was used to find out the significant difference between the three groups. The level of significance at 0.05%. The results proved that the regular yogic practices and diet modifications helped to significantly reduce the psychological variable stress.

Keywords: Yogic Practices, Diet Modifications, Stress.

INTRODUCTION

Oligomenorrhe*a* (or oligomenorrhoea) is infrequent menstruation. More strictly, it is menstrual periods occurring at intervals of greater than 35 days, with only four to nine periods in a year. In the modern era, the origin of yoga is not usually given much importance. While 'yoga' has now become a veritable household word, knowledge of its roots escapes most people, even many of those practising it with regularity."Historically yoga is more than a particular teaching. Yoga, a way of life, a culture and a lifestyle which encompassed not just techniques, practices or ideas, but also eating habits, bathing habits, prayer, social interaction, and work. Yoga included a vast body of 'attitudes toward being', an ingrained sense of morality and ethic and it is the bedrock of the personal – social – cosmic order which developed in that part of the earth known as India.

Therefore it is in the ancient Samskrithi (culture) of Bharata that origin of yoga is to be found."- Smt. Meenakshi Devi Bhavanani, "Returning to the Roots; Classical Yoga" Yoga is one of the six orthodox systems of Indian philosophy. It is coordinated and systematized by Patanjali in his classical work, the Yoga Sutras, which consists of 195

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3.4.5-J-Y- 2018-19

History Research Journal

ISSN: 0976-5425

Vol-5-Issue-6-November-December-2019

Effect of Yogic Practices with and Without Diet Modifications on Anxiety among Men with Andropause

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Abstract

The purpose of the present study was to find out the effect of Yogic practices with and without diet modifications on Anxiety among Men with Andropause. The study was conducted on 45 Men with Andropause Totally three groups, namely, control & experimental group I & II, consisting or 15 Men with Andropause underwent six weeks practice in Yogic practices with and without diet modifications whereas the control group did not under go any type of training. The Anxiety was measured before and after the experimentation using the Taylors questionnaire to measure the Anxiety. The data were analyzed by Analysis of Co-variance (ANCOVA) and it was concluded that the Yogic practices with and without diet modifications had significant ($P < 0.05$) effect on the Anxiety level.

Key words : Yogic practices with and without diet modifications , Anxiety .

INTRODUCTION

Andropause, the male menopause, low Testosterone regardless of name, the condition is characterized by a number of uncomfortable symptoms, including hot flashes in men, erectile dysfunction, low libido, irritability, muscle loss, and fatigue that are the result of low levels of testosterone. For men, testosterone production gradually decreases across the lifespan. According to a study published in the International Journal of Clinical Practice, nearly 40 percent of men over the age of 45 are affected by low testosterone. Declines in testosterone begin in a man's late 20s and continue to recede, reaching noticeably low levels around middle age, when men begin to experience symptoms of andropause or low testosterone.

Yoga means the experience of oneness or unity with inner being. This unity comes after dissolving the duality of mind and matter into supreme reality. The individual approaches truth by a science. The aim of all yoga practice is to achieve truth where the individual soul identifies itself with the supreme soul or God. Yoga has the surest remedies for man's physical as well as psychological ailments. It makes the organs of the body active in their functioning and has good effect on internal functioning of the human body. Yoga is a re-education of one's mental process, along with the physical.

STATEMENT OF THE PROBLEM

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3.4.5-J-Y-2018-19

ISSN NO: 1301-2746

EFFECT OF YOGIC PRACTICES WITH AND WITHOUT DIET MODIFICATIONS ON SELECTED PHYSIOLOGICAL VARIABLE AMONG POLYCYSTIC OVARY SYNDROME ADULTS

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ABSTRACT

Yoga is recognized as one of the most important and valuable gift of Indian Culture. Today's world is looking for solutions to solve the menacing problems of unhappiness, restlessness, emotional imbalances, hyperactivity, tension, stress, etc., The time has come to think of a change in attitude and take a new dimension to solve these problems. Hence the ancient discipline of yogic practices proves to be a boon to the raising lifestyle and health issues. In a yoga position, one should concentrate on a total awareness of our energy and how it flows. One should learn how body and mind work together. Almost all exercises can be beneficial depending on the intent and body condition. Practicing yoga ultimately leads towards long term health and well being.

The study was undertaken with the aim to observe the effect of yogic practices with and without diet modifications on selected physiological variable as body mass index among polycystic ovary syndrome adults. For this study totally 45 female students were selected as subjects from Shri Krishnasamy College for women, Chennai. Their age ranged between 18 to 25 years. They were divided in to three groups. Experimental group I –yogic practices with diet modifications , Experimental group II- yogic practices without diet modifications and group III – control group(no intervention)

The data was collected from three groups prior to training and after 12 weeks of yogic practices with and without diet modifications. Analysis of covariance was used to find out the significant difference between the three groups. The level of significance at 0.05%. The results proved that the regular yogic

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ISSN NO: 1021-9056

EFFECT OF YOGIC PRACTICES WITH AND WITHOUT DIET MODIFICATIONS ON SELECTED PSYCHOLOGICAL VARIABLE DEPRESSION AMONG POLYCYSTIC OVARY SYNDROME ADULTS

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ABSTRACT

An ancient discipline, Yoga is recognized as one of the most important and valuable gifts of the Indian culture. The emergence of the digital era with the development of science and technology provides man more comforts for his basic necessities, but with these comforts man also faces a different range of problems. . The time has come to think of a change in attitude and take a new dimension to solve these problems. The search for a solution, now more than ever, highlights the importance of Yoga. The Yoga Sutra (1.2) - Yogah Chitta Vruti Nirodhah explains, "Yoga is the ability to direct the mind, exclusively towards one object and to sustain this focus for a period of time without distractions. The wisdom and techniques of yoga restore balance by helping one to strengthen the body, calm the mind, regain focus and improve self-confidence. It is a complete package for beginners as well as regular practitioners and has something for everyone-of all age groups.

The study was undertaken with the aim to observe the effect of yogic practices with and without diet modifications on selected psychological variable as depression among polycystic ovary syndrome adults. For this study totally 45 female students were selected as subjects from Shri Krishnasamy College for women, Chennai. Their age ranged between 18 to 24 years. They were divided in to three groups. Experimental group I –yogic practices with diet modifications , Experimental group II- yogic practices without diet modifications and group III –control group(no intervention)

3.4.5-J-PE- 2018-19.

International Journal of Yogic, Human Movement and Sports Sciences



Peer Reviewed Journal, Refereed Journal, Indexed Journal

ISSN: 2456-4419

Publication Certificate

This certificate confirms that "Dr. P Kanagasabai" has published manuscript titled "Changes on cholesterol level in response to interval training among university players".

Details of Published Article as follow:

Volume	:	3
Issue	:	2
Year	:	2018
Page Number	:	18-19

Certificate No.: 3-2-8
Date: 01-07-2018

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International Journal of Yogic, Human Movement and Sports Sciences
www.theyogicjournal.com
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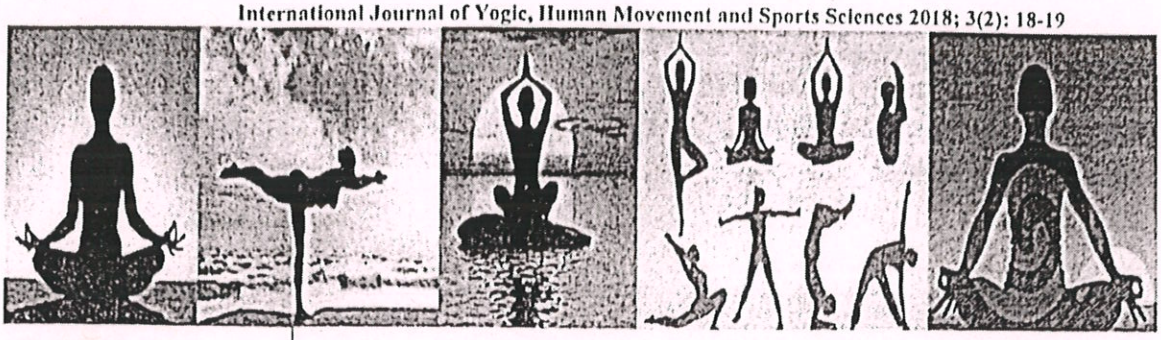
International Journal of Yogic, Human Movement and Sports Sciences 2018; 3(2): 18-19



ISSN: 2456-4419
Impact Factor: (RJIF): 5.18
Yoga 2018; 3(2): 18-19
© 2018 Yoga
www.theyogicjournal.com
Received: 08-05-2018
Accepted: 10-06-2018

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Changes on cholesterol level in response to interval training among university players

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Abstract
The purpose of the study was to find out the changes on total cholesterol level in response to Interval training among university players. To achieve this purpose, 30 university players from different disciplines studying in various departments of annamalai university, Chidambaram, tamilnadu, were randomly selected as subjects. The age of the subjects were ranged from 18 to 25 years. The subjects were further classified at random into two equal groups of 15 subjects each. Group – I (experimental group) underwent interval training for three days per week for twelve weeks and group - II acted as control. The selected criterion variable namely total cholesterol was assessed before and after the training period. The collected data were statistically analyzed by using Analysis of Covariance (ANCOVA). From the results of the study it was found that there was a significant difference on total cholesterol among the interval training group when compared with the control group.

Keywords: Interval training and total cholesterol

Introduction

Sport has ever reflected developments in society. Sport, indeed has been a mirror of society Sport has a very prominent role in modern society. It is important to an individual, a group, a nation-indeed the whole world. Sport is an institutionalized competitive activity that involves vigorous physical exertion or the use of relatively complex physical skills by individuals whose participation is motivated by a combination of the intrinsic satisfaction associated with the activity itself and external reward earned through participation. Fitness is defined as having the necessary qualities; or a readiness or preparedness. These seem to imply that fitness is a preparation for something or that fitness has the necessary qualities for something. Physical fitness is to the human body what fine-tuning is to an engine. It enables us to perform up to our more specifically, it is. "The ability to perform daily tasks vigorously and alertly, with energy left over for enjoying leisure-time activities and meeting emergency demands. It is the ability to endure, to bear up, to withstand stress to carry on in circumstances where an unfit person could not continue. And is a major basis for good health and well-being". The word training means different things in different fields. In sports the word training is generally understood to be synonyms of doing exercise (Brace). Physical training refers to the processes used in order to develop the components of physical fitness as for example, to improve aerobic endurance, to stretch and relax muscles, to increase arm and shoulder strength to related exercise and programmes to specific requirements or individual sports (Rex, 1985).Training denotes the process of preparation for some task. This process invariably extends to a number of days and even months and years. Means and measure from several sports scheme disciplines significantly support the training of an advanced sports person. Sports training are a basic preparation of the sportsmen for better performance through physical exercise. It is based on scientific principles of aiming at education and performance, enhancement. Sports activities consists of motor movement and action and their success depends to a great extend on how correctly they are performed. Techniques of training and improvement of tactical efficiencies plays a vital role in training process. Interval training is a programme of repeated running with set of interval after each run. The period between runs must belong enough to allow the athlete some time recover from the previous run but long enough to afford him complete recovery (Tom Backer).

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Interval training is exercise followed by a property of prescribed relief interval (Edward.L).

Methodology

The purpose of the study was to find out the changes on total cholesterol level in response to Interval training among university players. To achieve this purpose, 30 university players from different disciplines studying in various departments of annamalai university, Chidambaram, tamilnadu, were randomly selected as subjects. The age of the subjects were ranged from 18 to 25 years. The subjects were further classified at random into two equal groups of 15 subjects each. Group – I (experimental group) underwent interval training for three days per week for twelve weeks and group - II acted as control. The selected criterion variable namely total cholesterol was assessed before and after the training period. The collected data were statistically analyzed by using Analysis of Covariance (ANCOVA). All the data were analyzed using SPSS statistical package. The level of confidence was fixed at .05 level of significance.

The Analysis of covariance on total cholesterol of the pre test and post test scores of experimental group and control group have been analyzed and presented in the below table.

Analysis of covariance on total cholesterol among interval and control groups

Variable name	Test	Experimental group	Control Group	SOV	Sum of square	df	Mean square	'F' Ratio
Total Cholesterol	Adjusted post- test mean	206.677	213.389	B:	335.695	1	335.695	7.456*
				W:	1215.652	27	45.024	

*Significant at .05 level of confidence (The table value required for significance at .05 level of confidence for df 1 and 27 was 4.21).

Results

The above table shows the adjusted post-test means of experimental and control group of total cholesterol are 206.677 and 213.389 respectively. The obtained 'F' ratio of 7.456 for adjusted post test is more than the table value of 4.21 for df 1 and 27 required for significance at 0.05 level.

Discussions on finding

The findings of the study shows that significant difference exists between experimental and control group on total cholesterol. Since the obtained 'F' ratio of 7.456 respectively for adjusted post test means were greater than the required table value 4.21 for significance at .05 level of confidence with df 1 and 27, the interval training have its influence on total cholesterol of university players.

Conclusions

Based on the results of the study, there was a significant difference on total cholesterol among experimental group and control group. It is concluded that there was a significant decrease on total cholesterol between interval training group and control group.

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345-J-PE- 2018-19

Journal of Scientific Computing

An UGC-CARE Approved Group A Journal

ISSN NO: 1524-2560, Impact Factor : 6.1
www.jscglobal.org, Mail : editor.jscjournal@gmail.com

CERTIFICATE ID : JSC-R1452

CERTIFICATE OF PUBLICATION

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Authored by

Dr. P. Kumaravelu

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Tamil Nadu Physical Education and Sports University, Chennai

Has been published in

VOLUME 8 ISSUE 11 2019

IMPACT FACTOR 6.1

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INFOKARA RESEARCH, VOLUME 8, ISSUE 11, NOVEMBER - 2019

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Certificate ID - IK-3279

ISSN NO: 1021-9056 / web : http://infokara.com/
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Certificate of Publication

This is to certify that the paper entitled

EFFECT OF YOGIC EXERCISES ON SELECTED PHYSICAL EDUCATION AND PHYSIOLOGICAL VARIABLES AMOUNG COLLEGE WOMEN

Authored by

DR. P. KUMARAVELU

From

Physical Education and Sports University

Has been published in

INFOKARA RESEARCH, VOLUME 8, ISSUE 12, DECEMBER - 2019

Mathew Hull, Editor-In-Chief, INFOKARA RESEARCH

5.3 IMPACT FACTOR

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Published in Vol-5-Issue-6-November-December-2019

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3.4.5-J-PE-2018-19

Journal of Scientific Computing

An UGC-CARE Approved Group A Journal

ISSN NO: 1524-2560, Impact Factor : 6.1

www.jscglobal.org, Mail : editor.jscjournal@gmail.com

CERTIFICATE ID : JSC-R1464

CERTIFICATE OF PUBLICATION

This is to certify that the paper entitled

EFFECT OF E-CONTENT BASED COACHING ON SELECTED FUNDAMENTAL SKILLS IN VOLLEYBALL

Authored by

Dr. P. Kumaravelu

From

Tamil Nadu Physical Education and Sports University

Has been published in

VOLUME 8 ISSUE 12 2019

Matthew Hull,
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Published in Vol-22-Issue-14-December-2019 of THINK INDIA JOURNAL with ISSN:: 0971-1260

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Impact Factor 6.2

Indexed with Crossref and DOI https://doi.org/10.26643/think-india

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Efficacy Of Specific Ladder Drills On Selected Skill Test Performance Among Inter-Collegiate Badminton Players

UGC Care Approved: International Indexed and Referred Journal

Impact Factor 6.2

Indexed with Crossref and DOI https://doi.org/10.2444/thinkindia

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Published in Vol-22-Issue-14-December-2019 of THINK INDIA JOURNAL with ISSN:: 0971-1260

Effect Of Moderate Intensity Walking On Blood Pressure In Prehypertensive Adults

UGC Care Approved International Indexed and Referred Journal

Impact Factor 6.2

Indexed with Crossref and DOI https://doi.org/10.26643/think-india

Editor, Think India Journal

Registrar
Tamilnadu Physical Education
and
Sports University
Chennai

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3.4.5-J-EPN-2018-19

International Journal of
Adapted Physical Education & Yoga

International Journal of Adapted Physical Education & Yoga
IJAPEY
www.ijapey.info

Online Journal : www.ijapey.info

Faculty of General & Adapted Physical Education and Yoga (GAPLY)
Ramakrishna Mission Vivekananda Educational and Research Institute (RKMVERI), Coimbatore Campus
(Deemed to be University as declared by Govt of India under Section 3 of UGC Act 1956)
SRKV Post, Pottyanaickanpalayam, Coimbatore Tamil Nadu 641020 India

ISSN : 2455-8958
Open Access Refereed e-Journal

Research article

EFFECT OF SPECIFIC SKILL AND NEUROMUSCULAR TRAINING ON SELECTED SKILL PERFORMANCE VARIABLE AMONG STATE LEVEL MALE BADMINTON PLAYERS

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Received 24th January 2019, Accepted 30th April 2019

Abstract

The purpose of the study was to examine the effect of specific skill and neuromuscular training on selected skill performance variables among state level male badminton players. To achieve the purpose of the study thirty (N=30) state level male badminton players were selected randomly in the Chennai, city. They would be assigned into three group's namely experimental group I (Specific skill training), experimental group II (Neuromuscular training) and group III acted as Control Group. Their ages ranges from 17 and 19 years. They are selected only badminton players. After analyzing the various factors associated with the presented in this study. The following skill performance variable such as fore hand and back hand clear were tested using Poole fore hand and back hand clear test. The collected data were analysed statistically by ANCOVA was used. From the analysis of data it was proved that there were significant improvement on fore hand and back hand clear among state level male Junior Badminton Players.

Key Words: *Specific skill Training, Neuromuscular Training, Fore Hand clear and Back Hand clear.*

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INTRODUCTION

"The Game of Badminton is wonderful sport that requires eye-hand coordination, quick movements, striking and change of direction in pursuit of the shuttle cock. Badminton is a power game requiring quick and powerful movements to all directions to return the shuttle cock to the

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opponents' side of the court". According to Groppel and Roetert (1992) and Lei *et al.* (1993), the physical requirements of racquet sports demand efficiency in a number of fitness components. To be able to execute advanced strokes or compete effectively against progressively stronger opponents, a player would need to develop higher levels of the basic physical qualities, such as strength, power, muscular endurance, flexibility, coordination and agility.

To play the game effectively, a player can use various drills and strokes. Thus it is very important for a player to determine in advance which stroke his opponent player will use and where the shuttle will land on his court. He should always remain prepared and be very alert on the court. The player must improve the sprints, leaps, lunges, twists, turns, stretches and hitting actions. A successful player must move quickly when necessary but changes in direction are equally important in the game due to the nature of the movements required in a rally. While some people seem to be naturally fast and agile, these are both skills that can be acquired.

According to Singh (1984) Sports training aims is to improve the fitness of a person and promoting the acquisition of basic movement skills. To achieve this, training should have some basic principles and the most important basic principle of training is overload. Most Physiological systems can adapt to functional demands that exceed these loads encountered in normal daily life. In order to find out the outcome of specific skill and neuromuscular training on selected skill performance variables among state level male badminton players, the scholar being a badminton player has selected this area for his research.

STATEMENT OF THE PROBLEM

The purpose of the study was to examine the effect of specific skill and neuromuscular training on selected skill performance variables among state level male badminton players.

HYPOTHESIS

It was hypothesis that there would be significant improvement on selected skill performance variables due to specific skill training and neuromuscular training among state level male badminton players.

METHODOLOGY

The purpose of the study was to examine the effect of specific skill and neuromuscular training on selected skill performance variables among state level male badminton players. To achieve the purpose of the study thirty (N=30) state level male badminton players were selected randomly from Chennai city. They would be assigned into three group's namely experimental group I (Specific skill training), experimental group II (Neuromuscular training) and group III acted as Control Group. Their ages ranges from 17 and 19 years. They are selected only badminton players. After analyzing the various factors associated with the presented in this study. The following skill performance variable such as fore hand and back hand clear were tested to Poole

fore hand and back hand clear test. The collected data were analysed statistically ANCOVA. The level of significant was set at P< 0.05 level of confidence. Specific Badminton skill training can be initially categorised into on-court and off-court work. On-court work would mean training with badminton movements with a racket and usually with a shuttle. Off-court work is usually additional work that has the aim of enhancing some particular aspect of fitness. Neuromuscular training is to improve the nervous system's ability to generate a fast and optimal muscle firing pattern, to increase dynamic joint stability, to decrease joint forces, and to learn movement patterns and skills.

RESULTS AND DISCUSSION

TABLE I
ANALYSIS OF VARIANCE COVARIANCE ON SKILL PERFORMANCE VARIABLES OF CONTROL GROUP AND EXPERIMENTAL GROUP

Variables	Test	Ex I	Ex II	CG	SV	SS	df	MS	F
Fore Hand Clear	Pre test	45.00	46.60	45.20	B	15.20	2	7.60	1.49
					W	138.00	27	5.11	
	Post test	55.80	55.60	45.90	B	640.47	2	320.23	**72.72***
					W	118.90	27	4.40	
	Adjusted	56.03	55.22	46.05	B	607.41	2	303.70	**79.88***
					W	98.851	26	3.80	
	Mean Gain	-10.80	-9.00	-0.70					
Back Hand Clear	Pre test	45.80	47.30	45.90	B	14.07	2	7.03	1.60
					W	118.60	27	4.39	
	Post test	56.20	57.00	44.90	B	915.80	2	457.90	**47.10***
					W	262.50	27	9.72	
	Adjusted	56.30	56.81	44.99	B	872.14	2	436.07	**43.96***
					W	257.923	26	9.92	
	Mean Gain	-10.40	-9.70	1.00					

*Significant at 0.05 level of confidence for (df) 3 at 56 = 2.70 and for (df) 3 at 55 =2.72

The results presented in Table I showed that the pre, post and adjusted post test mean value on fore hand clear and back hand clear for specific skill training group, neuromuscular training group and control group. The calculated F ratio of 72.72 and 47.10 was greater than the required table value of 2.70 which indicated that there was significant improvement on fore hand clear and back hand clear after twelve weeks of specific skill training and neuromuscular training programme.

TABLE II
SCHEFFE'S POST HOC TEST ANALYSIS ON SKILL PERFORMANCE VARIABLES OF CONTROL GROUP AND EXPERIMENTAL GROUP

Variables	Ex 1	Ex 2	CG	MD	CI
Fore Hand Clear and Back Hand Clear	56.03	55.22	-	0.81	2.26
	56.03	-	46.05	**9.98***	2.26
	-	55.22	46.05	**9.17***	2.26
	56.30	56.81	-	-0.51	3.65
	56.30	-	44.99	**11.32***	3.65
	-	56.81	44.99	**11.82***	3.65

*Significant at 0.05 level

The post hoc analysis of adjusted means proved that there were significant differences between the control group and specific skill training group, control group and neuromuscular training group were greater than the required confidential interval value. However, there was no significant difference between specific skill training and neuromuscular training group as the mean difference was lesser than the confidence interval value.

CONCLUSION

It was concluded that there was significant improvement on fore hand clear and back hand clear volleying ability among state level male badminton players. Lee et. al (2005), in their study the result showed that the top three most popular shots used were clear, lift and net. The results of the present study also confirmed the same by adding the forehand clear and back hand clear among state level badminton players, badminton serving ability place a vital role especially in the game of doubles.

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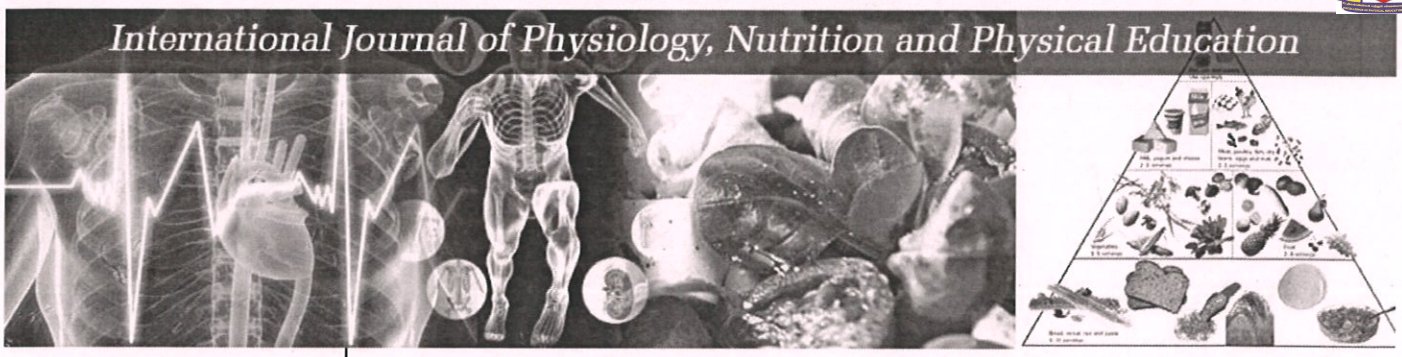
Site this article:

Ganesh kumar, T., & Senthilkumar, P.K. (2019). Effect of specific skill and neuromuscular training on selected skill performance variable among state level male badminton players. *International Journal of Adapted Physical Education & Yoga*, Vol. 4, No. 5, pp. 38 to 41.

3.4.5-J-EPN - 2018-19

International Journal of Physiology, Nutrition and Physical Education 2019; 4(1): 1455-1457



ISSN: 2456-0057
IJPNPE 2019; 4(1): 1455-1457
© 2019 IJPNPE
www.journalofsports.com
Received: 09-11-2018
Accepted: 11-12-2018

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Efficacy of specific skill and neuromuscular training on speed and explosive power among badminton players

T Ganeshkumar and Dr. PK Senthilkumar

Abstract
The purpose of the study was to find out the efficacy of specific skill and neuromuscular training on speed and explosive power among badminton players. To achieve the purpose of this study forty-five (N= 45) school level badminton players were selected as subjects, who were members of badminton clubs, in Chennai. The age group of the subjects were between 15 to 17 years. The subjects were randomly divided into three groups consists of fifteen subjects. Group I underwent neuromuscular training and Group II underwent specific skill training and group III acted as control group. The investigator selected speed and leg explosive power as variables for this study. Pre and post test random group design was followed in this study. The data obtained from initial and final scores were statistically analysed for test of significance using Analysis of Covariance (ANCOVA).In all cases the significance level fixed was 0.05 levels, which was considered as appropriate. The results existing proved that there was a significant influence due to the neuromuscular training and specific skill training on speed and leg explosive power among school level badminton players.

Keywords: Badminton, neuromuscular training, specific skill training, speed and leg explosive power

Introduction
Badminton is a highly complex sport and this presents great challenges for players and coaches of all levels. An individual rally is a series of demanding movements performed using a movement pattern which is unique compared with any other sport. Rally length is often short (average for elite players is around 6-8 seconds) and, consequently, performed at very high intensity. However, players must also be prepared for long rallies. Rallies are interspersed with short rest

Periods (typical duration around 15 seconds) which allow partial recovery from the previous rally, however, competitive matches may last at least 45 minutes. So, badminton is a combination of speed (anaerobic fitness) in rallies and endurance (aerobic fitness) to allow sustained efforts and to promote recovery between rallies. Great strength, power, agility and flexibility are also required. All of these fitness components should form part of a player's fitness training. Additionally, the development of tactical and technical elements is, of course, also vital.

Training needs to be varied in order to enhance Leg power is an important component in badminton in that it results in the player being able to move quickly and explosively to the shuttle in various directions and to jump high to play overhead strokes. Greater leg power results in a greater acceleration and faster speed when lifting off the floor when moving, or jumping to the shuttle. According to Omosegaard (1996) [2], an explosive player will typically be able to jump high, change direction quickly and will generally appear to be swift and mobile on the badminton court. Leg power is therefore a combination of co-ordination and muscular properties.

Speed is needed in badminton for moving to and from the shuttle, and the ability to cover short distances quickly would be a great advantage for the badminton player (Todd and Mahoney, 1995) [5]. If a player needs to increase movement speed, then that needs to be achieved in many varied circumstances on and off the court. Neuromuscular training has been defined as multi-intervention programs that combine balance, strength, plyometric, agility, and sport-specific exercises (Coughlan and Caulfield, 2007) [1].

The physical fitness of a badminton player can be the decisive determinant of success during a tournament, and if a player wishes to achieve success in competition, an improvement in physical fitness needs to be emphasis. At this perspective, the aim of our study was to investigate the efficacy of specific skill and neuromuscular training on speed and explosive power among badminton players.

Methodology

To achieve the purpose of this study forty-five (N=45) school level badminton players were selected as subjects, who were members of badminton clubs, in Chennai. The age group of the subjects were between 15 to 17 years. The subjects were randomly divided into three groups consists of fifteen subjects. Group I underwent neuromuscular training and Group II underwent specific skill training and group III acted as control group for the period of ten weeks. The investigator selected speed and leg explosive power as variables and tested with 50 meter dash and vertical jump test respectively for this study. Pre-test and post-test random group design was followed in this study. The data obtained from initial and final scores were statistically analysed for test of significance using Analysis of Covariance (ANCOVA). In all cases the significance level fixed was 0.05 levels, which was considered as appropriate.

Result and discussion

The statistical analysis of comparing the initial and final score of speed among experimental and control group.

Table 1: Analysis of co-variance of speeds among experimental and control groups (Scores in seconds)

	Exe Group-I	Exe Group-II	Control Group	Source of variance	Sum of variance	DF	Mean squares	Obtained F-ratio
Pre Test Mean	7.30	7.32	7.33	Between	0.00	2	0.00	0.24
				within	0.37	42	0.01	
Post Test Mean	7.21	7.23	7.30	Between	0.06	2	0.03	5.11*
				Within	0.25	42	0.01	
Adjusted Post Test Mean	7.22	7.23	7.29	Between	0.04	2	0.02	16.14*
				within	0.05	41	0.00	
Mean Diff	-0.10	-0.09	-0.03					

*Significant (table F ratio at 0.05 level of confidence for 2 and 42(DF) =3.22, 2 and 41(DF) =3.23)

As shown in table 1, the obtained F value on the scores of pre-test means 0.24, which was lesser than the required table value. Hence, it was insignificant at 0.05 levels. The obtained F value on post-test means was 5.11, which was greater than required table value of 3.22 and was significant at 0.05 levels. Taking into consideration of the pre and post-test means adjusted post-test means were determined and analysis of covariance was done and the obtained F value 16.14 was greater than the required value of 3.23 and hence it was accepted that there was significant difference among the treated groups. Since significant difference was recorded, the results were subjected to post hoc analysis using Scheffe's Confidence interval test. The result was presented in the table-2.

Table 2: Scheffe's Confidence Interval test scores on speed

Exp. Group-I	Exp. Group-II	Control group	Mean difference	Required CI
7.22	7.23		0.02	0.03
7.22		7.29	0.07*	
	7.23	7.29	0.05*	

*Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant difference existed between neuromuscular and specific skill training and control group and there was no significant difference between treatment groups.

Table 3: Analysis of covariance of leg explosive power among experimental and Control group (Scores in Numbers)

	Exp. Group-I	Exp. Group-II	Control group	Source of variance	Sum of squares	DF	Mean squares	Obtained F-ratio
Pre Test Mean	16.53	19.80	19.40	Between	95.24	2	47.62	1.51
				within	173.73	42	4.14	
Post Test Mean	19.87	22.93	18.87	Between	134.71	2	67.36	14.26*
				within	198.40	42	4.72	
Adjusted Post Test Mean	21.64	21.87	18.15	Between	124.65	2	62.32	37.72*
				within	67.74	41	1.65	
Mean Differ	3.33	3.13	-0.53					

*significant table F-ratio at 0.05 level of confidence for 2 and 42 (DF) =3.22, 2 and 41(DF) =3.23

As shown in table-2, the obtained F value on the scores of pretest means 1.51, which was lesser than the required table value, hence, it was insignificant at 0.05 levels. The obtained F value on posttest means was 14.26, which was greater than the required table value of 3.22 and was significant at 0.05 levels. Taking into consideration of the pre and posttest means adjusted means were determined and analysis of covariance was done and the obtained F value 37.72 was greater than the required value of 3.23 and hence it was accepted that there was significant differences among the treated groups. Since significant difference was recorded, the results were subjected to post hoc analysis using scheffe's confidence interval test. The results were presented in table -2.

Table 4: Scheffe's Confidence Interval Test Scores on leg explosive power

				Required CI
Strength training	**Court drills training**	**Control group**	**Mean difference**	
21.64	21.87		0.23	1.18
21.64		18.15	3.49*	
	21.87	18.15	3.72*	

*Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant difference existed between neuromuscular and specific skill training and control group and there was no significant difference between treatment groups.

Conclusion

The results of this study provide evidence that ten weeks of specific skill and neuromuscular training on Speed and leg explosive power was significantly improved due to neuromuscular and specific skill training among badminton players. The effects of training programs specifically targeted on speed and leg explosive power for the enhancement of the badminton playing ability. Badminton at the highest level puts a great demand on leg strength (Omosegaard, 1996) [2]. Speed is needed in badminton in moving to and from the shuttle. Speed on a badminton court is not only a question of being in good physical condition (Omosegaard, 1996) [2]. According to Roetert et al. (1996) [4], a vital aspect of sports such as badminton is the ability of the player to exert muscular force at high speed. Many sports require a generation of high forces and power outputs (Reilly et al., 1990) [3].

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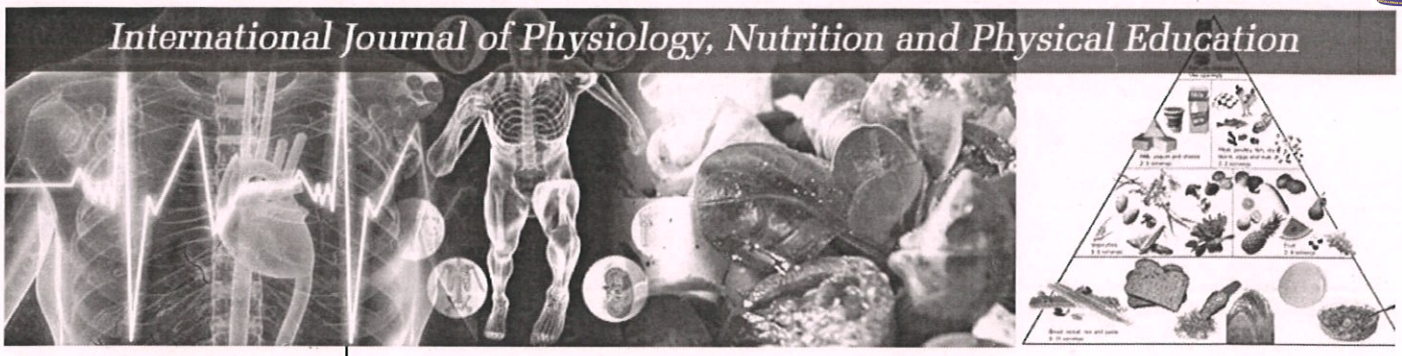
International Journal of Physiology, Nutrition and Physical Education 2019; 4(1): 1816-1819



ISSN: 2456-0057
IJPNPE 2019; 4(1): 1816-1819
© 2019 IJPNPE
www.journalofsports.com
Received: 21-11-2018
Accepted: 25-12-2018

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Efficacy of cardio resistance training and concurrent training on resting metabolic rate and respiratory rate among sedentary males

S Selvamurugamani and Dr. PK Senthilkumar

Abstract
The aim of the study was to examine the efficacy of cardio, resistance training and concurrent training on resting metabolic rate and respiratory rate among sedentary Males. To achieve the purpose of the study sixty healthy males (N=60) were randomly assigned into exercising group namely, cardio training group (n=15), resistance training group (n=15), and concurrent (cardio and strength) training group (n=15) a non-exercising control group (n=15). Resting metabolic rate was measured by using after calculation from fat free mass and respiratory rate was estimated number of breathing per minute of the subject's pre and post-experiment. The results of the study indicated that control group was found to have decreased their Resting metabolic rate, whereas the cardio and resistance training group increased their mean resting metabolic rate and significant reduction in respiratory rate. In conclusion, cardio training and strength training and concurrent training significantly interfere with improvement in resting metabolic rate and reduction in respiratory rate among sedentary males when compared to control one.

Keywords: Resting metabolic rate, respiratory rate, cardio, strength and concurrent training

Introduction
Physical activity is defined as 'bodily movement that is produced by the contraction of skeletal muscle and that substantially increases energy expenditure' (US Department of Health and Human Services 1996) [19]. Exercise is an integral part of increasing energy expenditure when trying to lose or maintain weight loss (Donnelly *et al*., 2004; Jakicic 1999) [6, 13]. An excess energy intake, positive energy balance, compared to energy expenditure results in weight gain, whereas a negative energy balance will result in weight loss. Exercise is one of the components of energy expenditure that is under voluntary control (Donnelly *et al*., 2004) [6]. Energy balance is altered by exercise in variety of ways. This can include the energy expended during exercise, the energy expended post exercise, and any alterations in resting metabolism induced by the exercise over time (Donnelly *et al*., 2004) [6].
Physical activity affects total energy expenditure, which is the sum of the basal metabolic rate (the amount of energy expended while at rest in a neutrally temperate environment and in a state of fasting), the thermic effect of food (otherwise known as dietary-induced thermogenesis) and the energy expended in physical activity (Department of Health 1991) [4].
Resting metabolic rate is the largest part of total daily energy expenditure. Resting metabolic rate accounts for approximately 60-75% of total daily energy expenditure and represents the energy requirements of vital body functions. Seventy five to eighty percent of the variability in resting metabolic rate is predicted by fat-free mass (Ravussin *et al*., 1992; Donahoo 2004; Illner *et al*., 2000; Speakman *et al*, 2003) [16, 5, 12, 18] and when comparing individual organs, it is the skeletal muscle and the liver that significantly contribute to resting energy expenditure (Illner *et al*., 2000) [12].
The thermic effect of food accounts for 10-15% of total daily energy expenditure and represents the energy requirement associated with digestion, absorption, and storage of food. The magnitude of thermic effect of food can be altered by a number of factors (Donahoo *et al*., 2004; Donnelly *et al*., 2004) [5, 6]. For example, thermic effect of food increases with a decrease in ambient temperature, is effected by over and under feeding, weight gain increases thermic effect of food and weight loss decreases thermic effect of food (Donahoo *et al*., 2004) [5].

Physical activity is a key component of energy balance (Donnelly et. al., 2004) [6]. The physiological effects of physical activity are wide ranging, and affect various body systems. As a modifiable component of energy expenditure, physical activity can affect energy balance. However, the total effects of physical activity on total energy expenditure go beyond the physical activity-induced energy expenditure. Increases in resting metabolic rate and non-exercise activity thermogenesis are also seen. Furthermore, physical activity can modify body composition favorably by decreasing fat mass and increasing lean mass.

It is well known that endurance training improves the aerobic capacity and changes occur both in the cardiorespiratory system (Ekblom *et al.*, 1968) [7] and within the muscle machinery itself with profound metabolic (Gollnick *et al.*, 1972) [9] and morphological adaptations (Hoppeler *et al.*, 1973) [11]. Resistance training may be an important component of a successful weight loss program by maximizing fat loss while stimulating increases in lean body mass and muscular strength (Kraemer *et al.* 2002) [14]. The increase in metabolic rate post exercise following resistance training may have a significant effect on weight loss. Resistance training does not produce the same caloric expenditure during exercise that aerobic exercise does (Braun *et al.*, 2005) [2]. The incorporating strength and endurance training sessions in the one training regime irrespective of whether the training is performed on the same day or separate days is known as concurrent training (Hickson, 1980) [10]. The literature advises health professionals to prescribe strength and endurance exercises in the one training regime in order to improve and sustain health-related fitness (Garber *et al.*, 2011) [8]. Therefore, the present study was aimed to assess the efficacy of cardio, resistance training and concurrent training on resting metabolic rate (RMR) and respiratory rate in healthy adults.

Methods

To achieve the purpose of the study sixty active men who volunteered to participate in this study were selected and their age ranged between 30 to 35 years. Subjects were randomly assigned into cardio training group (n = 15), a resistance training group (n=15), a concurrent cardio and resistance training group (n=15), and a non-exercising control group (n=15). Prior to participation in the investigation, all volunteers gave written informed consent and physical examinations. All subjects underwent a similar test before and after the 12-week intervention period. Each subject's Lean body mass (LBM) were calculated from the equations (Moore *et al.*, 1963) [15], where M is body mass in kg and A is age in years, assuming all subjects to be normal. Male LBM = (79.5 - 0.24 M - 0.15 A) x M ÷ 73.2.The methods of estimating Resting Metabolic Rate from Fat-free mass (Cunningham, 1980) [3], RMR (cal./day) = 500 + 22 (LBM in kg).

Statistics

Data were analyzed using analysis of covariance (ANCOVA) and the adjusted post-test means were tested for significance. If the 'F' ratio was significant, Scheffe's post-hoc test was employed to find out the paired mean difference. The level of confidence was fixed at 0.05 level of significance

Training programme

Cardio exercise training: Cardio exercise was performed on treadmills, rowers, steppers and cycle ergometers. After a 5 minute warming up exercise participants were instructed to perform cardio training before resistance training. Cardio exercise intensity was adjusted based on maximum heart rate (220 - age =MHR). For the first two weeks the target intensity was 50-60% of maximum heart rate (MHR). The intensity progressively increased to moderate level 60-85% MHR. 25 minute was given for the first two weeks and increased to 30 minute from the third week onwards.

Resistance exercise training

Resistance exercise training was performed after cardio exercise. Subjects were guided to perform sensible resistance exercise with major body muscles seven different exercises (Upper body: biceps curl, bench press; Core body: sit-ups or curl-up; Lower body: squat, leg press, leg extension, leg curl) were conducted. During the first week, the exercises were performed with 50% of one repetition maximum (1RM) in 2 sets with 10 repetitions and a recovery period of 1-2 min. The intensity of the workout increased to 85% of 1RM in 3 sets with 6 repetitions during the 8th week. At the end of the first 4 weeks, the 1RM was measured and the training programme for the second 4 weeks was devised based on the new 1RM.

Concurrent training

In the present investigation made use of sessions that utilized both cardio and resistance training in equal durations. Therefore, each subject in the concurrent group used resistance training equating to two sets of 15 repetitions at a workload of 50% 1-RM, or in the case of crunches, the maximum number of repetitions performed in one minute during the baseline testing. As with the Resistance training group, every week each subject's estimated 1-RM was re-evaluated and his exercise programme adjusted accordingly. The Concurrent group subjects were also required to exercise using a combination of treadmills, rowers, steppers and cycle ergometers at an intensity of 50% to 60% of their individual age-predicted heart rate maximum. This intensity was readjusted every week by a 5% increase in heart rate. While subjects in the exercise groups were not permitted to engage in any form of exercise other than their prescribed intervention programmes. The Non-exercising group subjects were not allowed to take part in any structured exercise and had to continue with their inactive lifestyles.

Results

Table 1: Analysis of covariance on basal metabolic rate of experimental and control groups

Test	Ex. Gr 1	Ex. Gr 2	Ex. Gr 3	Con. Gr	SV	SS	DF	MS	F
Pre Test	1594.20	1602.93	1643.93	1613.20	B	21156.06	3	7052.022	1.10
					W	359354.66	56	6417.048	
Post Test	1699.27	1713.13	1751.07	1610.47	B	159407.65	3	53135.883	8.36*
					W	355781..33	56	6353.238	
Adjusted	1717.33	1723.05	1722.74	1610.81	B	137000.30	3	45666.768	58.27*
					W	43104.94	55	783.726	
Mean Gain	-105.07	-110.20	-107.13	-2.73					

*Significant at 0.05 level of confidence for 2 and 56 (DF) = 2.70, 2 and 55 (DF) = 2.72

Table 2: Scheffe's test for the differences between the adjusted post-test paired means of experimental and control groups

Con. Gr	Ex. Gr 1	Ex. Gr 2	Ex. Gr 3	MD	CI
1610.81	1717.33	-	-	106.52*	29.20
1610.81	-	1723.05	-	112.24*	29.20
1610.81	-	-	1722.74	111.93*	29.20
-	1717.33	1723.05	-	5.72	29.20
-	1717.33	-	1722.74	5.41	29.20
-	-	1723.05	1722.74	0.31	29.20

*Significant

Table 3: Analysis of covariance on respiratory rate of experimental and control groups

Test	Ex. Gr 1	Ex. Gr 2	Ex. Gr 3	Con. Gr	SV	SS	DF	MS	F
Pre Test	15.41	16.13	16.28	16.04	B	6.641	3	2.214	1.39
					W	89.359	56	1.596	
Post Test	13.37	14.24	14.11	15.97	B	54.583	3	18.194	16.15*
					W	63.104	56	1.127	
Adjusted	13.78	14.12	13.88	15.92	B	45.420	3	15.140	54.10*
					W	15.393	55	0.280	
Mean Gain	2.03	1.89	2.17	-0.07					

*Significant at 0.05 level of confidence for 2 and 56 (DF) = 2.70, 2 and 55 (DF) = 2.72

Table 4: Scheffe's test for the differences between the adjusted post-test paired means of experimental and control groups

Con. Gr	Ex. Gr 1	Ex. Gr 2	Ex. Gr 3	MD	CI
15.92	13.78	-	-	2.14*	0.55
15.92	-	14.12	-	1.80*	0.55
15.92	-	-	13.88	2.04*	0.55
-	13.78	14.12	-	0.34	0.55
-	13.78	-	13.88	0.10	0.55
-	-	14.12	13.88	0.25	0.55

*Significant

The results of the study showed that the cardio, resistance and concurrent training produced significant improvement on basal metabolic rate and significant reduction in respiratory rate. However there were no significant differences between the cardio, resistance and concurrent training groups on basal metabolic rate and respiratory rate.

Discussion

The results of the current study show that a period of cardio, resistance and concurrent training results in a favorable improvement in basal metabolic rate and reduction in respiratory rate that have previously been thought of as mutually exclusive in terms of concurrent, cardio or resistance training performed in isolation. Consequently, for previously untrained, apparently healthy young men aiming to improve health status, concurrent training may be more effective than cardio and resistance training alone for simultaneously improving both the physical and physiological parameters. Endurance training may slightly lower respiratory rate and tidal volume and slightly decrease ventilation at light exercise loads. Regular physical training increases tidal volume both at rest and during submaximal and maximal exercise. In contrast, after prolonged exercise, respiratory rate is reduced both at rest and during submaximal exercise and increased maximal exercise when compared with matched controls (Åstrand and Rodahl 1977) [1]. Resistance training positively alters the body composition and preserves lean body tissues. Although the body weight may not change, lean body mass (Muscle and bone) increases and body fat decreases. Given that muscle tissue is more metabolically active (Burns more calories) than fat tissue, the increase in muscle size and lean body mass helps to maintain resting metabolic rate when you are on a weight loss diet. Exercise science and nutrition professionals recommend using resistance training combined with aerobic exercise to maximize the loss of body fat and to maintain lean body tissues (Heyward, and Gibson, 2014) [20]. The results of the study emphasize the importance of Regular physical activity and healthy eating habits in young people as well as adult. In addition, energy restriction induces an adaptive reduction of energy expenditure through a lowering of tissue metabolism and a reduction of body movement. An exercise-induced increase in activity expenditure is a function of the training status.

Conclusion

The results of this study suggested that there is a need to increase regular physical training by combining cardio and resistance exercises so that the body improves both resting metabolic rate and respiratory rate simultaneously. Further studies need to be done how the combination of combined exercise training influence resting metabolic rate and respiratory rate on sedentary individuals.

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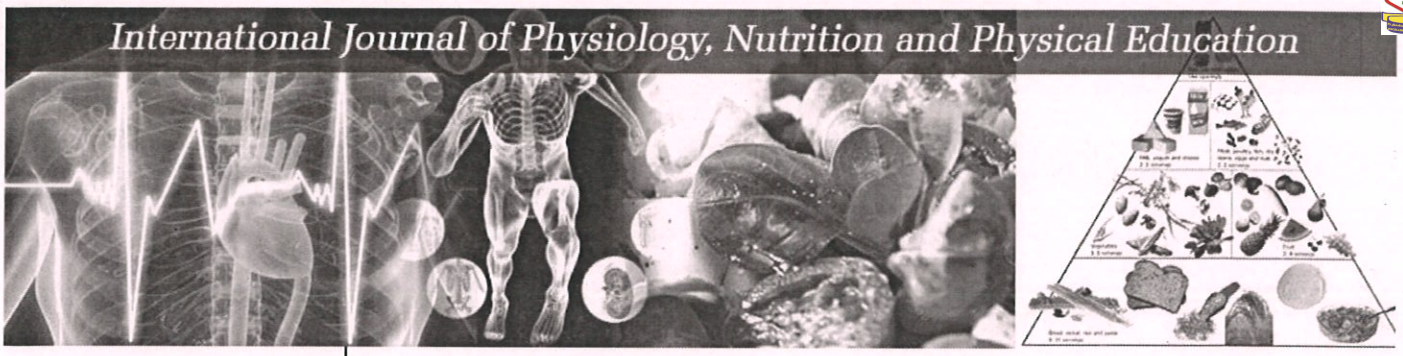
3.45-J-EPN-2018-19

International Journal of Physiology, Nutrition and Physical Education 2019; 4(1): 1661-1663



ISSN: 2456-0057
IJPNPE 2019; 4(1): 1661-1663
© 2019 IJPNPE
www.journalofsports.com
Received: 22-11-2018
Accepted: 24-12-2018

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Efficacy of functional core training and slide board training on selected range of motion parameters among young active men

Dr. PK Senthilkumar

Abstract
The objective of this study was to examine the efficacy of functional core training and slide board training on selected range of motion parameters among young active men. To achieve the purpose of the study forty five active men were randomly assigned into experimental group I (n=15), experimental group II (n=15) and control group (n= 15) and their age ranged between 20 and 25 years. The experimental groups underwent functional core training and slide board training for three sessions per week in 12 weeks. The subject's Range of motion parameters such as knee flexion and hip flexion was measured by Goniometer. The pre and post test data of both the groups were collected and statistically examined by applying analysis of covariance. Results of the study show that the range of motion of knee flexion and hip flexion significantly improved ($P<0.05$) in experimental group compared with the control one. In contrast, control subjects did not show any significant alteration in these parameters and also there was no significant difference between the treatment groups. The functional core training and slide board training programme may be recommended to improve the range of motion of knee flexion and hip flexion and it may contribute to enhance range of motion level young active men.

Keywords: Functional core training, slide board training, knee flexion and hip flexion

Introduction

"Core stability" describes the ability to control the position and movement of the central portion of the body. Core stability training targets the muscles deep within the abdomen which connect to the spine, pelvis and shoulders, which assist in the maintenance of good posture and provide the foundation for all arm and leg movements. The core is the link between the lower and upper body. The core transfers forces and power between the lower body and the upper body. For optimal performance the core needs to be solid, to avoid energy leaks within the kinetic chain. A dysfunctional core that ineffectively transfers forces will put more strain on the limb muscles and tendons, resulting in overuse injuries. A solid core keeps the back healthy, helps to maintain good posture, improves the balance, enhances performance and prevents injuries. A strong core will help throw a ball further and can even help you to change direction faster (Kibler, 2006) [3].

Slide boards have been used by speed skaters and hockey players for years and years now and are becoming ever more popular in fitness facilities today. The slide board develops lateral speed, agility, coordination, balance, and explosive power. Slide boards are intended to improve the strength, endurance, and stability of the hip and hip stabilizers. This type of cross-training is a great way to get the cardiovascular training done all while reducing the risk of hip injuries.

The slide board provides effective rehab for both the upper and lower body. Using the board for upper body injuries requires putting the booties on the hands. It is a functional training device that is becoming a popular addition to conditioning and rehabilitation programs (Reese and Lavery, 1991) [4]. Slide boards incorporate an integral skill of many sports: lateral agility and power. Slide board exercise requires the use of the hip adductors and abductors (Reese and Lavery, 1991) [4]. Slide boards can be used to develop and maintain aerobic conditioning and aid in numerous sport-related skills.

Motion of the human body is not isolated to one muscle or tissue moving in one specific direction. It is a complex event involving agonist and antagonist structures that work together to create changes in position and stabilizes the body in all three directional planes of motion. Regardless the type of sport it is essential to have core strength and trunk stability to maximize performance and prevent injury, especially in active daily living. The main objective of the study was to examine the effectiveness of functional core and slide board training on selected range of joint motion parameter in young active men.

Research design and methods

The study was formulated as a true random group design, consisting of a pre-test and post-test. Forty five (N=45) young active men from Chennai city were selected as subjects at random and their ages ranged from 20 to 25 years. The subjects were randomly assigned to three equal groups of fifteen subjects each. The exercise groups underwent functional core training and slide board training for three sessions per week in 12 weeks. The subject's Range of motion parameters such as knee flexion and hip flexion was measured by Goniometer. The pre and post test data of both the groups. The pretest and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant; Scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses.

Training programme

Functional Core: All subjects performed 10 minutes of warm-up exercise, which comprised flexibility exercises, involving a range of motion exercises to all joints of the upper and lower limbs and trunk. Each training session was supervised by the study investigators and certified fitness trainers in the Fitness Center. Crunches, Oblique Crunches, the Plank, Oblique Plank, Single Leg Bridging, Controlled roll ups, Hamstring Raises, Superman, Static Straight Legs, Lowering and Raising Legs, Hundreds and Wall squats.

Slide Board Training: The protocol for slide board training included a 10 minute warm-up period, a session lasting between 15-20 minutes, and a 10 minute cool down period. The sessions were held three days per week for 12 weeks. The Reebok Slide Trainer was used for this study. The Slide Trainer consists of a 6-foot portable board that has a durable slide surface, a nonskid backing, angle bumpers, to enable the participant to maintain the proper biomechanical alignment, and booties which are nylon and slip over any type of tennis shoe or cross-trainer. Finally, the Reebok Slide Trainer has unique graduated end ramps (10-degree angle) that minimize the impact on the ankle, knee, and hip joints. Speed skater, Single-Leg Mountain Climbers, Double-Leg Mountain Climbers, Double-Leg Pike Forward Lunge, Reverse Lunge, Side Lunge and Fly to Pushups.

The initial intensity was fixed at 60–65%. The intensity of the exercise was gradually increased, once in every two weeks. The intensity was fixed between 65% and 70% during 3-4 weeks, 70% and 75% during 5-6 weeks, 75% and 80% during 7-8 weeks, 80% and 85% during 9-10 weeks and 85% and 90% during 11-12th weeks. The subjects were asked to perform each exercises and 60 seconds rest was given as the recovery between sets. The number of sets was gradually increased once in two weeks along with the intensity. The training was given under the direct supervision of the investigator.

Results

Analysis of Covariance on range of motion of pretest and posttest means for functional core training and slide board training group and control group have been analyzed separately and presented table-1.

Table 1: Analysis of Covariance on Range of motion parameters

Variables	Test	EG - I	EG - II	CG	SV	SS	DF	MS	F
Knee Flexion	Pre Test	128	130	126	B	104.84	2	52.42	1.05
					W	2087.07	42	49.69	
	Post Test	134	137	129	B	498.71	2	249.36	6.37*
					W	1643.60	42	39.13	
	Adjusted	134	135	130	B	187.71	2	93.86	14.15*
					W	271.88	41	6.63	
	Mean Gain	6	7	3					
Hip Flexion	Pre Test	113	113	112	B	17.24	2	8.62	1.05
					W	343.33	42	8.17	
	Post Test	119	118	112	B	397.73	2	198.87	34.59*
					W	241.47	42	5.75	
	Adjusted	119	118	113	B	297.95	2	148.97	43.89*
					W	139.18	41	3.39	
	Mean Gain	6.3	5.3	0.9					

*Significant at 0.05level of confidence for 2 and 41 (DF) = 3.21, 2 and 42 =3.22

An examination of table - 1 indicated that the obtained pretest F-value on Knee Flexion and Hip Flexion was 1.05 and it was lesser than the required table F-value of 3.22. Hence the knee flexion and hip flexion before start of the respective treatments were found to be insignificant at 0.05 level of confidence for the degrees of freedom 2 and 42. Thus, this analysis confirmed that the random assignment of subjects into three groups were successful.

The obtained posttest F value of 6.37 and 34.59 was greater than the required table F value of 3.22. Hence the posttest means value of functional core training and slide board training on knee flexion and hip flexion were found to be significant at 0.05 level of confidence for the degrees of freedom 2 and 42. The results proved that knee flexion and hip flexion were significantly improved moderately than the control group of the sample populations.

The obtained adjusted posttest F value of 14.15 and 43.89 was higher than the required table F value of 3.23. Hence the adjusted posttest means value of functional core training and slide board training on knee flexion and hip flexion were

found to be significant at 0.05 level of confidence for the degrees of freedom 2 and 41. The results confirmed that functional core training and slide board training on knee flexion and hip flexion were produced significant difference among the groups.

In order to find out the superiority effects among the experimental and control groups the Scheffe's post hoc test were administered. The outcomes of the same are presented in the table 2.

Table 2: Scheffe's Confidence Interval Test on Range of motion parameters

Variables	EXP.GP 1	EXP.GP 2	C G	MD	CI
Knee Flexion	134	135	-	1	2
	134	-	130	4*	2
		135	130	5*	2
Hip Flexion	119	118	-	1	2
	119	-	113	6*	2
		118	113	5*	2

*Significant

The multiple comparisons showed in Table 2 proved that there existed significant differences between the adjusted means of functional core training with control group (4 and 6), slide board training with control group (5 and 5). Hence the comparison was significant. Further, there was no significant difference between functional core and slide board training (1and1) at 0.05 level of confidence with the confidence interval value of 2. The adjusted posttest mean deference of experimental and control group value graphically represented in the figure 1.

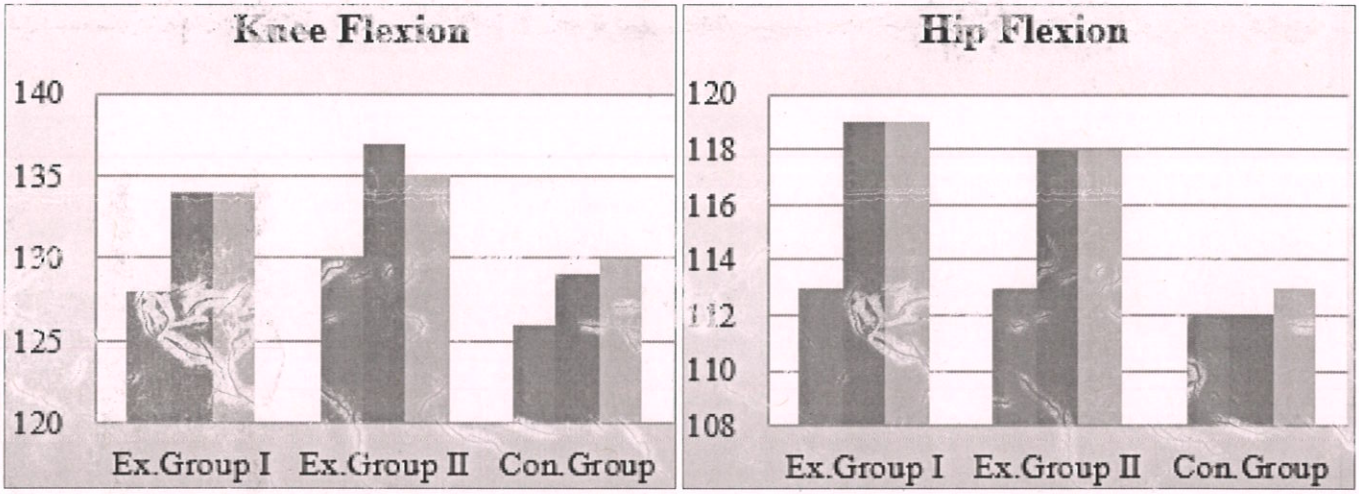

Fig1: Bar Diagram Showing the Adjusted Post Test Means of Range of motion parameters

Discussion

Based on statistical analysis experimental group significant improved on selected range of motion parameters due to effect of 12 weeks of functional core training and slide board training. Optimal core stability exists when the musculature is able to control the trunk to a point that allows optimal transfer of torque to the terminal segments of the extremities (Kibler, Press, Sciascia, 2006) [3], the study conducted by Sekendiz, Cug and Korkusuz, (2009) founded that Swiss-ball core strength training increases trunk flexion/extension of sedentary women. The study conducted by Cug Mutlu (2012) [2] Swiss ball training showed that a significant effect on knee proprioception. Baldon, *et al.*, (2012) [1] pointed out that functional stabilization training significantly increased knee flexor torques. The finding of the study in agreement with the above said studies.

Conclusions

It was concluded that experimental treatment improved on selected range of motion parameters due to the effect of functional core training and slide board training among young active men. The control group did not improve selected criterion variable. Core stability is the ability of body to control the whole range of motion of joint thereby functional core training and slide board training will enable the individual to achieve optimum gains in knee hip range of motion.

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B.H.5-J-EPN-2018-19

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

ANALYSIS OF BODY MASS INDEX PERCENTAGE OF BODY FAT AND MAXIMAL OXYGEN CONSUMPTION AMONG MALE AND FEMALE STUDENTS OF TNPESU

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ABSTRACT

The main purpose of the study was to analyze and compare the fitness in terms maximal oxygen consumption (VO_2 max) by 1.5 Mile Run/walk test and body mass index, percentage of body fat among the male students and female students of Department of Exercise Physiology and Nutrition, TNPESU. Twenty six young male and female students from each of the Active as well as inactive lifestyle were recruited by simple random sampling and their age ranged between 18- 23 years. Body Mass Index (BMI) of all the subjects was computed by Weight (kg)/Height (m^2).Skinfold measurement also assumes that subcutaneous fat is a reliable indicator of total body fat. Durnin and Womersley (1974) validated the sum of four skinflod thickness (biceps, triceps, subscapular and suprailiac) against densitometry and devised sex and age dependent population-based linear regression equations to estimate total body density.Once density is calculated, the Siri (1961) equation is used to estimate percentage body fat: Fat (%) = [(4.95 / D) – 4.5] x 100. Indirect estimation of maximal oxygen consumption (VO_2 max) was done by using 1.5 Mile Run/walk test of each group of subjects. This study try to compare whether there is any difference between male and female student student's t test were used for statistical treatment of the data. The results reveal that there was significant difference between male and female student on Body mass index, Percentage of body fat and VO_2 max of the male and female students of active as well as inactive lifestyle. The male young students do have a higher among males than the inactive lifestyle female young students.

Key words: Body Mass Index, Percentage of Body Fat, VO_2Max

INTRODUCTION

Maximum oxygen consumption (VO_2 max) reflects the maximum capacity of a person to absorb, carry and consume O_2 (Albouaini, et al, 2007) .VO_2 max reflects a person's overall fitness level, which is one's maximum potential for using oxygen to make ATP. This is also known as aerobic capacity. VO_2 max is defined by the limits of one's oxygen transport system, so this value does not vary from moment to moment in the same way that VO_2 will change. Individuals who are more physically fit will be able to use oxygen more efficiently (have a higher VO_2 max), and can therefore produce more ATP and perform more work with less effort. Factors that can affect VO_2 max include general respiratory and cardiovascular health, the amount of mitochondria in the muscle cells, and vascularization of the muscle tissue. A person can increase their VO_2 max over time with physical training. The body's use of oxygen during a bout of exercise can be measured by monitoring oxygen uptake (VO_2). The maximal ability of the body to deliver and consume oxygen (VO_2max) is the product of the maximal cardiac output (L blood/min) and the

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arterial-venous oxygen difference (ml O_2/L blood) (ACSM, 2008). VO_2max is considered the "gold standard" measure of cardiorespiratory fitness (ACSM, 2010) it is used as an objective indicator of cardiovascular function and as a benchmark for determining recommended exercise intensity. The present study was initiated to estimate the VO_2 max in inactive female student. Most of the VO_2 max studies are in male. Very few studies have been taken in female student. We intended to take VO_2 max levels in female having sedentary life-style.

METHOD

For the purpose of the study sixteen female (N=16) healthy sedentary students from the middle class socioeconomic background, having age range of 18 to 23 years were recruited for the study on the basis of random sampling from the Department of Exercise Physiology and Nutrition, TNPESU, Tamil Nadu. The experimental protocol was fully explained to participants to dispel their hesitation and ensure maximum cooperation. The participants had no history of any major disease and did not follow any physical conditioning program, apart from some recreational sports. Body Mass Index (BMI) of all the subjects was computed by Weight (kg)/Height (m^2). Skinfold measurement also assumes that subcutaneous fat is a reliable indicator of total body fat. Durnin and Womersley (1974) validated the sum of four SFT (biceps, triceps, subscapular and suprailiac) against densitometry and devised sex and age dependent population-based linear regression equations to estimate total body density. Once density is calculated, the Siri (1961) equation is used to estimate percentage body fat: Fat (%) = [(4.95 / D) – 4.5] x 100. Indirect estimation of maximal oxygen consumption (VO_2 max) was done by using 1.5 Mile Run/walk test of each group of subjects. VO_2max is computed with the following equation:

VO_2max (ml. kg-1.min-1) = 88.02 + (3.716 * gender) - (0.0753 * body weight in pounds) - (2.767 * time for 1.5 miles in minutes and fractions of minutes). Where gender = 1 for males and 0 for females.

This study tries to compare whether there is any difference between male and female student student's t test were used for statistical treatment of the data.

RESULTS

Means and standard deviation of age, body height, body mass, BMI and VO_2max of the male and female participants are presented in table 1. Though age did not show any inter-group variation, but the values of all other parameters are significantly higher among males than the female students.

From statistical analysis it was observed that, the mean and standard deviation value of BMI in female students was17.97 ± 2.57 kg/m^2, and in male students, it was 22.5 ± 2.95 kg/m^2. The obtained't' value 4.18shows statistical difference in the BMI of both genders. The mean value of Percentage of Body Fat (BF %) in female students was 24.33 ± 4.12, and in male students, it was 13. 95 ± 3.64. Percentage of Body Fat (BF %) values in female students were more as compared to values in male students.The mean value of VO_2 max in female students was 25.34 ± 3.95 ml/kg/min, and in male students, it was

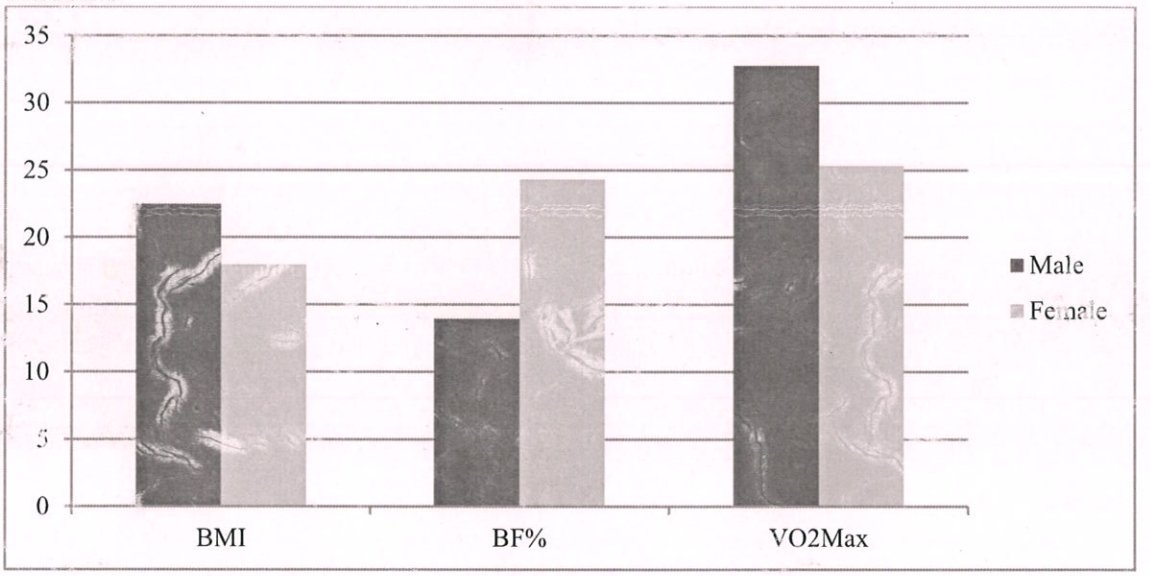
32.79 ± 3.67 ml/kg/min. VO_2 max values in male students were more as compared to values in female students.

Table I: Physical parameters and VO_2max of sedentary male and female University students

Variables		Mean	SD	SDE	't'
Body Mass Index (BMI)	Female	17.97	2.57	.71461	**4.18***
	Male	22.5	2.95	.81964	
Percentage of Body Fat (BF %)	Female	24.33	4.12	1.14106	**6.82***
	Male	13.95	3.64	1.00746	
VO_2Max	Female	25.34	3.95	1.09596	**4.98***
	Male	32.79	3.67	1.01802	

*Significant Table Value 2.05 with df=24

Figure 1: Physical parameters and VO_2max of sedentary male and female University students



DISCUSSION

Age and gender are two known important non-modifiable factors that determine Cardiorespiratory Fitness. Being physically fit has been associated with "the ability to carry out daily tasks without undue fatigue and with ample energy to enjoy leisure-time pursuits and to meet unforeseen emergencies" (United States President's Council of Physical Fitness, 1977). Such fitness is reflected in specific measures of work capacity and oxygen uptake (Cooper, 1977). Max VO_2 values vary with age, sex, weight, daily physical activity level and type of exercise. In this study, it was established that statistically significant difference in Body Mass Index (BMI), Percentage of Body Fat (BF %) and VO_2 max value of male and female gender, VO_2 max value being more in male gender. Our study results showed significant higher VO_2 max in male students as compared with female students. The study suggested females had a lower level of aerobic fitness as compared with male students (Nabi, Rafiq and Qayoom, 2015).

CONCLUSION

This study also concluded that significant difference was found between male and female students on Physical parameters and VO_2max. This study also concluded that body height, body weight and BMI of the male is significantly higher value than female and percentage of body fat significantly greater value in female than male. The male students' shows a significantly higher value of VO_2 max than female.

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International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

DIFFERENTIATION OF AEROBIC EXERCISES, DIET MODIFICATION AND COMBINED GROUP ON BLOOD GLUCOSE LEVEL AMONG WOMEN WITH NIDDM

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ABSTRACT

The aim of this study was to find out the differentiation of aerobic exercises, diet modification and combined group on blood glucose level among women with NIDDM. 80 women NIDDM patients undergoing treatment in Government Hospitals and Diabetic Centre selected as subjects in the age group of 35 to 45 and divided into experimental group I, which underwent combined aerobic and diet modification, experimental group II which underwent aerobic exercise, experimental group III which underwent diet modification and control group did not undergo any treatment consist of 20 subjects each, blood glucose level was statistically analyzed using ANCOVA.It was concluded that combined group was better in reducing the blood glucose among middle aged women with NIDDM.

Key words: Aerobic Exercise, Diet, NIDDM, Glucose

INTRODUCTION

Diabetes Mellitus is a constitutional disease with heritable tendencies. A disorder caused by decreased production of insulin, or by decreased ability to use insulin. Mellitus comes from a Latin word that means "sweet like honey" (Strukic, 1981).Non-Insulin dependent diabetes mellitus (NIDDM), is non-insulin dependent form and develops slowly and is usually milder and more stable. Insulin may be produced by pancreas but action is impaired. This form occurs mainly in adults and the person is usually overweight. Acidosis is infrequent. The majority of patients improves with weight loss and is maintained on diet therapy. Women who have had large babies or large families are also prone to develop this type of diabetes later in life (Srilakshmi, 2007).Any exercise or activity that elevates the heart rate to one hundred and twenty beats per minute for at least twelve minutes is said to be aerobic (Creggaing, 1984).

Fennicchiaet al. (2004) conducted a study on the effects of acuteand chronic resistance training on glucose and insulin responses to womenwith type II diabetes. The result of the study showed that exercise trainingsignificantly observed in glucose concentrations in diabetic patients. The sameresults were drawn by Fritz and Rosenqvist.Praetet al.,(2008) compared the clinical benefits of a twelve monthexercise intervention programme consisting of either brisk walking or amedical fitness programme in type II diabetes patients. It was concluded that,physical activity was associated with effective intervention to modulateglycemic control and lower risk of developing hypertension in a gradedfashion. Davenport et.al (2008) developed to document the effectiveness of astructured low intensity walking protocol on capillary glucose control in GDM women. It was concluded that, an effective role in glucose regulation for this structured walking program. Oshida et al. (2006) discussed the exercise therapy [mild exercises (walking, cycling and swimming) and resistance training] for aged diabetic

peoples. The purposes of exercise therapy for diabetes are to improve insulin resistance and to prevent diabetic complications. This combination therapy would bring about not only improvement of insulin resistance but also restoration of quality of life for aged diabetic subjects. Malhotra et al; (2005), conducted a study on 20 patients with type II diabetes were put on a 40 days' yoga routine. At the end of the 40 days of performing the asanas, on average the participants had a decrease in fasting glucose levels, a significant decrease in waist-hip ratio and beneficial change in insulin levels. Practicing and performing yoga postures as part of a regular exercise routine may further help in diabetics to increase insulin sensitivity and attain normal glucose metabolism.

METHOD

The aim of this study was to find out the differentiation of aerobic exercises, diet modification and combined group on blood glucose level among women with NIDDM. 80 women NIDDM patients undergoing treatment in Government Hospitals and Diabetic Centre selected as subjects in the age group of 35 to 45 and divided into experimental group I, which underwent combined aerobic and diet modification, experimental group II which underwent aerobic exercise, experimental group III which underwent diet modification and control group did not under-went any treatment consist of 20 subjects each, blood glucose level was statistically analyzed using ANCOVA.

RESULTS

Pre mean value of fasting blood glucose for the experimental groups and control groups were 146.85, 147.15, 140.65and 139.20 respectively. The post mean value of fasting blood glucose or the experimental groups and the control groups were 104.15, 113.90, 109.40 and 119.80 respectively. Hence there is a significant difference between experimental and control groups, which shows the effect of training on them.

TABLE I
SHOWING THE MEAN AND STANDARD DEVIATION OF BLOOD GLUCOSE

Fasting blood glucose				
Group	Pre test		Post test	
	Mean	SD	Mean	SD
Combined Group	146.85	23.01	104.15	17.25
Aerobic Group	147.15	26.44	113.90	16.12
Diet Group	140.65	23.93	109.40	19.17
Control Group	139.20	28.80	119.80	19.67
Postprandial blood glucose				
Combined Group	212.50	28.12	149.05	18.11
Aerobic Group	212.00	47.03	146.15	16.43
Diet Group	207.20	28.83	151.25	21.52
Control Group	193.65	47.67	159.95	23.57

The pre mean value of post prandial blood glucose for the experimental groups and control groups were212.50, 212.00, 207.20 and 193.65 respectively. The post mean value of post prandial blood glucose for the experimental groups and the control groups were 149.05,146.15, 151.25 and 159.95 respectively. Hence there is a significant difference between experimental and control groups, which shows the effect of training on them.

TABLE II, SHOWING THE ANCOVA OF BLOOD GLUCOSE

Adjusted Means					
Variables	SV	Df	SS	MS	F
Fasting blood glucose	BG	3	3632.70	1210.90	5.74*
	WG	75	15808.76	210.78	
	T	78	19441.46		
Postprandial blood glucose	BG	3	3976.60	1325.53	4.26*
	WG	75	23316.33	310.88	
	T	78	27292.93		

*Significant at 0.05 level of confidence. (The table value required for significance at 0.05 level with df 3 and 75 is 2.72). From the table II, it was proved that there was a significant difference existed between aerobic exercise group, diet modification group, combined group and control group on fasting blood glucose and postprandial blood glucose, since the F value of 5.74 and 4.26 were greater than the table value of 2.72 with df 3 and 75.

TABLE III, SHOWING THE POST HOC TEST OF BLOOD GLUCOSE

Variables	Combined Group	Aerobic Group	Diet Group	Control Group	MD	CI
Fasting blood glucose	102.64	112.26			9.62	13.11
	102.64		110.65		8.01	
	102.64			121.70	19.06*	
		112.26	110.65		1.61	
		112.26		121.70	9.44	
			110.65	121.70	11.05	
Postprandial blood glucose	147.38	144.61			2.76	15.93
	147.38		151.02		3.64	
	147.38			163.40	16.02*	
		144.61	151.02		6.40	
		144.61		163.40	18.78*	
			151.02	163.40	12.38	

From table III it was evident that combined group was better than the control group in reducing the fasting blood glucose. It's also proved that combined group and aerobic group was better than the control group in reducing the post prandial blood glucose.

CONCLUSION

It was concluded that combined group was better in reducing the blood glucose among middle aged women with NIDDM.

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345- J- EPN - 2018 -19

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

EFFECTS OF MORINGA OLEIFERA WITH AEROBIC TRAINING ON TOTAL CHOLESTEROL, LOW DENSITY LIPOPROTEIN, AND TESTOSTERONE AMONG COLLEGE MEN ATHLETE

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ABSTRACT

The purpose of the study was to investigate "Effects 0f Moringa Oleifera with Aerobic Training On Selected Lipid Profile Status and Testosterone Among College Men Athlete". Moringa Oleifera: Many studies show that Moringa oleifera may lead to modest reductions in blood sugar and cholesterol. It may also have antioxidant and anti-inflammatory effects and protect against arsenic toxicity. Moringa leaves are also highly nutritious and should be beneficial for people who are lacking in essential nutrients. Selection of Variables: The following variables were selected for this study. I. Dependent Variables: 1. Total cholesterol, 2. High density lipoprotein 3. Low density lipoprotein 4. Testosterone. Ii. Independent Variables: 1. Aerobic Exercise 2. Moringa Oleifera with Aerobic Exercise 3. Control Group. Experimental Design: The subject was selected for this study through the random group design consisting of pre and post-test, forty-five college men athletes randomly divided into three groups, the group was assigned as an experimental group and control group. The groups are 1. Moringa Aerobic Exercise, 2. Oleifera with Aerobic Exercise, 3. Control Group. Training Schedules and Supplementation: During the training period, the experimental group underwent their walking program period of eight weeks for all days with Moringa Oleifera. The experimental group underwent walking for forty-five minutes of duration in evening hours between 4:30 to 5:30 PM, for seven days per week. Statistical Technique: Analysis of Covariance statistical technique was used, to test the significant difference among the treatment groups. If the adjusted post-test results were significant, the scheffe's post hoc test was used to determine the paired mean significant difference. Thirumalaisamy R. (2004). After incorporate statistical technique, it was found that a significant decrease in Total Cholesterol and low density and greater increased in high density lipoprotein and testosterone in experimental group I (Moringa Oleifera with aerobic exercise), and also found that high density lipoprotein and testosterone significantly increase due to eight weeks of Natural Supplementation with aerobic training than that aerobic exercise group.

Key words: Training, Lipoprotein, supplementation, Athlete

INTRODUCTION

Moringa Oleifera: Many studies show that Moringa oleifera may lead to modest reductions in blood sugar and cholesterol. It may also have antioxidant and anti-inflammatory effects and protect against arsenic toxicity. Moringa leaves are also highly nutritious and should be beneficial for people who are lacking in essential nutrients.

EXPERIMENTAL DESINGN: The subject was selected for this study through the random group design consisting of pre and post-test, forty-five college men athletes randomly divided into three groups, the group was assigned as an experimental group and control group. The groups are 1.Moringa Oleifera with Aerobic Exercise, 2.Aerobic Exercise,3.Control. During the training period, the experimental group underwent their walking program period of eight weeks for all days with Moringa Oleifera. The

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experimental group underwent walking for forty-five minutes of duration seven days per week. **Statistical Technique**: Analysis of Covariance statistical technique was used, to test the significant difference among the treatment groups. Thirumalaisamy R. (2004).

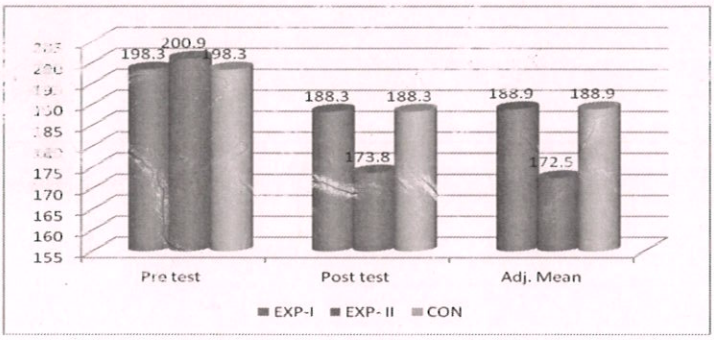
Computation of Analysis of Covariance: The following tables illustrate the statistical results of study.

TABLE I, COMPUTATION OF ANALYSIS OF COVARIANCE OF TOTAL CHOLESTEROL

MEANS	EXP-I	EXP- II	CON	S.V	S.S	D.F	M.S	O.F
Pre-test Mean	198.3	200.9	198.3	B	67.6	2	33.8	0.52
				W	2721.6	42	64.8	
Post-test mean	188.3	173.8	188.3	B	8448.5	2	4224.2	24.05
				W	7376.6	42	175.6	
Adj. Mean	188.9	172.5	188.9	B	9184.8	2	4592.4	31.03
				W	6068.6	41	148.0	

DISCUSSIONS AND FINDINGS OF TOTAL CHOLESTEROL

This result indicated that the effect of Moringa Oleifera with aerobic training and aerobic training had significantly reduced the total cholesterol Among College Men Athlete, when compared with control group in terms of means. further findings of the study indicated that aerobic training with Moringa Oleifera had greater reduction in total cholesterol than the aerobic training.



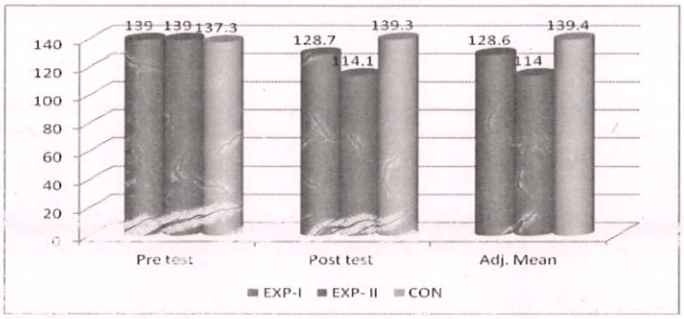
In Experimental Group had implementing the training and Moringa Oleifera prescription is influenced the significant reduction in total cholesterol, when compare to the control group. It's all because of the supplementing the natural products is influenced and converted the excess cholesterol spent as energy for working muscles and it avoid to formation of cholesterol in the body. So its concluded that the aerobic training with Moringa Oleifera had significantly influenced total cholesterol and to avoid the cholesterol deposition in the body.

TABLE – II - COMPUTATION OF ANALYSIS OF COVARIANCE OF LDL

Means	EXP - I	EXP -	Con. Grp	S.V	S.S	D.F	M.S	O. F
Pre test Mean	139	139	137.3	B	27.7	2	13.8	0.34
				W	1691.3	42	40.2	
Post test	128.7	114.1	139.3	B	4802.8	2	2401.4	71.94
				W	1402	42	33.3	
Adj.Post test	128.6	114.0	139.4	B	4808.6	2	2404.3	71.13
				W	1385.8	41	33.8	

DISCUSSION ON FINDINGS OF LOW DENSITY LIPOPROTEIN

From these analyses, it is found that the results obtained from the experimental groups had significant reduction in the Low Density Lipoprotein when compared with the one from the control group. This is due to the inclusion of Moringa Oleifera with aerobic training in the analyses on Experimental Groups.



It is interesting to note that the results obtained from Experimental Group I had more effect than Experimental Group II on the reduction of Low Density Lipoprotein level. This is due to the implementation of Moringa Oleifera with aerobic training in Experimental Group I.

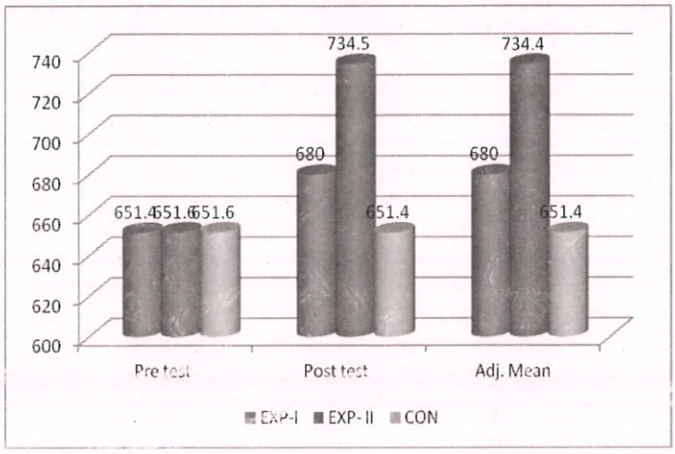
These results are found to be in good agreement with the earlier works done by different researchers. Coggan et.al (1990). It is concluded that the bad cholesterol (LDL) is always block and build up waxy substances deposited in the arteries. So due to this reason we have to maintain the normal level of ldl in the body is always is good for the internal systems.

TABLE – III - COMPUTATION OF ANALYSIS OF COVARIANCE OF TESTOSTERONE

Means	EXP - I	EXP - II	Con.	S.V	S.S	D.F	M.S	O. F
Pre test Mean	651.4	651.6	651.6	B	0.40	2	0.2	**0.00**
				W	17924.4	42	426.7	
Post test	680	734.5	651.4	B	53440.5	2	26720.27	**38.3**
				W	29289.4	42	697.3	
Adj.Post test Mean	680.0	734.4	651.4	B	53413.9	2	26706.9	**44.5**
				W	24581.7	41	599.5	

DISCUSSION ON FINDINGS OF TESTOSTERONE:

From these analyses, it is found that the results obtained from the experimental groups had significantly increased in Testosterone level when compared with the one from the control group. This is due to the inclusion of Moringa Oleifera with Aerobic Training in the analyses on Experimental Groups. It is interesting to note that the results obtained the value of testosterone from Experimental Group I had greater increase from its lower level to maximal level than Experimental Group II on the improvement of Testosterone. This is due to prescription of Moringa Oleifera with Aerobic Training to boost the volume of testosterone in the Experimental Groups I.



RESULTS

Within the limitations of the study, the following conclusions were drawn:

Experimental group I (Moringa Oleifera with aerobic Training) showed greater reduction on total cholesterol, Low Density Lipoprotein and showed greater increased testosterone than that of Experimental group II due to twelve weeks of training.

FINDINGS

After incorporate statistical technique, it was found that a significant decrease in Total Cholesterol, low density lipoprotein and greater increased in high density lipoprotein, testosterone in experimental group I (Moringa Oleifera with aerobic Training), due to eight weeks of Moringa Oleifera with aerobic training.

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3-45-J-PSY-2018-19

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

PHYSICAL FITNESS AND PHYSIOLOGICAL DIFFERENCE AMONG THE SPRINTERS LONG DISTANCE RUNNER'S JUMPERS AND THROWERS OF TELANGANA UNIVERSITIES

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ABSTRACT

This paper was aimed to compare the physical fitness and physiological difference among the sprinters long distance runner's jumpers and throwers. For this purpose, 100 men intercollegiate athletes were selected from Osmania University and Palamuru University from Telangana State and their age ranged between 18 and 25 years. 100 athletes consist of 25 sprinters, 25 long distance runners, 25 jumpers and 25 throwers. The selected physical fitness variables explosive power and agility were tested through standing broad jump and shuttle run respectively, selected physiological variables breath holding time and vital capacity were tested through nose clip test and spirometer test respectively. The data were collected in the academic year 2017 to 2018 intercollegiate matches. The collected data were analyzed with ANOVA for find out the comparison among the sprinters, long distance runners, jumpers and throwers. Whenever the F ratio was significant further it was computed with post hoc test in all cases level of significance was fixed at 0.05 level.It was concluded that there was a significant difference among sprinters, long distance runners, jumpers and throwers on explosive power and agility and also there was no significant difference among sprinters, long distance runners, jumpers and throwers on Breath holding time and vital capacity

Key words: Sprinters, Long Distance Runners, Jumpers, Throwers

INTRODUCTION

Physical fitness is a state which characterizes the degree to which a person is able to function. Ability to function depends upon the physical, mental, emotional, social and spiritual components as fitness, all of which are related to each other and are mentally independent. This may be referred to as total fitness. **(Uppal, 2004).** The term physical fitness has been an elusive one to define objectively. The simplest definition is the capacity of an individual to perform given task. Once a pupil has reached a satisfactory level as fitness and has an appreciation of how fitness is vital to his full growth and development. The effect of the fitness objectives is more completely realized. "Physical fitness implies the ability to function at once best level of efficiency in all his daily living". For the physical system of body to be fit they must function well enough to support to specific activity that the individualism performing more ever different activities make different demands upon the organism **(Miller David k, 2010).** In physiology, one learns how the organs system, tissues, cells and molecules within cells work and hoe their functions are put together to maintain the internal environment. Physiology is the science dealing with the study of how body's structures and functions are changed as a result of exercise. It applies the concept of exercise physiology to training the athlete and enhancing the athlete's sports performance **(Ajmer Singh, 2005).** If the trainer work with scientific knowledge of physiology of exercise can produce the elite athletes by giving the

suitable training models. In this study investigator interested to know the physical fitness and physiological difference among the sprinters long distance runner's jumpers and throwers.

METHOD

This paper was aimed to compare the physical fitness and physiological difference among the sprinters long distance runner's jumpers and throwers. For this purpose, 100 men intercollegiate athletes were selected from Osmania University and Palamuru University from Telangana State and their age ranged between 18 and 25 years. 100 athletes consist of 25 sprinters, 25 long distance runners, 25 jumpers and 25 throwers. The selected physical fitness variables explosive power and agility were tested through standing broad jump and shuttle run respectively, selected physiological variables breath holding time and vital capacity were tested through nose clip test and spirometer test respectively. The data were collected in the academic year 2017 to 2018 intercollegiate matches. The collected data were analyzed with ANOVA for find out the comparison among the sprinters, long distance runners, jumpers and throwers. Whenever the F ratio was significant further it was computed with post hock test in all cases level of significance was fixed at 0.05 level.

RESULTS AND DISCUSSION

Table I, Showing the ANOVA calculation on selected variables

	Sprinters	Long distance runners	Jumpers	Throwers	SOV	df	SOS	MSS	'F' Value
Explosive Power	3.13	1.98	3.03	3.05	B	3	22.15	7.38	22.59*
					W	96	31.37	0.32	
					T	99	53.53		
Agility	7.07	9.04	8.86	9.60	B	3	89.84	29.94	8.80*
					W	96	326.45	3.40	
					T	99	416.29		
Breath holding time	90.48	96.96	94.96	94.48	B	3	552.76	184.25	1.23
					W	96	14272.4	148.67	
					T	99	14825.16		
Vital capacity	3.67	3.84	4.04	4.06	B	3	2.56	0.85	2.02
					W	96	40.56	0.42	
					T	99	43.12		

***Significant, Table value with df 3 & 96 = 2.70**

From the table I it was proved that the 'F' value of explosive power and agility were 22.59 and 8.80 which was greater than the table value of 2.70 with degrees of freedom 3,96. Hence, there was a significant difference among sprinters, long distance

runners, jumpers and throwers on explosive power and agility. For find out the inter group difference further it was computed to post hoc test in table II.

Breath holding time and vital capacity "F' values 1.23 and 2.02 were lesser than the table value of 2.70 with degrees of freedom 3,96. Hence, there was no significant difference among sprinters, long distance runners, jumpers and throwers on Breath holding time and vital capacity.

Table II, Post hoc test for selected variables

	Sprinters	Long distance runners	Jumpers	Throwers	M D	C D
Explosive Power	3.13	1.98			1.14*	0.46
	3.13		3.03		0.10	
	3.13			3.05	0.08	
		1.98	3.03		-1.04*	
		1.98		3.05	-1.06*	
			3.03	3.05	-0.01	
Agility	7.07	9.04			-1.96*	1.48
	7.07		8.86		-1.78*	
	7.07			9.60	-2.53*	
		9.04	8.86		0.18	
		9.04		9.60	-0.56	
			8.86	9.60	-0.74	

Table II shows that sprinters have better explosive power compare with long distance runners, jumper has better explosive power than long distance runners and throwers has better explosive power compared with long distance runners. Sprinters has better agility compared with long distance runners, jumpers and throwers hence the mean difference was higher than the confidence interval value.

CONCLUSION

1. It was concluded that there was a significant difference among sprinters, long distance runners, jumpers and throwers on explosive power and agility
2. It was concluded that there was no significant difference among sprinters, long distance runners, jumpers and throwers on Breath holding time and vital capacity

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International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

CORRELATION BETWEEN KINEMATIC VARIABLES AND GOALKEEPING PERFORMANCE IN PENALTY STROKE

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ABSTRACT

The purpose of the study was to find out the correlation between kinematic variables and goalkeeping performance in penalty stroke in field hockey. To achieve the purpose of this study, ten Inter-Collegiate goalkeepers were selected as subjects from Chennai and age group was ranged from 19 to 25 years. The selected kinematic variables in the penalty stroke position were stance width, knee angle and trunk lean.The overall penalty stroke performance of the goalkeeper was measured using the 10 point scale which consists of five penalty strokes. Each goalkeeper wasgiven five trials only. The successful trials of each goalkeeper were digitized and analysed by taking the mean values. The goalkeepers preferred stance width and the knee angle and trunk angle also was measured by using kinovea software. Canon EOS 600D and SONY HDR-XR550E camera was positioned on a camera tripod 1.50m off the ground 6.40 m directly in front of the goalkeeper and 5.00m directly perpendicular of the goalkeeper. The Collected data from the video camera were connected to the computer and the required frame was analysed through the software. The collected data were statistically analyzed by using Pearson product moment correlationand the level of significance was fixed at 0.05level. It was concluded that the kinematic variable stance width had a significant relationship with goalkeeping performance. The knee angle and trunk leandid not have significancewith penalty stroke position in goalkeeping performance.

Keywords: *Kinematic, Penalty Stroke, Goalkeeping, Stance width, Knee angle, Trunk lean.*

INTRODUCTION

A game of field hockey is won by outscoring the opposition. The goalkeeper forms the last line of defence for a team and their task is to intercept shots that are made from within a 14.6m radius from the goal.An excellent goalkeeper can influence a game decisively to his team's advantage, when his calmness and ability to communicate themselves to the rest of the defence. His reliability gives not only his defence, but also his forwards, confidence in themselves and trust in him, qualities which can inspire the whole team to an outstanding performance and, at the same time, cripple theopposition. If on the other hand, the last line of defence is weak and suffers from nervousness and unsureness, his influence on his team's performance is always negative, even if he does not let in a goal during the game. For instance the forwards are then afraid to mount an attack with numerical superiority and all too easily fallback upon nervous defence (Wein, 1973).

Goalkeepers were not considered the glamorous men in earlier days but now with recent revolution in the development of the game things have changed and there is a general recognition of importance of goalkeeper.A good goalkeeping performance not only frustrates opponents in their attempt to score goals but also spread an air off confidence to fellow defenders. The goal keeper should endeavor to play calmly with concentration and to act with determination before and during the game.To build him up

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both physically and psychologically the goalkeeper in training should frequently play in other positions also both as a defender and as an attacker (Whitaker, 1986).

Goalkeeping is an exciting job, one that can result in dramatic saves which keep a team in a game. Some of the basic skills the goalkeeper must develop are mobility, quick reflexes and agility to clear rebounds and to utilize the sliding tackle to challenge an attacker who has broken clear of other opponents. It is also essential for the goalkeeper to direct the defence. But his primary duty is to save goals. He must never forget where the goal posts are and he has to work hard to improve his defence mechanism at penalty-corners and strokes (Cadman, 1985).

Ball and Giblin(2009) analysed the minimising movement time is essential for a field hockey goalkeeper and stance width is considered important to agility. The aim of this study was to examine if an optimal stance width exists for field hockey goalkeepers and if so, does it vary for different movement directions and for different individuals. Ten state and national level goalkeepers made simulated saves from ten different stance widths ranging from 0.4 m to 1.2 m. AMTI force plate data was used to identify start of movement time and timing gates in the corner of the goals recorded the end of movement time. On a group basis, a stance width of 1.1 m was optimal for minimising movement time for high and low saves and for right and left saves. On an individual basis, 1.1 m was the optimal stance for eight of ten subjects. Only two subjects performed optimally at their preferred stance width. Where shots to the corner of the goals are likely, goalkeepers should adopt a wide stance.

There are few studies examining goalkeeping technique and none exist in field hockey. In soccer, technique differences have been identified between goalkeepers of different skill levels (Suzuki et al., 1987) and between saves to the dominant and non-dominant sides (Spratford et al., 2007). These studies reported that a more direct path towards the save point was evident in more elite performers (Suzuki, et al., 1987) and on the dominant compared to the non-dominant side (Spratford et al., 2007).In spite of the importance of stance width in numerous sports, it is perhaps surprising that there are only a few studies focusing on this feature of sport skills. The aim of this study was to examine stance width, knee angle and trunk lean existed for goalkeeping performance.

METHOD

Teninter-Collegiate level male field hockey goalkeepers were selected for the study. The age of subjects ranged from 19 to 25 years. The scores of the subject in penalty stroke were used as the criterion in the study. Subjects were instructed to react as fast as possible to the signal and to use their normal save movement when completing each trial. Each subject wore their full goalkeeping gear as used in games (pads, kickers, helmet, gloves protective equipment and stick) and performed simulated saves. The performance of the goalkeepers was captured by video however the accuracy of penalty strokeassessment of the overall goalkeeping performance. Each goalkeeper has given five trials only. For each saves 2 points, like that 10 points was given andthe average rating of five penalty strokes on the overall goalkeeping performance was considered as the score of subjects. The successful trials of each goalkeeper were digitized and analysed.From this penalty stroke position, each goalkeeper's stance width was measured from the distance between outer edges of the both the foot included the

goalkeepers preferred stance width and the knee angle and trunk angle also was measured by using KINOVEA software. Canon EOS 600D camerawas positioned on a camera tripod 1.50m off the ground 6.40 m directly in front of the goalkeeper and SONY HDR-XR550E camera was positioned on a camera tripod 1.50m off the ground 5.00m directly perpendicular of the goalkeeper. The Collected data from the software to find out the inter relationship between various factors namely stance width, knee angle, trunk lean and goalkeeping performance Pearson product moment correlations was used by using SPSS. The level of significance was fixed at 0.05.

RESULT

The Table I showed that mean, standard deviation and goalkeeping performance in penalty stroke in field hockey.

TABLE –I
SHOWING MEAN, STANDARD DEVIATION AND GOALKEEPING PERFORMANCE IN PENALTY STROKE

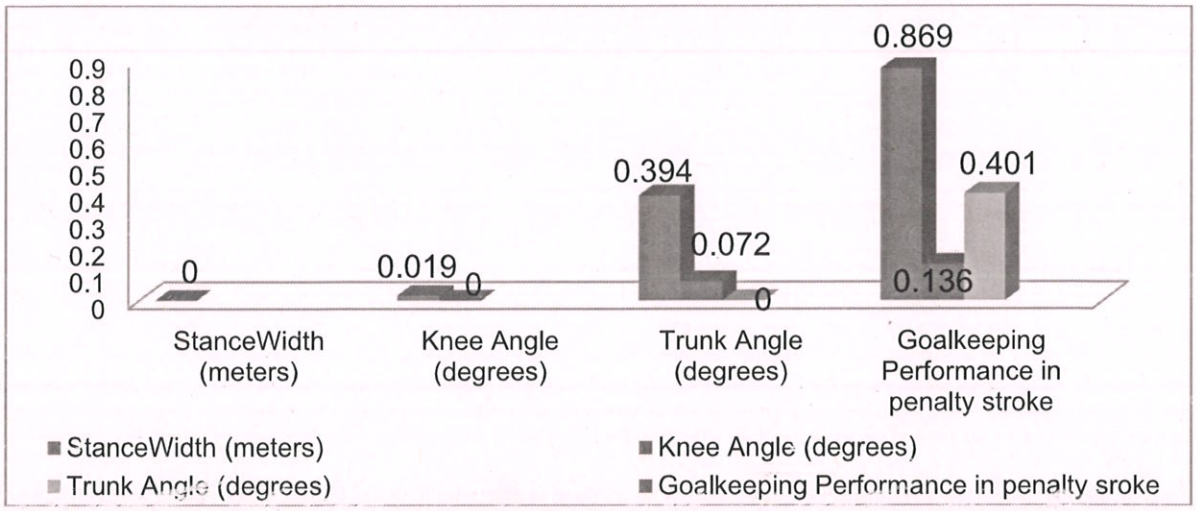
	Mean	S.D	Stance Width (meters)	Knee Angle (degrees)	Trunk Angle (degrees)	Goalkeeping Performance in penalty stroke	Critical "r" Value
StanceWidth (meters)	0.68	0.20	0	0.019	0.394	0.869**	0.632
Knee Angle (degrees)	129.47	0.74		0	0.072	0.136	
Trunk Angle (degrees)	108.49	4.83			0	0.401	
Goalkeeping Performance In penalty stroke	6.80	1.93				0	

*Significant at the 0.05 level 0.632. **Significant at the 0.01 level 0.765 (df=8)

It was inferred from the Table –I that the goalkeeping performance was significantly correlated with stance width (0.869) at the 0.05 level of 0.765.The knee angle (0.019) and trunk angle (0.394) was did not have significance with goalkeeping performance.

FIGURE- 1





CONCLUSION

It was concluded that the stance width had a significant relationship with goalkeeping performance. The stance width was important for the goalkeepers to react quickly to save the goals in penalty stroke. Hence, it was recommended to coaches and goalkeepers adopting (0.72m to 1.00m) stance width ideal to save the goals.

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3.4.5-J-PE-2018-19

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

IMPACT OF YOGASANA AND STEP AEROBIC TRAINING ON SELECTED PHYSIOLOGICAL PARAMETERS AMONG SCHOOL GIRLS

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ABSTRACT

The purpose of the study is to find out effect of yogasana and step aerobic exercises on selected physiological parameters. To achieve these purpose 45 school Girls' students were selected from Chidambaram region selected as subjects. Their age group ranged from 14 to16 years. They were divided in to three equal groups of 15 subjects each and assigned to Experimental group-1, Experimental group-2 and control group. The group-1 underwent yogasana practices and the group-2 underwent step aerobics training. The experimental groups underwent their respective training program three days per week (alternate days) for twelve weeks. The criterion variables selected are resting pulse rate, vital capacity and breath holding time. ANCOVA was used to find out the significant differences. Statistical analysis found significant differences between yogasana practices and step aerobics training in improving the physiological parameters. Step aerobics training differed significantly ($p<0.05$) from both yogasana practices and control groups for resting pulse rate. Both experimental groups improves breath holding time when compare to control group.

Key words: Yoga, Fitness, Aerobics, Health

INTRODUCTION

Yogasana practices play an important role in the maintenance of the bodies various systems. The practice of yoga not only develops the body but also enhances the mental faculties. Moreover, the yogi acquires mastery over the involuntary muscles of his organism. This working of Pranayama is seen in the systolic and diastolic actions of the heart, when it pumps the blood into arteries in the action of inspiration and expiration during the course of breathing; in the digestion of food; in the excretion of urine and fecal matter; in the manufacture of semen, Chile, chime, gastric juice, bile, intestinal juice, saliva; in closing and opening of the eyelids, in walking, playing, running, talking, thinking, reasoning, feeling and willing. Chandler. (1994). Found that a properly initiated sports specific step aerobic exercise program essential for maximal performance to be reached in most any sports. Gopinath (2008) examined the effects of step aerobics with 45 minutes training period found significant changes in selected physiological parameters. More research is required concerning the variation in different methods of aerobic training and its effects. The applicability of this method of training to develop motor fitness and physiological parameters are not yet completely known. Hence, there is a need to find out whether step aerobics training is superior to yogasana practices in improving the selected physiological parameters.

METHOD

The prime purpose of this study was to explore the effect of yogasana and step aerobics training on selected physiological parameters on physically untrained school Girls' students. To achieve these purpose 45 school Girls students were selected from Chidambaram region selected as subjects. The age, height and weight of the subjects ranged from 14 to 16 years, 150 to 163 centimeters and 56 to 67 kilograms respectively. The selected subjects were medically examined by a qualified physician and certified that

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they were medically and physically fit enough to undergo the exercise. They were divided in to three equal groups of 15 subjects each and assigned to Experimental group-1, Experimental group-2 and control group. In a week the Experimental group-1 underwent yogasana practices, Experimental group-2 underwent aerobic training and control group was not given any special training. The selected independent variables were yogasana and aerobic exercise and the dependent variables were resting pulse rate and breathe holding time. These criterion variables were assessed using standard tests and procedures, before and after the exercise. The resting pulse rates tested by Manual palpation and breathe holding time tested by holding the breath for time. The training programmes were scheduled for one session a day, each session lasted between 45 minutes and an hour, approximately excluding warming up and relaxation in morning session. During the training period, the experimental groups underwent their respective training program three days per week for twelve weeks. The group-1 underwent yogasana practices and the group-2 utilized step aerobics training. The group-3 acted as control, which did not undergo any special training program. The training sessions were held every other day, so that the body would rest. The selected variables were statistically examined for significant difference, if any, by applying the analysis of covariance (ANCOVA) with the help of SPSS package. The level of significance was accepted at $P < 0.05$.

Results on Resting Pulse Rate

Table 1, Computation of analysis of covariance of Resting Pulse Rate

	Yogasana exercises group	Step Aerobic training Group	Control Group	S V	Sum of Squares	df	MS	obtained F
Pre-Test Mean	69.22	69.75	70.25	B	11.0	2	5.50	1.63
				W	193.7	42	3.38	
Post-Test Mean	66.61	64.81	70.35	B	320.7	2	160.35	**34.57***
				W	264.5	42	4.46	
Adjusted Post- Test Mean	66.69	64.80	70.72	B	302.3	2	151.15	**32.59***
				W	259.6	41	4.46	

Table F-ratio at 0.05 level of confidence for 2 and 27 (df) =3.35, 2 and 26 (df) =3.37.
*Significant at 0.05 level

Table-1 shows the obtained 'F' ratio value on the scores of pre test means 1.63 was lesser than the required table value of 3.15 for significance at 0.05 level of confidence with degrees of freedom 2 and 42, which proved that the random assignment of the subjects were successful and their scores in resting pulse rate before the training were equal and there was no significant differences. The obtained post test 'F' ratio value of 34.57 was greater than the required table value of 3.15. It implies that significant differences existed between the groups during the post test period on resting pulse rate. Table-1 also indicate that the adjusted post test means obtained 'F' ratio value of 32.59 was greater than the required table value of 3.15. The result of the study shows that significant differences existed between the adjusted post test mean of yogasana exercise, step aerobics training and control groups in reducing the resting pulse rate. Since the adjusted post test mean 'F' value was found to be significant, the results were subjected to post hoc analysis using Scheffe'S test. The results were presented in table-2.

Table 2, Scheffe's Confidence Interval Test Scores on Resting Pulse Rate

MEANS				Required C.I.
Yogasana exercises group	Step Aerobic training Group	Control Group	Mean Difference	
66.69	64.80		1.89*	1.73
67.48		70.27	3.58*	1.73
	64.80	70.27	5.47*	1.73

* Significant at 0.05 level.

Table- 2 shows the result of the study shows that significant differences existed between yogasana exercises and aerobic exercise groups; yogasana exercise and control groups; and aerobic exercise and control groups, since the mean differences were greater than the confidence interval value of 1.73. This proved that due to twelve weeks of yogasana exercise and aerobic exercise resting pulse rate of the subjects was reduced significantly. While considering the two training methods, from the results presented in table- 2 it was found that aerobic exercise group was better than yogasana exercise group in reducing resting pulse rate.

Results on Breath Holding Time

Table 3, Computation of analysis of covariance of Breath Holding Time

	Yogasana exercises group	Step Aerobic training Group	Control Group	S V	SS	df	MS	Obtained F
Pre-Test Mean	42.60	42.90	37.95	B	308.1	2	154.05	2.39
				W	3673.6	42	64.45	
Post-test Mean	50.25	52.30	38.95	B	2067.4	2	1033.70	**16.70***
				W	3526.9	42	61.88	
Adjusted Post-test Mean	48.91	50.69	41.90	B	798.8	2	399.40	**54.49***
				W	410.5	41	7.33	

Table F-ratio at 0.05 level of confidence for 2 and 27 (df) =3.35, 2 and 26 (df) =3.37.
*Significant at 0.05 level

Table-3 shows the obtained 'F' ratio value on the scores of pre-test means 2.39 was lesser than the required table value of 3.15, which proved that the random assignment of the subjects were successful and their scores in vital capacity before the training were equal and there was no significant differences. The obtained post-test 'F' ratio value of 16.70 was greater than the required table value of 3.15. It implies that significant differences existed between the groups during the post test period on vital capacity. Table-3 also indicates that the adjusted post-test means on breath holding time. The obtained 'F' ratio value of 54.49 was greater than the required table value of 3.15. The result of the study shows that significant differences existed between the adjusted post-test mean of yogasana exercise, step aerobics training and control groups in improving the breath holding time. Since the adjusted post-test mean 'F' value was found to be significant, the results were subjected to post hoc analysis using Scheffe'S test. The results were presented in table-4.

Table 4, Scheffe's Confidence Interval Test Scores on Breath Holding Time

MEANS				Required C.I.
Yogasana exercises group	Step Aerobic training Group	Control Group	Mean Difference	
48.91	50.69		1.78	2.18
48.91		41.90	**7.01***	2.18
-	50.69	41.90	**8.79***	2.18

* Significant at 0.05 level.

Table-4 shows that, the result of the study shows that significant differences existed between yogasana exercise and control groups; step aerobics training and control groups, since the mean differences were greater than the confidence interval value of 2.18. It was concluded from the result of the study that yogasana exercise and step aerobic exercise groups have significantly improved the breath holding time. The result of the study shows that no significant differences existed between yogasana exercises and aerobic training groups; since the mean differences were lesser than the confidence interval value of 2.18. However, there was no significant differences existed between experimental groups.

DISCUSSION ON FINDINGS

The analysis of covariance indicated that experimental group-1 (yogasana exercise), experimental group-2 (step aerobic exercise) were significantly improved the resting pulse rate. It may be due to the nature of varied regimens of yogasana exercises and step aerobics training. Which have influenced to increase the physiological level and function of various organs and systems. Further, finding of the study showed that the control group did not improve the resting pulse rate. However, the experimental group-2 had more effect on the improvement of resting pulse rate greater than the experimental group. The analysis of covariance indicated that experimental group-1and 2 were significantly improved the breath holding time. It may be due to the nature of varied regimens of yogasana exercises and step aerobics training. Which would have influenced to increase the physiological level and function of various organs and systems? Further, finding of the study showed that the control group did not improve the breath holding time. The present stud was supported by Madanmohan et.al (2005) and Lohan and Rajesh (2002).

CONCLUSION

Within the limitations of this study, the following conclusions were drawn:

1. Significant decreases on resting pulse rate have been observed following twelve weeks of yogasana and step aerobic exercises, when compared to control group.
2. When comparing the two experimental groups, step aerobic exercise was significantly better than the yogasana exercise in reducing resting pulse rate.
3. Significant increase on breath holding time have been observed following twelve weeks of yogasana and step aerobic exercises, when compared to control group.
4. It was also concluded that there was no significant differences between yogasana exercise and step aerobic exercise groups in improving breath-holding time.

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3.4.5-J- EPN - 2018-19

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

EFFECTS OF YOGIC PRACTICES AND BRISK WALKING ON FUNCTIONAL VARIABLES AMONG DIABETIC PATIENTS

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ABSTRACT

The purpose of the study was to find out the relative effect of yogic practices and brisk walking on functional variables among diabetic patients. To achieve the purpose of the study, thirty (N=30) male subjects who were undergoing treatment in Government Hospital, Chennai for diabetic were randomly selected in the age group of thirty five to forty five years as subjects for this study with their consent and they were assigned into three different groups. The groups were considered as experimental group-I, experimental group-II and control group consisting of ten diabetic patients in each. Random group design was followed in this study. Experimental group-I underwent yogic practices, experimental group-II underwent brisk walking and control group was not given any special treatment. Pre-tests were conducted for all the subjects on functional variables such as resting pulse rate, breath holding time and mean arterial blood pressure. The experimental groups participated in their respective exercises, namely brisk walking for twelve weeks and yogic exercises for twelve weeks. The post--tests were conducted on the above said dependent variables after a period twelve weeks. The difference between the initial and final scores was considered the effect of respective experimental treatments. To test the statistical significance ANCOVA was used. In all cases 0.05 level was fixed to test. The results of the study showed that there was significant reduction in resting pulse rate and significant improvement in breath holding time. However, there were no changes in Mean arterial blood pressure among the diabetic patients.

Key word: Resting pulse rate, Breath holding time and Mean arterial blood pressure

INTRODUCTION

Yoga may be attractive as an alternative to traditional aerobic and strength training programs because it requires little space, virtually no equipment, has limited harmful side effects and with its focus on relaxation, body awareness, and meditation provides a qualitatively different exercise experience which may be perceived as less strenuous and more pleasurable. Given these characteristics, yoga satisfies many of the conditions which have been shown to be strongly related to participation in physical activity, such as low perceived barrier to participation, being enjoyable, and having a low-to-moderate intensity Although yoga has received a considerable amount of study to date demonstrating significant cardio-respiratory musculoskeletal and metabolic health benefits the degree to which the physical activity component of yoga may have contributed to these benefits has received virtually no attention.

Walking sometimes called 'weight bearing exercise because of carrying our body weight. It improves management of conditions such as hypertension, high cholesterol, joint and muscular pain or stiffness and diabetes, walking improve blood circulation and helps the blood deliver oxygen to the lungs and tissues more efficiency. It develops stronger bones, increases bone density and helps in preventing osteoporosis. Walking increases cardiovascular and pulmonary fitness, muscle strength and endurance. It reduces body fat and hence the risk of coronary heart diseases and stroke. It lowers blood pressure and reduces high cholesterol and improves blood lipid profile. Walking also reduces the

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risk of cancer in the colon and helps in preventing osteoarthritis and enhances mental wellbeing. Walking helps to improve flexibility and co- ordination hence to improve body balance, control body weight and reduces the risk of non- insulin dependent diabetes. Walking is now widely endorsed as a great way to get daily exercise (Stan Reents & Pharm, 2006).

METHOD

The purpose of the study was to find out the relative effect of yogic practices and brisk walking on selected functional variables among diabetic patients. Random group design was followed in this study. Thirty (N=30) diabetic patients were randomly selected as subjects for this study with their consent from who were undergoing treatment in Government Hospital, Chennai. The subjects were divided into three groups, experimental group-I, experimental group-II and control group. Experimental group-I underwent yogic practices, experimental group-II underwent brisk walking and control group was not given any special treatment. Pre--tests were conducted for all the subjects on selected functional variables such as resting pulse rate breath holding time and mean arterial blood pressure. The experimental groups participated in their respective exercises, namely brisk walking for twelve weeks and yogic exercises for twelve weeks. The post--tests were conducted on the above said dependent variables after a period twelve weeks. The difference between the initial and final scores was considered the effect of respective experimental treatments. To test the statistical significance ANCOVA was used. In all cases 0.05 level was used.

Results on Resting Pulse Rate

Table 1

Computation of analysis of covariance of resting Pulse rate

	Yogic Practices Group	Brisk Walking Group	Control Group	S V	Sum of Squares	df	MS	obtained F
Pre Test Mean	64.90	62.40	63.30	B	32.07	2	16.03	0.33
				W	1301.40	27	48.20	
Post-Test Mean	57.30	58.60	63.50	B	213.80	2	106.90	**4.01***
				W	719.00	27	26.63	
Adjusted Post- Test Mean	56.42	59.33	63.65	B	262.57	2	131.28	**18.55***
				W	184.02	26	7.08	
MD	-7.60	-3.80	0.20					

Table F-ratio at 0.05 level of confidence for 2 and 27 (df) =3.35, 2 and 26 (df) =3.37.
*Significant at 0.05 level

The effect of Yogic practices and brisk walking on Resting Pulse Rate is presented in Table 1. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F-value 18.55 was greater than the required table F-value to be significant at 0.05 level. The results presented in Table 2 proved that there was significant difference between Yogic practices group and control group (MD: 7.23) and Brisk walking group and control group (MD: 4.32). Comparing between the treatment groups, it was found that there was no significant difference between yogic practices and brisk walking group among diabetic patients. Thus, it was found that yogic practices and brisk walking were significantly better than control group in beneficially altering Resting Pulse Rate of the diabetic patients.

Table 2, Scheffe's Confidence Interval Test Scores on Resting Pulse Rate

MEANS				Required C.I.
Yogic practices Group	Brisk walking Group	Control Group	Mean Difference	
56.42	59.33	-	2.90	3.08
56.42	-	63.65	**7.23***	3.08
-	59.33	63.65	**4.32***	3.08

* Significant at 0.05 level.

Results on Breath Holding Time

Table 3, Computation of analysis of covariance of Breath Holding Time

	Yogic Practices Group	Brisk Walking Group	Control Group	S V	SS	df	MS	Obtained F
Pre-Test Mean	32.60	31.10	32.30	B	12.60	2	6.30	0.19
				W	915.40	27	33.90	
Post-Test Mean	37.50	34.60	32.60	B	121.40	2	60.70	2.14
				W	765.30	27	28.34	
Adjusted Post- Test Mean	37.01	35.34	32.35	B	111.17	2	55.59	9.86*
				W	146.55	26	5.64	
MD	4.90	3.50	0.30					

Table F-ratio at 0.05 level of confidence for 2 and 27 (df) =3.35, 2 and 26 (df) =3.37.
*Significant at 0.05 level

The effect of Yogic practices and brisk walking on Breath Holding Time is presented in Table 4. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F-value 9.86 was greater than the required table F-value to be significant at 0.05 level. Since significant F-value was obtained, the results were further subjected to post-hoc analysis and the results presented in Table 4 proved that there was significant difference between Yogic practices group and control group (MD:4.65) and brisk walking group and control group (MD: 2.99). Comparing between the treatments groups, it was found that there was no significant difference between Yogic practices and brisk walking group among diabetic patients. Thus, it was found that Yogic practices and brisk walking were significantly better than control group in beneficially altering Breath Holding Time of the diabetic patients.

Table 4, Scheffe's Confidence Interval Test Scores on Breath Holding Time

MEANS				Required C.I.
Yogic practices Group	Brisk walking Group	Control Group	Mean Difference	
37.01	35.34	-	1.67	2.75
37.01	-	32.35	4.65*	2.75
-	35.34	32.35	2.99*	2.75

* Significant at 0.05 level.

Results on Mean Arterial Blood Pressure

Table 5, Computation of Analysis of Covariance of Mean Arterial Blood Pressure

	Yogic Practices Group	Brisk Walking Group	Control Group	SV	SS	df	MS	Obtained F
Pre-Test Mean	93.30	91.50	92.30	B	16.27	2	8.13	0.23
				W	940.70	27	34.84	
Post-Test Mean	84.90	87.10	91.60	B	233.27	2	116.63	6.99*
				W	50.20	27	16.67	
Adjusted Post-Mean	84.55	87.43	91.63	B	252.49	2	126.24	10.40*
				W	315.47	26	12.13	
MD	-8.40	-4.40	-0.70					

Table F-ratio at 0.05 level of confidence for 2 and 27 (df) =3.35, 2 and 26 (df) =3.37.
*Significant at 0.05 level

Table 6, Scheffe's Confidence Interval Test Scores on Mean Arterial Blood Pressure

MEANS				Required C.I.
Yogic practices Group	Brisk walking Group	Control Group	Mean Difference	
84.55	87.43	-	2.88	4.03
84.55	-	91.63	**7.08***	4.03
-	87.43	91.63	**4.20***	4.03

* Significant at 0.05 level

The effect of Yogic practices and brisk walking on Mean Arterial Blood Pressure is presented in Table 5. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F-value 10.40 was greater than the required table F-value to be significant at 0.05 level. Since significant F-value was obtained, the results were further subjected to post-hoc analysis and the results presented in Table 6 proved that there was significant difference between Yogic practices group and control group (MD:7.08) and Brisk walking group and control group (MD: 4.20). Comparing between the treatments groups, it was found that there was no significant difference between Yogic practices and brisk walking group among diabetic patients. Thus, it was found that yogic practices and brisk walking were significantly better than control group in beneficially altering Mean Arterial Blood Pressure of the diabetic patients.

CONCLUSION

The twelve weeks Yogic practices and brisk walking induced to exert more energy and exercise themselves along with their usual medication. As the subjects began to do the physical exertion there was increased blood circulation, which resulted in stabilization of blood pressure. With the additional aerobic power, the blood pressure began to stabilize. Hence, there was reduction in blood pressure. The findings proved that the twelve weeks of yogic and walking exercises has beneficially altered mean arterial blood pressure significantly and altering Breath Holding Time and resting pulse rate.

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3.4.5 - J - EPN - 2018-19

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

RELATIVE EFFECT OF ISOLATED AND COMBINED INTERVAL TRAINING AND CONTINUOUS RUNNING ON SELECTED ENDURANCE COMPONENTS AMONG STATE LEVEL FOOTBALL PLAYERS

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ABSTRACT

The purpose of the study was to find out the relative effect of isolated and combined interval training and continuous running on selected endurance components among state level football players. The study was formulated as a true random group design, consisting of a pre-test and post-test. Sixty state level football players from Tamilnadu, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects (N=60) were randomly assigned to four equal groups of fifteen subjects each. Pre-test was conducted for all the subjects on selected speed and endurance components. This initial test scores formed as pre-test scores of the subjects. The groups were assigned as Experimental Group I, Experimental Group II, Experimental Group III and Control Group in an equivalent manner. Experimental Group I was exposed to interval training, Experimental Group II was exposed to continuous training, Experimental Group III was exposed to combined interval and continuous training and Control Group underwent no training. The duration of experimental period was 12 weeks. After the experimental treatment, all the sixty subjects were tested on their selected endurance components. This final test scores formed as post test scores of the subjects. The pre-test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant, Scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses. The combined interval and continuous training group had shown better performance on endurance components among the state level football players than the interval training, continuous training and control groups.

Keywords: Interval Training, Continuous Training,

INTRODUCTION

Interval training is a form of progressive conditioning in which the intensity of the activity, the duration of each set, the number of sets, the time or kind of rest periods between sets or the order of the sets are varied. The variables associated with interval training include the number of repetitions, the duration of effort, work intensity and duration of recovery (Dhayanithi, 1991). Continuous training means the trainee uses 60-80% of his maximum heart rate for at least 30-60 minutes at least four or five times a week. This method suits long distance runners as well as football players, because it means that their endurance levels will increase. It is the way which they would normally compete. It is a good way for an athlete to build up their cardio-vascular endurance levels. It also forms the basis for all other training methods both anaerobic and aerobic.

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METHOD

The study was formulated as a true random group design, consisting of a pre-test and post-test. Sixty state level football players from Tamilnadu, India was selected as subjects at random and their ages ranged from 18 to 25 years. The subjects (N=60) were randomly assigned to four equal groups of fifteen subjects each. Pre-test was conducted for all the subjects on selected endurance components. This initial test scores formed as pre-test scores of the subjects. The groups were assigned as Experimental Group I, Experimental Group II, Experimental Group III and Control Group in an equivalent manner. Experimental Group I was exposed to interval training, Experimental Group II was exposed to continuous training, Experimental Group III was exposed to combined interval and continuous training and Control Group underwent no training. The duration of experimental period was 12 weeks. After the experimental treatment, all the sixty subjects were tested on their selected endurance components. This final test scores formed as post test scores of the subjects. The pre-test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant, Scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses.

Results

Table I, Computation of analysis of covariance on Muscular Endurance and Cardiorespiratory Endurance

		ITG	CTG	CICTG	CG	SV	Sum of Squares	df	Means Squares	F-ratio
Muscular Endurance	Pre-test	34.93	34.66	35.06	34.33	BG	4.717	3	1.572	0.826
						WG	106.533	56	1.902	
	Post-test	40.20	39.66	42.53	35.06	BG	439.533	3	146.511	67.031*
						WG	122.400	56	2.186	
	Adjusted	40.22	39.65	42.56	35.02	BG	431.245	3	143.75	65.235*
						WG	121.194	55	2.204	
Cardio Respiratory Endurance	Pre-Test Means	1547.33	1535.33	1527.06	1536.00	BG	3119.13	3	1039.71	1.588
						WG	36673.6	56	654.8	
	Post-Test Means	1684.33	1700.33	1737.00	1539.66	BG	337713.33	3	112571.11	216.781*
						WG	29080.00	56	519.28	
	Adjusted Means	1685.44	1700.22	1736.04	1539.62	BG	335338.51	3	111779.514	214.245*
						WG	28695.45	55	521.74	

Muscular endurance obtained F-ratio for the post-test was 67.031 and the table F-ratio was 2.76. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 56. The obtained F-ratio for the adjusted post-test means was 235 and the table F-ratio was 2.77. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 55. This proved that there was a significant difference among the means due to the experimental trainings on muscular endurance.

Cardio respiratory endurance obtained F-ratio for the post-test was 216.781 and the table F-ratio was 2.76. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 56. The obtained F-ratio for the adjusted post-test means was 214.245 and the table F-ratio was 2.77. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 55. This proved that there was a significant difference among the means due to the experimental trainings on Cardio respiratory endurance.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe"s post hoc test. The results were presented in table 2.

Table II, The Scheffe's Test for the Differences between the Adjusted Post-Test Means on Muscular Endurance and Cardio Respiratory Endurance

	Adjusted Post-Test Means				Mean Difference	Confidence Interval
	ITG	CTG	CICTG	CG		
MUSCULAR ENDURANCE	40.22	39.65	---	---	0.57	1.56
	40.22	---	42.56	---	2.34*	
	40.22	---	---	35.02	5.20*	
	---	39.65	42.56	---	2.91*	
	---	39.65	---	35.02	4.63*	
	---	---	42.56	35.02	7.54*	
CARDIO RESPIRATORY ENDURANCE	1685.44	1700.22	---	---	14.78	24.04
	1685.44	---	1736.04	---	50.60*	
	1685.44	---	---	1539.62	145.82*	
	---	1700.22	1736.04	---	35.82*	
	---	1700.22	---	1539.62	160.60*	
	---	---	1736.04	1539.62	196.42*	

The combined interval and continuous training group had shown better performance on endurance components among the state level football players than the interval training, continuous training and control groups.

CONCLUSION

1. The interval training group had shown significant improvement in all the selected endurance components among state level football players after undergoing interval training group for a period of twelve weeks.

2. The continuous training group had shown significant improvement in all the selected endurance components among state level football players after undergoing the continuous training group for a period of twelve weeks.
3. The combined interval and continuous training group had shown better performance on endurance components among the state level football players than the interval, continuous training and control groups.

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B.A.S-J-PE-2018-19

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

EFFECT OF CONTRAST AND PLYOMETRIC TRAINING ON SPEED AMONG INTERCOLLEGIATE LEVEL FOOTBALL PLAYERS

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ABSTRACT

The purpose of the study is to find out the effect of Contrast and Plyometric training on speed among intercollegiate level football players. To achieve this purpose of the study thirty six male football players were selected randomly intercollegiate level football players. The age of the subject ranged from 18 to 25. The selected subjects were divided into three equal groups of 12 each, Group I underwent contrast training ,Group II underwent plyometric training for five days per week which was stipulated for 6 weeks and Group 'III' acted as control group in which they did not undergo any special training program apart from their regular program of the curriculum. Speed is selected as a criterion variable of this and it was measured by using 50 yard dash. The analysis of covariance ANCOVA was used statistical tool. In all cases 0.05 level of confidence was fixed to test the significance, which was considered as an appropriate. It was concluded from results of study that there was a significant improvement due to Contrast and plyometric training on speed as compared to control group.

Keywords: contrast training, plyometric training, speed, football players

INTRODUCTION

Contrast training

Contrast training is a work out comprising of a resistance exercise immediately followed by a match plyometric exercise. Resistance training is a type of exercise that challenges the muscles to move against an unaccustomed force. Plyometric is a quick powerful movement involving a pre stretching of muscles, there by activating the stretch shorting cycle(*Wilk et al., (1993*).

Plyometric trainng

Plyometrics as it is known and used today received a great deal of attention in the early 1970s when athletes from the Eastern European countries began to dominate power dependant events. Plyometrics is a specialised, high-intensity training technique that enables an athlete's muscles to deliver as much strength as possible in the shortest period of time so that power development results. Plyometrics make use of the stretch-shortening cycle, which utilises the energy stored during the eccentric loading phase and stimulation of the muscle spindles to facilitate maximum power production during the concentric phase of movement (Hamid et al., 2012).

METHOD

The purpose of the study is to find out the effect of contrast and Plyometric training on selected speed among intercollegiate football players. To achieve this purpose of the study thirty six male football players were selected randomly intercollegiate level male football players. The age of the subject ranged from 18 to 25 years. They were divided into three equal groups, each group consisted of twelve (n=12) The selected

subjects were divided into three groups of twelve each at random. Group 'I' underwent contrast training, Group "II" plyometric training for five days per week , which was stipulated for 6 weeks and Group 'III' acted as control group in which they did not undergo any special training programme apart from their regular programme of the curriculum. Speed was selected as a criterion variable and it was measured by using 50 yard dash. For every exercise programmer there would be a change in various structures and system in a human body. The experimentation was subjected to six weeks of plyometric training. The exercise programmed was scheduled for one session per day between 6am. to 7am. In exercise session first 30 minutes running and the remaining 30 minutes medicine ball over head throw, hopping, plyo pushup exercises. Contrast and Plyometric training was given under the direct supervision of the investigator. The progression of load was followed during experimentation. The exercise were arranged simple to complex.

Data analysis

Mean and standard deviation were calculated for speed for each exercise group. And the data analyzed by using analysis of covariance (ANCOVA). Statistical significance was fixed at 0.05 levels.

RESULT

Table-I, Analysis of covariance for pre-test and post test
Data on speed of experimental groups and control group

	CTG	PTG	CG	Sources of variance	Sum of square	df	Mean square	'F' ratio
Pre-test								
Mean	7.04	7.05	7.03	B	2.22	2	1.11	0.012
S.D	0.034	0.024	0.030	W	0.030	33	0.001	
Post-test								
Mean	6.59	6.66	7.08	B	1.65	2	0.82	52.00*
S.D	0.036	0.061	0.206	W	0.524	33	0.016	
Adjusted Post-test Mean	6.59	6.66	7.07	B	1.63	2	0.817	55.64*
				W	0.47	32	0.015	

Significant at 0.05 level

(The table value required for significant at 0.05 level with df 2, 33 and 2, 32 are 3.32)

Table I shows that the pre-test mean on speed of contrast training group, plyometric training group and control group are 7.04, 7.05 and 7.03 respectively and the obtained' F' ratio is 0.012.Since the obtain F ratio for the pre-test mean on speed fail to reach the required table value of 3.32, It found to be insignificant at 0.05 level of confidence for 2, 33 degree of freedom.

The post-test means on speed of contrast training group, plyometric training group and control group are6.59, 6.66 and 7.08 respectively the obtained 'F' ratio is 52.00.Since the obtained 'F' ratio for the post-test mean on speed is greater than the required table value of 3.32, it found to be significant at 0.05 level of confidence for 2, 33 degrees of freedom.

The adjusted post-test means on speed of contrast training group, plyometric training 6.59, 6.66 and 7.07 respectively the obtained 'F' ratio is 55.64.Since the obtained 'F' ratio for the adjusted post-test mean on speed is greater than the required table value of 3.32, it found to be significant at 0.05 level of confidence for 2, 32 degrees of freedom.

The pre-test, post-test and adjusted post-test mean values of Contrast and plyometric training group and control groups on speed are graphically presented in figure II

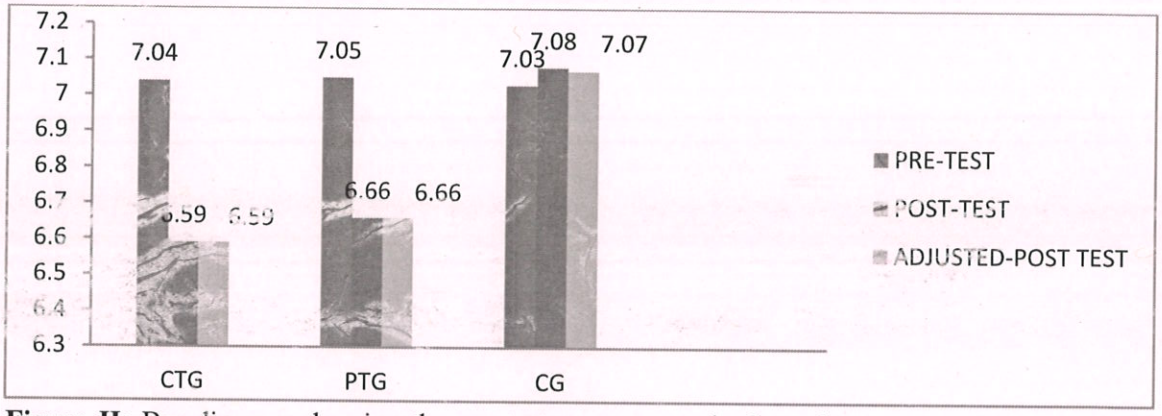

Figure II: Bar diagram showing the pre-test, post-test and adjusted post-test mean contrast and plyometric training group and control group on speed.

DISCUSSION

The result of this study reveals that there is no significant difference in speed in the pre- test of experimental and control group. But there is significant differences in the post and adjusted post mean due to the twelve weeks of the training program.

From the finding of Impellizeri et al., (2008) found significant improvement on sprinting ability due to the effect of plyometric training on sand versus grass surfaces. Its similar finding from Manjo et al., (2010), Shaik and Mallik (2012), Kagitha and Kumar (2013) and Bujjibabu and Jhonson (2012).

CONCLUSION

The Contrast and Plyometric training help to improve speed, during the age between 18 to 25 years of Inter-collegiate men football players. The results of the study indicated that there was a significant improvement on speed due to six weeks of Contrast and plyometric training. The Contrast and plyometric training have significantly improved on speed when compared with control group.

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3.4.5-J- EPN - 2016-19

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

IMPACT OF RESISTANCE TRAINING AND FARTLEK TRAINING ON PULSE RATE AND ENDURANCE AMONG COLLEGE LEVEL FOOTBALL PLAYERS

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ABSTRACT

This paper aimed to find out the impact of resistance training and fartlek training on pulse rate and endurance among college level football players for the purpose of the study, forty-five men football players were selected randomly as subjects and divided in to three groups namely resistance training group, fartlek training group and control group of fifteen subjects in each groups and the subject's ages ranged from 18-27 years. All the subjects were tested on selected variables prior to and immediately after the training period. The selected criterion variables such as endurance was measured by Copper's 12 min/walk test and resting pulse rate was measured by palpation technique. The analysis of covariance (ANCOVA) were used to find the significant difference if any, among the experimental and control groups on selected criterion variables. In all the cases, 0.5 level of confidence was fixed to test the significance, which was considered as an appropriate. Since there were three groups involved in this study the Scheffe's test was used as post-hoc test.Results proved that there were significant improvements in the variables such as endurance and pulse rate due to training on the experimental groups. Participation in resistance and fartlek training resulted in a significant development in the endurance and pulse rate on experimental groups when compared to control group.

Keywords: Resistance training, Fartlek training, Endurance, Pulse rate

INTRODUCTION

Resistance training comprises of weight lifting and power lifting, in which resistance exercise used in training becomes the competition tool, and body building, in which resistance exercise training is used to create an idealized physique. Additionally, resistance training has become integral part of training in other sports such as football, track and field, and tennis. while sports depend on specific talents and characteristics, such as strength, explosiveness, power, endurance capabilities, and agility, ideally these sports also depend on a training process that develops and maximizes such talents. Resistance training is a primarily ingredient in that process becomes paramount Fartlek is a Swedish term that means "run as you feel" or "Speed play". One way of doing it is to cover as much as distance as an athlete can in forty to sixty minutes. Fartlek training is much easier for experienced runners than for novice runners, because novice runners often don't know how to change the pace. Fartlek running is an enjoyable free from method of training involving running at varying speed over varied turnout. Fartlek is a variation of faster and relatively slower speed runs, variety of change of pace and change of terrains. This sort of method of training should be a part of training program for better understanding of the environment or terrain, changes in the running paces and prepare an athlete to run in a group.

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METHOD

For the purpose of the study, forty-five men football players were selected randomly as subjects and divided in to three groups namely resistance training group, fartlek training group and control group of fifteen subjects in each groups and the subject's ages ranged from 18-27 years. All the subjects were tested on selected variables prior to and immediately after the training period. The selected criterion variables such as endurance was measured by Copper's 12 min/walk test and resting pulse rate was measured by palpation technique. The analysis of covariance (ANCOVA) were used to find the significant difference if any, among the experimental and control groups on selected criterion variables. In all the cases, 0.5 level of confidence was fixed to test the significance, which was considered as an appropriate. Since there were three groups involved in this study the Scheffe's test was used as post-hoc test.

RESULTS AND DISCUSSION

Table I, Analysis of Covariance on Endurance and Pulse Rate

		Resistance Training	Fartlek training	Control group	SOV	Sum of squares	df	Mean square	'F' ratio
Endurance	Pre -test Mean	2473.33	2462.67	2446.67	B	5404.04	2	2702.22	0.90
	S.D.	59.00	58.12	46.09	W	125760.00	42	2994.29	
	Post -test Mean	2488.67	2541.33	2382.00	B	197693.33	2	98846.7	18.36*
	S.D.	53.03	64.90	95.56	W	2261186.67	42	5385.40	
	Adjusted post-test Mean	2477.58	2539.75	2394.67	B	156089.13	2	78044	25.31*
					W	126417.37	41	3083.35	
Pulse rate	Pre -test Mean	80.07	80.93	79.47	B:	50.98	2	25.49	1.19
	S.D.	4.95	3.24	4.94	W:	831.60	42	19.80	
	Post-Test Mean	80.67	78.27	80.20	B:	48.58	2	24.29	1.23
	S.D.	4.67	3.31	5.14	W:	828.67	42	19.73	
	Adjusted post-test Mean	79.48	78.16	81.50	B:	82.67	2	41.34	25.54*
					W:	66.36	41	1.62	

(* Significant, The table at .05 level of confidence with df 2 and 42 and 2 and 41 were 3.23 and 3.21 respectively)

Table I shows that the pre -test 'F' ratio value of 0.90 on endurance was lesser than the required table value of 3.23 hence it wasinsignificant. The post –test 'F' ratio value of 18.36 was greater than the required table value of 3.23 hence it was significant. The adjusted post -test 'F' ratio value of 25.31 was greater than the required table value of 3.21 hence it was significant with df 2 and 41 at .05 level of confidence.

Table I also shows that the pre -test 'F' ratio value of 1.19 on pulse rate was lesser than the required table value of 3.23 hence it was insignificant. The post –test 'F' ratio value of 1.23 was lesser than the required table value of 3.23 hence it was insignificant. The adjusted post -test 'F' ratio value of 25.54 was greater than the required table value of 3.21 hence it was significant with df 2 and 41 at .05 level of confidence.

The above statistical analysis showed that there was development in endurance after the training. It also showed that there was no development in resting pulse rate after the training. Further to determine which of the paired means has a significant improvement, Scheffe'S test was applied and which is presented in table II.

Table II, Scheffe's Test for the Difference between the Adjusted Post-Test Mean of Endurance and Pulse Rate

	Resistance training group	Fartlek training group	Control group	Mean Difference	Confidence interval
Endurance	2477.58		2394.67	82.91*	62.82
	2477.58	2539.75		62.17	62.82
		2539.75	2394.75	145.08*	62.82
Pulse Rate	79.48		81.50	2.02*	1.45
	79.48	78.16		1.32	1.45
	79.48		81.50	3.34*	1.45

*Significant at .05 level of confidence

Table II indicated that resistance and fartlek training group better than the control group, and there was no significant difference between resistance and fartlek training group on improving endurance. Table II also indicated that resistance and fartlek training group better than the control group, and there was no significant difference between resistance and fartlek training group on improving pulse rate.

CONCLUSION

1. There were significant improvements in the variables such as endurance and pulse rate due to training on the experimental groups.
2. Participation in resistance and fartlek training resulted in a significant development in the endurance and pulse rate on experimental groups when compared to control group.

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3.4.5-J- EPN - 2016-19

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

INFLUENCE OF COMBINED CARDIO AND RESISTANCE TRAINING ON MEAN ARTERIAL BLOOD PRESSURE AND RESTING PULSE RATE AMONG MIDDLE AGED MEN

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ABSTRACT

The aim of this study was to find out the influence of combined cardio and resistance training on mean arterial blood pressure and resting pulse rate among middle aged men. To achieve the purpose, sixty (N=60) sedentary middle aged men were randomly selected and their age ranged between 30 and 40 years and they were assigned into two groups, cardio and resistance training group (CRTG) and Control group (CG) consisting of thirty (n=30) in each. After assessing the mean arterial blood pressure and resting pulse rate initially, the experimental groups underwent training intervention for twelve weeks. After the completion of twelve weeks experimental period, all the subjects were measured of their mean arterial blood pressure and resting pulse rate. The results revealed that the cardio and resistance training produce significant alteration on mean arterial blood pressure and resting pulse rate among sedentary middle aged men comparing to initial and final scores. The differences were found to be significant $P < 0.05$. Thus, it was concluded that cardio and resistance training is the best training intervention for sedentary middle aged men to enhance overall health and wellbeing.

Key Words: Cardio and Resistance Training, Mean arterial blood pressure and Resting pulse rate

INTRODUCTION

Sedentary lifestyle is threatening the health of every individual in every moment of life. In middle aged and elderly people such lifestyle, encourages or increases the risk of obesity, muscle weakness, postural deficiencies, diabetes, hypertension and coronary heart disease. A regular physical activity causes important changes that it shows in the increase of health related fitness and in the decrease of the risk factors in many of developing medical conditions in inactive people (Physical Activity Guidelines Advisory Committee Report, 2008). Exercise is one of the important tools used to diagnose and understand functions of cardiovascular system. Exercise causes increase in cardiovascular function to deliver required oxygen and other nutrients to the exercising muscles and muscle blood flow increases drastically during exercise (Guyton, 2008). There are numerous variables which can be taken from the individuals of a population to clarify physical health of that particular population of which, one important variable is blood pressure. Blood pressure varies and is influenced by age, sex, health, race or ethnicity, socioeconomic status, occupation, education, living arrangements, personal circumstances and environmental factors (Thomas et al, 2002).

Blood pressure measurement is one of the basic clinical examinations. Blood pressure is also defined, as it is the force created by the heart as it pushes blood into the arteries through the circulatory system. Each time the heart contracts or "beats" the blood is pumped out and creates a surge of pressure in the arteries. A person's blood pressure is usually expressed in terms of the systolic pressure over diastolic pressure and is measured

in millimeters of mercury. The systolic arterial pressure is defined as the peak pressure in the arteries, which occurs near the beginning of the cardiac cycle. The diastolic arterial pressure is the lowest pressure (at the resting phase of the cardiac cycle). The average pressure throughout the cardiac cycle is reported as mean arterial pressure. The blood pressure values are reported in millimeters of mercury (mmHg).

The physiological response to dynamic exercise is an increase in oxygen consumption and heart rate that parallels the intensity of imposed activity and a curvilinear increase in stroke volume. There is a progressive increase in systolic blood pressure with the maintenance of or slight decrease in diastolic blood pressure and concomitant widening of pulse pressure. Thus, aerobic exercise imposes primarily a volume load on myocardium. Whereas, the isometric exercise the heart rate and blood pressure responses are largely proportionate to tension exerted relative to greatest possible tension in muscle group rather than absolute tension developed. Therefore, the purpose of this study was to evaluate the influence of combined cardio and resistance training on mean arterial blood pressure and resting pulse rate among middle aged men

METHOD

For the purpose of the study (N=60) sixty sedentary middle aged men were selected from Chennai city. They were in the age group of 30 – 40 years. The study was formulated as a true random group design consisting of a pre-test and post-test. The subjects were randomly assigned to two equal groups consisting of thirty (n=30) sedentary middle aged men each. The groups were assigned as cardio and resistance training group (CRTG) and control group (CG) respectively. Pre tests were conducted for all the 60 subjects on mean arterial blood pressure and resting pulse rate. Blood pressure was measured via a sphygmomanometer. Mean Arterial Pressure was calculated by using the formula:

Mean Arterial Pressure = Diastolic pressure + 1/3 pulse pressure

Where, Pulse pressure = (systolic pressure – diastolic pressure)

Resting pulse rate was measured through electronic heart rate monitor. After the experimental period of twelve weeks post-test were conducted and the scores were recorded. The differences between the initial and final scores were considered as the influence of cardio and resistance training group (CRTG) on mean arterial blood pressure and resting pulse rate. The obtained data were statistically analyzed using ANCOVA.

Exercise Program: The cardio and resistance training was performed 3 days/ week for 12 weeks. They performed both resistance and cardio training on the same session, in which the cardio exercise were performed first and were immediately followed by the resistance exercises. All the training sessions were carefully supervised by the experienced personal trainers. The resistance training program included nine exercises (inclined leg press, knee extension, leg curl, seated row, biceps curl, bench press, inverted fly, triceps curl and abdominal exercises) performed until failure. These exercises were chosen to emphasize both major and minor muscle groups, using single as well multi-joint

exercises, based in the recommendation of ACSM (2009). The schedule of the training program consisted of three workouts per week, During the first three weeks, subjects performed three sets of 10-12 RM (repetition maximum) plus 25 min of cardio training at 65 to 70% MHR (maximum heart rate); in weeks 4 and 6: 8-10 RM (repetition maximum) plus 30 min of cardio training at 70 to 75% MHR (maximum heart rate); in weeks 7 and 9: 6-8 RM (repetition maximum) plus 30 min of cardio training at 75 to 80% MHR (maximum heart rate), and ending with weeks 10 and 12 performing between 4 and 6 RM (repetition maximum) plus 30 min of cardio training at 80 to 85% MHR (maximum heart rate). The recovery between sets lasted 120 seconds. The cardio training program was performed on a treadmill walking and elliptical training. Each session lasted 30 min and had the intensity individually monitored according to the HRmax. The program began after the adaptation period and the initial and final five minutes were always used to warm-up and cool-down respectively.

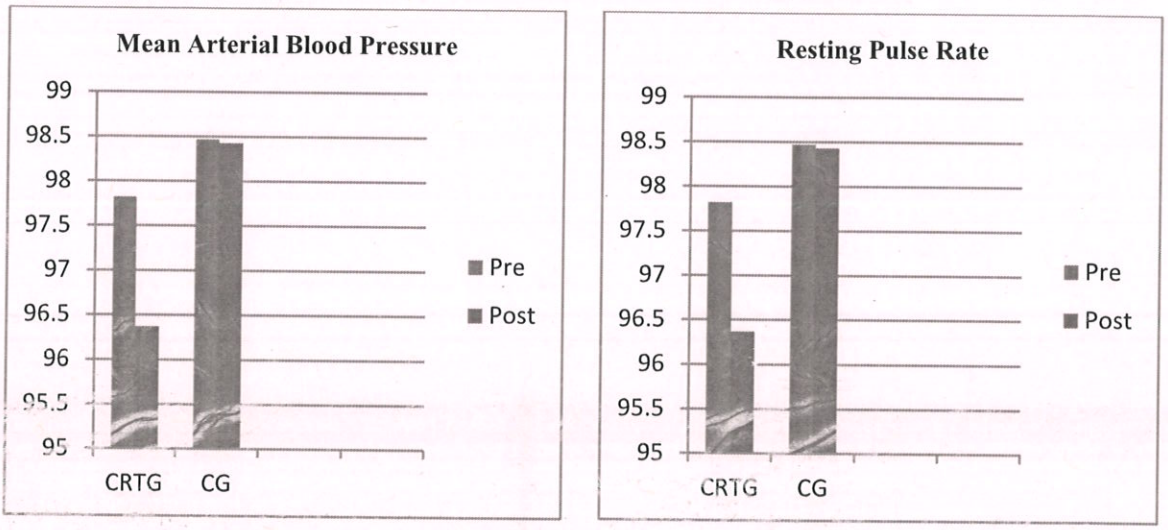
RESULTS

Table I: influence of Cardio and Resistance training on mean arterial blood pressure and resting pulse rate among sedentary middle aged men

MEAN ARTERIAL BLOOD PRESSURE (Scores in mmHg)							
	ECT G	**CG**	**S V**	**SS**	**df**	**MS**	**Obtained F**
Pre Test	97.82	98.47	B	6.34	1	6.337	**1.10**
			W	334.71	58	5.77	
Post Test	96.37	98.43	B	64.07	1	64.07	**7.39**
			W	503.07	58	8.67	
Adjusted	96.58	98.22	B	39.81	1	39.81	
			W	361.80	57	6.35	**6.27**
Mean Gain	**1.45**	**0.03**					
RESTING PULSE RATE (Scores in beats per minute)							
Pre Test	76.30	75.60	B	7.35	1	7.350	**1.09**
			W	389.50	58	6.72	
Post Test	73.70	75.53	B	50.42	1	50.42	**9.50**
			W	307.77	58	5.31	
Adjusted	73.40	75.83	B	86.69	1	86.69	
			W	28.01	57	0.49	**176.42**
Mean Gain	2.60	0.07					

*Significant at 0.05 level of confidence for 1 and 58 (df) = 4.00, 1 and 57 (df) = 4.00

Figures: Pre and Post Test Mean scores on mean arterial blood pressure and resting pulse rate among sedentary middle aged men



The results presented in Table I proved that there was significant variation due to Cardio and Resistance training on mean arterial blood pressure and resting pulse rate. The obtained adjusted post test F values 6.27 and 176.42 were greater than the required F value of 4.00 to be significant at 0.05 level.

DISCUSSION

In our study, the statistical analysis showed a significant reduction in the resting Heart Rate of the subject. In addition, it was found a fall of systolic blood pressure after stopping of exercise however it did not fall below the resting values however it found that Diastolic Pressure changed on a minor scale similar to Systolic Pressure the point in conformation with the study on diastolic blood pressure. Endurance training increases the number of capillaries in trained skeletal muscle, thereby allowing a greater capacity for blood flow in the active muscle (Terjung 1995). This enhanced capacity for blood flow is associated with a reduction in total peripheral resistance; thus, the left ventricle can exert a more forceful contraction against a lower resistance to flow out of the ventricle (Blomqvist and Saltin 1983). Arterial blood pressure at rest, blood pressure during submaximal exercise, and peak blood pressure all show a slight decline as a result of endurance training in normotensive individuals (Fagard and Tipton 1994). The most important finding of this study was the decrease in resting diastolic blood pressure following Cardio and Resistance training period. These results are in agreement with several previous studies which reported a significant decline in resting diastolic blood pressure but no change in resting systolic blood pressure, as a result of Cardio and Resistance training intervention. The results obtained by Berent *et al.* (2011) in a study on the relative advantages of resistance exercises in combination with resistance and aerobic exercises in cardiac patients are in line with the present study.

CONCLUSION

Our obtained results showed that doing combined cardio and resistance exercise for twelve weeks led to a reduction in mean arterial blood pressure and resting pulse rate

among middle aged men. Lifestyle modification and awareness, exercise in any form has become an important part of life.

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3.4.5-J- PE -2019

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

EFFECT OF CIRCUIT TRAINING ON AGILITY AMONG COLLEGE MEN CRICKET PLAYERS

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ABSTRACT

The purpose of the study was to find out the effect of circuit training on agility among college men cricket players. To achieve this purpose of the study, thirty cricket players from TNPESU, Chennai, Tamil Nadu, were selected as subjects at random. The selected subjects were divided into two equal groups of fifteen subjects each, such as experimental group and control group. The group I underwent circuit training for three days per week for twelve weeks. Group II acted as control who did not participate any special training. The dependent 't' test was used to find out the difference between two means. It was concluded that the experimental group produced significant improvement on agility than the control group.

Keywords: Circuit Training, Agility, Cricket Players.

INTRODUCTION

Circuit training was invented in 1953 as an efficient way for coaches to train many athletes in a limited amount of time with limited equipment. The exerciser moved through a series of weight training or calisthenics arranged consecutively. It was a fast-paced workout of 15 to 45 seconds per station with little (15 to 30 seconds) or no rest between stations. Today, this is known as "circuit weight training". Research has shown that it can increase muscular strength and endurance. There is a mild improvement in aerobic stamina but only if the rest periods are kept very short. Another variation is "aerobic circuit training". Aerobic stations like a treadmill, rower, bike, or stepper (one to five minutes per station) are interspersed with weight training stations. This protocol has been found to increase aerobic stamina and muscular endurance and endurance. Circuit training is an effective organizational form of doing physical exercises for improving all physical fitness components. Before and after training, the initial and final tests were conducted for the variables such as speed, agility, power, co-ordination, static balance and dynamic balance for the experimental and control groups. Circuit training was given for eight weeks for alternate days. The study showed that the skill related fitness components such as speed, agility, coordination, power, static balance and dynamic balance were significantly improved due to circuit training among college men soccer players. The maximum improvement attained at the sixth week of training. The problem in many cases has been the system of circuit or weight training employed and the fears of the possible side effects of strength training on speed, endurance, flexibility and so on. Circuit training is a new method of conditioning in the esteemed sports field. It is a method of physical conditioning that employs both weight training and conditioning exercises. The unique contribution to sports training called the circuit training has come to us from England. It aims at developed the heart core of basic fitness. It is based on very extensive study and research by the sport and physical condition department. It was immediately accepted by Physical educators, coaches and trainers as an excellent and self motivating means of increasing strength, flexibility and endurance is an orderly fashion within a group. The intensity and vigour of circuit training is necessary challenging and enjoyable to the performer. This system produces positive changes in motor performance. Circuit training is a practical method entailing some preliminary planning, but beyond that, it needs co-

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ordination. Athletes find it motivating since it makes conditioning fun and challenging through competition against team-mates.

METHOD

The purpose of the study was to find out the effect of circuit training on agility among college men cricket players. To achieve this purpose of the study, thirty cricket players from TNPESU, Chennai, Tamil Nadu, were selected as subjects at random. The selected subjects were divided into two equal groups of fifteen subjects each, such as experimental group and control group. The group I underwent circuit training for three days per week for twelve weeks. Group II acted as control who did not participate any special training. The dependent 't' test was used to find out the difference between two means.

RESULT

TABLE -I, COMPUTATION OF 't' RATIO BETWEEN THE PRE TEST AND POST TEST MEANS OF AGILITY OF EXPERIMENTAL AND CONTROL GROUP

S. No	Variables	Mean diff	SD	σ DM	't' ratio
1	Agility	Exp: 5.33	Exp: 0.80	Exp: 0.21	25.79*
		Con: 0.89	Con:1.79	Con: 0.46	1.94

*Significant at 0.05 level

An examination of table I indicates that the obtained„t" ratio for agility of experimental group was 25.79. The obtained„t" ratio on agility was found to be greater than the required table value of 2.14 at 0.05 level of significance for 14 degrees of freedom. So it was found to be significant. The obtained„t" ratios for agility of control group was 1.94. The obtained„t" ratio on agility was found to be lesser than the required table value of 2.14 at 0.05 level of significance for 14 degrees of freedom. So it was found to be not significant.

CONCLUSION

It was concluded that the experimental group produced significant improvement on agility than the control group.

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3.45-J- EPN - 2018-19

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

RELATIONSHIP STUDY ON SELECTED KINEMATIC VARIABLES AND THE PERFORMANCE OF MALE BASKETBALL PLAYERS IN SET SHOT

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ABSTRACT

The primary concern of the present study was to find out the significance relationship between the selected kinematic variables and the performance of the subjects in set shot by two dimensional kinematic analysis among male basketball players from the ICF (Integral Coach Factory). To facilitate the study eight right handed male basket players were randomly selected for the purpose of this study. Their age was between 24 to 28 years. The data were collected and put into statistically analysis. Pearson product moment correlation was computed to analyze the data at 5% level of significance. It was found that there is a significant relationship between the selected angular kinematics variables at moment execution phase and performance of subjects in set shot.

Keywords: Kinematic variables,Set Shot inbasket ball, Two dimensional analysis.

INTRODUCTION

Basketball is one of the most popular and widely viewed sports in the world. Points are scored by throwing (shooting) the ball through the basket from above, the team with more points at the end of the game wins. The ball can be advanced on the court by bouncing it (dribbling) or passing it between teammates. Disruptive physical contact (foul) is penalized and there are restrictions on how the ball can be handled (violations). Through time, basketball has developed to involve common techniques of shooting, passing and dribbling, as well as player's positions and offensive and defensive structures. In some countries, basketball is also a popular spectator sport. Shooting is the act of attempting to score points by throwing the ball through the basket.

PURPOSE OF THE STUDY

The present study was designed to find out the relationship and study the significant difference of selected kinematic variables to the performance of the subjects in set shot by two dimensional kinematic analysis among male basketball players.

SIGNIFICANCE OF THE STUDY

To provides a model for the technique of skill for analyzing the performance of the players. It will be helpful in preparing how effectively and efficiently the free throw set shot has been made.

DELIMITATIONS

1. The study was delimited to the male basketball players.

2. The study was delimited to right handed basketball players.
3. The study was delimited to set shot while performing free throws only.
4. In the study digital video cameras or camcorders was used for the determination of the technique.

LIMITATIONS

1. Non-availability of sophisticated devices was the major limitation of the study.
2. The factors like environment, temperature, atmosphere pressure etc were beyond the control of the investigator, which might have affected the performance of the subjects.
3. The study was limited to the female basketball players.
4. The study was limited to left handed basketball players.

METHOD

SELECTION OF THE SUBJECTS

Eight male Basketball players were purposively selected from ICF [integral coach factory] basketball team , the age of the subjects ranged from 24 to 28 years and the height of the subjects ranged from 5.8 to 6 feet tal . The subjects had past playing experience of at least four years in basketball. To acquire biomechanical data the high definition camera (Sony 10) was used to record the performances that were approximately transverse to the trajectory of the plane of motion. The camcorder mounted at the height of 1.5 meter, placed 6 meters away perpendicular to the trajectory of the plane of motion. A cage with the dimensions of 1.0x1.0m at 4 control points was used to calibrate the space, in which the set shot was performed. After a 15-minute standard warm-up session, participants perform the set shot; 10 trials were randomly captured from the subjects.

SELECTION OF THE VARIABLES

Angle at right ankle joint , angle at right knee joint , angle at right hip joint , angle at right shoulder joint , angle at right elbow joint , angle at right wrist joint , angle of release of the ball.

STATISTICAL TECHNIQUE

The researcher has used suitable statistical tools for testing the above hypothesis and correlation coefficient by Pearson product moment method.

Table No -1, Relationship of Selected Angular Kinematic Variables at Movement Release with the Performance of Subjects in Set Shot

S.No	Variables	Co-efficient of Correlation 'r'
1	Angle of right ankle joint(Deg)	0.145
2	Angle of right Knee joint(Deg)	-0.076
3	Angle of right hip joint(Deg)	-0.365

4	Angle of right shoulder joint(Deg)	0.358
5	Angle of right elbow joint(Deg)	-0.171
6	Angle of right wrist joint(Deg)	-0.032
7	Angle of Ball release (Deg)	0.213

The above table has shown the values of coefficients of correlation of selected angular kinematics variables at moment execution phase in Set Shot. Ankle joint (right), Elbow joint (right) and Angle of Ball release shows positively correlated with the performance of subjects in set shot (ie) if the ankle joint, Elbow joint and Angle of Ball release angles increases then the performance of subject in set shot will increase. Knee joint (right), Hip joint (right), Elbow joint (right) and Wrist joint (right) angles were negatively correlated with performance of subjects in set shot (ie) if the Knee joint, Hip joint, elbow joint and Wrist joint angles decrease then the performance of subject in set shot will increase. The Pearson product moment correlation coefficient for selected angular Kinematic variables at Movement Release with the performance of subjects in set shot were presented through bar diagram for better understanding of the result of this study.

Figure1

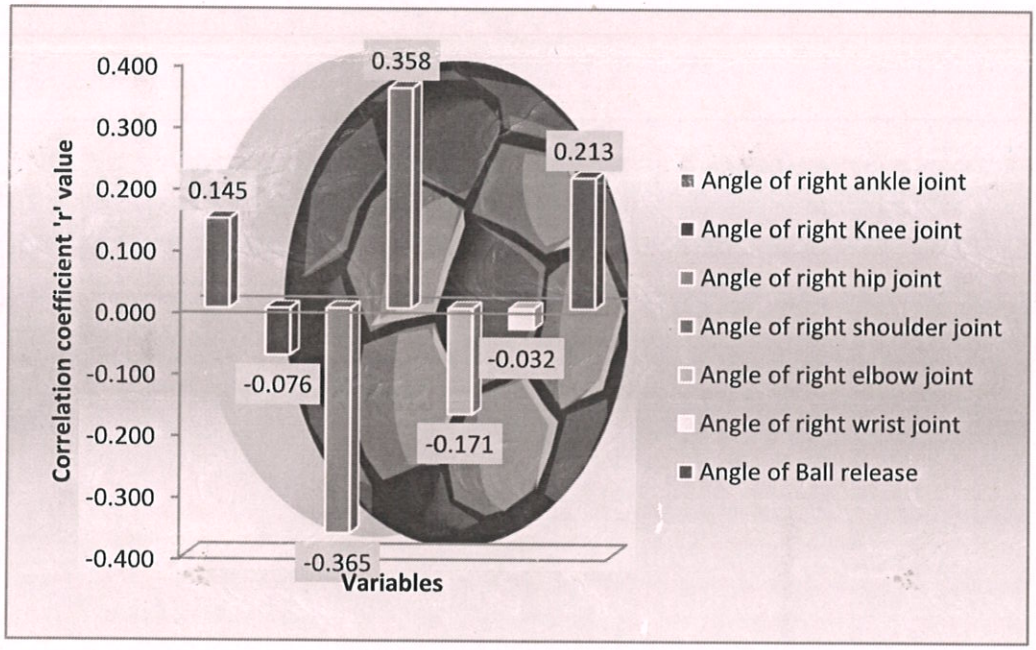

Table No. 2, Test for significance of the Pearson product moment correlation coefficient Between Selected Angular Kinematic Variables at Movement Release with the Performance of Subjects in Set Shot

Variables	Obtained 'r' Value	Required 'r' Value at 0.05 level
Angle of right ankle joint(Deg)	0.359	0.707

Angle of right Knee joint(Deg)	0.187	
Angle of right hip joint(Deg)	0.961*	
Angle of right shoulder joint(Deg)	0.940*	
Angle of right elbow joint(Deg)	0.426	
Angle of right wrist joint(Deg)	0.080*	
Angle of Ball release (Deg)	0.533	

*indicates significance at 5% level

DISCUSSION

It was prudent from the above table that Angle of right hip joint, Angle of right shoulder joint, and Angle of right wrist joint angles significantly influence the performance of subjects in set shot of male basket-ball players since the calculated r value of Angle of right hip joint (0.961), Angle of right shoulder joint (0.940) and Angle of right wrist joint (0.080) was greater than the table r value 0.707 at 5 % level of significance. Also Angle of right ankle joint, Angle of right Knee joint, Angle of right Elbow joint and Angle of Ball release angles have no significant influence of the performance of subjects in set shot of male basket-ball players since the calculated r value of Angle of right ankle joint (0.359), Angle of right Knee joint (0.187) , Angle of right Elbow joint (0.426) and Angle of Ball release(0.533) was lesser than the table r value 0.707 at 5 % level of significance.

CONCLUSION

Based on the results obtained, the following conclusions were drawn

1. Ankle joint (right), Elbow joint (right) and Angle of Ball release showed positively correlated the performance of subjects in set shot of male basket ball players
2. Angle of right hip joint, Angle of right shoulder joint, and Angle of right wrist joint angles significantly influence the performance of subjects in set shot of male basket ball players

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3.4.5 - J - BM - 2018-19

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

DIFFERENTIATION OF SPEED AND AGILITY BETWEEN UNIVERSITY HOCKEY AND FOOTBALL PLAYERS

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ABSTRACT

This research was aimed at to find out the difference between hockey and football players on speed and agility. To achieve the purpose of these study 15 male hockey players and 15 male football players were selected randomly from university level. Their age groups are between 18 to 25 years. The tests were conducted to the entire subject on the selected variables namely speed and agility. Speed was measured through 50 meters run and the scores recorded in seconds. Agility was measured through 4 x 10 meters shuttle run and the scores recorded in seconds. The data collected on selected criterion variables were subjected to statistical analysis using t test technique. It concluded that there was a significant difference between nockey and football players on speed and agility. It was also concluded that the hockey players had better speed and agility than football players.

Key words: *Speed, agility hockey, football*

INTRODUCTION

Sports are the top level profession among various professions in the world. Day by day sports and games become a part of human life these sports and games have various types like individual event, group event, and team games. Before days all this sports and games played only for recreational aspect but it becomes a professional competition like between the individual, group, state, and country. When it is become a competition at various level the professional like to improve the sports performance and popularize the sports.

Physical activities and sports serving as vehicles to achieve and maintain social relationship with other people. sport for all becomes a very popular slogan all over the world today. The modern world is a world of competition. In every phase of life people have to face one or other kind of competition. In this competitive world sports and games occupy. The main aim of modern sports competition is to detect and develop human ability at an early stage of life and channelize it in the right direction to realize the achievements aimed at in particular sports and games.

Improvisation of the sports performance athletes should be good in the fitness and skills. To develop this fitness and skill the professionals are introduce so many training methods according to the individual and teams and games.

METHOD

This research was aimed at to find out the difference of speed and agility between hockey and football players from university and state level.

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To achieve the purpose of these study 15 male hockey players and 15 male football players were selected at randomly. The players are selected from university level. Their age groups are between 18 to 25 years. The tests were conducted to the entire subject on the selected physical fitness variables namely speed and agility.

The criterion measures of the study were given below:

1. Speed was measured through 50 meters run and the scores recorded in seconds.
2. Agility was measured through 4 x 10 meters shuttle run and the scores recorded in seconds.

The data collected on selected criterion variables were subjected to statistical analysis using t statistical technique to find out the significant difference if any, between the groups on selected criterion variables separately. In all the cases, 0.05 level of confidence was fixed to test the significance, which was considered as appropriate.

RESULTS

TABLE – I, SIGNIFICANCE OF MEAN GAINS & LOSSES BETWEEN HOCKEY AND FOOTBALL PLAYERS SCORES ON SPEED AND AGILITY

Variables	Group	Mean	Mean difference	Standard deviation	Std error mean	df	t-ratio
Speed	Hockey	6.67	0.97	0.95	0.26	28	3.07*
	Football	7.58		0.65	0.17		
Agility	Hockey	7.87	2.96	1.15	0.30	28	7.65*
	Football	10.83		0.98	0.26		

*Significant, Required table value is 2.05 with degrees of freedom 28.

According to Table I, speed mean value of hockey players is 6.67 sec and the mean value of football players is 7.58 sec. The obtained 't' ratio of 3.07 on speed were found to be greater than the required table value of 2.05 at 0.05 Level of significance for 28 degrees of freedom. The results of the study showed that there was a significant difference between university men hockey players and football players on speed.

According to Table I, agility mean value of hockey players is 7.87 sec and the mean value of football players is 10.83 sec. The obtained 't' ratio of 7.65 on agility were found to be greater than the required table value of 2.05 at 0.05 Level of significance for 28 degrees of freedom. The results of the study showed that there was a significant difference between university men hockey players and football players on agility.

This result of the study in line with the studies of Bhat, & Moiz, (2013) suggestion that agility was significantly more in field hockey players. Field hockey players and football players did not differ in terms of dynamic balance. Simonek, Horicka, & Hianik (2017) reported that Complex reaction speed, acceleration, maximum speed, speed of whole-body change of direction and agility represent the basic components of sport performance mainly in sport games and combat sports.

For better understanding of the results mean values presented in a bar diagram in figure 1.

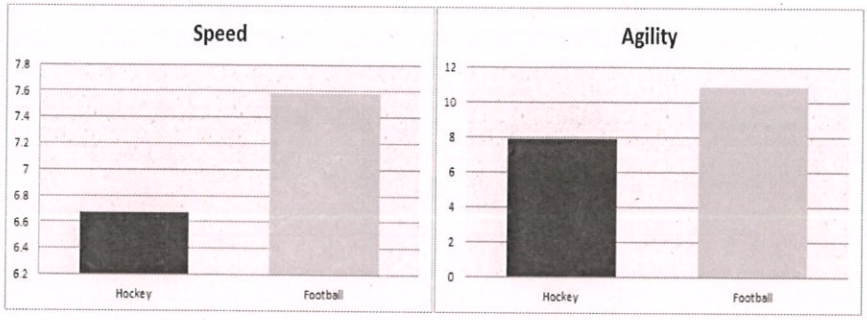

Figure 1
Showing the mean values of selected variables among Hockey and Football Players

The findings suggest that specific training procedures for each speed and agility component should be utilized already in junior ages. Cherappurath, (2015) reported that handball players have greater speed than basketball players. However, no significant difference was elicited between handball and basketball players for the variable of agility. Lockie, Schultz, Callaghan, and Jeffriess, (2016) There is a relationship between dynamic stability as measured by functional reaching and multidirectional speed in field sport athletes, possibly because of similarities in movement demands and muscle recruitment. Dynamic stability training could strengthen muscles for multidirectional sprinting and develop functional joint motion.

The implications of the current study suggest that specific training based on their participating sports and playing position and conditioning may be required. The lower level of physical outputs may suggest that training at elite level versus amateur level need to be specific to the level of the players. Coaches may consider fitness requirements of players and modify the training schedule accordingly.

CONCLUSION

1. It was concluded that there was a significant difference between hockey and football players on speed and agility.
2. It was also concluded that the hockey players had better speed and agility than football players.

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3.4.S- J- PE- 2018-19

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

EFFECT OF PHYSICAL EXERCISE ON LEVEL OF PAIN AMONG WOMEN WITH FIBROMYALGIA

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ABSTRACT

The purpose of the study was to find out the effect of physical exercise on level of pain among women with fibromyalgia. Thirty Women from Chennai city were selected as subjects their age ranged from 25-35 years, and were divided in to experimental group (15) and control group (15), randomly. The experimental group participated in physical exercise was adopted for ten weeks training on four days a week, the control group was not exposed to experimental treatment. The level of pain were tested through Allina health pain assessment scale. The collected data were statistically analyzed using dependent 't' test and level of confidence was fixed at 0.05. The result of the study showed that there was a significant reduce the level of pain among women with fibromyalgia due to the physical exercises.

Keywords: Physical Exercise, Level of Pain and Fibromyalgia

INTRODUCTION

Fibromyalgia is a common and chronic syndrome that causes bodily pain and mental distress. According to the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), around 5 million adults aged 18 years or over in the United States experience fibromyalgia, and 80 to 90 percent of fibromyalgia patients are women Symptoms of fibromyalgia as a rheumatic condition, in other words, one that causes soft tissue pain or myofascial pain. (Christian Nordqvist, 2018). It affects around 7 times as many women as men. The condition typically develops between the ages of 30 and 50, but can occur in people of any age, including children and the elderly. (https://www.nhs.uk/conditions/fibromyalgia/). In many cases, the condition appears to be triggered by a physically or emotionally stressful event. (https://www.nhs.uk/conditions/fibromyalgia/). Pain is an uncomfortable feeling in your body that warns you something is wrong. Fibromyalgia-related pain is pain that causes you to ache all over. Your muscles may feel like they have been overworked or pulled even though you haven't exercised. The 7 Types of Fibromyalgia Pain are Hyperalgesia, Widespread Muscle Pain, Joint Pain Allodynia, Neuropathic Pain, Headaches, Abdominal and Pelvic Pain (Adrienne Dellwo, 2018). Physical exercise is considered important for maintaining physical fitness including healthy weight; building and maintaining healthy bones, muscles, and joints; promoting physiological well-being; reducing surgical risks; and strengthening the immune system. (https://www.sciencedaily.com/terms/physical_exercise.htm).

Statement of the Problem: The purpose of the study was to find out the effect of physical exercise on level of pain among women with fibromyalgia.

Hypothesis

It was hypothesized that there would be significant reduction on the level of pain due to physical exercise among women with fibromyalgia.

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Review of Literature

Redondo et al. (2004) evaluated long term efficacy of therapy in patients with fibromyalgia, the outcome variables are physical activity, aerobic capacity, and results of the Fibromyalgia Impact Questionnaire (FIQ), Short Form 36, Beck Anxiety and Depression Inventory, Chronic Pain Self Efficacy Scale, and Chronic Pain Coping Inventory. All were measured at baseline, post treatment, 6 months, and 1 year. The duration of both treatments was 8 weeks. Some items of the FIQ and some strategies to cope with pain improved significantly in both groups after treatment. There were no differences in anxiety, depression, and self-efficacy after treatment in either group. After 1 year of follow up, most of the parameters had returned to baseline values in both groups. However, in the PE group, functional capacity remained significantly better. PE and CBT improve clinical manifestations in FM patients only for short periods of time.

METHOD

Thirty Women from Chennai city were selected as subjects their age ranged from 25-35 years, and were divided in to experimental group (15) and control group (15), randomly taken for the study. All the subjects selected for the study were examined by medical practitioner and certified to undergo physical exercises. The experimental group participated in physical exercise training involves low intensity of aerobic dance training [50%-60% of Max Heart Rate] involves maintaining a lower heart rate for a longer period of time. (Jogging, running, jumping calisthenics exercise, ladder training, sand running, aquatic activities with normal intensity and aerobic dancing was adopted for ten weeks training on four days a week, the control group was not exposed to experimental treatment.

Level of pain was tested through Allina health pain assessment scale (10- Worst pain you can imagine, 7-9 Severe pain, 4-6 Moderate pain, 1-3 Mild pain, 0-No pain). (Allina Health's Patient Education Department, 2016).

7 Tender points of fibromyalgia were selected namely Neck of the shoulder, Lower neck in front, Base of the skull, edge of the upper breast, Upper inner shoulder, Below side bone at elbow and Just above knee on inside. (Huether & Mc Cance, 2012). Scoring: Total scores was arrived by adding the pain level measured in the above seven points.

Statistical Techniques : The collected data were statistically analyzed using dependent 't' test. The level of confidence was fixed at 0.05 for all the cases.

RESULTS AND DISCUSSION

Table-I, Mean, Mean Difference, Standard Deviation and 't' ratio for the pre and post test score on level of pain among women with Fibromyalgia

Variables	Groups	Test	Mean	S. D	M. D	't' ratio
Level of Pain	Experimental Group	Pre	62.73	3.882	19.533	16.746*
		Post	43.20	3.509		
	Control Group	Pre	62.47	3.461	0.333	0.580
		Post	62.80	2.569		

***Significant 0.05 level of confidence. Table 't' value =2.042.**

The result presented in table-I indicate that the pre-test mean values of level of pain experimental group were 62.73 and control group were 62.47 and Post-test mean values of experimental group 43.20 and control group were 62.80. As obtained table't' value of experimental group was 16.746 greater than the table value of 2.042. Hence, it was proved that there was a significant reduced in the level of pain of experimental group due to the ten weeks of physical exercises. Since the obtained 't' value of control group was 0.580 lesser than the table value of 2.042. It was proved that there was no significant difference in control group on level of pain.

CONCLUSION

The result of the study showed that there was a reduction on level of pain among women with fibromyalgia due to the physical exercise.

RECOMMENDATION

Low intensity physical exercise may be prescribed to the women with fibromyalgia with proper medical practitioner's advice and fitness expert guidance.

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International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

COMPARATIVE ANALYSIS OF SPORTS COMPETITION ANXIETY AND MENTAL TOUGHNESS AMONG NORTH AND SOUTH ZONE INDIAN GYMNASTS

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ABSTRACT

The purpose of the study was to compare the sports competitive anxiety and mental toughness among north and south zone Indian gymnasts. To achieve the purpose of the present study, eighty (N=80) national level male artistic gymnast from two different zones of India namely North Zone (n=40) and South Zone (n=40) were selected as subjects. The age was considered according to International Gymnastics Federation (FIG), and fixed as 16&above. The mental toughness was measured using Mental Toughness Questionnaire (MTQ) developed by Loehr et.al, (1992) and the Sports Competitive Anxiety was assessed using SCAT questionnaire developed by Martens (1977). To determine the difference in mental toughness and Sport Competition Anxiety variables among north and south zone Indian Gymnasts. The level of significance was tested at 0.05 level and the calculations were performed using SPSS version 20. It was concluded that the north zone Indian gymnasts' mental toughness is higher than the south zone gymnasts and there was no significant difference found between north and south zone Indian gymnasts in Sports Competition anxiety.

Keywords: Mental Toughness, Sports Competition Anxiety and Gymnasts

INTRODUCTION

Gymnastics and other sports are about much more than physical skills and talent. Gymnasts require focus, concentration, endurance, patience, and the ability to bounce back from setbacks. Those are all mental toughness skills and to become a champion the gymnasts need to consistently work on their mental side abilities. Mental toughness is the ability to defend against, manage and overcome doubts, worries, concerns and circumstances that prevent us from succeeding, or excelling at a task or towards an objective or a performance outcome that set out to achieve. Mental toughness is often described as a psychological boundary that helps people endure challenges, overcome adversity, and achieve more success. There are many common myths about mental toughness that can influence the beliefs about where it comes from and the willingness to work at getting more of it. Big businesses, elite athletes, and now military leaders are interested in mental toughness because it helps us to overcome challenges, achieve optimal performance, and maintain readiness. Mental toughness is not a substitute for well-grounded strokes in athleticism or top physical condition, but when most other things are equal, the mentally tough performer and the team that practices mental toughness will succeed (Loehr, 1995). Mental toughness can transform physically talented athletes into

great athletes (Gucciardi, Gordon S & Dimmock, 2008). Mental toughness Questionnaire is a four factor model; containing the following components: competitive desire, focus, self-confidence, and resiliency. Although there are several other essential mental skills and / or some other MTQs in sport, these four components of MT (four-factor model) were chosen to represent the concept of mental toughness with playing ability of rugby players in the present study. This study will be useful to develop the mental toughness of players which in more playing ability required for the game. The collected data's interpreted to find out the accurate results with help of Pearson product-moment correlation Coefficient. Sports Competitive anxiety is something that nearly every gymnasts faces some time in his or her career. When the demands of training or competition exceed a gymnasts perceived ability, their stress level elevates. Anxiety is the inevitable outcome. The investigator felt that no research was found to be conducted with regard to mental toughness and sports competition anxiety among Indian gymnasts, therefore the investigator made an attempt to study about the Indian gymnast's mental toughness and sports competition anxiety of different topographical regions.

Review of related literature

Dolly & Amit Chhikara, (2017) compared the mental toughness level between male, female and urban, rural AIIU gymnasts. A total of gymnasts were studied, of which 30 were male and 35 were female. The data was collected in AIIU gymnastics championship held at Panjab University. The results showed a significant difference between mental toughness of male and female gymnasts. Male gymnasts showed significantly higher scores than their female counterparts. Similar were the result for urban and rural AIIU gymnasts, in which, the rural area gymnasts showed the higher scores as compared to urban area AIIU gymnasts.

Despoina Dallas, and Skordilis (2011) designed a study to examine the competitive state anxiety and self-confidence of rhythmic gymnasts participating in the Greek national competition. 86 participants, ages 11 and 12 years, completed the Competitive State Anxiety Inventory–2, 1 hr. before competition. The athletes, classified by performance (high and low performance) and participation in the finals (finalists and nonfinalists), responded to the three subscales: Cognitive Anxiety, Somatic Anxiety, and Self-confidence. Analyses indicated No significant differences were found on Cognitive and Somatic Anxiety.

Statement of the Problem

The purpose of the study was to compare the sports competitive anxiety and mental toughness among north and south zone Indian gymnasts.

METHOD

To achieve the purpose of the present study, eighty (N=80) national level male artistic gymnast from two different zones of India namely North Zone (n=40) and South Zone (n=40) were selected as subjects. The age was considered according to International Gymnastics Federation (FIG), and fixed as 16&above. The mental toughness was measured using Mental Toughness Questionnaire (MTQ) developed by Loehr et.al, (1992)

and the Sports Competitive Anxiety was assessed using SCAT questionnaire developed by Martens (1977).

Analysis of Data

The data collected from the gymnasts on selected Criterion variables were statistically examined by using Independent't' test to determine the difference in mental toughness and Sport Competition Anxiety variables among north and south zone Indian Gymnasts. The level of significance was tested at 0.05 level and the calculations were performed using SPSS version 20.

Table I

Descriptive Statistics of Mental Toughness of North and South Zone Indian gymnasts

	Group	N	Mean	Std. Deviation	Std. Error Mean
Mental Toughness	North Zone	40	41.35	5.489	.868
	South Zone	40	38.08	4.341	.686

Table I shows the Mental Toughness mean scores and SD of the North and South Zone Indian gymnasts are 41.35±5.489 and 38.08 ± 4.341respectively.

Table II

Computation of Independent 't' test on Mental Toughness of North and South Zone Indian gymnasts

		t-test for Equality of Means				
		T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Mental Toughness	Equal variances assumed	2.960	78	.004	3.275	1.106
	Equal variances not assumed	2.960	74.063	.004	3.275	1.106

From the table II it is observed that the scores of mental toughness between north and south zone Indian gymnasts have the obtained't' value of 2.960 with df 78, were found to have significant difference since the 'p' value is less than the significant level of .05 ($P \leq 0.05$).

Table III

Descriptive Statistics of Sports Competition Anxiety of North and South Zone Indian gymnasts

	Group	N	Mean	Std. Deviation	Std. Error Mean
SCAT	North Zone	40	20.08	2.903	.459
	South Zone	40	20.75	3.719	.588

Table III shows the Sports Competitive Anxiety Test mean scores and SD of the North and South Zone Indian gymnasts are 20.08±2.903 and 20.75±3.719 respectively.

Special Issue
Volume : 6 - No: 3
MAY 2019

IJFHPEIG

ISSN 2349 - 722x

International

Journal of Fitness Health, Physical Education & Iron Games

Published by
International Federation for Fitness, Health, Physical Education & Iron Games

Approved by UGC
New Delhi Approved Journal No:- 63896

Thomson Reuters ID - 6684 - 2015
Scientific Journal Impact Factor - SJIF 2019 = 7.124

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International Conferece
On Exercise Physiology and Nutrition
for Enhancing Health, Fitness, and Sports Performance
At
Tamil Nadu Physical Education & Sports University, India.
5th - 7th March 2019

Registrar
Tamilnadu Physical Education
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Sports University
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International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue - Vol: 6, No: 3, MAY 2019

DIFFERENTIATION OF AEROBIC EXERCISES, DIET MODIFICATION AND COMBINED GROUP ON BLOOD GLUCOSE LEVEL AMONG WOMEN WITH NIDDM

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ABSTRACT

The aim of this study was to find out the differentiation of aerobic exercises, diet modification and combined group on blood glucose level among women with NIDDM. 80 women NIDDM patients undergoing treatment in Government Hospitals and Diabetic Centre selected as subjects in the age group of 35 to 45 and divided into experimental group I, which underwent combined aerobic and diet modification, experimental group II which underwent aerobic exercise, experimental group III which underwent diet modification and control group did not undergo any treatment consist of 20 subjects each, blood glucose level was statistically analyzed using ANCOVA.It was concluded that combined group was better in reducing the blood glucose among middle aged women with NIDDM.

Key words: Aerobic Exercise, Diet, NIDDM, Glucose

INTRODUCTION

Diabetes Mellitus is a constitutional disease with heritable tendencies. A disorder caused by decreased production of insulin, or by decreased ability to use insulin. Mellitus comes from a Latin word that means "sweet like honey" (Strukic, 1981).Non-Insulin dependent diabetes mellitus (NIDDM), is non-insulin dependent form and develops slowly and is usually milder and more stable. Insulin may be produced by pancreas but action is impaired. This form occurs mainly in adults and the person is usually overweight. Acidosis is infrequent. The majority of patients improves with weight loss and is maintained on diet therapy. Women who have had large babies or large families are also prone to develop this type of diabetes later in life (Srilakshmi, 2007).Any exercise or activity that elevates the heart rate to one hundred and twenty beats per minute for at least twelve minutes is said to be aerobic (Creggaing, 1984).

Fennicchiaet al. (2004) conducted a study on the effects of acuteand chronic resistance training on glucose and insulin responses to womenwith type II diabetes. The result of the study showed that exercise trainingsignificantly observed in glucose concentrations in diabetic patients. The sameresults were drawn by Fritz and Rosenqvist.Praetet al.,(2008) compared the clinical benefits of a twelve monthexercise intervention programme consisting of either brisk walking or amedical fitness programme in type II diabetes patients. It was concluded that,physical activity was associated with effective intervention to modulateglycemic control and lower risk of developing hypertension in a gradedfashion. Davenport et.al (2008) developed to document the effectiveness of astructured low intensity walking protocol on capillary glucose control in GDM women. It was concluded that, an effective role in glucose regulation for this structured walking program. Oshida et al. (2006) discussed the exercise therapy [mild exercises (walking, cycling and swimming) and resistance training] for aged diabetic

peoples. The purposes of exercise therapy for diabetes are to improve insulin resistance and to prevent diabetic complications. This combination therapy would bring about not only improvement of insulin resistance but also restoration of quality of life for aged diabetic subjects. Malhotra et al; (2005), conducted a study on 20 patients with type II diabetes were put on a 40 days' yoga routine. At the end of the 40 days of performing the asanas, on average the participants had a decrease in fasting glucose levels, a significant decrease in waist-hip ratio and beneficial change in insulin levels. Practicing and performing yoga postures as part of a regular exercise routine may further help in diabetics to increase insulin sensitivity and attain normal glucose metabolism.

METHOD

The aim of this study was to find out the differentiation of aerobic exercises, diet modification and combined group on blood glucose level among women with NIDDM. 80 women NIDDM patients undergoing treatment in Government Hospitals and Diabetic Centre selected as subjects in the age group of 35 to 45 and divided into experimental group I, which underwent combined aerobic and diet modification, experimental group II which underwent aerobic exercise, experimental group III which underwent diet modification and control group did not under-went any treatment consist of 20 subjects each, blood glucose level was statistically analyzed using ANCOVA.

RESULTS

Pre mean value of fasting blood glucose for the experimental groups and control groups were 146.85, 147.15, 140.65and 139.20 respectively. The post mean value of fasting blood glucose or the experimental groups and the control groups were 104.15, 113.90, 109.40 and 119.80 respectively. Hence there is a significant difference between experimental and control groups, which shows the effect of training on them.

TABLE I
SHOWING THE MEAN AND STANDARD DEVIATION OF BLOOD GLUCOSE

Fasting blood glucose				
Group	Pre test		Post test	
	Mean	SD	Mean	SD
Combined Group	146.85	23.01	104.15	17.25
Aerobic Group	147.15	26.44	113.90	16.12
Diet Group	140.65	23.93	109.40	19.17
Control Group	139.20	28.80	119.80	19.67
Postprandial blood glucose				
Combined Group	212.50	28.12	149.05	18.11
Aerobic Group	212.00	47.03	146.15	16.43
Diet Group	207.20	28.83	151.25	21.52
Control Group	193.65	47.67	159.95	23.57

The pre mean value of post prandial blood glucose for the experimental groups and control groups were212.50, 212.00, 207.20 and 193.65 respectively. The post mean value of post prandial blood glucose for the experimental groups and the control groups were 149.05,146.15, 151.25 and 159.95 respectively. Hence there is a significant difference between experimental and control groups, which shows the effect of training on them.

TABLE II, SHOWING THE ANCOVA OF BLOOD GLUCOSE

Adjusted Means					
Variables	SV	Df	SS	MS	F
Fasting blood glucose	BG	3	3632.70	1210.90	5.74*
	WG	75	15808.76	210.78	
	T	78	19441.46		
Postprandial blood glucose	BG	3	3976.60	1325.53	4.26*
	WG	75	23316.33	310.88	
	T	78	27292.93		

*Significant at 0.05 level of confidence. (The table value required for significance at 0.05 level with df 3 and 75 is 2.72). From the table II, it was proved that there was a significant difference existed between aerobic exercise group, diet modification group, combined group and control group on fasting blood glucose and postprandial blood glucose, since the F value of 5.74 and 4.26 were greater than the table value of 2.72 with df 3 and 75.

TABLE III, SHOWING THE POST HOC TEST OF BLOOD GLUCOSE

Variables	Combined Group	Aerobic Group	Diet Group	Control Group	MD	CI
Fasting blood glucose	102.64	112.26			9.62	13.11
	102.64		110.65		8.01	
	102.64			121.70	19.06*	
		112.26	110.65		1.61	
		112.26		121.70	9.44	
			110.65	121.70	11.05	
Postprandial blood glucose	147.38	144.61			2.76	15.93
	147.38		151.02		3.64	
	147.38			163.40	16.02*	
		144.61	151.02		6.40	
		144.61		163.40	18.78*	
			151.02	163.40	12.38	

From table III it was evident that combined group was better than the control group in reducing the fasting blood glucose. It's also proved that combined group and aerobic group was better than the control group in reducing the post prandial blood glucose.

CONCLUSION

It was concluded that combined group was better in reducing the blood glucose among middle aged women with NIDDM.

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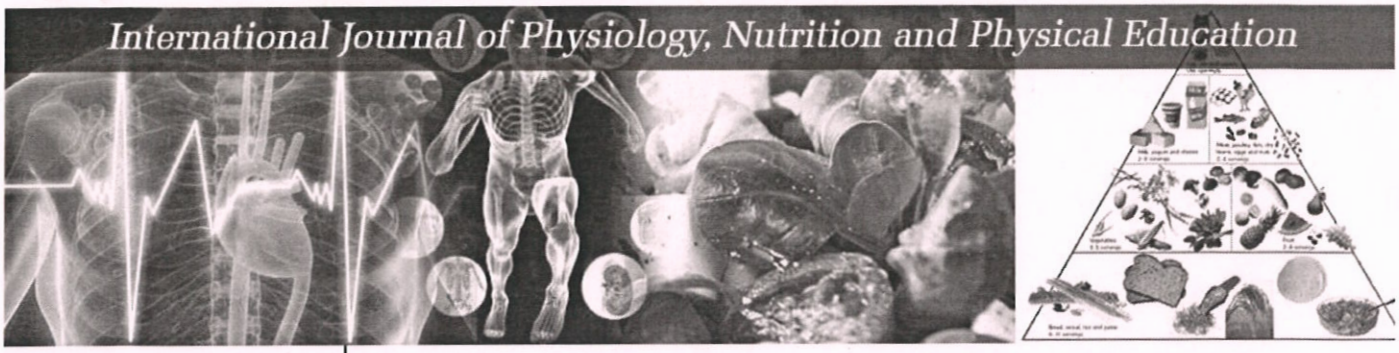
International Journal of Physiology, Nutrition and Physical Education 2019; 4(1): 288-289



ISSN: 2456-0057
IJPNPE 2019; 4(1): 288-289
© 2019 IJPNPE
www.journalofsports.com
Received: 16-11-2018
Accepted: 18-12-2018

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Impact of aerobic exercises with and without diet on LDL and triglycerides among middle aged women with NIDDM

G Sona Santhakumari and Dr. Grace Helina

Abstract
The aim of this study was to find out the effect of aerobic exercises with and without diet modification on LDL and triglycerides among women with NIDDM. 45 women NIDDM patients undergoing treatment in Government Hospitals and Diabetic Centre selected as subjects in the age group of 35 to 45 and divided into experimental group I, which underwent aerobic exercises with diet, experimental group II which underwent aerobic exercise without diet and control group did not underwent any treatment consist of 15 subjects each, LDL and triglycerides were statistically analyzed using ANCOVA. It was concluded that there was a significant modification on LDL and triglycerides due to aerobic exercise with and without diet modification among middle aged women with NIDDM.

Keywords: Aerobic exercise, diet, NIDDM

Introduction
Diabetes Mellitus is a constitutional disease with heritable tendencies. A disorder caused by decreased production of insulin, or by decreased ability to use insulin. Insulin is a hormone produced by the pancreas that is necessary for cells to be able to use blood sugar. The medical name for diabetes, diabetes mellitus, comes with Greek and Latin roots. Diabetes comes from a Greek word that means to `Siphon'. The most obvious sign of diabetes is excessive urination. Water passes through the body of a person with diabetes as if it were being siphoned from the mouth through the urinary system out of the body. Mellitus comes from a Latin word that means "sweet like honey" (Strukic, 1981) [3].

Non-Insulin dependent diabetes mellitus (NIDDM), is non-insulin dependent form and develops slowly and is usually milder and more stable. Insulin may be produced by pancreas but action is impaired. This form occurs mainly in adults and the person is usually overweight. Acidosis is infrequent. The majority of patients improves with weight loss and is maintained on diet therapy. Women who have had large babies or large families are also prone to develop this type of diabetes later in life (Srilakshmi, 2007) [2].

Any exercise or activity that elevates the heart rate to one hundred and twenty beats per minute for at least twelve minutes is said to be aerobic (Creggaing, 1984). Harris *et al.* (1998) [1] passed on that weight reduction and physical exercise are the best on enhancing insulin affectability in patients with sort 2 diabetes. Thent *et al.* (2013) [4] reported that activity preparing programs have developed as a valuable helpful regimen for the administration of sort 2 diabetes mellitus (T2DM) Researches were attempted to discover which of the diverse types of physical exercises are advantageous to control NIDDM. Yeater (1990) [5] documented in their study on "Coronary risk factors in type II diabetes response to low intensity aerobic exercise". Triglycerides decreased in the exercise group from 285 to 223 mg/dl Body weight, total and HDL cholesterol, glucose and insulin independent of dietary changes is an effective and feasible method of improving cardiovascular risk factors. Physical fitness, systolic blood pressure, plasma triglycerides and glycemic control in non-insulin dependent diabetic subjects.

Methodology
The aim of this study was to find out the effect of aerobic exercises with and without diet

modification on LDL and triglycerides among women with NIDDM. 45 women NIDDM patients undergoing treatment in Government Hospitals and Diabetic Centre selected as subjects in the age group of 35 to 45 and divided into experimental group I, which underwent aerobic exercises with diet, experimental group II which underwent aerobic exercise without diet and control group did not underwent any treatment consist of 15 subjects each, LDL and triglycerides were statistically analyzed using ANCOVA.

Results

Table I: Effect of Aerobic Exercises with and Without Diet Modification on LDL and Triglycerides among Women with NIDDM

Tests	Aerobic without Diet	Aerobic with Diet	Control Group	Source of Variance	Sum of Squares	df	Mean	Obtained F
LDL								
Pre Test	103.067	104.80	103.01	between	31.12	2	15.560	0.25
				within	2628.40	42	62.58	
Post Test	93.8467	94.93	101.73	between	548.10	2	274.05	5.61*
				within	2051.36	42	48.84	
Adjusted Post Test	94.28	94.01	102.22	between	649.71	2	324.85	31.01*
				within	429.503	41	10.48	
Mean Difference	9.22	9.87	1.27					
Triglycerides								
Pre Test	179.53	177.9333	177.40	between	36.98	2	18.489	0.27
				within	2924.27	42	69.63	
Post Test	170.27	162.4	180.20	between	2386.98	2	1193.49	10.88*
				within	4608.93	42	109.74	
Adjusted Post Test	170.22	162.41	180.23	between	2391.18	2	1195.59	10.65*
				within	4604.562	41	112.31	
Mean Difference	9.27	15.53333	-2.80					

Table F-ratio at 0.05 level of confidence for 2 and 42, 41 (df) =3.16.

Table II: Multiple Comparisons of Adjusted Paired Means among Aerobic Exercise with and Without Diet Group and Control Group on LDL and Triglycerides

Aerobic without Diet	Aerobic with Diet	Control Group	MD	C.I
LDL				
94.28	94.01	-	0.27*	0.24
94.28		102.22	7.93*	0.24
-	94.01	102.22	8.21*	0.24
Triglycerides				
162.41	170.22	-	7.80*	7.64
162.41		180.23	17.82*	7.64
-	170.22	180.23	10.02*	7.64

*Significant

The obtained results are proved that LDL and the triglycerides was reduced 9.22 and 9.27 respectively in aerobic exercise without diet group and 9.87 and 15.33 respectively in aerobic exercise with diet group.

The adjusted mean comparisons through post hoc analysis of results proved that aerobic exercise with and without diet significantly reduced the LDL and triglycerides compared to control group. As for LDL and triglycerides it proved that aerobic with diet was significantly better than without diet in beneficially reduce the LDL and triglycerides.

Conclusion

It was concluded that there was a significant reduce on LDL and triglycerides due to aerobic exercise with and without diet modification among middle aged women with NIDDM.

It was concluded that aerobic exercise with diet group better in modification of LDL and triglycerides compared with aerobic exercise without diet group.

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3.4.5-J- EPN - 2018-19

Research article

INFLUENCE OF AEROBIC EXERCISES WITH AND WITHOUT DIET ON SYSTOLIC AND DIASTOLIC BLOOD PRESSURE AMONG MIDDLE AGED WOMEN WITH NIDDM

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Received 7th January 2019, Accepted 30th March 2019

Abstract

The aim of this study was to find out the effect of aerobic exercises with and without diet modification on systolic and diastolic blood pressure among women with NIDDM. Sixty women NIDDM patients undergoing treatment in Government Hospitals and Diabetic Centre selected as subjects in the age group of 35 to 45 and divided into experimental group I, which underwent aerobic exercises with diet, experimental group II which underwent aerobic exercise without diet and control group did not underwent any treatment. Systolic and diastolic blood pressure were statistically analyzed using ANCOVA. It was concluded that there was a significant modification on blood pressure due to aerobic exercise with and without diet modification among middle aged women with NIDDM.

Key words: *Aerobic Exercise, Diet, NIDDM*

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INTRODUCTION

Diabetes is a chronic disease that usually manifests itself as one of two major types: type 1, mainly occurring in children and adolescents 18 years and younger, in which the body does not produce insulin and thus insulin administration is required to sustain life; or type 2, occurring usually in adults over 30 years of age, in which the body's tissues become unable to use its own limited amount of insulin effectively (Clark, 1998). While all persons with diabetes require self-management training, the treatment for type 2 diabetes usually consists of a combination of physical activity, proper nutrition, oral hypoglycemic tablets, and insulin if required. Previously, type 1 diabetes has been referred to as juvenile or insulin-dependent diabetes and type 2 diabetes as adult-onset or non-insulin-dependent diabetes.

Any exercise or activity that elevates the heart rate to one hundred and twenty beats per minute for at least twelve minutes is said to be aerobic (Creggaing, 1984). Harris et al. (1998) passed on that weight reduction and physical exercise are the best on enhancing insulin affectability in patients with sort 2 diabetes. The imminent, randomized trial has demonstrated that eating regimen related weight reduction and physical exercise can each decrease the rate of diabetes beginning in patients with weakened glucose resistance (Knowler et al. 2002). These behavioral ways to deal with keeping the beginning of diabetes or to enhancing insulin affectability in built up diabetes are hard to actualize and support. Decreased exercise limit, as surveyed by crest oxygen utilization (crest VO2), was freely connected with an expanded frequency of diabetic nephropathy and retinopathy in patients with diabetes without a background marked by coronary vein sickness (Estacio et al. 1998). The rate of hypertension is high among patients with sort 2 diabetes mellitus; the condition is available in roughly 40% of patients at determination, expanding to 80– 90% when diabetic nephropathy creates. Randomized Appropriate Blood Pressure Control in Diabetes (ABCD) clinical trial was embraced with speculation that pulse control would avert or moderate the movement of diabetic nephropathy, neuropathy, retinopathy and cardiovascular occasions and underscored the significance of forceful circulatory strain control, in both hypertensive and normotensive patients, as one successful methods for reducing the weight of confusions caused by sort 2 diabetes mellitus.

Thent et al. (2013) reported that activity preparing programs have developed as a valuable helpful regimen for the administration of sort 2 diabetes mellitus (T2DM) Researches were attempted to discover which of the diverse types of physical exercises are advantageous to control NIDDM. Hegde et al. (2013) examined the adequacy of yoga mediation on oxidative anxiety, glycemic status, pulse and anthropometry in prediabetes and discovered Yoga is valuable in decrease in BMI, midsection periphery, systolic circulatory strain and fasting glucose. Sanghani et al. (2013)

evaluated the impact of organized exercise preparing and unstructured physical movement intercessions on glycemic control and discovered organized exercise preparing was valuable than unstructured physical action. In this way, the hypothetical establishments laid demonstrated that yogic practices and physical exercises can usefully contribute in overseeing NIDDM. Nonetheless, there was further investigate for research to discover which of the two, regardless of whether yogic practices or physical exercises is more proficient to control NIDDM, particularly among ladies. Consequently, this examination was attempted.

METHODS AND MATERIALS

The aim of this study was to find out the effect of aerobic exercises with and without diet modification on systolic and diastolic blood pressure among women with NIDDM. Sixty women NIDDM patients undergoing treatment in Government Hospitals and Diabetic Centre were selected as subjects in the age group of 35 to 45 and divided into experimental group I, which underwent aerobic exercises with diet, experimental group II which underwent aerobic exercise without diet and control group which did not underwent any treatment, systolic and diastolic blood pressure were statistically analyzed using ANCOVA.

RESULTS

TABLE - I
EFFECT OF AEROBIC EXERCISES WITH AND WITHOUT DIET MODIFICATION ON SYSTOLIC AND DIASTOLIC BLOOD PRESSURE AMONG WOMEN WITH NIDDM

Tests	Aerobic without Diet	Aerobic with Diet	Control Group	Source of Variance	Sum of Squares	df	Mean	F
Systolic blood pressure								
Pre Test	143.75	144.75	145.50	Between	30.83	2	15.42	0.14
				Within	6162.50	57	108.11	
Post Test	137.00	136.25	147.25	Between	1510.83	2	755.42	**10.94***
				Within	3937.50	57	69.08	
Adjusted Post Test	137.63	136.19	146.67	Between	1287.62	2	643.81	**36.26***
				Within	994.38	56	17.76	
Diastolic blood pressure								
Pre Test	93.00	92.00	93.25	Between	17.50	2	8.75	0.25
				Within	2003.75	57	35.15	
Post Test	88.00	83.50	95.25	Between	1405.83	2	702.92	**34.88***
				Within	1148.75	57	20.15	
Adjusted Post Test	87.86	83.93	94.97	Between	1243.99	2	622.00	**69.44***
				Within	501.59	56	8.96	

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.

TABLE - II

MULTIPLE COMPARISONS OF ADJUSTED PAIRED MEANS AMONG AEROBIC EXERCISE WITH AND WITHOUT DIET GROUP AND CONTROL GROUP ON SYSTOLIC AND DIASTOLIC BLOOD PRESSURE

Aerobic without Diet	Aerobic with Diet	Control Group	MD	C.I
Systolic Blood Pressure				
137.63	136.19		1.44	3.35
137.63		146.67	**9.04***	3.35
	136.19	146.67	**10.48***	3.35
Diastolic Blood Pressure				
87.86	83.93		**3.93***	2.38
87.86		94.97	**7.11***	2.38
	83.93	94.97	**11.04***	2.38

*Significant

The obtained results are proved that the blood pressure was stabilized and the systolic blood pressure was reduced by 6.75 in aerobic exercise without diet group and by 8.50 in aerobic exercise with diet group while there was a slight increase of 1.75 in control group. Similarly, there was a decrease in diastolic blood pressure to the extent of 5.00 among aerobic exercise without diet group and 8.5 among aerobic exercise with diet group and an increase of 2.00 among control group.

The adjusted mean comparisons through post hoc analysis of results proved that aerobic exercise with and without diet significantly altered systolic blood pressure compared to control group. As for as systolic blood pressure it was found that both groups significantly regularized compared to control group. The results further proved that aerobic with diet was significantly better than without diet in beneficially altering diastolic blood pressure.

CONCLUSION

It was concluded that there was a significant modification on blood pressure due to aerobic exercise with and without diet modification among middle aged women with NIDDM.

It was concluded that aerobic exercise with diet group was found to be better in modification of diastolic blood pressure compared with aerobic exercise without diet group.

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Site this article:

Sona Santhakumari, G., & Grace Helina. (2019). Influence of aerobic exercises with and without diet on systolic and diastolic blood pressure among middle aged women with NIDDM. *International Journal of Adapted Physical Education & Yoga*, Vol. 4, No. 4, pp. 1 to 5.

International Federation of Physical Education, Fitness and Sports Science Associations
www.ifpefssa.org

IFCSS

ISSN 2231-3265
(Online and Print)

International Journal of Health, Physical Education & Computer Science in Sports

A Peer Reviewed (Refereed) International Research Journal

Volume - 32 No. 1
QUARTERLY
October 2018 to December 2018

Published by :
Indian Federation of Computer Science in Sports
www.ijhpecss.org & www.ifcss.in

Publication Impact Factor I2OR 4.005
ISRA Journal Impact Factor 5.115
Index Journal of

J-Gate
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ISSN 2231-3265
International Journal of Health, Physical Education and Computer Science in Sports
Volume No.32, No.1pp7-11
Publication Impact Factor 5.115
A Peer Reviewed (Refereed) International Research Journal

Effects Of Aerobic Training With And Without Moringa Oleifera On Resting Heart Rate, Low Density Lipoprotein, High Density Lipoprotein And Testosterone Among College Men Athlete

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Abstract:
The purpose of the study was to investigate "Effects Of Aerobic Training With And Without Moringa Oleifera On Resting Heart Rate, Low Density Lipoprotein, High Density Lipoprotein And Testosterone Among College Men Athlete". Moringa Oleifera: Many studies show that Moringa oleifera may lead to modest reductions in blood sugar and cholesterol. It may also have antioxidant and anti-inflammatory effects and protect against arsenic toxicity. Moringa leaves are also highly nutritious and should be beneficial for people who are lacking in essential nutrients. Selection Of Variables: The following variables were selected for this study. I. Dependent Variables: 1. Resting Heart Rate, 2.High density lipoprotein 3.Low density lipoprotein 4.Testosterone.Ii.Independent Variables: 1. Aerobic Training 2. Moringa Oleifera with Aerobic Training 3.Control Group. Experimental Design: The subject were selected for this study through the random group design consisting of pre and post test, forty five college men athletes randomly divided into three groups, the group was assigned as an experimental group and control group. The groups are 1. Aerobic Training, 2. Moringa Oleiferawith with Aerobic Training,3.Control Group. Statistical Technique: Analysis of Covariance statistical technique was used, to test the significant difference among the treatment groups. If the adjusted post-test results were significant, the scheffe's post hoc test was used to determine the paired mean significant difference. Thirumalaisamy R. (2004). After incorporate statistical technique, it was found that a significant decrease in Resting Heart Rate and low density lipoprotein and greater increased in high density lipoprotein and testosterone in experimental group II (Moringa Oleifera with Aerobic Training) due to eight weeks of Natural Supplementation with aerobic training than that aerobic exercise group.

Moringa Oleifera: Many studies show that Moringa oleifera may lead to modest reductions in blood sugar and cholesterol. It may also have antioxidant and anti-inflammatory effects and protect against arsenic toxicity. Moringa leaves are also highly nutritious and should be beneficial for people who are lacking in essential nutrients.

Health Benefits Of Moringa Oleifera: Boost Testosterone: One of the biggest marketing claims made by manufacturers of moringa supplements is its ability to increase testosterone levels, boost erections and enhance sexual performance. Essentially that it is an aphrodisiac. Moringa Oleifera on Lower Cholesterol: Modern societies are increasingly suffering from high amounts of cholesterol in the blood. Cholesterol is a big problem because it is linked to an increased risk of heart disease. Many plant foods such as chia seeds, flaxseeds, almonds and oats are found to effectively reduce cholesterol. Moringa also has similar cholesterol-lowering effects. In a particular study Moringa has been found that Moringa possesses a hypolipidaemic effect which reflects a decrease in the lipid profile. In another study it was found that Moringa Oleifera leaf powder along with high-fat diet decreased the high-fat diet-induced increases in serum, liver, and kidney cholesterol levels by 14.35%, 6.40% and 11.09% respectively.

ISSN 2231-3265
International Journal of Health, Physical Education and Computer Science in Sports
Volume No.32, No.1pp113-117
Publication Impact Factor 5.115
A Peer Reviewed (Refereed) International Research Journal

Effects Of Aerobic Training With Moringa Oleifera On Resting Heart Rate, Mean Arterial Pressure, Triglycerides And Testosterone Among College Men Athlete

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Abstract:
The purpose of the study was to investigate "Effects Of Moringa Oleifera With Aerobic Training On Selected Lipid Profile Status And Testosterone Among College Men Athlete". Moringa Oleifera: Many studies show that Moringa oleifera may lead to modest reductions in blood sugar and cholesterol. It may also have antioxidant and anti-inflammatory effects and protect against arsenic toxicity. Moringa leaves are also highly nutritious and should be beneficial for people who are lacking in essential nutrients. Selection Of Variables: The following variables were selected for this study. Independent Variables: 1. Resting Heart Rate, 2.Mean Atrial Pressure, 3.Triglycerides 4.Testosterone.II.Independent Variables: 1. Aerobic Exercise 2. Moringa Oleifera with Aerobic Exercise 3.Control Group. Experimental Design: The subject were selected for this study through the random group design consisting of pre and post test, forty five college men athletes randomly divided into three groups, the group was assigned as an experimental group and control group. The groups are 1.Moringa Aerobic Exercise, 2. Oleifera with Aerobic Exercise,3.Control Group. Training Schedules And Supplementation: During the training period, the experimental group underwent their walking program period of eight weeks for all days with Moringa Oleifera. The experimental group underwent walking for forty five minutes of duration in evening hours between 4:30 to 5:30 p.m for seven days per week. Statistical Technique: Analysis of Covariance statistical technique was used, to test the significant difference among the treatment groups. If the adjusted post-test results were significant, the scheffe's post hoc test was used to determine the paired mean significant difference. Thirumalaisamy R. (2004). After incorporate statistical technique, it was found that a significant decrease in Resting Heart Rate, Mean Arterial Pressure, Triglycerides and greater increased in testosterone in experimental group II (Moringa Oleifera with aerobic Training), due to eight weeks of Natural Supplementation with aerobic training than that aerobic exercise group.

Moringa Oleifera: Many studies show that Moringa oleifera may lead to modest reductions in **blood sugar** and **cholesterol**. It may also have **antioxidant** and **anti-inflammatory** effects and protect against arsenic toxicity. Moringa leaves are also highly nutritious and should be beneficial for people who are lacking in essential **nutrients**.

Health Benefits Of Moringa Oleifera: Boost Testosterone: One of the biggest marketing claims made by manufacturers of moringa supplements is its ability to increase testosterone levels, boost erections and enhance sexual performance. Essentially that it is an aphrodisiac. **Moringa Oleifera on Lower Cholesterol:** Modern societies are increasingly suffering from high amounts of cholesterol in the blood. Cholesterol is a big problem because it is linked to an increased risk of heart disease. Many plant foods such as chia seeds, flaxseeds, almonds and oats are found to effectively reduce cholesterol. Moringa also has similar cholesterol-lowering effects. In a particular study Moringa has been found that Moringa possesses a hypolipidaemic effect which reflects a decrease in the lipid profile. In another study it was found that Moringa Oleifera leaf powder along with high-fat diet decreased the high-fat diet-induced increases in serum, liver, and kidney cholesterol levels by 14.35%, 6.40% and 11.09% respectively.

3.4.5-J-EPN-2018-19-2

International Federation of
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Sports Science Associations

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ISSN 0975-7732

ASIAN JOURNAL OF PHYSICAL EDUCATION & COMPUTER SCIENCE IN SPORTS

A Peer Reviewed (Refereed) International Research Journal

Volume 19 No. 1
HALF YEARLY
July 2018 to December 2018

Journal Impact Factor 4.171
Index Journal of

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Published by :
Indian Federation of Computer Science in Sports
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ISSN 0975--7732
Asian Journal of Physical Education and Computer Science in Sports
Volume No.19, No.1.pp11-15
Journal Impact Factor 4.171
A Peer Reviewed (Refereed) International Research Journal

Effects Of Swiss Ball Exercise With Green Tea And Moringa Tea Intake On West Hip Ratio, Good Cholesterol,Systole And Diastole Blood Pressure Among Middle Aged Men In Chennai

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Green Tea: tea made from unfermented a leaf that is pale in color and slightly bitter in flavor, produced mainly in China, India and Japan. Green tea is an herb that differs from black and oolong teas because it is not fermented.

Moringa Tea: Instead of turning to several sources for your daily dose of vitamins and minerals, consider one cup of Moringa Tea, it has all the health benefits you need. Made from 100% Moringa Oleifera leaves, this tea is not only bursting with vitamins, minerals and antioxidants but is also refreshing and nutritious. There is no other plant leaf that contains such a concentrated amount of nutrients – this tea truly beats them all.

Statement of the Problem: The purpose of the study was to find out the Effects Of Swiss Ball Exercise With Green Tea And Moringa Tea intake On Waist hip ratio, good cholesterol and systolic and diastolic blood pressure Among Middle Aged Men In Chennai.

DEPENDENT VARIABLES - such as Waist hip ratio, good cholesterol and systolic and diastolic blood pressure. **INDEPENDENT VARIABLE: 1.** Experimental group I- fifteen selected subjects were Swiss ball exercise with green tea 2.Experimental group II-fifteen selected subjects were Swiss ball exercise with Moringa Tea3. Experimental group III 4.Control group-fifteen selected subjects were not given any supplements. **STATISTICAL TECHNIQUE**: Analysis of Covariance statistical technique was used, to test the significant difference among the treatment groups. If the adjusted post-test results were significant, the scheffe's post hoc test was used to determine the paired mean significant difference. Thirumalaisamy R. (2004).

COMPUTATION OF ANALYSIS OF COVARIANCE OF WAIST HIP RATIO: The following tables illustrate that statistical result of the Effects of Swiss Ball Exercise with Green Tea and Moringa Tea Intake on West hip ratio, good cholesterol, systole and diastole Among Middle Aged Men In Chennai and the adjusted post test mean and difference between the means of the groups under study were given in the tables

ISSN 0975--7732
Asian Journal of Physical Education and Computer Science in Sports
Volume No.19, No.1.pp16-19
Journal Impact Factor 4.171
A Peer Reviewed (Refereed) International Research Journal

Effects Of Aerobic Training With And Without Moringa Oleifera On Resting Heart Rate, Iron, Mean Arterial Pressure And Testosterone Among College Men Athlete

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Tamil Nadu Physical Education and Sports University, Chennai – 600 127

Moringa Oleifera: Many studies show that Moringa oleifera may lead to modest reductions in blood sugar and cholesterol. It may also have antioxidant and anti-inflammatory effects and protect against arsenic toxicity. Moringa leaves are also highly nutritious and should be beneficial for people who are lacking in essential nutrients.

Health Benefits Of Moringa Oleifera: Boost Testosterone: One of the biggest marketing claims made by manufacturers of moringa supplements is its ability to increase testosterone levels, boost erections and enhance sexual performance. Essentially that it is an aphrodisiac. Moringa Oleifera on Lower Cholesterol: Modern societies are increasingly suffering from high amounts of cholesterol in the blood. Cholesterol is a big problem because it is linked to an increased risk of heart disease. Many plant foods such as chia seeds, flaxseeds, almonds and oats are found to effectively reduce cholesterol. Moringa also has similar cholesterol-lowering effects.

Statement Of The Problem: The purpose of the study was to investigate "Effects Of Aerobic Training With And Without Moringa Oleifera On Resting Heart Rate , Iron, Mean Arterial Pressure And Testosterone Among College Men Athlete".

Selection Of Variables: The following variables were selected for this study. I.DEPENDENT VARIBLES: 1. Resting Heart Rate ,2. Iron, 3.Mean Arterial Pressure 4.Testosterone.II.INDEPENDENT VARIBLES: 1. Aerobic training 2. Moringa Oleifera with Aerobic Exercise 3.Control Group

EXPERIMENTAL DESINGN: The subject were selected for this study through the random group design consisting of pre and post test, forty five college men athletes randomly divided into three groups, the group was assigned as an experimental group and control group. The groups are 1. Aerobic Training, 2. Moringa Oleifera with Aerobic Exercise,3.Control Group

TRAINING SCHEDULES AND SUPPLEMENTATION: During the training period, the experimental group underwent their walking program period of eight weeks for all days with Moringa Oleifera. The experimental group underwent walking for forty five minutes of duration seven days per week. **Statistical Technique**: Analysis of Covariance statistical technique was used, to test the significant difference among the treatment groups. Thirumalaisamy R. (2004).

2019-20
3.4.5-J- EPN -

PRINT ISSN No. 2277 - 8160
INDEX COPERNICUS IC VALUE : 85.78
Journal DOI : 10.15373/22778160

PRINT ISSN No. 2277 - 8160



GLOBAL JOURNAL FOR RESEARCH ANALYSIS

Registrar
Tamilnadu Physical Education and Sports University Chennai

A Peer Reviewed, Referred, Refereed & Indexed International Journal

UGC Sr. No. 49177

A Medico Journal

IMPACT FACTOR : 5.956

VOLUME-8 | ISSUE-8 | AUGUST-2019

₹ 500

VOLUME-8, ISSUE-8, AUGUST-2019 • PRINT ISSN N

Original Research Paper

Cardiology

TO STUDY THE LONG TERM EFFECT OF MULTIPLE SESSIONS OF ACU-TENS ON DYSPNOEA IN COPD PATIENTS: AN EXPERIMENTAL STUDY

Dr. V. Kiran MPT (Cardio) Professor In Physiotherapy, Apollo College Of Physioterapy

Dr. R. Venkatesan M.Sc , PhD, Assosiate Professor, Tnpesu, Chennai

Dr. Radhakrishnan M P T. Professor, tagor College Of Physiotherapy

ABSTRACT

BACKGROUND :- Knowledge of factors contributing to Dyspnea is critical to the development and selection of therapeutic interventions to alleviate breathing discomfort, and the interest in doing so is high. Goal in this statement is to review the current understanding of the pathophysiologic mechanisms of Dyspnea, the tools used to assess this symptom and its impact on patients' lives, and therapeutic approaches that may be employed to ameliorate the discomfort. This approach assumes standard treatments for the underlying disease state have been exhausted.

SPECIFIC OBJECTIVE :- To find out whether the multiple sessions of Acu-Tens is effective in providing the long term effect on Dyspnea in COPD patient

DESIGN :- It is an experimental study design

STUDY SETTING :- Department of PHYSIOTHERAPY, Narayana Medical College Hospitals, Nellore.

PARTICIPANTS :- A total of 30 patients who are coming from pulmonology deparment

INTERVENTION :- All the 30 patients of Dyspnea were divided into two groups (15 in each group),group A and group B.The subjects of group A received traditional physiotherapy treatment (which includes training of relaxed postural re-education, controlled breathing, breathing retraining[13][9] - exercise like pursed lip and diaphragmatic)and session of 45 minutes of Acu-TENS.The subjects of group B were treated with traditional physiotherapy treatment mentioned above. Data was taken on Day 0,12th week and 14th week.

OUTCOME MEASURES :-Distance covered in 6 minute walk test, VAS Scale, Borg Scale

RESULTS :- There was a significant improvement in the functional capacity of the patient in Group A which was accessed by 6 MWT. Patient covered more distance in 6 MWT, and reduction on Borg scale and VAS scale. As already the short term effect of Acu-TENS was proved. The multiple sessions of Acu-TENS i.e 45 Minutes session once a week for 12 weeks has also showed improvement & helped in relieving dyspnea. A follow up of the treatment was taken on 14th week, which finally proved the long term effect of multiple sessions of Acu-TENS.

CONCLUSION:- Hence this study concludes that there is a significant reduction in dyspnea in pts with COPD who are under gone. multiple sessions of Acu-TENS 12 weeks is associated with reduction in dyspnea and therefore showed improvement in 6MWT and reduction of VAS scale and Borg scale.When two samples was conducted after 12th & 14th week using Borg scale. It was found that there is a significant reduction after 12th week with p =0.000, and its sinificancy is maintained after 14th week in GP A compare GP B p=000

KEYWORDS :

INTRODUCTION:-

COPD, or chronic obstructive pulmonary disease, is a progressive disease that makes it hard to breathe. "Progressive" means the disease gets worse over time. COPD can cause coughing that produces large amounts of mucus (a slimy substance), wheezing, shortness of breath, chest tightness, and other symptoms. Cigarette smoking is the leading cause of COPD. Most people who have COPD smoke or used to smoke. Long-term exposure to other lung irritants, such as air pollution, chemical fumes, or dust, also may contribute to COPD.

The term "COPD" includes two major entities —emphysema (destructions of air sacs) and chronic obstructive bronchitis (affects bronchi and bronchioles) most people who have COPD have both conditions. The COPD develops slowly. Symptoms often worsen over time and can limit your ability to do routine activities. Severe COPD may prevent you from doing even basic activities like walking, cooking, or taking care of yourself. Us, the general term "COPD" is more accurate. COPD is a major cause of disability, and it's the fourth leading cause of death in the United States.

One of the most common symptoms of COPD is shortness of breath (Dyspnoea). People with COPD commonly describe this as: "My breathing requires effort," "I feel out of breath," or "I can't get enough air in". People with COPD typically first notice Dyspnoea during vigorous exercise when the demands on the lungs are greatest. Over the years, Dyspnoea tends to get gradually worse so that it can occur during milder, everyday activities such as housework. In the advanced stages of COPD, Dyspnoea can become so bad that it occurs during rest and is constantly present. Other symptoms of COPD are a persistent cough, sputum or mucus production, wheezing, chest tightness, and tiredness.

Patients with chronic pulmonary disease are often limited in their activities by respiratory discomfort. Reductions in functional status, quality of life, and disability are frequently consequences of this symptom. Diseases producing chronic dyspnoea may leave the patient with significant breathlessness despite maximal therapy. Having identified these factors, appropriate additional treatment strategies might be devised. Pulmonary rehabilitation programs have been shown to relieve dyspnoea, reduce hospitalizations, and improve quality of life. Having identified these factors, appropriate additional treatment strategies might be devised. Pulmonary rehabilitation programs have been shown to relieve dyspnoea, reduce hospitalizations, and improve quality of life.

DEFINITION

Dyspnoea is the term generally applied to sensations experienced by individuals who complain of unpleasant or uncomfortable respiratory sensations. Many definitions of dyspnoea have been offered, including: "difficult, labored, uncomfortable breathing", an "awareness of respiratory distress", "the sensation of feeling breathless or experiencing air hunger" and "an uncomfortable sensation of breathing". These definitions have sometimes mixed the true symptom (what patient's say they are feeling) with physical signs (what the physician observes about the patient, e.g., "exhibits labored breathing"). In the final analysis, a symptom can only be described by the person who experiences it. In this context, recent investigations of the perception of breathlessness suggest that there are multiple types of dyspnoea

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REVIEW OF RESEARCH

IMPACT FACTOR : 5.7631(UIF) UGC APPROVED JOURNAL NO. 48514 ISSN: 2249-894X

VOLUME - 8 | ISSUE - 5 | FEBRUARY - 2019

EFFECT OF RANDORI AND UCHIKOMI TRAINING ON STRESS AMONG JUNIOR STATE LEVEL JUDOKAS

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ABSTRACT :



Judo had its origin in the ancient Japanese art of jujutsu, a system of hand-to-hand combat. Randori training is a free exercise training which is practiced under conditions of actual contest. It includes throwing, choking, holding the opponent down, and bending or twisting of the arms. Uchikomi training is repetition training and is used in Judo to refer to the repeated practice of a throwing motion up to the point where the throw would actually be executed. The purpose of the study was to determine the effect of randori and uchikomi training on stress among junior state level judokas. To achieve the purpose of the study, forty five judokas were randomly selected from Tamil Nadu state junior state championship in the age group of 18 to 21 years. They were assigned into three groups of which one group participated in randori training, second group participated in uchikomi training and the third group served as control group. The training programme was scheduled for three days a week and each training session consist of 45 minutes including warm up and cool down exercises. Analysis of covariance (ANCOVA) statistical technique was used to test the adjusted post-test mean differences among randori training and uchikomi training groups and the adjusted post-test result was significant, the scheffe's post-hoc test was used to determine the significance of the paired mean differences. Randori training made significant reduction on stress among junior state level judokas due to the six weeks of randori training. It was concluded that randori training can be better utilized for controlling stress than uchikomi training among junior state level judokas.

KEYWORDS : *Randori Training, Uchikomi Training, Stress .*

INTRODUCTION:

Judo is an art of attack and defense. It involves variety of holds, throws, arm locks, foot movements, direction change, and so on. Kamlesh M L., (2016).

As Judo spread throughout the Western world it slowly gained the form of a sport. Its eventual popularity in World and Regional Games and inclusion in the 1964 Olympic Games led more and more to an emphasis of the physical and competitive aspects of the art, sometimes at the expense of its intellectual, moral and spiritual underpinnings. Nadamala Gangadhara Reddy, (2009).

The process which helps in preparing an individual for any event or activity is said to be training. Aneja O P., (2015).

Registrar
Tamilnadu Physical Education and Sports University Chennai

Volume : 6 - No: 1
Half - Yearly
Jan 2019 - June 2019

IJFHPEIG

ISSN 2349 - 722x

International
Journal of Fitness Health, Physical Education & Iron Games

Published by
International Federation for Fitness, Health, Physical Education & Iron Games

Approved by UGC
New Delhi Approved Journal No:- 63896

Thomson Reuters ID - 6684 - 2015
Scientific Journal Impact Factor - SJIF 2018 = 7.124
icrtfhss@gmail.com





International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Vol: 6, No: 1, Jan 2019- June 2019

CORRELATION OF PSYCHOLOGICAL VARIABLES AND PLAYING ABILITY AMONG FOOTBALL PLAYERS AS A FUNCTION OF GENDER

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ABSTRACT

The purpose of the study was to find out psychological correlates of playing ability among football players as a function of gender. To achieve the purpose of this study the investigator selected 100 football players consisting of 50 men and women. The subjects were randomly selected from players who competed at intercollegiate level competitions held at Chennai. The selected subject's age group were ranging from 19 to 25 years. Selected psychological Variable Team Cohesion was measured through Group Environment Questionnaire; Mental Toughness was measured through Sports Mental Toughness Questionnaire (SMTQ) and Subjects playing ability in football was assessed subjectively through three experts in football in a playing situation. To examine the relationship between playing ability in football and psychological variables, mental toughness and team cohesion simple correlation using Pearson Coefficient of Correlation was used. The results proved that though men and women football players" psychological levels in team cohesion and mental toughness were positively related with their playing ability, comparing between men and women football players, it was found that men football players were found to me more accurately related with the selected psychological variables than the football players.

Key words: Psychology, Mental Toughness, Cohesion, Players

INTRODUCTION

According to Whitakar (1986), in every tactical move in football one depends on team work and the individual skills such as good dribbling, stopping the ball, controlling the ball, passing the ball, anticipating the ball and keeping eyes on the ball and moving players. Tactics will succeed only through mastery on individual fundamental skills and with players thinking as a team.

Morehouse and Miller (1967) are of opinion that "skill is the element of performance which enables the performer to accomplish a large amount of work with a relatively small amount of effort. Skill is acquired mainly through a refinement of the co-ordination of different muscle groups. When one has mastered the fundamental skills of the game, the player gains a feeling of wellbeing. Thus high level of performance in Football is dependent upon the mastery over the fundamental skills. Debey (1990) quotes that practice can be defined as any activity which a player

undertakes in order to try to modify or consolidate skilled actions. Sample repetition of an action is not enough and all types of practices should stress quality. Quantity alone is not sufficient and indeed the practice of wrong movements may only serve to confirm bad habits and so will be detrimental. Normally it is accepted that shorter, more frequent practice sessions are most beneficial. But if the criterion of quality is applied, then it can be seen that length and distribution of practice sessions will be determined by how much a player can absorb and how long he or she can sustain the standard of the practice.

A football player must have speed, agility, endurance, dexterity as well as the power and skills. Skill is the ability to use the correct muscle at the correct time with the exact force necessary to perform the desired movements in the proper sequence and timings. In football, there are many skills such as dribbling, passing, tackling, stopping, throwing and shooting etceteras.

Mental toughness is a contested term, in that many people use the term liberally to refer to any set of positive attributes that helps a person to cope with difficult situations.

Cohesion has been defined in many ways. In the sporting world, one definition is most widely used and accepted, and it is the one we will use. Cohesion is the total field of forces which act on members to remain in a particular group (Festinger, Schacter, & Back, 1950).

METHOD

The purpose of the study was to find out psychological correlates of playing ability among football players as a function of gender. To achieve the purpose of this study the investigator selected 100 football players consisting of 50 men and women. The subjects were randomly selected from players who competed at intercollegiate level competitions held at Chennai. The selected subject's age group was ranging from 19 to 25 years. Selected psychological Variable Team Cohesion was measured through Group Environment Questionnaire; Mental Toughness was measured through Sports Mental Toughness Questionnaire (SMTQ) and Subjects playing ability in football was assessed subjectively through three experts in football in a playing situation. To examine the relationship between playing ability in football and psychological variables, mental toughness and team cohesion simple correlation using Pearson Coefficient of Correlation was used.

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue Vol: 6, No: 2, May 2019

IMPACT OF SMALL SIDED GAMES ON EXPLOSIVE POWER AND FLEXIBILITY AMONG MEN FOOTBALL PLAYERS

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ABSTRACT

The purpose of the study was to find out the effect of small sided games on selected physical variables such as Explosive power and Flexibility among football players. The research design of the study was random group design. Thirty six (N=36) football players were selected at random. The selected subjects were randomly assigned into experimental group-I (Small Side Game Group (SSGG) and control group. Each group consisted of eighteen (n=18) subjects. On completion of pretest for both groups, the experimental group I were treated with their training program for a period of twelve weeks. After twelve weeks of treatment, the post test was conducted for all two groups and the final readings have been recorded carefully. To analyse the data obtained from experimental groups and control group the standard statistical procedure that is ANCOVA was used. The test of significance at 0.05 level of confidence. It is found that the experimental groups performed better on physical fitness variables such as explosive power and flexibility than the control group. This might be due to the effect of specified training given to the experimental groups.

Keywords: Football, Small Sided Games Training, Explosive power and Flexibility

INTRODUCTION

Small-sided games (SSGs) are played on reduced pitch areas, often using modified rules and involving a smaller number of players than traditional football. These games are less structured than traditional fitness training methods but are very popular training drills for players of all ages and levels. At present, there is relatively little information regarding how Small-sided games (SSGs) can best be used to improve physical capacities and technical or tactical skills in footballers.

Small-sided games (SSGs), also referred to as skill-based conditioning games (Gabbett, 2006) or game-based training, (Gabbett, Jenkins and Abernethy, 2009) are modified games played on reduced pitch areas, often using adapted rules and involving a smaller number of players than traditional football games. These small-sided games develop physical abilities, as well as technical and tactical skills (Impellizzeri, et al. 2006 & Dellal, et al. 2011). As far as physical condition is concerned, small-sided games develop aerobic capacity (Dellal, et al. 2008 & Hill-Haas, et al.2011).

METHOD

The purpose of the study was to find out the effect of small sided games on selected physical variables such as Explosive power and Flexibility among football players. The research design of the study was random group design. Thirty six (N=36) football players were selected at random. The selected subjects were randomly assigned into experimental group-I (Small Side Game Group (SSGG) and control group. Each group consisted of eighteen (n=18) subjects. On completion of pretest for both groups, the experimental group I were treated with their training programme for a period of twelve weeks.

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Table IV

Computation of Independent't' test of Sports Competitive Anxiety Test of North and South Zone Indian gymnasts

		t-test for Equality of Means				
		T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
SCAT	Equal variances assumed	-.905	78	.368	-.675	.746
	Equal variances not assumed	-.905	73.661	.369	-.675	.746

Level of Significance was tested at 0.05.

From the table IV it is observed that the scores of Sports competitive anxiety between north and south zone Indian gymnasts have the obtained 't' value of -.905 with df 78, were found to have no significant difference between the groups, since the 'p' value is greater than the significant level of .05 ($P \geq 0.05$).

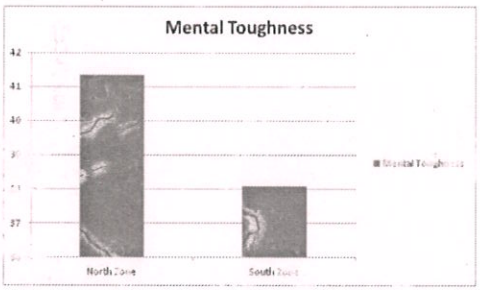

Fig. 1 Graphical Representation of mean Scores of mental toughness between North and South Zone Indian Gymnasts.

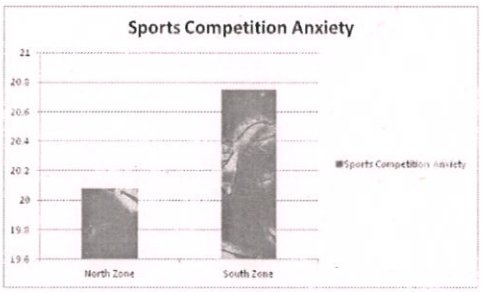

Fig. 2 Graphical Representation of mean Scores of Sports Competition Anxiety between North and South Zone Indian Gymnasts.

DISCUSSION

In this study, the differences in mental toughness and Sport competition anxiety among north and south zone Indian gymnasts were studied. The results of mental toughness revealed that there was a significant difference exists between north zone and south zone Indian gymnasts further it is understood through the means scores that north zone gymnasts are high in mental toughness than the south zone gymnasts. A relevant study conducted by *Dolly & Amit Chhikara, (2017)* on mental toughness level between male, female and urban, rural AIIU gymnasts revealed that significant difference was found between male and female gymnasts as well as between urban and rural gymnasts. The results of sports competition anxiety revealed that there was no significant difference found between north and south zone Indian gymnasts. In line with this a study conducted by *Despoina Dallas, and Skordilis (2011)* on the state anxiety of rhythmic gymnasts participating in the Greek national competition revealed that no significant differences were found on Cognitive and Somatic Anxiety between finalists and non-finalists.

CONCLUSION

Psychological research in the area of gymnastics is still insufficient, and future studies should include detailed profile of these gymnasts.Within the limitations of the study the following conclusions were drawn:

1. It was concluded that the north zone Indian gymnast's mental toughness is higher than the south zone gymnasts.
2. It was concluded that there was no significant difference found between north and south zone Indian gymnasts in Sports Competitive anxiety.

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Volume : 6 - No: 1
Half - Yearly
Jan 2019 - June 2019

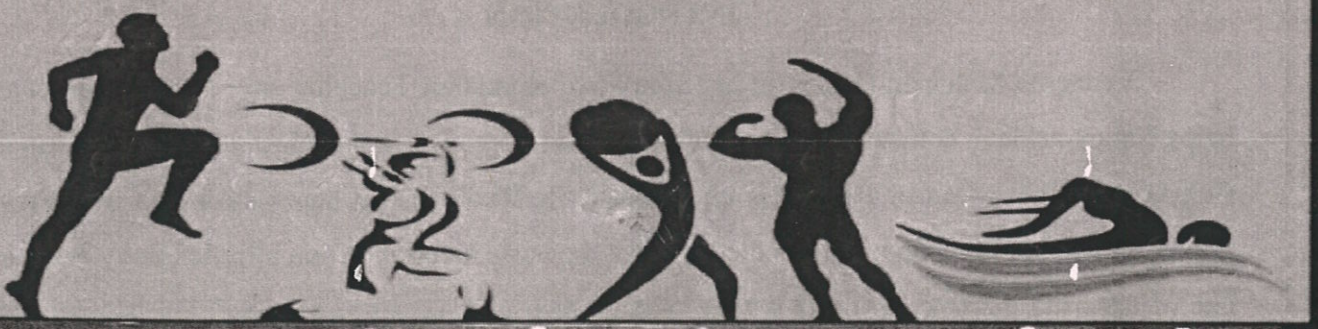
IJFHPEIG

ISSN 2349 - 722x

International
Journal of Fitness Health, Physical Education & Iron Games

Published by
International Federation for Fitness, Health, Physical Education & Iron Games

Approved by UGC
New Delhi Approved Journal No:- 63896
Thomson Reuters ID - 6684 - 2015
Scientific Journal Impact Factor - SJIF 2018 = 7.124
icrtfhss@gmail.com





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International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Vol: 6, No: 1, Jan 2019- June 2019

COMPARATIVE EFFECT OF FOOT REFLEXOLOGY AND MENTAL TRAINING ON ANXIETY AND STRESS AMONG MEN DIABETES

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ABSTRACT

The aim of this study was to find out the effect of foot reflexology and mental training on anxiety and stress among men diabetes. The investigator randomly selected 45 male adult suffering from Diabetics in the age group of 30 to 45 years. The subjects were randomly divided into three groups, namely, Foot Reflexology Training (FRT) group and mental training group (MNT) group, and the third group was kept under control. Prior to the experimental treatment the subjects level of anxiety and stress due to Diabetics were collected using standard questionnaires Apart from their usual medication, the FRT group and MNT group subjects were provided with foot reflexology Training and mental training for 12 weeks and the control group was not participated in any special treatment. After the experimental treatment, post test scores were obtained on anxiety and stress using the same questionnaires. The differences between the initial and final scores on selected variables were considered as influence of respective treatments. The ANCOVA results proved that FRT training was better than MNT training on anxiety and stress. Compared to control group FRT group and MNT group have significantly altered FRT training and MNT graining. However, these differences between FRT and MNT training were not significant. It was concluded that FRT and MNT can be safely used for the benefit of Diabetic patients to reduce their anxiety and stress.

Key words: Reflexology, Anxiety, Mental, Performance

INTRODUCTION

Vedantha Maharshi (1983) in his Simplified Kundalini Teaching says Foot Reflexology helps Nature achieve homeostasis. Overactive glands or organs can be helped to return to normal. Conversely, if an organ or a gland is underactive, Reflexology can help return it to its normal functioning level. It is important to note here that the normalization action of reflexology is never one of opposite extreme. In other words, once homeostasis or a normal condition is achieved, working the area too much cannot unbalance it. Overworking can cause some minor reactions such as diarrhea or perhaps some nasal mucus being secreted (runny nose). These reactions though are cleansing poisons from the body. Succinctly, Reflexology cannot harm a system, it simply brings it back into balance. Reflexology helps Nature achieve homeostasis. Overactive glands or organs can be helped to return to normal. Conversely, if an organ or a gland is underactive, Reflexology can help return it to its normally functioning level. It is important to note here that the normalization action of reflexology is never one of opposite extreme. In other words, once

Table II, Showing Pearson Coefficient Correlation between Criterion and Independent Variables of Men Football Players

S.No	Variables PLAYING ABILITY Vs	No. of Subjects	Obtained 'r'	Required 'r'
1	Team Cohesion	50	0.844*	0.273
2	Mental Toughness	50	0.886*	0.273

* Significant at 0.05 level.

The results presented in Tables II showed that there was significant relationship between playing ability and team cohesion (r: 0.844), playing ability and mental toughness (r: 0.886) among men football players.

The obtained Pearson Correlation Coefficient between criterion variable (playing ability) and independent psychological variables of women football players are presented in Table III.

Table III, Showing Pearson Coefficient Correlation between Criterion and Independent Variables of Women Football Players

S.No	Variables PLAYING ABILITY Vs	No. of Subjects	Obtained 'r'	Required 'r'
1	Team Cohesion	50	0.401*	0.273
2	Mental Toughness	50	0.669*	0.273

* Significant at 0.05 level.

The results presented in Tables III showed that there was significant relationship between playing ability and team cohesion (r: 0.401), playing ability and mental toughness (r: 0.669) among women football players.

CONCLUSION

The results proved that though men and women football players" psychological levels in team cohesion and mental toughness were positively related with their playing ability, comparing between men and women football players, it was found that men football players were found to me more accurately related with the selected psychological variables than the women football players.

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RESULTS AND DISCUSSION

Table I, Showing Descriptive Statistics, number of Subjects, Means and Standard Deviation on Selected Psychological Variables and Playing Ability of the Football players

S.No	Variables	No. of Subjects	Mean	Standard Deviation
MEN FOOTBALL PLAYERS				
1	Team Cohesion	50	69.52	5.14
2	Mental Toughness	50	90.62	12.40
3	Playing Ability	50	38.10	5.63
WOMEN FOOTBALL PLAYERS				
1	Team Cohesion	50	66.34	5.94
2	Mental Toughness	50	87.74	8.97
3	Playing Ability	50	36.76	5.94

Table I shows that the mean values of team cohesion was 69.52 with standard deviation ± 5.14. The mean values of mental toughness was 90.6 with standard deviation ± 12.40. The mean values of playing ability of men football players was 38.10 with standard deviation ± 5.63.

Table I shows that the mean values of team cohesion of football women players" was 66.34 with standard deviation ± 5.94. The mean values of mental toughness was 87.74 with standard deviation ± 8.97. The mean values of playing ability of women football players was 36.76 with standard deviation ± 5.94.

RESULTS ON COEFFICIENT OF CORRELATION FOOTBALL PLAYERS

The obtained Pearson Correlation Coefficient between criterion variable (playing ability) and independent psychological variables of men football players are presented in Table II.

ISSN 2231-3265
International Journal of Health, Physical Education and Computer Science In Sports
Volume No.32, No.1pp47-51
Publication Impact Factor 5.115
A Peer Reviewed (Refereed) International Research Journal

Effect Of Sport Loading Training On Selected Physical Fitness Variables Among The Coastal Area Womens Basketball Players

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Abstract

The Purpose Of The Study Was To Examine The Effect Of Sport Loading Training On Selected Physical Fitness Variables Among The Coastal Area Women Basketball Players. The Study Was Formulated As A True Random Group Design, Consisting Of A Pre-Test And Post-Test. Thirty (30)Women Coastal Area Basketball Players From Chennai District, Tamilnadu State, India Was Selected As Subjects At Random And Their Ages Ranged From 18 To 25 Years. The Subject (N=30) Were Randomly Assigned To Two Equal Groups Of Fifteen Subjects Each. Pre Test Was Conducted For All The Subjects On Selected Physical Fitness Variables. This Initial Test Scores Formed As Pre Test Scores Of The Subjects. The Groups Were Assigned As Experimental Group I And Control Group In An Equivalent Manner. Experimental Group I Was Exposed To Sport Loading Training And Control Group Was Not Exposed To Any Experimental Training Other Than Their Regular Daily Activities. The Duration Of Experimental Period 6 Weeks. After The Experimental Treatment, All The Thirty Subjects Were Tested On Their Physical Fitness Variables. The Final Test Scores Formed As Post Test Scores Of The Subjects. The Pre Test And Post Test Scores Were Subjected To Statistical Analysis Using ANCOVA To Find Out The Significance Among The Mean Differences At $P<0.05$ And It Concluded That Experimental Group Showed Improvement Than Control Group.Keywords: Sport loading, Speed, Strength, Explosive Power, Coastal Area.

Introduction:

Women's sports include amateur and professional competitions in virtually all sports. Female participation in sports rose dramatically in the twentieth century, especially in the last quarter, reflecting changes in modern societies that emphasized gender parity. Although the level of participation and performance still varies greatly by country and by sport, women's sport have broad acceptance throughout the world, and in few instance, such as figure skating, rival or exceed their male counterparts in popularity. Basketball involves approximately 450 million registered participation from over 200 national federations belonging to the Federation International de Basketball (FIBA). The modern game of basketball has evolved to the point were tall, heavy players are preferentially recruited to key positions close to the basket, while faster and more agile players are chosen for decades. When we compare the peoples with coastal area their physical abilities can be more than the normal peoples. Sports loading can be defined as the systematic addition of weight to the others player's body in any form or to the implements used in sports.

Sports loading is a technique designed to improve explosive concentric movements such as sprinting speed. A relatively light resistance that does not drastically alter sprinting form produces the best results. Sport loading along with strength training, speed endurance training, plyometric and over speed training procedure the greatest change in the exercise in the fast twitch muscle fibers.

Hypotheses:

It was hypothesized that there would be a significant improvement in speed from the base line to post training due to the influence of sports loading training among the coastal area women basketball players. It was hypothesized that there would be a significant improvement in strength endurance from the base line to post training due to the influence of sports loading training among the coastal area women basketball players. It was hypothesized that there would be a significant improvement in explosive power from the base line to post training due to the influence of sports loading training among the coastal area women basketball players.

Limitations:

The impact of training schedules, previous experiences, motivational factors and various physical activities on the subjects playing ability were not taken into account. Hereditary, environmental factor and socio-economic status, which contribute to both physical and mental efficiency were not controlled.The quantum of physical exertion, life style and psychological stress and other factor that affects the metabolic functions were also considered as limitations. Variations in performance due to diet, climatic conditions, group conditions and other environmental factors that might affect study, were not considered.

Delimitations:

The study was delimited to thirty women coastal area basketball players from Chennai district, Tamilnadu, India.The study was confined to coastal area women basketball players between the age group of 18 and 25 years. The study was delimited to only sport loading training.The study was selected physical fitness variables name such as speed, strength endurance and explosive power was measured.

Methodology:

The purpose of the study was to find out the effect of sport loading training on selected physical fitness variables among the coastal area women basketball players. To achieve the purpose of the study 30 coastal area women basketball players in the age group 18 to 25 years were selected at random from Chennai district, Tamilnadu, India. Selected subjects were divided in to two equal groups of fifteen each. Group I acted as Experimental Group (Sport Loading Training) and Group II acted as Control Group. The Experimental Group I Participated in the Sport Loading Training for three alternate days only morning session for the period of six weeks. The control group training were maintained their daily routine activities and no special training was given.

The data pertaining to the variables in this study were examined by using to find out the significant improvement and analysis of covariance (ANCOVA) for each variables separately in order to determine the difference and tested at 0.05 level of significance and post hoc test also administered whenever 'f' ratio was significant.

Table I Sport Loading Schedule for 1st to 6th week

Weeks	Sport Loading Training	Duration	Intensity	Time	Frequency/Week	Rest
1-2	Stadium stairs	60 Mins	40 to 60%	7.00 to 8.00 am	3	2 Mins
						2 Mins
	Weight Vests (60 M)					2 Mins
						2 Mins
	Weight Body Suit (80 M)					2 Mins
						2 Mins
3-4	Weight Sled (60 M)	60 Mins	50 to 70%	7.00 to 8.00 am	3	3 Mins
						3 Mins
	Step Running					3 Mins
						3 Mins
	Sand Running					3 Mins
						3 Mins
	Weight Sled (70 M)					4Mins

Sports loading is a technique designed to improve explosive concentric movements such as sprinting speed A relatively light resistance that does not drastically alter sprinting form produces the best results. Sport loading along with strength training, speed endurance training, plyometric and over speed training procedure the greatest change in the exercise in the fast twitch muscle fibers.

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						2 Mins
	Weight Vests (60 M)					2 Mins
						2 Mins
	Weight Body Suit (80 M)					2 Mins
						2 Mins
3-4	Weight Sled (60 M)	60 Mins	50 to 70%	7.00 to 8.00 am	3	3 Mins
						3 Mins
	Step Running					3 Mins
						3 Mins
	Sand Running					3 Mins
						3 Mins
	Weight Sled (70 M)					4Mins
						4 Mins

5-6	Weight Body Suit (80 M)	60 Mins	60 to 80%	7.00 to 8.00 am	3	4 Mins
	Weight Vests (70 M)					4 Mins
						4 Mins
						4 Mins

Table II COMPUTATION OF MEAN AND ANALYSIS OF COVARIANCE SPEED OF EXPERIMENTAL AND CONTROL GROUPS

Speed	Pre, Post, Adjusted Means		Source of variance	Sum of Squares	df	Mean squares	F ratio
	Sport Loading Training	Control Group					
Pre Test Mean	11.10	11.06	Between	0.013	1	0.013	2.65
			Within	0.135	28	0.005	
Post Test Mean	10.79	11.07	Between	0.577	1	0.577	46.42*
			Within	0.348	28	0.012	
Adjusted Post Test Means	10.80	11.06	Between	0.464	1	0.464	38.56*
			Within	0.325	27	0.012	

*Significant Table F-ratio at 0.05 level of confidence for 1,28 was 4.20,1,27 (df) = 4.21

The above table indicates the adjusted mean value on speed of experimental and control groups were 10.80 and 11.06 respectively. The obtained F-ratio of 38.56 for adjusted mean was greater than the table value 4.21 for the degrees of freedom 1 and 27 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant difference among experimental and control groups on speed. The above table also indicates that both pre and post test means of experimental and control groups differ significantly.

Figure-1SHOW THE MEAN VALUES ON SPEED OF SPORT LOADING TRAINING AND CONTROL GROUPS

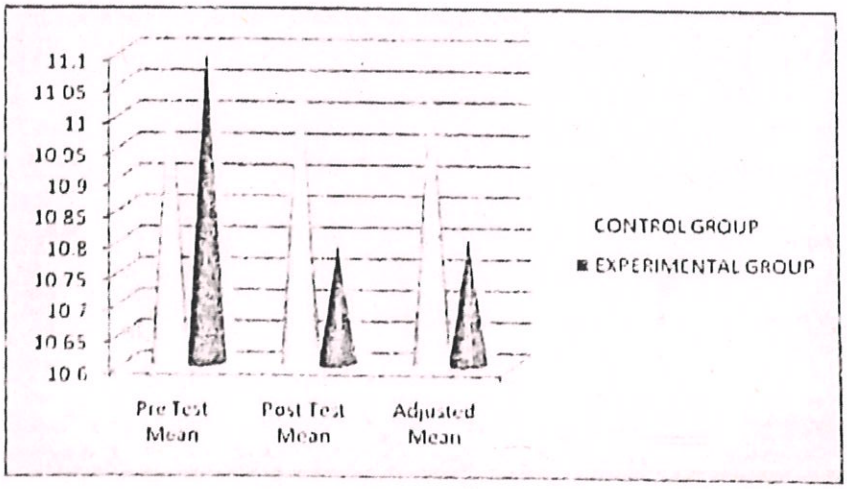


Table III COMPUTATION OF MEAN AND ANALYSIS OF COVARIANCE STRENGTH ENDURANCE OF EXPERIMENTAL AND CONTROL GROUPS

Strength Endurance	Pre, Post, Adjusted Means		Source of variance	Sum of Squares	df	Mean squares	F ratio
	Sport Loading Training	Control Group					
Pre Test Mean	15.60	16.00	Between	2.133	1	2.133	0.914
			Within	65.333	28	2.333	
Post Test Mean	17.66	16.13	Between	20.833	1	20.833	12.32*
			Within	47.333	28	1.690	
Adjusted Post Test Means	17.69	15.97	Between	21.582	1	21.582	12.50*
			Within	46.583	27	1.725	

*Significant Table F-ratio at 0.05 level of confidence for 1,28 was 4.20,1,27 (df) = 4.21

The above table indicates the adjusted mean value on strength endurance of experimental and control groups were 17.69 and 15.97 respectively. The obtained F-ratio of 12.50 for adjusted mean was greater than the table value 4.21 for the degrees of freedom 1 and 27 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant difference among experimental and control groups on strength endurance. The above table also indicates that both pre and post test means of experimental and control groups differ significantly.

Figure-2
SHOW THE MEAN VALUES ON STRENGTH ENDURANCE OF SPORT LOADING TRAINING AND CONTROL GROUPS

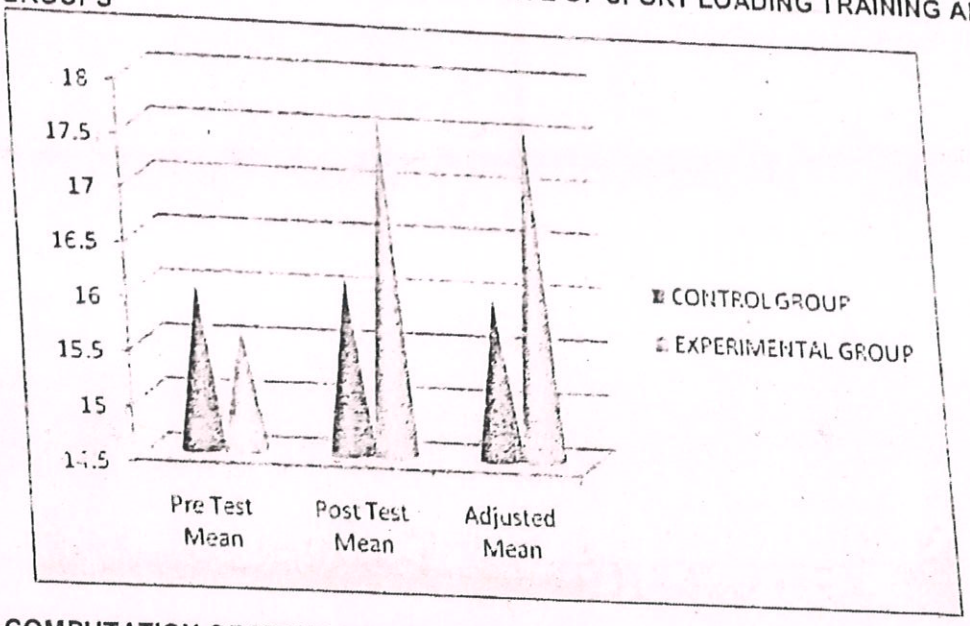


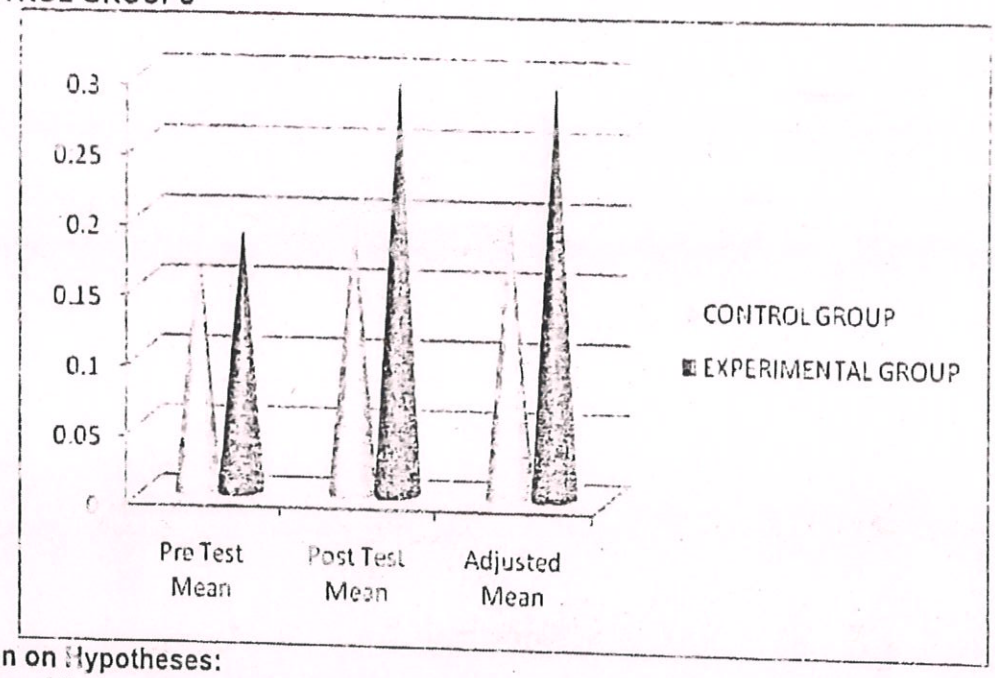
Table IV COMPUTATION OF MEAN AND ANALYSIS OF COVARIANCE EXPLOSIVE POWER OF EXPERIMENTAL AND CONTROL GROUPS

Explosive Power	Pre, Post, Adjusted Means		Source of variance	Sum of Squares	df	Mean squares	F ratio
	Sport Loading Training	Control Group					
Pre Test Mean	0.19	0.18	Between	0.001	1	0.001	0.37
			Within	0.025	28	0.001	
Post Test Mean	0.30	0.20	Between	0.073	1	0.073	40.04*
			Within	0.051	28	0.002	
Adjusted Post Test Means	0.30	0.20	Between	0.073	1	0.073	38.70*
			Within	0.051	27	0.002	

*Significant Table F-ratio at 0.05 level of confidence for 1,28 was 4.20,1,27 (df) = 4.21

The above table indicates the adjusted mean value on explosive power of experimental and control groups were 0.30 and 0.20 respectively. The obtained F-ratio of 38.70 for adjusted mean was greater than the table value 4.21 for the degrees of freedom 1 and 27 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant difference among experimental and control groups on explosive power. The above table also indicates that both pre and post test means of experimental and control groups differ significantly. The sport loading training showed the significant difference than control group on speed, strength endurance and explosive power. Since significant differences were obtained. The prime intension of the research was to analyze the effect of sport loading training on selected physical fitness variables among the coastal area women basketball players. While analyzing results it was revealed that there was a significant differences found in the experimental group.

Figure-3:SHOW THE MEAN VALUES ON EXPLOSIVE POWER OF SPORT LOADING TRAINING AND CONTROL GROUPS



Discussion on Hypotheses:

The findings of the study showed that there was significant improvement in speed from the base line to post training due to the influence of sport loading training among the coastal area women basketball players. Hence the first hypothesis was accepted.

The findings of the study showed that there was significant improvement in strength endurance from the base line to post training due to the influence of sport loading training among the coastal area women basketball players. Hence the second hypothesis was accepted.

The findings of the study showed that there was significant improvement in explosive power from the base line to post training due to the influence of sport loading training among the coastal area women basketball players. Hence the third hypothesis was accepted.

Conclusions:

It was observed that the six weeks of sport loading training have significantly improved the speed of coastal area women basketball players.It was observed that the six weeks of sport loading training have significantly improved the strength endurance of coastal area women basketball playersIt was observed that the six weeks of sport loading training have significantly improved the explosive power of coastal area women basketball playersThe experimental group had achieved significant improvement due to sport loading training and has significantly improved the selected physical fitness variables of coastal area women basketball players when compared to control group.

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volleyball players must be able to quickly change direction from the upward motion of a vertical jump to the downward motion of a point-saving dig (or vice versa). To play volleyball one has to be good at vertical jump, known as explosive power.

Methodology

The purpose of the study was to find out the effect of plyometric training on selected physiological variables among college level volleyball players. To achieve the purpose of the study 30 inter-collegiate men volleyball players from TNPESU University, Chennai. The subjects were randomly assigned in to two equal groups namely, Plyometric training group (PTG) (n=15) and Control group (CG) (n=15). A pilot study was conducted to assess the initial capacity of the subjects in order to fix the load. The respective training was given to the experimental group the 3 days per weeks (alternate days) for the training period of twelve weeks. The control group was not given any sort of training except their routine.

Table 1: Computation of 'T' Ratio on Selected Plyometric training variables of college men volleyball players Breath Holding Time on Experimental Group and Control Group

Variables	Group Name	Mean		Sd		Sd Error	Df	't' ratio
		Pre	Post	Pre	Post			
Breath Holding Time	Experimental Group	30.26	31.37	4.12	3.53	0.26	14	4.34*
	Control Group	29.14	29.84	4.28	4.60	0.67		1.01

*level of significance was fixed at 0.05 with df 14 table value is 2.14

The table I shows that the mean values of pre-test and post-test of experimental group in Breath holding time were 30.26 and 31.37 respectively. The obtained't' ratio was 4.34 since the obtained 't' ratio was greater than the required table value of 2.14 for significance at 0.05 level of with 14 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in breath holding time were 29.14 and 29.84 respectively. The obtained't' ratio was 1.01 which was lesser than the table value of 2.14 for significance at 0.05 level of with 14 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on Breath holding time due to plyometric training on college level volleyball players.

Table 2: Computation of 'T' Ratio on Selected Plyometric training variables of college men volleyball players [illegible] Experimental Group and Control Group

Variables	Group Name	Mean		SD		SD Error	DF	't' ratio
		Pre	Post	Pre	Post			
Resting Heart Rate	Experimental Group	76.53	74.67	2.45	2.09	0.22	14	8.67*
	Control Group	77.33	76.67	4.15	3.83	0.44		1.50

*level of significance was fixed at 0.05 with df 14 table value is 2.14

The table II shows that the mean values of pre-test and post-test of experimental group in Resting heart rate were 76.53 and 74.67 respectively. The obtained't' ratio was 8.67 since the obtained 't' ratio was greater than the required table value of 2.14 for significance at 0.05 level of with 14 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in resting heart rate were 77.33 and 76.67 respectively. The obtained't' ratio was 1.50 which was lesser than the table value of 2.14 for significance at 0.05 level of with 14 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on resting heart rate due to plyometric training on college level volleyball players.

Conclusions

1. It was concluded that twelve weeks Plyometric training significantly improved the Breath holding time and resting heart rate of the inter collegiate male Volleyball players.
2. Plyometric training is one among the most appropriate means to bring about the desirable changes over physiological variables of Volleyball players. Hence, suggested that coaches and the experts deal with Volleyball players to incorporate. Plyometric training as a component in their training programme.

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3.4.5-J-EP

ISSN: 2456-5067

Impact Factor: RJIF 5.24
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International Journal of Yoga, Physiotherapy and Physical Education

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VOLUME 3 | ISSUE 4 | JUL-AUG | 2018









Published By
Gupta Publications

Registrar
Tamilnadu Physical Education and Sports University
Chennai

Year: 2018, Volume: 3, Issue: 4
ISSN: 2456-5067
Impact Factor: RJIF 5.24
Online Available at www.sportsjournal.in

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International Journal of Yoga, Physiotherapy and Physical Education
ISSN: 2456-5067
Impact Factor: GIIF: 5.24
www.sportsjournal.in
Volume 3; Issue 4; July 2018; Page No. 26-32

Effect of plyometric training and circuit training on selected physical and physiological variables among male Volleyball players

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Abstract

The purpose of the study was to find out the effect of plyometric training and circuit training on selected physical and physiological variables among male volleyball players. Twenty four male volleyball players aged between 18 to 25 years were selected randomly. They were divided into two groups (two experimental and one control group) the experimental group I was given plyometric training and experimental group II was given circuit training for six weeks and control group was not allowed to participate in any training programme. Pretest was conducted dependent variables such as speed, muscular endurance, flexibility, agility, explosive strength, vital capacity and anaerobic capacity at the beginning before the experimental treatment and posttest was taken after the experimental treatment. The data were analyzed by applying dependent 't' test and ANCOVA. The results revealed that the plyometric training and circuit training had significantly improved the speed, muscular endurance, flexibility, agility, explosive strength, vital capacity and anaerobic capacity.

Keywords: plyometric training, circuit training, speed, muscular endurance, flexibility, explosive strength, vital capacity, aerobic capacity and anaerobic capacity

Introduction: Plyometrics

Plyometric is the term now applied to exercise, that have their roots in "Europe" where they were first known simply as "Jumping training".

Interest in this jump training increased during the early 1970's as east European athletes emerged as powers on the world sports scene. As the eastern bloc countries began to produce superior athletes in such sports as track and field, gymnastics, and weight lifting, the mystique of their success began to Centre on the training methods. (Donald. A. Chu, 1998)[1].

Importance of Plyometric Training

Plyometric is the name given for a type of exercise that is designed to increase intensity or explosive power in certain muscle groups. This kind of training is used to increase power of a boxer's punch or the force of volleyball and basketball player's jump. Plyometric training is different from traditional strength training exercise because it is performed quickly and explosively. It increase muscle power by capitalizing on lengthening and shortening of the muscle cycles. This kind of training usually starts with a rapid stretch of a muscle or eccentric phase followed by a rapid shortening of the same muscle (or) the concentric phase burpees, clap push-ups, jumping ropes, and jumping jacks are types of plyometric exercise. Several studies suggest that plyometric can greatly improve athletic performance in terms of vertical jumps, long jumps, sprinting, cycling, volleyball, basketball, kick boxing and many more. It is said that even one (or) two types of plyometric training completed one to three times in a week may improve motor performance with in 6 to 12 weeks In addition to this, 3 sets of plyometric pushups may also increase upper body strength (Donald A. Chu, 1998)[1].

Circuit Training

Circuit training was invented in 1953 as effective and efficient way for coaches to train many athletes in a limited amount of time with limited equipment. The exercises moved through a series of weight training or calisthenics arranged consequently. It was fast paced workout of 15 to 45 seconds per station with little (15 – 30 seconds) rest or no rest between stations. Today this is known as "circuit weight training" research has shown that it can increase muscular strength and endurance. There is mild improvement in aerobic stamina but only if the rest periods are kept very short. Another variation is "aerobic circuit training" aerobic station like treadmill, rower or stepper (1 to 5 minute per station) or interspersed with weight training stations. This protocol has been found to increase aerobic stamina and muscular endurance and endurance. (Dabir. R. Qureshi, 2012)[4].

Hypotheses

1. It was hypothesized that there would be a significant improvement between pre and post-test due to 6 weeks of combined plyometric and circuit training on selected physical and physiological variables among male volleyball players.
2. It was hypothesized that there would not be a significant improvement between pre and post-test for control group

on selected physical and physiological variables among male volleyball players.

3. It was hypothesized that there would be a significant difference between experimental and control group on selected physical and physiological variables among male volleyball players.

Delimitations

1. The following delimitations are considered in this study. 24 male intercollegiate volleyball players were selected randomly.
2. The experimental group was given combined plyometric and circuit training for a period of 6 weeks.
3. The subject's age group ranged from 18-25 years.
4. The study was restricted to 5 physical variables such as speed, muscular endurance, flexibility, agility, explosive strength and 2 physiological variables such as vital capacity and anaerobic capacity.

Methodology

The purpose of the study was to find out the effect of plyometric training and circuit training on selected physical and physiological variables among male volleyball players. To achieve the purpose of the study 24 men volleyball players in the age group 18 to 25 years were selected at random from various engineering college in Chennai, Tamil Nadu. Selected subjects were divided in to three groups of experimental I, experimental II and control group. The experimental group I participated combined plyometric training group and experimental group II circuit training group for the training period six weeks three alternate days per week. The control group were maintained their daily routine activities and no special training was given.

The data pertaining to the variables in this study were examined by using dependent 't' test to find out the significant improvement and analysis of covariance (ANCOVA) for each variables separately in order to determine the differences and tested at 0.05 level of significance and post hoc test also administrated wherever 'f' ratio was significant. The analysis of dependent 't' test on data obtained for speed, muscular endurance, flexibility, agility, explosive strength, vital capacity and anaerobic capacity of the pretest and posttest means of experimental and control group have been analyzed and presented in Table I.

Table 1: Computation of 't' ratio between pre and post test scores of experimental group and control group

Variables	Group Name	Mean		SD		SD Error	DF	't' ratio
		Pre	Post	Pre	Post			
Speed	Experimental Group	3.64	3.54	0.24	0.21	0.012	11	8.33*
	Control Group	3.63	3.64	0.23	0.31	0.032		0.312
Muscular Endurance	Experimental Group	40.00	44.75	7.73	6.63	0.41	11	11.58*
	Control Group	39.91	39.25	3.36	3.07	0.43		1.56
Flexibility	Experimental Group	32.41	36.75	4.99	4.71	0.284	11	15.24*
	Control Group	32.25	31.41	6.11	5.85	1.02		0.813
Agility	Experimental Group	11.73	10.78	0.93	0.76	0.31	11	3.03*
	Control Group	11.64	11.71	0.97	0.92	0.084		0.821
Explosive Strength	Experimental Group	37.16	40.75	5.84	5.37	0.29	11	12.37*
	Control Group	37.12	36.25	2.43	2.17	0.902		0.96
Vital Capacity	Experimental Group	3.75	4.15	0.61	0.42	0.076	11	5.26*
	Control Group	3.72	3.60	0.51	0.41	0.084		1.42
Anaerobic Capacity	Experimental Group	121.20	134.73	15.49	17.11	0.914	11	14.80*
	Control Group	121.03	119.23	15.41	14.41	0.86		2.08

*level of significance was fixed at 0.05 with df 11 table value is 2.20

The table I shows that the mean values of pre-test and post-test of experimental group in speed were 3.64 and 3.54 respectively. The obtained 't' ratio was 8.33 since the obtained 't' ratio was greater than the required table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in speed were 3.63 and 3.64 respectively. The obtained 't' ratio was 0.312 which was lesser than the table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on speed due to combined plyometric and circuit training on male volleyball players.

The table I shows that the mean values of pre-test and post-test of experimental group in muscular endurance were 40.00 and 44.75 respectively. The obtained 't' ratio was 11.58 since the obtained 't' ratio was greater than the required table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in muscular endurance were 39.91 and 39.25 respectively. The obtained 't' ratio was 1.53 which was lesser than the table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on muscular endurance due to combined plyometric and circuit training on male volleyball players.

The table I shows that the mean values of pre-test and post-test of experimental group in flexibility were 32.41 and 36.75 respectively. The obtained 't' ratio was 15.24 since the obtained 't' ratio was greater than the required table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in flexibility were

32.25 and 31.41 respectively. The obtained 't' ratio was 0.813 which was lesser than the table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on flexibility due to combined plyometric and circuit training on male volleyball players.

The table I shows that the mean values of pre-test and post-test of experimental group in agility were 11.73 and 10.78 respectively. The obtained 't' ratio was 3.03 since the obtained 't' ratio was greater than the required table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in agility were 11.64 and 11.71 respectively. The obtained 't' ratio was 0.821 which was lesser than the table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on agility due to combined plyometric and circuit training on male volleyball players.

The table I shows that the mean values of pre-test and post-test of experimental group in explosive strength were 37.16 and 40.75 respectively. The obtained 't' ratio was 12.37 since the obtained 't' ratio was greater than the required table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in explosive strength were 37.12 and 36.25 respectively. The obtained 't' ratio was 0.96 which was lesser than the table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on explosive strength due to combined plyometric and circuit training on male volleyball players.

The table I shows that the mean values of pre-test and post-test of experimental group in vital capacity were 3.75 and 4.15 respectively. The obtained 't' ratio was 5.26 since the obtained 't' ratio was greater than the required table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in vital capacity were 3.72 and 3.60 respectively. The obtained 't' ratio was 1.42 which was lesser than the table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on vital capacity due to combined plyometric and circuit training on male volleyball players.

The table I shows that the mean values of pre-test and post-test of experimental group in anaerobic capacity were 121.20 and 134.73 respectively. The obtained 't' ratio was 14.80 since the obtained 't' ratio was greater than the required table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in anaerobic capacity were 121.03 and 119.23 respectively. The obtained 't' ratio was 2.08 which was lesser than the table value of 2.20 for significance at 0.05 level of with 11 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on anaerobic capacity due to combined plyometric and circuit training on male volleyball players.

Result and discussion

Table 2: Computation of analysis of co-variance on speed among experimental group and control group

TEST	Experimental Group	Control Group	SSV	SS	DF	MS	'F'
PRE-test Mean	3.74	3.67	BG	0.002	1	0.002	0.026
PRE-Test SD	0.25	0.23	WG	1.29	22	0.059	
Post-Test Mean	3.64	3.62	BG	0.062	1	0.062	0.852
Post-Test SD	0.22	0.31	WG	1.60	22	0.073	
Adjusted posttest mean	3.53	3.65	BG	0.084	1	0.084	11.38*
			WG	0.155	21	0.007	

*Significant at 0.05 level of confidence

Table value at 0.05 level of significance for 1 and 22 degrees of freedom is 4.30 and 1 and 21 degrees of freedom is 4.32.

Table II shows that the pre-test mean value on speed of experimental group (plyometric training group) and control group were 3.74 and 3.67 respectively. The obtained 'F' ratio of pre-test mean was 0.026, which was lesser than the required table value of 4.30 for df 1 and 22 at 0.05 level of confidence on speed. The post-test mean value on speed of experimental group (plyometric training group) and control group were 3.54 and 3.64 respectively. The obtained 'F' ratio of post-test mean is 0.852. The adjusted post-test mean value on speed of experimental group (plyometric training group) and control group were 3.53 and 3.65 respectively. The obtained 'F' ratio of adjusted post-test mean was 11.38 which was greater than the required table value of 4.32 for df 1 and 21 at 0.05 level of confidence on speed. The result of the study indicates that there was a significant difference between the adjusted post-test mean of plyometric training and control group on speed.

Table 3: Computation of analysis of co-variance on muscular endurance among experimental group and control group

Test	Experimental Group	Control group	SSV	SS	DF	MS	'F'
Pre-test mean	40.00	39.91	BG	0.042	1	0.042	0.001
Pre-test sd	7.73	3.36	WG	782.917	22	35.59	
Post-test mean	44.75	39.25	BG	181.5	1	181.5	6.79*
Post-test sd	6.63	5.78	WG	588.5	22	26.75	
Adjusted posttest mean	45	39.28	BG	176.87	1	176.87	131.16*
			WG	28.319	21	1.349	

*Significant at 0.05 level of confidence

Table value at 0.05 level of significance for 1 and 22 degrees of freedom is 4.30 and 1 and 21 degrees of freedom is 4.32.

Table III shows that the pre-test mean value on speed of experimental group (plyometric training group) and control group were 40.00 and 39.91 respectively. The obtained 'F' ratio of pre-test mean was 0.001, which was lesser than the required table value of 4.30 for df 1 and 22 at 0.05 level of confidence on muscular endurance. The post-test mean value on speed of experimental group (plyometric training group) and control group were 44.75 and 39.25 respectively. The obtained 'F' ratio of post-test mean was 6.79 which were greater than the required table value of 4.30 for df 1 and 22 at 0.05 level of confidence on muscular endurance. The adjusted post-test mean value on muscular endurance of experimental group (plyometric training group) and control group were 45 and 39.28 respectively. The obtained 'F' ratio of adjusted post-test mean was 131.16 which were greater than the required table value of 4.32 for df 1 and 21 at 0.05 level of confidence on muscular endurance. The result of the study indicates that there was a significant difference between the adjusted post-test mean of combined plyometric and circuit training and control group on muscular endurance.

Table 4: Computation of analysis of co-variance on flexibility among experimental group and control group

TEST	Experimental Group	Control Group	SSV	SS	DF	MS	'F'
Pre-Test Mean	32.41	32.25	BG	0.16	1	0.16	0.005
Pre-Test SD	4.90	6.11	WG	676.66	22	30.75	
post-test Mean	36.75	31.41	BG	170.66	1	170.66	6.045*
Post-Test SD	4.71	5.85	WG	621.16	22	28.24	
Adjusted post test mean	37	31.49	BG	160.71	1	160.71	180.66*
			WG	18.68	21	0.89	

*Significant at 0.05 level of confidence

Table value at 0.05 level of significance for 1 and 22 degrees of freedom is 4.30 and 1 and 21 degrees of freedom is 4.32.

Table IV shows that the pre-test mean value on flexibility of experimental group (combined plyometric and circuit training group) and control group were 32.41 and 32.25 respectively. The obtained 'F' ratio of pre-test mean was 0.005, which was lesser than the required table value of 4.30 for df 1 and 22 at 0.05 level of confidence on flexibility. The post-test mean value on flexibility of experimental group (combined plyometric and circuit training group) and control group were 36.75 and 31.41 respectively. The obtained 'F' ratio of post-test mean is 6.045 which were greater than the required table value of 4.30 for df 1 and 22 at 0.05 level of confidence on flexibility. The adjusted post-test mean value on flexibility of experimental group (combined plyometric and circuit training group) and control group were 37 and 31.49 respectively. The obtained 'F' ratio of adjusted post-test mean was 180.66 which was greater than the required table value of 4.32 for df 1 and 21 at 0.05 level of confidence on flexibility. The result of the study indicates that there was a significant difference between the adjusted post-test mean of combined plyometric and circuit training and control group on flexibility.

Table 5: Computation of analysis of co-variance on agility among experimental group and control group

Test	Experimental group	control group	SSV	SS	DF	MS	'F'
Pre-test Mean	11.73	11.64	BG	0.043	1	0.043	0.048
Pre-test Sd	0.93	0.97	WG	19.93	22	0.906	
Post-test Mean	10.78	11.71	BG	5.19	1	5.19	7.17*
Post-test Sd	0.76	0.92	WG	15.94	22	0.72	
Adjusted osttest Mean	10.76	11.73	BG	5.72	1	5.72	12.20*
			WG	9.86	21	0.47	

*Significant at 0.05 level of confidence

Table value at 0.05 level of significance for 1 and 22 degrees of freedom is 4.30 and 1 and 21 degrees of freedom is 4.32.

Table V shows that the pre-test mean value on agility of experimental group (combined plyometric and circuit training group) and control group were 11.73 and 11.64 respectively. The obtained 'F' ratio of pre-test mean was 0.048, which was lesser than the required table value of 4.30 for df 1 and 22 at 0.05 level of confidence on agility. The post-test mean value on agility of experimental group (combined plyometric and circuit training group) and control group were 10.78 and 11.71 respectively. The obtained 'F' ratio of post-test mean is 7.17 which were greater than the required table value of 4.30 for df

1 and 22 at 0.05 level of confidence on agility. The adjusted post-test mean value on agility of experimental group (combined plyometric and circuit training group) and control group were 10.76 and 11.73 respectively. The obtained 'F' ratio of adjusted post-test mean was 12.20 which was greater than the required table value of 4.32 for df 1 and 21 at 0.05 level of confidence on agility. The result of the study indicates that there was a significant difference between the adjusted post-test mean of combined plyometric and circuit training and control group on agility.

Table 6: Computation of analysis of co-variance on explosive strength among experimental group and control group

Test	Experimental Group	Control group	SSV	SS	DF	MS	'F'
pre-test mean	37.16	37.12	BG	0.010	1	0.010	0.001
Pre-test SD	5.84	2.43	WG	441.22	22	20.05	
Post-test mean	40.75	36.25	BG	121.50	1	121.50	7.21*
Post-test SD	5.37	2.17	WG	370.50	22	16.84	
Adjusted posttest mean	41	36.27	BG	119.51	1	119.51	113.99*
			WG	22.01	21	1.048	

*Significant at 0.05 level of confidence

Table value at 0.05 level of significance for 1 and 22 degrees of freedom is 4.30 and 1 and 21 degrees of freedom is 4.32.

Table VI shows that the pre-test mean value on explosive strength of experimental group (combined plyometric and circuit training group) and control group were 37.16 and 37.12 respectively. The obtained 'F' ratio of pre-test mean was 0.001, which was lesser than the required table value of 4.30 for df 1 and 22 at 0.05 level of confidence on explosive strength. The post-test mean value on explosive strength of experimental group (combined plyometric and circuit training group) and control group were 40.75 and 36.25 respectively. The obtained 'F' ratio of post-test mean was 7.21 which were greater than the required table value of 4.30 for df 1 and 22 at 0.05 level of confidence on explosive strength. The adjusted post-test mean value on explosive strength of experimental group (combined plyometric and circuit training group) and control group were 41 and 36.27 respectively. The obtained 'F' ratio of adjusted post-test mean was 113.99 which was greater than the required table value of 4.32 for df 1 and 21 at 0.05 level of confidence on explosive strength. The result of the study indicates that there was a significant difference between the adjusted post-test mean of combined plyometric and circuit training and control group on explosive strength.

Table 7: Computation of analysis of co-variance on vital capacity among experimental group and control group

Test	Experimental Group	Control Group	SSV	SS	DF	MS	'F'
Pre-test Mean	3.75	3.72	BG	0.005	1	0.005	0.017
pre-test SD	0.61	0.51	WG	6.97	22	0.32	
Post-test Mean	4.15	3.60	BG	1.83	1	1.83	10.37*
Post-test SD	0.42	0.41	WG	3.88	22	0.18	
Adjusted post test mean	4.15	3.61	BG	1.70	1	1.70	40.70*
			WG	0.88	21	0.042	

* Significant at 0.05 level of confidence

Table value at 0.05 level of significance for 1 and 22 degrees of freedom is 4.30 and 1 and 21 degrees of freedom is 4.32.

Table VII shows that the pre-test mean value on Vital capacity of experimental group (combined plyometric and circuit training group) and control group were 3.75 and 3.72 respectively. The obtained 'F' ratio of pre-test mean was 0.017, which was lesser than the required table value of 4.30 for df 1 and 22 at 0.05 level of confidence on vital capacity. The post-test mean value on vital capacity of experimental group (combined plyometric and circuit training group) and control group were 4.15 and 3.60 respectively. The obtained 'F' ratio of post-test mean was 10.37 which were greater than the required table value of 4.30 for df 1 and 22 at 0.05 level of confidence on vital capacity. The adjusted post-test mean value on vital capacity of experimental group (combined plyometric and circuit training group) and control group were 4.15 and 3.61 respectively. The obtained 'F' ratio of adjusted post-test mean was 40.70 which was greater than the required table value of 4.32 for df 1 and 21 at 0.05 level of confidence on vital capacity. The result of the study indicates that there was a significant difference between the adjusted post-test mean of combined plyometric and circuit training and control group on vital capacity.

Table 8: Computation of analysis of co-variance on anaerobic capacity among experimental group and control group

Test	Experimental group	Control group	SSV	SS	DF	MS	'F'
Pre-test mean	121.20	121.03	BG	0.167	1	0.167	0.001
pre-test SD	15.40	15.41	WG	5223.50	22	237.43	
Post-test mean	134.73	119.23	BG	1441.19	1	1441.19	5.76*
Post-test SD	17.11	14.41	WG	5506.97	22	250.31	
adjusted post test mean	134.6	119.3	BG	1409.98	1	1409.98	175.13*
			WG	169.07	21	8.05	

*Significant at 0.05 level of confidence

Table value at 0.05 level of significance for 1 and 22 degrees of freedom is 4.30 and 1 and 21 degrees of freedom is 4.32.

Table VIII shows that the pre-test mean value on anaerobic capacity of experimental group (combined plyometric and circuit training group) and control group were 121.20 and 121.03 respectively. The obtained 'F' ratio of pre-test mean was 0.001, which was lesser than the required table value of 4.30 for df 1 and 22 at 0.05 level of confidence on anaerobic capacity. The post-test mean value on anaerobic capacity experimental group (combined plyometric and circuit training group) and control group were 134.73 and 119.23 respectively. The obtained 'F' ratio of post-test mean was 5.76 which were greater than the required table value of 4.30 for df 1 and 22 at 0.05 level of confidence on anaerobic capacity. The adjusted post-test mean value on vital capacity of experimental group (combined plyometric and circuit training group) and control group were 134.7 and 119.3 respectively. The obtained 'F' ratio of adjusted post-test mean was 175.13 which was greater than the required table value of 4.32 for df 1 and 21 at 0.05 level of confidence on anaerobic capacity. The result of the study indicates that there was a significant difference between the adjusted post-test mean of combined plyometric and circuit training and control group on margaria kalamen power test.

Discussion on findings

Speed

The result of the study reveals that there is a significant difference in speed of combined plyometric and circuit training group between pre and post-test. But there is no significant difference in the speed of control group between pre and post-test. Regarding statistical analysis it is observed that there is a significant difference in speed between adjusted post-test means of experimental group (combined plyometric and circuit training group) and control group. It is concluded that the combined plyometric and circuit training group showed significant improvement in speed of volleyball players.

Muscular Endurance

The result of the study reveals that there is a significant difference in muscular endurance of combined plyometric and circuit training group between pre and post-test. But there is no significant difference in the muscular endurance of control group between pre and post-test. Regarding statistical analysis it is observed that there is a significant difference in muscular endurance between adjusted post-test means of experimental group (combined plyometric and circuit training group) and control group. It is concluded that the combined Plyometric and circuit training group showed significant improvement in muscular endurance of volleyball players.

Flexibility

The result of the study reveals that there is a significant difference in flexibility of combined plyometric and circuit training group between pre and post-test. But there is no significant difference in the flexibility of control group between pre and post-test. Regarding statistical analysis it is observed that there is a significant difference in flexibility between adjusted post-test means of experimental group (combined plyometric and circuit training group) and control group. It is concluded that the combined Plyometric and circuit training group showed significant improvement in flexibility of volleyball players.

Agility

The result of the study reveals that there is a significant difference in agility of combined plyometric and circuit training group between pre and post-test. But there is no significant difference in the agility of control group between pre and post-test. Regarding statistical analysis it is observed that there is a significant difference in agility between adjusted post-test means of experimental group (combined plyometric and circuit training group) and control group. It is concluded that the combined Plyometric and circuit training group showed significant improvement in agility of volleyball players.

Explosive strength

The result of the study reveals that there is a significant difference in explosive strength of combined plyometric and circuit training group between pre and post-test. But there is no significant difference in the explosive strength of control group between pre and post-test. Regarding statistical analysis it is observed that there is a significant difference in explosive strength between adjusted post-test means of experimental group (combined plyometric and circuit training group) and control group. It is concluded that the combined Plyometric and circuit training group showed significant improvement in explosive strength of volleyball players.

Vital Capacity

The result of the study reveals that there is a significant difference in vital capacity of combined plyometric and circuit training group between pre and post-test. But there is no significant difference in the vital capacity of control group between pre and post-test. Regarding statistical analysis it is observed that there is a significant difference in vital capacity between adjusted post-test means of experimental group (combined plyometric and circuit training group) and control group. It is concluded that the combined Plyometric and circuit training group showed significant improvement in vital capacity of volleyball players.

Anaerobic capacity

The result of the study reveals that there is a significant difference in anaerobic capacity of combined plyometric and circuit training group between pre and post-test. But there is no significant difference in the anaerobic capacity of control group between pre and post-test. Regarding statistical analysis it is observed that there is a significant difference in anaerobic capacity between adjusted post-test means of experimental group (combined plyometric and circuit training group) and control group. It is concluded that the combined Plyometric and circuit training group showed significant improvement in anaerobic capacity of volleyball players.

Conclusion

The plyometric training group had shown significant improvement in all selected physical and physiological variables (speed, muscular endurance, flexibility, explosive strength, agility, vital capacity and anaerobic capacity) among male volleyball players.

The control group had not shown any significant changes on selected physical and physiological variables (speed, muscular endurance, flexibility, explosive strength, agility, vital capacity and anaerobic capacity) among male volleyball.

The result of the study showed that there is a significant difference among the adjusted post-test mean of the experimental group and control group on selected physical and physiological variables among male volleyball players.

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group and MNT group have significantly altered FRT training and MNT graining. However, these differences between FRT and MNT training were not significant. Bagheri-Nesami M et al. (2014) found significant reduction in anxiety due to foot reflexology massage. Moyle W et al. (2013) explored effectiveness of foot massage for care and concluded foot reflexology improved mood, reduced anxiety and lower blood pressure in long-term care. Santaella DF, et.al. (2006) studied the acute after effects of exercise and relaxation, performed alone and in combination, on blood pressure (BP) measured at baseline and during stressful conditions. Thus, the findings of this study are in agreement with the previous researches, that FRT and MNT reduces anxiety, improves mood, reduction in pain which are the causes for reduction in anxiety and stress among men diabtes as found in this study.

CONCLUSIONS

It was concluded that FRT and MNT can be safely used for the benefit of Diabetic patients to reduce their anxiety and stress.

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Half - Yearly

ISSN 2349 -722X

International

Journal of Fitness Health, Physical Education & Iron Games

Published by

International Federation for Fitness, Health, Physical Education & Iron Games

Approved by UGC

New Delhi Approved Journal No:- 63896



World Congress on Sports Science + Sports Medicine
Manama, Kindom of Bahrain - 2019

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International Journal of Fitness, Health, Physical Education & Iro
ISSN 2349 – 722X, Special Issue Vol: 6, No: 2, May

IMPACT OF SMALL SIDED GAMES ON EXPLOSIVE POWER AND FLEXIBILITY AMONG MEN FOOTBALL PLAYERS

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ABSTRACT

The purpose of the study was to find out the effect of small sided games on selected physical variables such as Explosive power and Flexibility among football players. The research design of the study was random group design. Thirty six (N=36) football players were selected at random. The selected subjects were randomly assigned into experimental group-I (Small Side Game Group (SSGG) and control group. Each group consisted of eighteen (n=18) subjects. On completion of pretest for both groups, the experimental group I were treated with their training program for a period of twelve weeks. After twelve weeks of treatment, the post test was conducted for all two groups and the final readings have been recorded carefully. To analyse the data obtained from experimental groups and control group the standard statistical procedure that is ANCOVA was used. The test of significance at 0.05 level of confidence. It is found that the experimental groups performed better on physical fitness variables such as explosive power and flexibility than the control group. This might be due to the effect of specified training given to the experimental groups.

Keywords: Football, Small Sided Games Training, Explosive power and Flexibility

INTRODUCTION

Small-sided games (SSGs) are played on reduced pitch areas, often using modified rules and involving a smaller number of players than traditional football. These games are less structured than traditional fitness training methods but are very popular training drills for players of all ages and levels. At present, there is relatively little information regarding how Small-sided games (SSGs) can best be used to improve physical capacities and technical or tactical skills in footballers.

Small-sided games (SSGs), also referred to as skill-based conditioning games (Gabbett, 2006) or game-based training, (Gabbett, Jenkins and Abernethy, 2009) are modified games played on reduced pitch areas, often using adapted rules and involving a smaller number of players than traditional football games. These small-sided games develop physical abilities, as well as technical and tactical skills (Impellizzeri, et al. 2006 & Dellal, et al. 2011). As far as physical condition is concerned, small-sided games develop aerobic capacity (Dellal, et al. 2008 & Hill-Haas, et al.2011).

METHOD

The purpose of the study was to find out the effect of small sided games on selected physical variables such as Explosive power and Flexibility among football players. The research design of the study was random group design. Thirty six (N=36) football players were selected at random. The selected subjects were randomly assigned into experimental group-I (Small Side Game Group (SSGG) and control group. Each group consisted of eighteen (n=18) subjects. On completion of pretest for both groups, the experimental group I were treated with their training programme for a period of twelve weeks.

Small-Sided Games

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue Vol: 6, No: 2, May 2019

EFFECT OF SQUAT JUMP TRAINING ON LEG STRENGTH AND EXPLOSIVE POWER AMONG NOVICE FOOTBALL PLAYERS

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ABSTRACT

The purpose of the study was to find out the effect of squat jump training on leg strength and explosive power among novice football players. To achieve the purpose of this study, 20 novice football players are randomly selected as subjects from the TNPE & Sports University, Chennai, Tamilnadu, India. Their age ranged from 18 to 25 years. The selected participants were randomly divided into two groups such as experimental group underwent squat jump training (n=10) and control group (n=10). Experimental group underwent squat jump training for three alternate days per week and each session lasted for an hour for six week. Control group was not exposed to any specific training but they were participated in regular activities. The data on leg strength and explosive power were collected by administering by wall sit test and standing broad jump. The pre and post-tests data were collected on selected criterion variables prior and immediately after the training programme. The pre and post-test scores were statistically examined by the dependent 't'-test and Analysis of Co-Variance (ANCOVA) for each and every selected variable separately. It was concluded that the squat jump training group had shown significantly improved in leg strength and explosive power. However the control group had not shown any significant improvement on any of the selected variables such as leg strength and explosive power.

Keywords: Squat, Jump, Training, Football

INTRODUCTION

Sports are institutionalized competitive activities that involve vigorous physical exertion or the use of relatively complex physical skills by participants motivated by personal enjoyment and external rewards. Sport is all forms of physical activity which, through casual or organized participation, aim to use, maintain or improve physical fitness and provide entertainment to participants.

The word "training" has been a part of human language since ancient times. It denotes the process of preparation for some task. This process invariably extends to a number of days and even months and years.

Jump squat is a plyometric exercise where the squatter engages in a rapid eccentric contraction and jumps forcefully off the floor at the top of the range of motion. This jump squat variation is performed rhythmically with each jump occuring immediately after the next. The performance will be just like the vertical or horizontal jumps. These variations are most effective for reactive development and to peak the vertical and horizontal jumps. They should quickly descend down into a 1/4 squat position and try to jump as high as and as farther an possible on the ascent - focus on driving the balls of the feet through the floor at toe-off, also these variation the focus is just as much on the negative eccentric contraction as it is on the "jump".

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue Vol: 6, No: 2, May 2019

EFFECT OF WALKING PROGRAMME ON SELECTED PHYSIOLOGICAL VARIABLES AMONG MIDDLE AGED WOMEN

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ABSTRACT

The purpose of this study was to investigate the effect of walking program on selected physiological variables among middle aged women. To fulfill these aim thirty subjects were selected from virudhunagar district. The selected subjects were aged between 45 to 55 years. The subjects were given only walking exercise for six weeks. The selection of the subject was made at random. For the present study the following dependent variables were selected as physiological variables such as blood pressure and body fat. Walking exercise was selected as independent variable. To find out any significant difference, the dependent 't' radio was used. The result of the study showed that the training program has resulted in to bring about desirable and significant changes in blood pressure and decrease of the percentage of body fat of middle aged women.

Keywords: Walking programme, blood pressure body fat, middle aged women.

INTRODUCTION

Today middle-aged women are so busy that they cannot take even healthy food. Now a day middle-aged women have no time to relax their body and mind. They do not have the awareness of their body and health. They do not have awareness and knowledge about food how to tea and when to take and where to take and they have no ideas how to maintain the body.

They have no relaxed mind in their working sites that leads to blood pressure and diabetes. The percentage of body fat-reduce treatment benefits of obese individuals. Obese patient which risk factors for coronary heart disease should fat-reduce programme.

Walking is a common exercise to all the people at various stage. It needs no coaching and equipment's. They can walk at any safety and leveled area. Walking as examined by

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PHYSICAL EDUCATION

RELATIONSHIP OF SPEED LEG STRENGTH AND COORDINATION ON 100M SPRINTING PERFORMANCE

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Abstract

The purpose of the study was to find out the relationship between speed, leg strength and coordination and 100m sprinting performance. For this purpose, 29 university level sprinters were selected from different colleges and athletic club in Chennai. The performance of 100-meter sprint was measured in 1/100 of seconds, speed was tested with 50m, leg strength was tested with standing broad jump and coordination was tested through Scott obstacle race test. The collected data were analyzed with Pearson product moment correlation to find the relationship between speed, leg strength and coordination with 100-meter sprint performance. In all cases, level of significance was fixed at 0.05. It was concluded that speed and coordination had significant correlation with 100m sprint performance.

Keywords: Speed, Leg Strength, Coordination.

INTRODUCTION

The strength, power and speed are inherently related to one another, because they are all the output of same functional systems to generate the sprint (Delecluse, 1997). The braking/propulsion phases occur immediately after the block phase and that muscle strength strongly affects running velocity in the sprint start (Mero, 1988). Strength coached should be aware that the potential benefits of increased muscular strength during short sprints are likely to be affected by mechanical specificity and that improvements in sprinting performance may not occur immediately after a period of resistance training (Moir, et al, 2007). Muscle training with high contraction velocity is one of the main methods of increasing muscle power. Passive leg press training is a unique method for enhancing jump performance, speed and muscle power (Liu et al, 2013). Performance at 100m sprint is strongly associated with strength and power parameters (Smirniotou, 2008). The selected motor variables muscular strength and speed were higher positive relationship in 100m sprinting performance (Valsaraj 2013). The maximum absolute strength was more related to maximum sprinting speed (Young et al. 1995). Resistance training indicates that intramuscular coordination is an important component in achieving transfer to sports skills (Warren, 2006). Improved movement coordination will have a greater impact on muscle force gains in more complex skill (Daley, 2007).

METHODOLOGY

The purpose of the study was to find out the relationship between speed, leg strength and coordination on 100m sprinting performance. For this purpose, 29 university level sprinters were selected from different colleges and athletic club in Chennai. The performance of 100-meter sprint was measured in 1/100 of seconds. Speed was tested with 50m test. The speed was recorded nearest one tenth of the seconds. Leg strength was tested with standing broad jump test. The measurement was taken from takeoff line to the nearest point of contact on the landing. Coordination was tested through Scott obstacle race test. The time taken from start to the finish was recorded in one-tenth of a second. The collected data were analyzed with Pearson product moment correlation to find the relationship between speed, leg strength and coordination with 100-meter sprint performance. In all cases, level of significance was fixed at 0.05.

Registrar
Tamilnadu Physical Education
and
Sports University
Chennai

2018-19

Original Article

ISSN: 2349 - 4891

International
Journal of Recent Research and Applied Studies
(Multidisciplinary Open Access Refereed e-Journal)

Relationship of Stride Length Stride Time Stride Frequency on 100m Sprint Performance

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Received 15th October 2018, Accepted 08th November 2018

Abstract

The purpose of the study was to find out the relationship of stride length, stride time and stride frequency on 100m sprint performance. For this purpose, 13 university level sprinters were selected from different colleges and athletic club in Chennai. The subjects were captured while running 100 meters sprint on mud track using four YI cameras with f/2.8 aperture lens with 155 degrees of view, resolution at 1080p and 60fps. All the 4 cameras were mounted at a height of 0.93 meters with the equal distance of seven meters from plane of motion. Video was captured from 40 meters to 68 meters of 100 m performance. The performance of 100 meter sprint was measured in 1/100 of a second. The captured video was analyzed by KINOVEA software to find out the stride length (meters), stride time (seconds) and stride frequency (strides/s). The collected data were analysed using Pearson product moment correlation to find the relationship of stride length, stride time and stride frequency on 100m sprint performance. In all cases, level of significance was fixed at 0.05. It was concluded that stride length and stride frequency had significant correlation with 100m sprint performance.

Keywords: Stride Length, Stride Time, Stride Frequency.

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Introduction

The speed is the determinant component of 100m sprinting performance and the speed is the product of stride length and stride frequency. Success in sprinting depends on the stride length and stride frequency (Sadri, 1994). The stride length is the more contributing factor of speed in 100m performance than stride frequency among average and elite sprinters (Mackala 2007). Maximal velocity running is a result of stride length and stride frequency. Stride length can be greatly limited by an individual's size. Stride frequency can be affected by muscle composition (Majumdar, 2011). The stride time and stride frequency are the major parameters for the elite sprinters (Coh et al. 2001). The shorter sprinters are shorter in stride length and greater in stride frequency. The best sprinters of the world were observed by longer stride length and slower in stride frequency, most of the sprinters prefer to run with a shorter stride length but a faster stride frequency (Rompotti, 1972). The stride length and stride frequency is most essential factor to predict the sprinting performance (Hoffman, 1971). There are many studies reinforcing the fact that stride frequency and stride length are the determinants of 100m sprint speed. But there is no evidence whether stride frequency and stride length at acceleration phase contributes to 100m sprint performance. Hence, the present study investigate whether stride length, stride frequency and stride time at acceleration phase influences 100m sprint performance.

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Methodology

The purpose of the study was to find out the relationship of stride length, stride time and stride frequency on 100m sprint performance. For this purpose, 13 university level sprinters were selected from different colleges and athletic clubs in Chennai. The subjects were captured while running 100 meters sprint on mud track using four YI cameras with f/2.8 aperture lens with 155 degrees of view, resolution at 1080p and 60fps. All the 4 cameras were mounted at a height of 0.93 meters with the equal distance of seven meters from plane of motion. Video was captured from 40 meters to 68 meters of 100m performance. The performance of 100m sprint was measured in 1/100 of a second. The captured video was analyzed with KINOVEA software to find out the stride length (the stride length was measured from toe to toe contact distance of successive steps in meters), stride time (time taken to complete the stride in seconds) and stride frequency (stride frequency is the number of strides taken in a given amount of time in numbers of stride/seconds). The collected data were analyzed using Pearson product moment correlation to find the relationship of stride length, stride time and stride frequency on 100m sprint performance. In all cases, level of significance was fixed at 0.05.

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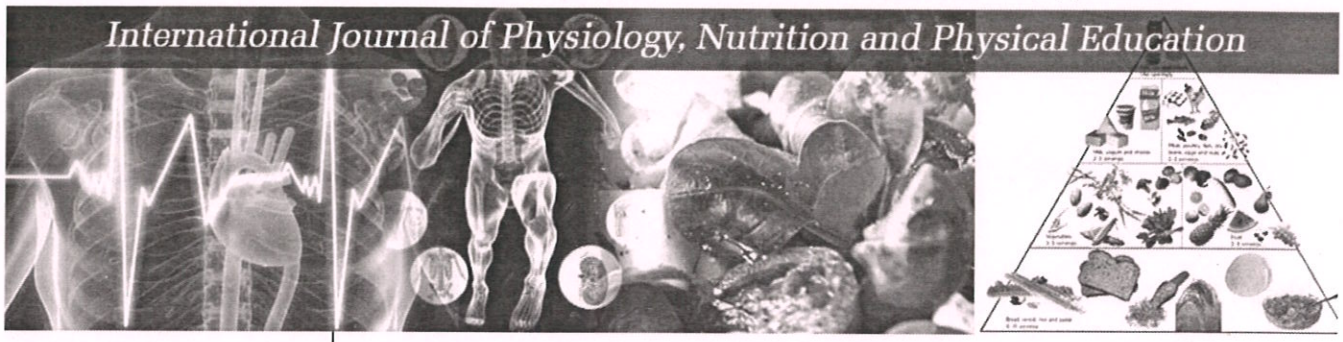
2018-19

International Journal of Physiology, Nutrition and Physical Education 2019; 4(1): 1380-1381



ISSN: 2456-0057
IJPNPE 2019; 4(1): 1380-1381
© 2019 IJPNPE
www.journalofsports.com
Received: 19-11-2018
Accepted: 21-12-2018

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Correlation of goalkeeping performance in relation to anthropometric and physical fitness variables in field hockey

Kalaiselvan R and Dr. P Rajinikumar

Abstract
The purpose of the study was to predict the field hockey goalkeeping performance in relation to their anthropometric and physical fitness variables. To achieve the purpose of this study, fifteen Inter-Collegiate goalkeepers were selected as subjects from Chennai and age group was ranged from 19 to 25 years. The height, arm length, agility and flexibility were selected as independent variables. The overall goalkeeping performance of the goalkeeper was measured using the 10 point scale which consists of five penalty shootout. Each goalkeeper was given five trials only. The successful trials of each goalkeeper were digitized and analyzed by taking the mean values. The selected anthropometric variables height was measured in centimeters by stadiometer and arm length was measured in centimeters by steel tape. The selected physical fitness variables agility was measured in seconds by agility and flexibility was measured in centimeters by flexibility test. The collected data were statistically analyzed by using Pearson product moment correlation and the level of significance was fixed at 0.05 level. It was concluded that the flexibility, height and arm length has significant and positive correlation with performance of goalkeeper significant at 0.05 level. Agility has negatively significant correlated with performance in goalkeeper at 0.05 level.

Keywords: Height, arm length, agility, flexibility, goalkeeping

Introduction
Hockey is a dynamic field game, played by both sexes, requiring high level skills, excellent conditioning and well co-ordinated team efforts (Dubey, H.C. 1999) [1]. Field hockey, a team sport is played comparatively on a large population for active as well as secondary participation.

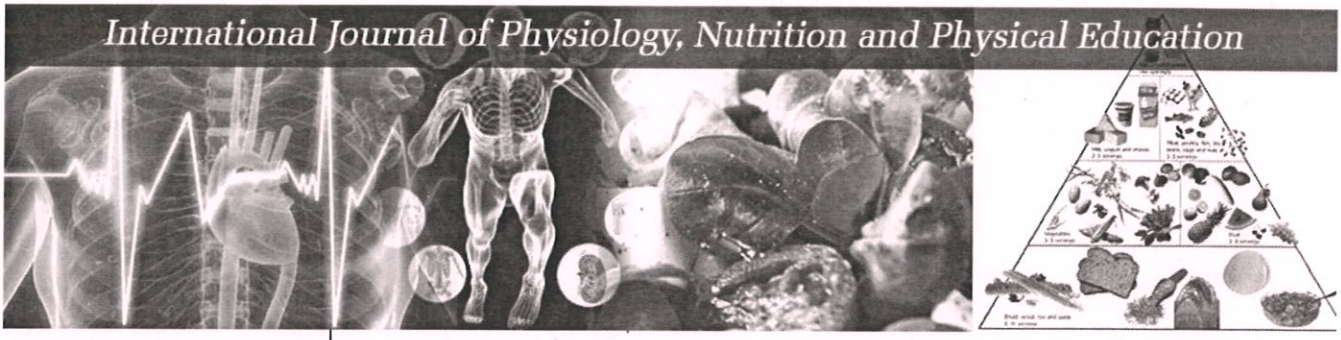
Anthropometry is the science that deals with measurements of size, weight and proportions of human body. It provides scientific methods and observations on the living humans. Anthropometric techniques (skinfold fat, circumference and diameter measurements) are popular for predicting body composition because they are not much expensive, require little space and can be performed easily (Behenke and Willmore, 1974 and Pollock and Willmore, 1990) [2]. Anthropometry is oftenly used in physical education, sports science, physical activity and biomedical sciences.

The study was investigated the relationship of anthropometric measurements, strength and flexibility of lower limbs to the skating speed of 17 university hockey players. The tests conducted were leg strength, grip strength, lower limb flexibility, skating speed test and anthropometry of legs. The results revealed that the flexibility was considered a necessary factor to each and a general skating body type. Flexibility was found to be correlated with strength but anthropometry and flexibility were not related to skating speed (Reid, 1978) [8].

Investigated the national football and hockey players with regard to their aerobic power and body composition according to their field positions. It was found that the players of different positions were quite similar in body mass, body weight and aerobic power (Kansal. *et al*., 1980a) [3]. Further suggested that the body proportions of defenders and offenders did not differ much. The two groups showed significant difference in body size and other body measurements (Kansal *et al*., 1980b) [4]. Conducted a study to determine the level of physical fitness of trained university athletes, form body composition, static strength and

2018-19

International Journal of Physiology, Nutrition and Physical Education 2019; 4(1): 1354-1356



ISSN: 2456-0057
IJPNPE 2019; 4(1): 1354-1356
© 2019 IJPNPE
www.journalofsports.com
Received: 23-11-2018
Accepted: 24-12-2018

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Impact of stance width on field hockey goalkeeping performance in penalty stroke

Kalaiselvan R and Dr. P Rajinikumar

Abstract
The purpose of the study was to find out the impact of stance width on goalkeeping performance in penalty stroke in field hockey. To achieve the purpose of this study, ten Inter-Collegiate goalkeepers were selected as subjects from Chennai and age group was ranged from 19 to 25 years. The stance width and knee angle in the penalty stroke position were selected as independent variables. The overall penalty stroke performance of the goalkeeper was measured using the 10 point scale which consists of five penalty strokes. Each goalkeeper was given five trials only. The successful trials of each goalkeeper were digitized and analysed by taking the mean values. The goalkeepers preferred stance width and the knee angle also was measured by using KINOVEA software. Canon EOS 600D and SONY HDR-XR550E camera was positioned on a camera tripod 1.50m off the ground 6.40 m directly in front of the goalkeeper and 5.00m directly perpendicular to the goalkeeper. The collected data were statistically analysed by using Pearson product moment correlation and the level of significance was fixed at 0.05 level. It was concluded that the stance width had a significant relationship with goalkeeping performance in penalty stroke position in field hockey.

Keywords: Penalty stroke, goalkeeping, stance width

Introduction
A game of field hockey is won by outscoring the opposition. The goalkeeper forms the last line of defence for a team and has task is to intercept shots that are made from within a 14.6m radius from the goal. An excellent goalkeeper can influence a game decisively to his team's advantage, when his calmness and ability to communicate themselves to the rest of the defence. His reliability gives not only his defence, but also his forwards, confidence in themselves and trust in him, qualities which can inspire the whole team to an outstanding performance and, at the same time, cripple the opposition. If on the other hand, the last line of defence is weak and suffers from nervousness and unsureness, his influence on his team's performance is always negative, even if he does not let in a goal during the game. For instance, the forwards are then afraid to mount an attack with numerical superiority and all too easily fallback upon nervous defence (Wein, 1973) [3].

Goalkeepers were not considered the glamorous men in earlier days but now with recent revolution in the development of the game things have changed and there is a general recognition of importance of goalkeeper. A good goalkeeping performance not only frustrates opponents in their attempt to score goals but also spread an air of confidence to fellow defenders. The goal keeper should endeavor to play calmly with concentration and to act with determination before and during the game. To build him up both physically and psychologically, the goalkeeper in training should frequently play in other positions also both as a defender and as an attacker (Whitaker, 1986) [2].

Goalkeeping is an exciting job, one that can result in dramatic saves which keep a team in a game. Some of the basic skills the goalkeeper must develop are mobility, quick reflexes and agility to clear rebounds and to utilize the sliding tackle to challenge an attacker who has broken clear of other opponents. It is also essential for the goalkeeper to direct the defence. But his primary duty is to save goals. He must never forget where the goal posts are and he has to work hard to improve his defense mechanism at penalty-corners and strokes (Cadman, 1985) [4]. Ball and Giblin (2009) [1] analysed the minimizing movement time is essential for a

International Journal of Fitness, Health, Physical Education & Iron Games
ISSN 2349 – 722X, Special Issue Vol: 6, No: 2, May 2019

RECONSTRUCTIVE VERSUS NON RECONSTRUCTIVE PHYSICAL THERAPY REHABILITATION ON ANTERIOR CRUCIATE LIGAMENT INJURY OF KNEE – AN EVIDENCE BASED REVIEW

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ABSTRACT

Clinical Question: Anterior Cruciate Ligament injury is very common in pivoting and twisting knee sports events which restrain the career of athletes. There is still consensus among the athletes whether to opt reconstructive or non reconstructive rehabilitation program to get remedy and pursue their sports career.

Objective: The purpose of this evidence based review was to systematically analyze aggregated data from the literature to determine if a benefit exists for either non reconstructive or reconstructive physical therapy rehabilitation for ACL injury.

Study Design: Evidence based review of literature.

Methodology: The literature selection process included the extraction of data on the following clinical parameters on research oriented databases: post traumatic osteoarthritis, return to sports, clinical outcome scores, revision surgery, and knee instability/pathological laxity after the reconstructive or non reconstructive physical therapy rehabilitation program.

Conclusion: Literature review revealed multiple trends that favor early surgical reconstructive stabilization over non reconstructive or delayed reconstructive physical therapy rehabilitation. There are also very minimal or no difference elucidated between the reconstructive and non reconstructive physical therapy rehabilitation programme in some clinical parameters.

Keywords: anterior cruciate ligament; ACL reconstruction; Physical Therapy rehabilitation.

INTRODUCTION

Injuries to the knee joint ranked the second most frequently occurring musculoskeletal injuries in primary care (van Grinsven, van Cingel, Holla, & van Loon, 2010). The prevalence of knee injuries is on the rise in sports recreational or competitive of which most common are ligament injuries and in particular anterior cruciate ligament (ACL) injuries. It is commonly injured in the adolescent age group with the knee is slightly flexed and in external rotation. ACL is the principal stabilizer of the knee complex with an injury causing the knee to become unstable. Management of this knee instability involves conservative or reconstructive surgical management with rehabilitation before and after, being the most important part of the treatment (Beynnon et al., 2005). Rehabilitation plays a momentous role in determining how quickly and safely an athlete can return to sport (Cascio, Culp, & Cosgarea, 2004). Reports have been stating that sports career of professional athletes has been reduced up to two years, along with a reduction in their performance by up to 20 % following ACL injuries (Wilk et al., 2012).

The primary objective of this study is to provide an evidence-based literature review of the effectiveness of reconstructive surgery versus non reconstructive (conservative) physical therapy rehabilitation on ACL injuries in knee complex. In light of the prevalence of recent literature reviews on ACL injuries and the lack of consensus in the literature on the ideal

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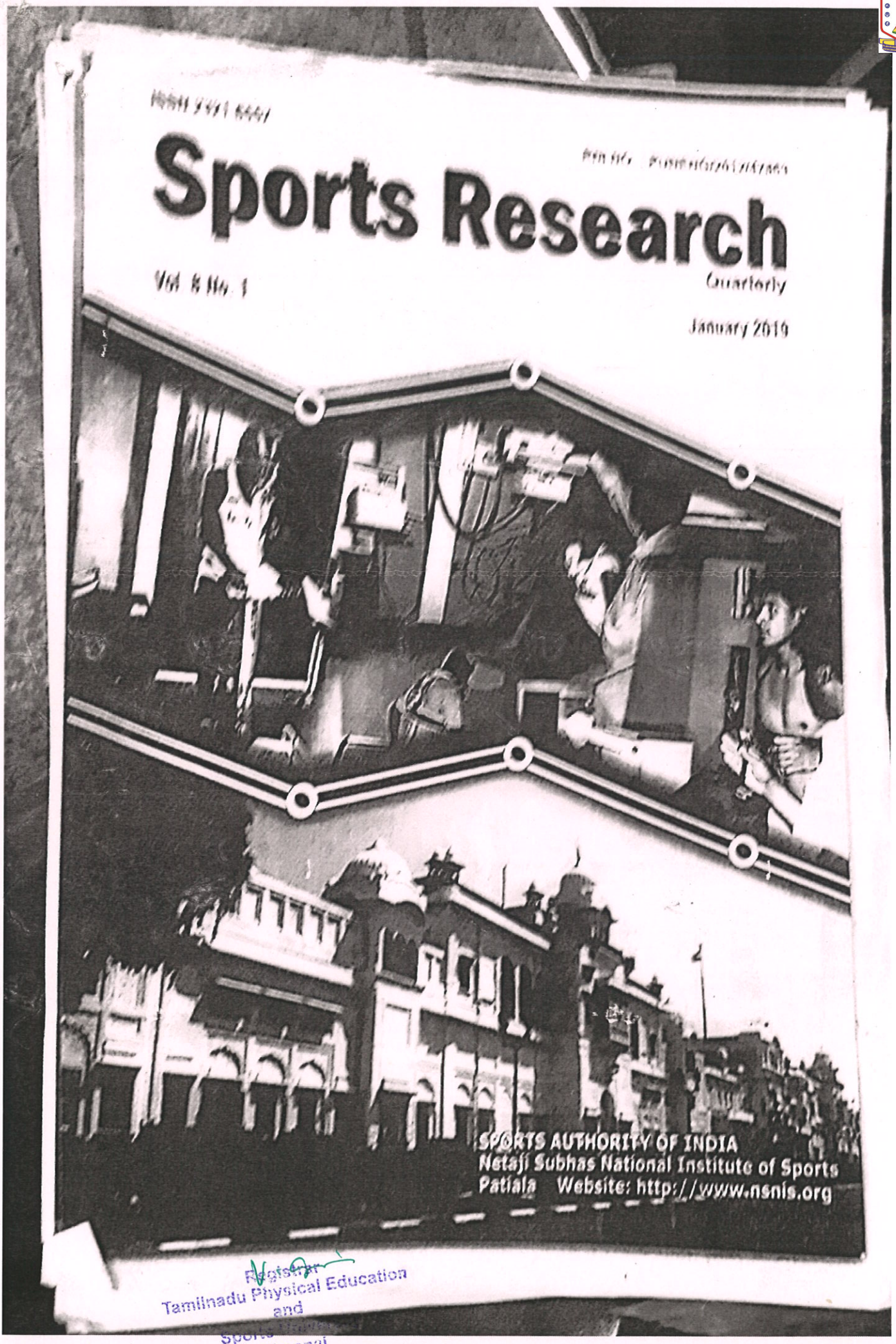
Sports Research

Quarterly

Vol. 8 No. 1

January 2019



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Vol. 8 January, 2010 No. 1

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Effect of Yogic Practices on Selected Psychological Variables among Athletes

Dr. P. Loganathan*

ABSTRACT

The purpose of the present study was to find out the effect of yogic practices on selected psychological variables among athletes. For this purpose 30 inter collegiate men athletes were selected as subjects from the Arts and Science College, and they were divided randomly into two equal groups with 15 each as experimental and control group. Both the group undergone usual athletics training in the morning and evening, three to four hours, and in addition experimental group undergone Yogic practice morning 01 minutes in a schedule of weekly three alternative days, and the control group was not given any special training other than their routine Athletics training. The training period for this study was 6 weeks in a schedule of three days in a week. The pre and post test were conducted prior and after the training programme on the selected psychological variables of stress, anxiety and self-confidence. The collected data were statistically analyzed by using ANCOVA, to find out the significant difference between the groups, if any. The significant level was fixed at 0.05 level it was concluded from the result of the study that the experimental group that had done the yogic practices had significant impact on the selected psychological variables of stress, anxiety and self-confidence among inter-collegiate athletes. Further, the mean value indicated that the experimental group considerably reduced the stress and anxiety and increased self-confidence than the control group.

Key words

Yoga, stress, anxiety and self-confidence.

INTRODUCTION

Yoga is perhaps the only form of activity which massages all the internal glands and organs of the body, in a thorough manner. Yoga acts in a healthy manner on the various body parts. Yoga, originated in India thousands years ago, is a method of learning that aims to attain the unity of mind, body, and spirit through three main Yoga structures: exercise, breathing, and meditation (Calbet, 1999). The physical postures and exercises (Asanas), breathing techniques (pranayama), deep relaxation, and meditation practices are cultivating proper awareness and ultimately more profound states of consciousness.

Yoga (Yoga Psychology) offers practices to enhance mental health and alleviate the symptoms of psychological illness or mental illness, using mind-body-lifestyle interventions to cultivate a healthy, productive, flourishing life. According to the British Psychological Society, yoga involves concentration on the breath and

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Tamilnadu Physical Education
and
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Chennai

2018-19

ISSN 2321-6557

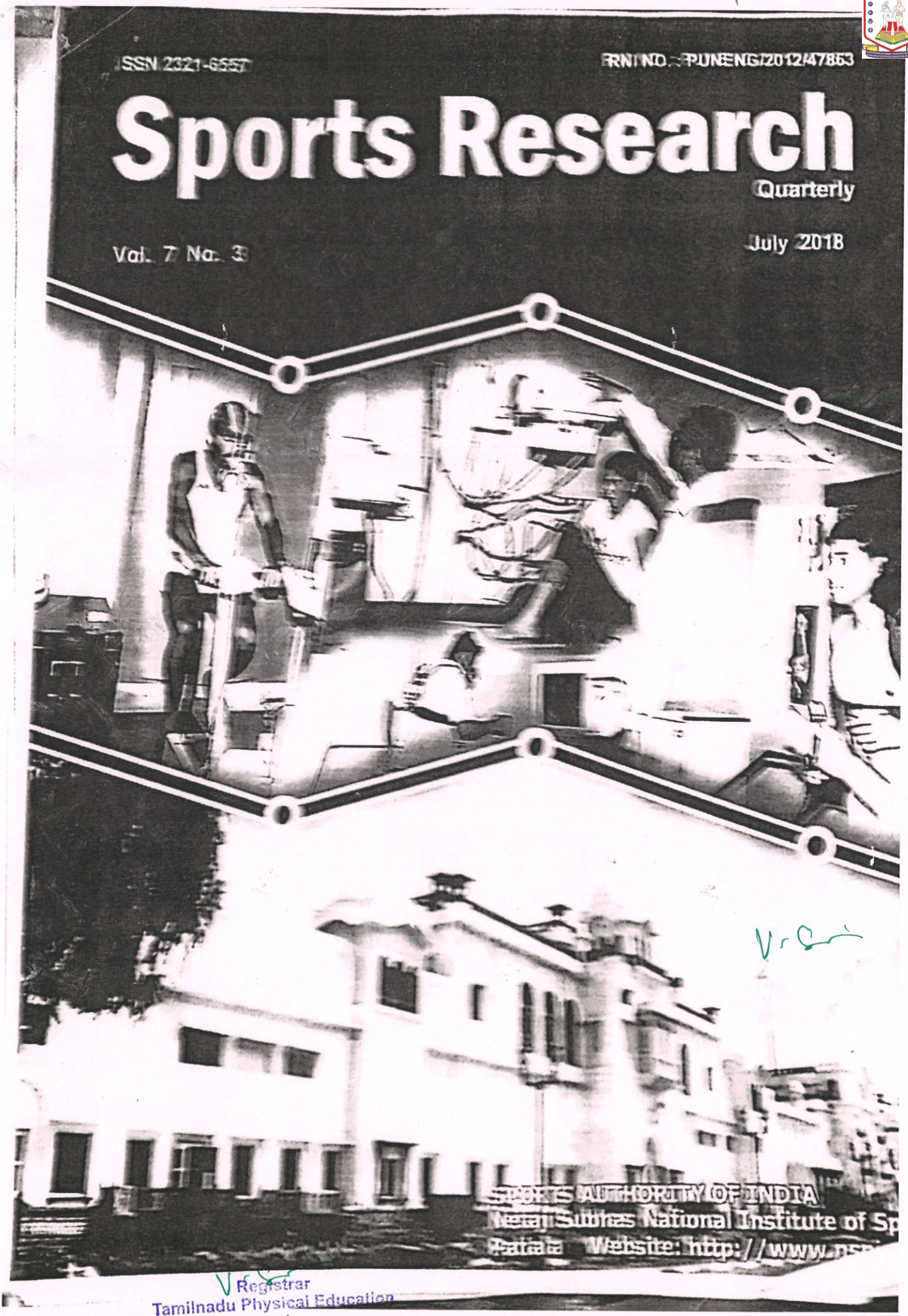
RNI NO. : PUNENG/2012/47863

Sports Research

Quarterly

Vol. 7 No. 3

July 2018



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Vol. 7 July, 2018 No. 3

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AT A GLANCE

History and Progression of Commonwealth Games

Dr. P. Gopinathan*

INTRODUCTION

The Commonwealth Games is an international, multi-sport event involving athletes from the Commonwealth of Nations. It is organized among the countries of former British Empire. The current form of games has come after many evolutionary chances. The Commonwealth Games are arranged every four years between the Olympic years among the member countries of Commonwealth of Nations since 1930; except 1942 and 1946, due to World War II. It is the third mega sports event in the world after Olympics and Asian Games. Commonwealth Games being long known as the 'Friendly Games'. There are currently 54 members of the Commonwealth of Nations, and 72 Games Associations (teams) participate in the Games. The Commonwealth Games may not have as rich sporting history as the Olympics but over the years, the event has grown in stature from just being a sporting extravaganza for former British colonies by throwing up some world-class athletes. It has tremendous growth and progression from one after other games.

HISTORY OF COMMONWEALTH GAMES

Commonwealth Games are like the Olympics, the multi-sport event – dubbed as the "Friendly Games" – is held every four years; but, unlike the Olympics, the competition only comprises countries and territories which formed part of the British Empire in the earlier period. Reverend Ashley Cooper was the first person to propose the idea of having a Pan-Britannic sporting contest to foster a spirit of goodwill and understanding within the British Empire. The holding of the first recorded Games between Empire athletes coincided with the celebrations in connection with the Coronation of His Majesty King George the Fifth, in 1911, and was known as the 'Festival of Empire'.

The idea for organizing Commonwealth Games took shape during the Olympic Games of 1928 as Canada got the rights of organizing the first meet and then at the initiation of a Canadian athlete, Melville Marks Robinson, the first ever British Empire Games were held in Hamilton, Canada in 1930. It attracted 400 athletes from eleven countries with six sports. The success of the first Games provided enough incentive to make them a regular feature. In the year 1954, feature the name of the game was changed as British Empire and Commonwealth Games. In the year 1970, the games were renamed as British Commonwealth Games. In the Year 1978, the name for the games was again changed to The Commonwealth Games; and it is retained till date.

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ISSN 2231-3265
(Online and Print)

International Journal of Health, Physical Education & Computer Science in Sports

A Peer Reviewed (Refereed) International Research Journal

Volume - 32 No: 1
QUARTERLY
October 2018 to December 2018

Published by :
Indian Federation of Computer Science in Sports
www.ijhpecss.org & www.ifcss.in

Publication Impact Factor I2OR 4.005
ISRA Journal Impact Factor 5.115
Index Journal of

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2018-19

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Physical Edu
Sports University

International Journal of Health, Physical Education and Computer Science in Sports
ISSN 2231-3265
Volume No.32, No.1pp52-54
Publication Impact Factor 5.115
A Peer Reviewed (Refereed) International Research Journal

ect of Physical Exercises, Fartlek and Combined Training on Selected Physical ysiological and Psychological Variables among Men Trainee Sub-Inspectors of Andhra Pradesh

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cal exercise means planned, structured repetitive and purposeful physical activity. Physical ses are performed quickly and with a lot of heavy breathing, Physical exercise in any organized y that involves continuous participation and effects on whole body. Exercise occupies a leading role ing a person fit. It will be quite difficult to adjunct one's life in terms on stress, diet, and sleep and without proper exercise. Regular practices of physical exercise maintain the physical body in an n condition and promote health even in an unhealthy body. Physical exercise is a planned and ent activity whose primary goal is to improve the health and physical shape of the participants and te the adaptive process that will produce certain positive changes in the human body.

EK TRAINING

Physical work out are done with oxygen. Use of oxygen in the body metabolic or energy ng process to perform the work by muscles is refereed as aerobics. Many types of exercise d at moderate levels of intensity for extended periods of time are known as aerobic activity. lfartlek is said to be the forerunner of the interval training system. It involves alternating fast-and ng over natural terrain. Interval training is a programme of repeated running with a set of resting g after each repetition. Continuous training is when an athlete's exercise in a steady aerobic ut any pauses or breaks in between.

AL FITNESS

l fitness refers to the organic capacity of the individual to perform the normal task of daily living ndue or fatigue having reserves of strength and energy available to meet satisfactorily any d demands suddenly placed upon him." – Nixon.

E OF THE STUDY:

archer will prove that the physical exercises and fartlek training programme significantly selected physical, physiological, psychological variables.

ose of this study to find out whether the existing training programme for trainee sub-inspectors cant influence selected physical, physiological, and psychological variables. Whether the physical exercise or combination of physical exercise and fartlek training has made any uence on selected physical, physiological, psychological variables than the regular training inspectors.

OF THE PROBLEM:

of the study was to find out the "Effect of physical exercises, fartlek and combined training physical, Physiological and psychological variables among men trainee sub inspector of

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gnificance Of The Study:

he present study would acquaint the authorities on the effect of physical exercises, fartlek training and mbined effect of physical exercises and fartlek training on selected physical variables such as speed, plosive power, muscular endurance among trainee sub-inspectors.

he present study would acquaint the authorities on the effect of physical exercises, fartlek training on lected physiological variables blood pressure, resting pulse rate among trainee sub-inspectors.

he present study would acquaint the authorities on the effect of physical exercises, fartlek training and mbined effect of physical exercises and fartlek training on selected psychological variables anxiety, self ncept among trainee sub-inspectors.

uld facilitate to find out the differences among the existing physical activities provided to the trainees the proposed physical exercises, fartlek training and combined physical exercises and fartlek training ong trainee sub-inspectors.

OTHESES:

It is hypothesized that there would be significant improvement in selected physical variables due ysical exercises, fartlek training and combination of physical exercises and fartlek training to trainee nspectors of Andhra Pradesh.

It is hypothesized that there would be significant improvement in selected physiological variables o physical exercises, fartlek training and combination of physical exercises and fartlek training to ee sub-inspectors of Andhra Pradesh.

It is hypothesized that there would be significant improvement in selected physiological variables o physical exercises, fartlek training and combination of physical exercises and fartlek training to ee sub-inspectors of Andhra Pradesh.

MITATIONS:

ical exercises,Fartlek training

ined training (physical exercises, Fartlek training)

four sub- inspectors randomly selected from Andhrapradesh police academy, which have been ed to undergo training during the year 2017-2018.

ge of the subjects ranged between 21 to 27 years.

ieve the purpose of the study following variables has been selected physical exercises and fartlek physical, physiological and psychological variable.

aining schedule should be fixed 12 weeks programme.

dy is delimited with training of six days per week (each day 90 minutes of training).

dy further delimited to four equal groups three experimental and one control group.

ATIONS:

inee sub-inspectors would have been under different training methods to get them selected as e sub-inspector. The effects of training were not considered in this study.

and environmental factors which contribute to physical, physiological, psychological factors have n controlled.

scholar confined himself only to the men trainee sub-inspectors (direct ent) for this study.

dology

TION OF SUBJECT

re the purpose of the study sixty four men trainee sub-inspectors were selected from Beachpally, radesh. Their age ranged from 21 to 25 years. The experimental treatment assigned such as ning, physical exercise programme and fartlek training with physical exercise programme for a ups.

of variables

archer had gone through various literatures and had discussions with various experts and with before selecting of variables. The availability of techniques for the purpose of analysis, ailability of the procedure and outcome were extensively taken care of before finding the The following independent and dependent variables were selected.

ndent variables:
cal variables
d,Explosive power and Muscular endurance
ological variables
lic Blood pressure,Diastolic Blood pressure and Resting pulse rate
ological variables
ty and Self-concept
endent variables
k training and Physical exercise programme.
k training with physical exercise programme

stical **Analysis Of Data**

llowing statistical techniques were adopted to treat the collected data in connection with ished hypothesis and objectives of this study.

ata was collected from the four groups before and after the training programme on selected al, physiological and psychological variables of trainee sub inspector. Analysis of Co Variances OVA) was applied to find out the significant differences among all the groups in the selected es. Whenever the adjusted post-test means were found significant, the Scheffe's post hoc test was strator to find out the paires means difference. All the data were analyzed using computer with statistical packages. The level of significance was fixed at 0.05 level of confidence.

usions

e basis of the interpretation of data, the following conclusions were drawn from the study.

al variables:

ected physical variables speed, explosive power and muscular endurance significantly improved ee experimental groups when compared with control group.

mbined training group [fartlek training with physical exercise group] is better than the fartlek g group and physical exercise group on speed and muscular endurance.

al exercise group is better than the fartlek training group on explosive power and muscular nce.

k training group is better than the physical exercise group on speed.

r it was concluded that there is no significant differences exist between physical exercise group and ed training group [fartlek training with physical exercise group] on explosive power.

ological variables

ected physiological variables resting pulse rate and cardiovascular endurance significantly d by three experimental groups when compared with control group.

mbined training group [fartlek training with physical exercise group] is better than the fartlek group and physical exercise group on cardiovascular endurance.

t is no significant differences exist between fartlek training group, physical exercise group and ek training group [fartlek training with physical exercise group] on resting pulse rate.

t it was concluded that there is no significant improvement due to the effect of fartlek training hysical exercise group and combined training group [fartlek training with physical exercise group] ic blood pressure and diastolic blood pressure.

ological variables

ded psychological variables anxiety and self concept significantly improved by three ental groups when compared with control group.

t was concluded that there is no significant differences exists between fartlek training group, exercise group and combined training group [fartlek training with physical exercise group] on nd self concept.

2018-19

ISSN : 2230-7540

Tilly

Journal of Advances & Scholarly Researches in Allied Education

Vol 16, Issue 6
May 2019

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Journal of Advances and Scholarly Researches in Allied Education
Vol. 16, Issue No. 6, May-2019, ISSN 2230-7540

Effect of Physical Exercises, Fartlek Training and Combined Training on Anxiety among Men Trainee Sub Inspectors of Andhra Pradesh

Yaswantha Reddy B.[1]* Dr. I. Lilly Pushpam[2]

[1] Research Scholar, Tamil Nadu Physical Education and Sports University

[2] Assistant Professor, Tamil Nadu Physical Education and Sports University

Abstract *– The present study was undertaken to analyse the effect of physical exercises, fartlek training and combined training on anxiety among men trainee sub-inspectors of Andhra Pradesh. The researcher selected sixty four men trainee sub-inspectors were from beachpally, Andhra Pradesh. Their age ranged from 21 to 25 years. The subject chosen for the study divided into four equal groups and designed fartlek training group (FTG), Physical exercise group (PEG) and fartlek training with physical exercise programme (FTPEG) and control group (CG). Experimental groups underwent for twelve weeks of training program on alternative days. The data were selected before and after the training period. The collected data analysed with analysis of covariance (ANCOVA). The level of significant was fixed at 0.05 levels. Where ever the 'F' ratio found significant Scheffe's post-test was used for find out the significant differences among the adjusted paired mean. The result of the study concluded that FTG, PEG and FTPEG are significantly improved anxiety level when compared with control group.*

Keywords: *Physical Exercises, Fartlek Training, Anxiety*

----------X----------

BACK GROUND AND PURPOSE

The police are people empowered to enforce the law, protect property and reduce civil disorder. Their powers include the legitimized use of force. The term is most commonly associated with police services of a state that are authorized to exercise the police power of that state within a defined legal or territorial area of responsibility. The word comes via medieval French police; from Latin politia " civil administration", from ancient Greek Law enforcement, however, constitutes only part of policing activity.

Exercise is a planned and expedient activity whose primary goal is to improve the health and physical shape of the participants (Ostojic et al., 2009), and to active the adaptive process that will produce certain positive changes in the human body (Tivanovic,2000) . This running is the combination aerobic and anaerobic is accomplished in a varied pace run by interrupting steady, continuous running of short sprints, one established form of varied pace training is known as fartlek (Hazeldine 1985). "The individual's belief about himself or herself, including the person's attributes and who and what the self is" (Baumeister 1999).

HYPOTHESIS

1. It was hypothesis that there will be significant improvement in anxiety level after the twelve weeks of fartlek training group (FTG), physical exercise group (PEG) and fartlek training with physical exercise programme (FTPEG) when compared with control group (CG).

2. It was hypothesis that fartlek training with physical exercise programme (FTPEG) will be significantly better than fartlek training group (FTG) and physical exercise group (PEG).

METHODOLOGY

The purpose of the study was to find out the influence of physical exercises, fartlek training and combined training on anxiety level among men trainee sub inspectors of Andhra Pradesh. The researcher selected sixty four men trainee sub-inspectors from beachpally, Andhra Pradesh. Their age ranged from 21 to 25 years. The subject chosen for the study divided into four equal groups and designated fartlek training group (PEG), physical exercise group (PEG) and fartlek training with physical exercise programme (FTPEG) and

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control group (CG). Experimental groups underwent for twelve weeks of training program on alternative days. The data were collected by questionnaire.

RESULT AND DISCUSSIONS

The analysis of data on anxiety has been examined by analysis of covariance (ANCOVA). The level of significant was fixed at 0.05 levels. Where ever the 'F' ratio found significant Scheffe's post hoc test was used for find out the significant differences among the adjusted paired mean.

Table-I Analysis of covariance of pre-test, post-test and adjusted post-test on anxiety of experimental groups and control group

COMPUTATION OF ANALYSIS OF COVARIANCE OF ANXIETY

(Scores)

Test	Physical Exercise Group	Fartlek Training Group	Combined Training Group	Control Group	Source of variance	Sum of squares	df	Mean squares	Obtained F values
Pre test	45.50	51.31	52.44	49.86	between	443.81	3	147.94	2.51
					within	3535.13	60	58.92	
Post test	44.31	42.50	45.94	52.56	between	923.80	3	307.93	5.07*
					within	3642.31	60	60.71	
Adjusted	47.57	41.34	43.92	52.49	between	1101.18	3	367.06	13.53*
					within	1600.63	59	27.13	
Mean gain	1.19	8.81	6.50	-2.69					

Table F ratio at 0.05 level of confidence for 3 and 60 (df) and 3 and 59 df was 2.76

The table-1 shows that there is significant difference in anxiety among the four groups such as fartlek training group (FTG). Physical exercise group (PEG) and fartlek training and physical exercise group (FTPEG) and control group (CG). Since the calculated 'F' value required being significant at 0.05 levels for 3.60 and 3.59 degree of freedom is 2.76, but the calculate values for anxiety of adjusted post-test 'F' value is 13.53. This was higher than tabulated value. Since the obtain 'F" ratio is found significant, Scheffe's test is used as post hoc test.

Table-II

Scheffe's post hoc test for the differences between paired means of experimental and control groups on Anxiety

(Scores)

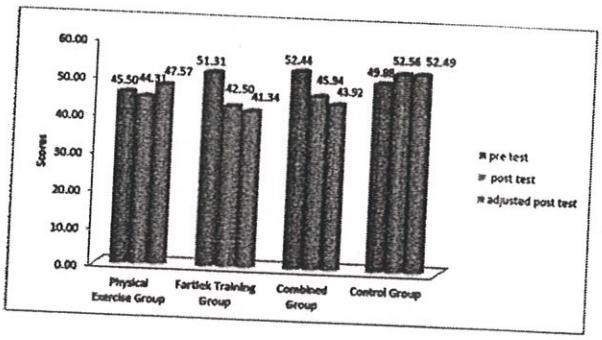
Physical Exercise Group	Fartlek Training Group	Combined Training Group	Control Group	Mean Difference	CD at 5% level
41.34			47.57	6.23*	5.49
	43.92		47.57	3.65	
		52.49	47.57	4.93	
41.34	43.92			2.58	
43.92		52.49		8.57*	
	43.92	52.49		8.57*	

Significant at 0.05 level of confidence

The table-II reveals that there is significant difference among pair adjusted post-test means between FTG and CG, PEG and CG and FTPEG and CG. The result of the study clearly showed that there is significant improvement in anxiety due to the influence of FTG,PEG and FTPEG when compared with control group.

BAR DIAGRAM SHOWING THE PRE, POST AND ADJUSTED POST TEST MEAN VALUES ON ANXIETY OF EXPERIMENTAL AND CONTROL GROUPS

(Scores)



DISCUSSION ON HYPOTHESIS

1. The first hypothesis says that there will be a significant improvement in anxiety after twelve weeks of PEG, FTG and FTPEG as compared with control group. The result of the study shows that there was significant improvement in anxiety after twelve weeks of PEG, FTG and FTPEG as compared with control group. Hence the research hypothesis accepted at 5% level of significance.

2. The second hypothesis says that fartlek training with physical exercise programme (FTPEG) will be significantly better than physical exercise group (PEG) and fartlek training group (FTG) as compared with control group. The result of the study shows that FTPEG is better than PEG and FTG. Hence the research hypothesis has been accepted

DISCUSSION AND FINDINGS

The result of the study found significant improvement on anxiety level due to the effect of physical exercises, fartlek training and combined training (physical exercise and fartlek training). The following studies connected with the anxiety **Kocher K.C and Pratap V (1972)** found that physical exercise improve anxiety and decrease psychosomatic problems. **Karen and Wendell (1994)** suggested on the bases of literature that physical activity improves the anxiety level.

CONCLUSION

1. Anxiety level significantly improved by three experimental groups when compared with control group.

2. Further it was concluded that there is significant differences exists between physical exercise group fartlek training group and combined training group [fartlek training with physical exercise group] among three experimental groups when compared with control group.

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2018-19

ISSN : 2230-7540

Lilly

Journal of Advances & Scholarly Researches in Allied Education

Vol 16, Issue-5
April 2019

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Journal of Advances and Scholarly Researches in Allied Education
Vol. 16, Issue No. 5, April-2019, ISSN 2230-7540

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Yaswantha Reddy B.[1]* Dr. I. Lilly Pushpam[2]

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HYPOTHESIS

1. It was hypothesis that there will be significant improvement in speed level after the twelve weeks of fartlek training group (FTG), physical exercise group (PEG) and fartlek training with physical exercise programme (FTPEG) when compared with control group (CG).

2. It was hypothesis that fartlek training with physical exercise programme (FTPEG) will be significantly better than fartlek training group (FTG) and physical exercise group (PEG).

METHODOLOGY

The purpose of the study was to find out the influence of physical exercises, fartlek training and combined training on speed level among men trainee sub inspectors of Andhra Pradesh. The researcher selected sixty four men trainee sub-inspectors from beachpally, Andhra Pradesh. Their age ranged from 21 to 25 years. The subject chosen for the study divided into four equal groups and designated fartlek training group (PEG), physical exercise group (PEG) and fartlek training

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with physical exercise programme (FTPEG) and control group (CG). Experimental groups underwent for twelve weeks of training program on alternative days. The data were collected by questionnaire.

RESULT AND DISCUSSIONS

The analysis of data on speed has been examined by analysis of covariance (ANCOVA). The level of significant was fixed at 0.05 levels. Where ever the 'F' ratio found significant Scheffe's post hoc test was used for find out the significant differences among the adjusted paired mean.

Table-I Analysis of covariance of pre-test, post-test and adjusted post-test on speed of experimental groups and control group

Table- I

COMPUTATION OF ANALYSIS OF COVARIANCE OF PRE, POST AND ADJUSTED POST TEST ON SPEED OF EXPERIMENTAL AND CONTROL GROUPS

(Scores in Seconds)

Test	Physical Exercise Training Group	Fartlek Training Group	Combined Training Group	Control Group	Source of variance	Sum of squares	df	Mean Squares	Obtained F values
Pre test	7.28	7.41	7.33	7.40	between	0.17	3	0.06	1.09
					within	3.19	60	0.05	
Post test	7.06	7.32	6.94	7.37	between	1.66	3	0.55	12.94*
					within	3.77	60	0.06	
Adjusted	7.13	7.17	6.97	7.33	between	1.06	3	0.35	14.37*
					within	1.26	59	0.02	
Mean gain	0.22	0.19	0.39	0.03					

The table value required for significance at 0.05 level of confidence of freedom 3, 60 and 3, 59 was 2.76.

The table-1 shows that there is significant difference in speed among the four groups such as fartlek training group(FTG). Physical exercise group (PEG) and fartlek training and physical exercise group (FTPEG) and control group(CG). Since the calculated 'F' value required being significant at 0.05 levels for 3.60 and 3.59 degree of freedom is 2.76, but the calculate values for speed of adjusted post-test 'F' value is 14.37. This was higher than tabulated value. Since the obtain 'F" ratio is found significant, Scheffe's test is used as post hoc test.

Table-II

Scheffe's post hoc test for the differences between paired means of experimental and control groups on speed

(Scores in seconds)

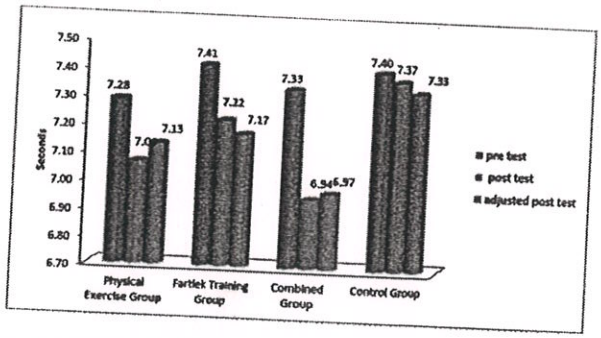
Physical Exercise Training Group	Fartlek Training Group	Combined Training Group	Control Group	Mean Difference	CD at 5% level
7.13	7.17			0.04	0.15
7.13		6.97		0.16	
7.13			7.33	0.20*	
	7.17	6.97		0.20	
	7.17		7.33	0.16	
		6.97	7.33	0.37*	

Significant at 0.05 level of confidence

The table-II reveals that there is significant difference among pair adjusted post-test means between FTG and CG, PEG and CG and FTPEG and CG. The result of the study clearly showed that there is significant improvement in speed due to the influence of FTG,PEG and FTPEG when compared with control group.

BAR DIAGRAM SHOWING THE PRE, POST AND ADJUSTED POST TEST MEAN VALUES ON SPEED OF EXPERIMENTAL AND CONTROL GROUPS

(Seconds)



DISCUSSION ON HYPOTHESIS

1. The first hypothesis says that there will be a significant improvement in speed after twelve weeks of Physical exercise group, Fartlek training group and FTPEG as compared with control group. The result of the study shows that there was significant improvement in speed after twelve weeks of Physical exercise group, Fartlek training group and FTPEG as compared with control group. Hence the research hypothesis accepted at 5% level of significance.

2. The second hypothesis says that fartlek training with physical exercise programme (FTPEG) will be significantly better than physical exercise group (PEG) and fartlek

training group (FTG) as compared with control group. The result of the study shows that FTPEG is better than PEG and FTG. Hence the research hypothesis has been accepted.

CONCLUSION

1. Speed level significantly improved by three experimental groups when compared with control group.

2. Further it was concluded that there is significant differences exists between physical exercise group fartlek training group and combined training group [fartlek training with physical exercise group] among three experimental groups when compared with control group.

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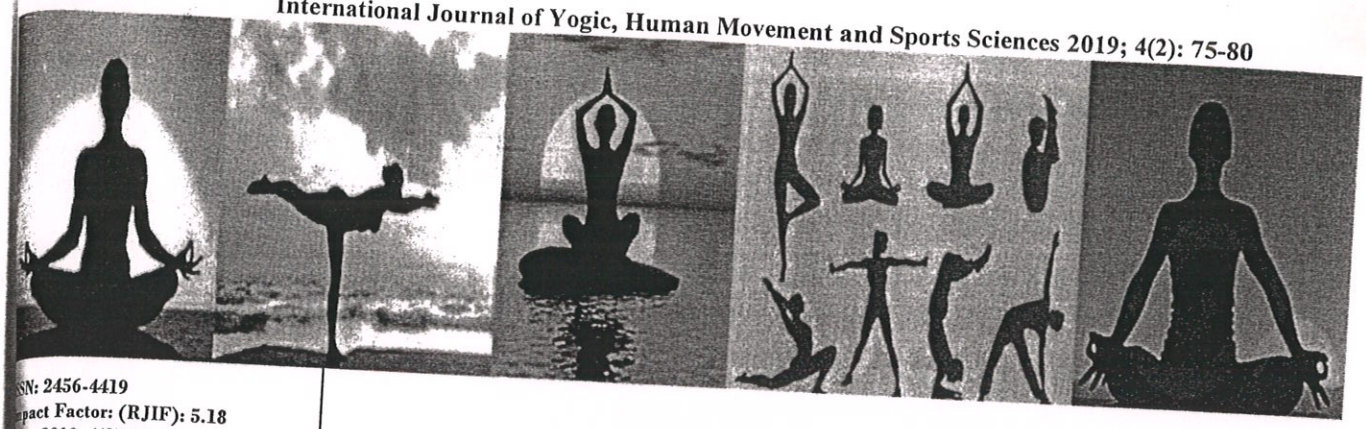
2018-19

International Journal of Yogic, Human Movement and Sports Sciences 2019; 4(2): 75-80



SN: 2456-4419
pact Factor: (RJIF): 5.18
ga 2019; 4(2): 75-80
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epted: 18-06-2019

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Effect of isolated and combind strength training endurance training on selected maximum strength and speed among women

Siby Thomas and Dr. Lillypuspam

Abstract

Aim: The objective of the present study is to identify the effects of Isolated and Combined Strength Training performances on maximum strength and speed among college level Women.

Methodology: Twelve weeks of Isolated Training was studied with constant-speed procedure and constant-time procedure. Twelve weeks of Combined Strength Training was studied maximum strength and speed. ANCOVA statistical analyses have been used to analyses the performance and outcome of the college level women and Scheffe's post hoc test was used to find out the mean difference of confidence Isolated Training and Combined Strength Training maximum strength and speed among college level Women.

Result: The submaximal-performance effects on maximum Strength F-ratio at 0.05 level of confidence (df) =3.56 (df) =2.70 Significant is better than control group. These effects have been compared for speed women F-ratio at 0.05 level of confidence for (df) =3.56, (df) =2.70. Significant is better than control group.

Keywords: Maximum strength, speed, Isolated and combined strength training

1. Introduction

The present study sought to evaluate the inconsistencies previously observed regarding the pre dominance of Isolated and Combined Strength Training for improving fitness. The experimental design initially equated and subsequently maintained the same relative exercise intensity by both groups throughout the programs. Thirty subjects were equally divided into isolated training (isolated training, exercise at 50% to 60% maximal work) or Combined Strength training (30 subject as working group and control group respectively at 100% maximal work) training groups that performed 30 min per day for 3 days in all 12 weeks. Following Isolated training and Combined Strength training, exercising work rates were parallel examined both the Combined Strength and Isolated training. Three equated groups were performed to measure the performance of maximum strength and speed; one group act as control group and another two group act as experimental group. I Combined Strength training and isolated training regimens are used to improved physical fitness. There is conflicting evidence as to which is the more effective in improving biochemical, physiological, and performance measures (Cunningham *et al*. 1979). The purpose of this study were to compare the effects of using the same relative work intensities in the two training modes and examine their effect in Isolated training and Combined Strength training tests.

2. Methodology

2.1 Sample selection

Simple random procedure was used to select the subjects for the present study. To delimit the present study only women of Kerala were selected. Totally, 90 members have been taken as sample size. The sample size was divided into three groups namely; isolated training group, combined strength training group and control group.

2.2 Collection of data

A selected package of isolated training and combined strength were administered to collect the data.

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12 weeks was administered to all three groups. The performance of all groups was administered for only 30 min per day especially for continuously 3 days in all 12 weeks.

2.3 Analysis

ANCOVA and Scheffe's post hoc test were used for the study. The mean, sum of squares, mean square and f-ratio are identified by using the SPSS package and Microsoft version is used to all the tabular columns and figures.

2.4 Selection of Variables

The various scientific literatures have been reviewed, based on the review Strength endurance training and endurance training among college women in Kerala was selected as variables of the present study.

3. Results on maximum strength

The statistical analysis comparing the initial and final means of Maximum strength due to isolated strength training (IST), isolated endurance training (IET), combined strength and endurance (CSE) training and control groups (CG) of college level women is presented in Table 1.

Table 1: Computation of analysis of covariance due to isolated and combined strength training and endurance training on maximum strength

	IST Group	IET Group	CSE Group	Control Group	SOV	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	149.53	145.87	149.20	150.73	B	195.53	3	65.18	0.65
Std Dev	12.61	11.36	7.80	7.17	W	5606.80	56	100.12	
Post Test Mean	154.87	155.40	162.87	150.20	B	1234.87	3	411.62	4.18*
Std Dev	13.29	9.99	7.80	7.36	W	5511.47	56	98.42	
Adjusted post test mean	154.20	158.21	162.52	148.40	B	1608.49	3	536.16	61.13*
					W	482.43	55	8.77	

T: Isolated Strength Training; IET: Isolated Endurance Training
SE: Combined Strength and Endurance Training
OV: Source of Variance; B: Between W: Within
quired $F_{(0.05),(df\ 3,56)} = 2.70$
Significant at 0.05 level of confidence

shown in Table 1, the pre-test mean on Maximum strength strength trainings group was 149.53 with standard viation ±12.61 pre-test mean of Endurance training group s 145.87 with standard deviation ±11.36, the pre-test mean combined strength and Endurance training group was .20 with standard deviation ±7.80, the pre-test mean of ntrol group was 150.73 with standard deviation ±7.17. The tained F ratio of 0.65 on pre-test means of the groups was significant at 0.05 level as the obtained F value was less an the required table F value of 2.70 to be significant at 0.05 el. This shows that there was no significant difference in ans of the groups at initial stage.

e results presented in Table 1 the post-test mean on ximum strength of strength trainings group was 154.87 standard deviation ± 13.29 post-test mean of Endurance ining group was 155.40 with standard deviation ± 9.99, the t-test mean of combined strength and Endurance training up was 162.87 with standard deviation ± 9.99, the post-test st of control group was 150.20 with standard deviation ± 7.36. The obtained F ratio of 4.18 on post-test means of the groups was significant at 0.05 level as the obtained F value was greater than the required table F value of 2.70 to be significant at 0.05 level. This shows that there was significant difference in means of the groups at post experimental stage. Taking into consideration of the pre-test means and post-test means, adjusted post-test means were determined and analysis of covariance was done. The adjusted mean on Maximum strength on strength trainings group was 154.20, Endurance training group was 158.21, combined strength and Endurance training group was 162.52 and control group was 148.40. The obtained F value on adjusted means was 61.13. The obtained F value was greater than the required value of 2.70 and hence it was accepted that there was significant differences among the adjusted means on the Maximum strength of the subjects. Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table 2.

Table 2: Multiple paired means comparisons among isolated and combined strength training, endurance training and control groups and scheffe's post hoc analysis on maximum strength

Adjusted Means of					
IST group	IET group	CSE group	Control group	Mean diff	C.I
154.20	158.21			-4.01*	3.16
154.20		162.52		-8.32*	3.16
154.20			148.40	5.80*	3.16
	158.21	162.52		-4.31*	3.16
	158.21		148.40	9.81*	3.16
		162.52	148.40	14.12*	3.16

IST: Isolated Strength Training; IET: Isolated Endurance Training
CSE: Combined Strength and Endurance Training
* Significant at 0.05 level.

post hoc analysis of obtained ordered adjusted means d that to be significant at 0.05 level confidence the ed confidence interval was 3.16. The following paired comparisons were greater than the required confidence el and were significant at 0.05 level. Strength trainings p Vs Endurance training Group (MD: -4.01)

StrengthtrainingsGroupVsCombinedtrainingGroup(MD-8.32)
Strength trainings Group Vs Control Group (MD: 5.80)
Endurance training Group Vs Combined training Group (MD: -4.31)
Endurance training Group Vs Control Group (MD: 9.81)
Combined training Group Vs Control Group (MD: 14.12)

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The pre-test, post-test and ordered adjusted means were presented through line graph for better understanding of the results of this study in Figure 1.

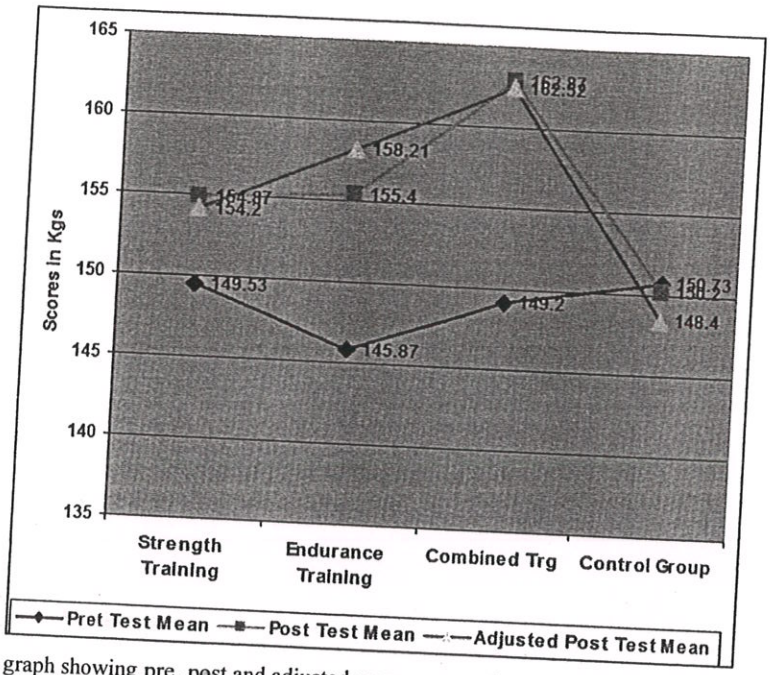

Fig 1: Line graph showing pre, post and adjusted means on maximum strength among college women

Results on speed

statistical analysis comparing the initial and final means speed due to isolated strength training (IST), isolated endurance training (IET), combined strength and endurance (CSE) training and control groups (CG) of college women is presented in Table 3.

Table 3: Computation of analysis of covariance due to isolated and combined strength training and endurance training on speed

	IST group	IET group	CSE group	Control group	SOV	Sum of squares	df	Mean squares	Obtained F
Pre Test Mean	6.79	6.71	6.82	6.86	B	0.17	3	0.06	
Std Dev	0.16	0.15	0.17	0.18	W	1.51	56	0.03	2.06
Post Test Mean	6.57	6.57	6.67	6.84	B	0.69	3	0.23	
Std Dev	0.18	0.14	0.17	0.20	W	1.58	56	0.03	8.18*
Adjusted Post Test Mean	6.58	6.65	6.65	6.78	B	0.29	3	0.10	
					W	0.25	55	0.00	21.63*

IST: Isolated Strength Training; IET: Isolated Endurance Training
CSE: Combined Strength and Endurance Training
SOV: Source of Variance; B: Between W: Within
Required $F_{(0.05),\,(df\,3,56)} = 2.70$
* Significant at 0.05 level of confidence

shown in Table XIII, the pre-test mean on Speed of ength trainings group was 6.79 with standard deviation 16 pre-test mean of Endurance training group was 6.71 standard deviation ±0.15, the pre-test mean of combined ength and Endurance training group was 6.82 with standard ation ±0.17, the pre-test mean of control group was 6.86 standard deviation ±0.18. The obtained F ratio of 2.06 on est means of the groups was not significant at 0.05 level e obtained F value was less than the required table F e of 2.70 to be significant at 0.05 level. This shows that was no significant difference in means of the groups at stage.

results presented in Table 3, the post-test mean on Speed ength trainings group was 6.57 with standard deviation post-test mean of Endurance training group was 6.57 standard deviation ±0.14, the post-test mean of ined strength and Endurance training group was 6.67 standard deviation±0.14, the post-test mean of control was 6.84 with standard deviation ±0.20. The obtained F ratio of 8.18 on post-test means of the groups was significant at 0.05 level as the obtained F value was greater than the required table F value of 2.70 to be significant at 0.05 level. This shows that there was significant difference in means of the groups at post experimental stage.

Taking into consideration of the pre-test means and post-test means, adjusted post-test means were determined and analysis of covariance was done. The adjusted mean on Speed on strength trainings group was 6.58, Endurance training group was 6.65, combined strength and Endurance training group was 6.65 and control group was 6.78. The obtained F value on adjusted means was 21.63. The obtained F value was greater than the required value of 2.70 and hence it was accepted that there was significant differences among the adjusted means on the Speed of the subjects.

Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table 4.

Table 4: Multiple paired means comparisons among isolated and combined strength training, endurance training and control groups and scheffe's post hoc analysis on speed

Adjusted Means Of					
IST Group	IET Group	CSE Group	Control Group	Mean Diff	C.I
6.58	6.65			-0.07*	0.07
6.58		6.64		-0.08*	0.07
6.58			6.78	-0.20*	0.07
	6.65	6.64		0.01	0.07
	6.65		6.78	-0.13*	0.07
		6.65	6.78	-0.12*	0.07

IST: Isolated Strength Training; IET: Isolated Endurance Training
CSE: Combined Strength and Endurance Training
*Significant at 0.05 level.

The post hoc analysis of obtained ordered adjusted means proved that to be significant at 0.05 level confidence the required confidence interval was 0.07. The following paired mean comparisons were greater than the required confidence interval and were significant at 0.05 level.

Strength trainings Group Vs Endurance training Group (MD: -0.07)

Strength trainings Group Vs Combined training Group (MD: -0.08)

Strength trainings Group Vs Control Group (MD: -0.20)

Endurance training Group Vs Control Group (MD: -0.13

Combined training Group Vs Control Group (MD: -0.12

The following paired mean comparisons were less than the required confidence interval and were not significant at 0.05 level.

Endurance training Group Vs Combined training Group (MD: 0.01)

The pre-test, post-test and ordered adjusted means were presented through line graph for better understanding of the results of this study in Figure 2.

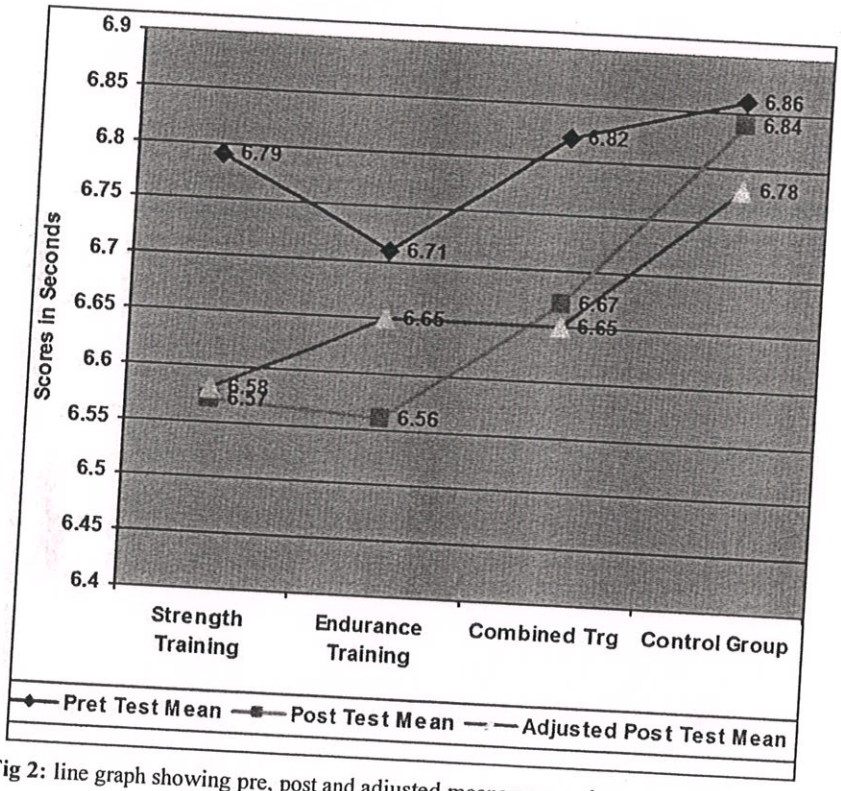

Fig 2: line graph showing pre, post and adjusted means on speed among college women

Results on muscular endurance

The statistical analysis comparing the initial and final means of muscular endurance due to isolated strength training (IST), isolated endurance training (IET), combined strength and endurance (CSE) training and control groups (CG) of college women is presented in Table 5.

Table 5: Computation of analysis of covariance due to isolated and combined strength training and endurance training on muscular endurance

	IST group	IET group	CSE group	Control group	SOV	Sum of squares	df	Mean squares	Obtained F
Pre Test Mean	30.67	29.73	31.33	31.93	B	40.05	3	13.35	0.758
Std Dev	4.20	3.51	4.72	4.27	W	986.53	56	17.62	
Post Test Mean	34.40	36.53	39.87	32.27	B	473	3	157.58	10.41*
Std Dev	4.03	3.09	4.72	3.83	W	848.00	56	15.14	
Adjusted post test mean	34.59	37.43	39.55	31.49	B	546.52	3	182.17	35.88*
					W	279.24	55	5.08	

IST: Isolated Strength Training; IET: Isolated Endurance Training
CSE: Combined Strength and Endurance Training
SOV: Source of Variance; B: Between W: Within
Required $F_{(0.05),(df\ 3,56)} = 2.70$
* Significant at 0.05 level of confidence

As shown in Table 5, the pre-test mean on Muscular endurance of strength trainings group was 30.67 with standard deviation ±4.20 pre-test mean of Endurance training group was 29.73 with standard deviation ± 3.51, the pre-test mean of combined strength and Endurance training group was 31.33 with standard deviation ± 4.72, the pre-test mean of control group was 31.93 with standard deviation ±4.27. The obtained F ratio of 0.758 on pre-test means of the groups was not significant at 0.05 level as the obtained F value was less than the required table F value of 2.70 to be significant at 0.05 level. This shows that there was no significant difference in means of the groups at initial stage.

The results presented in Table 5, the post-test mean on Muscular endurance of strength trainings group was 34.40 with standard deviation ± 4.03 post-test mean of Endurance training group was 36.53 with standard deviation ± 3.09, the post- test mean of combined strength and Endurance training group was 39.87 with standard deviation ± 3.09, the post-test mean of control group was 32.27 with standard deviation ± 3.83. The obtained F ratio of 10.41 on post-test means of the groups was significant at 0.05 level as the obtained F value was greater than the required table F value of 2.70 to be significant at 0.05 level. This shows that there was significant difference in means of the groups at post experimental stage.

Taking into consideration of the pre-test means and post-test means, adjusted post-test means were determined and analysis of covariance was done. The adjusted mean on Muscular endurance on strength trainings group was 34.59, Endurance training group was 37.43, combined strength and Endurance training group was 39.55 and control group was 31.49. The obtained F value on adjusted means was 35.88. The obtained F value was greater than the required value of 2.70 and hence it was accepted that there was significant differences among the adjusted means on the Muscular endurance of the subjects. Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table 6.

Table 6: Multiple paired means comparisons among isolated and combined strength training, endurance training and control groups and scheffe's post hoc analysis on muscular endurance

Adjusted means of					
IST Group	**IET Group**	**CSE Group**	**Control Group**	**Mean Diff**	**C.I**
34.59	37.43			-2.84*	2.41
34.59		39.55		-4.96*	2.41
34.59			31.49	3.10*	2.41
	37.43	39.55		-2.12	2.41
	37.43		31.49	5.94*	2.41
		39.55	31.49	8.06*	2.41

IST: Isolated Strength Training; IET: Isolated Endurance Training
CSE: Combined Strength and Endurance Training
*Significant at 0.05 level.

The post hoc analysis of obtained ordered adjusted means proved that to be significant at 0.05 level confidence the required confidence interval was 2.41. The following paired mean comparisons were greater than the required confidence interval and were significant at 0.05 level.

Strength trainings Group Vs Endurance training Group (MD: 4.84)

Strength trainings Group Vs Combined training Group (MD: -5.96)

Strength trainings Group Vs Control Group (MD: 3.10)

Endurance training Group Vs Control Group (MD: 5.94

Combined training Group Vs Control Group (MD: 8.06

The following paired mean comparisons were less than the required confidence interval and were not significant at 0.05 level.

Endurance training Group Vs Combined training Group (MD: -2.12)

The pre-test, post-test and ordered adjusted means were presented through line graph for better understanding of the results of this study in Figure 3.

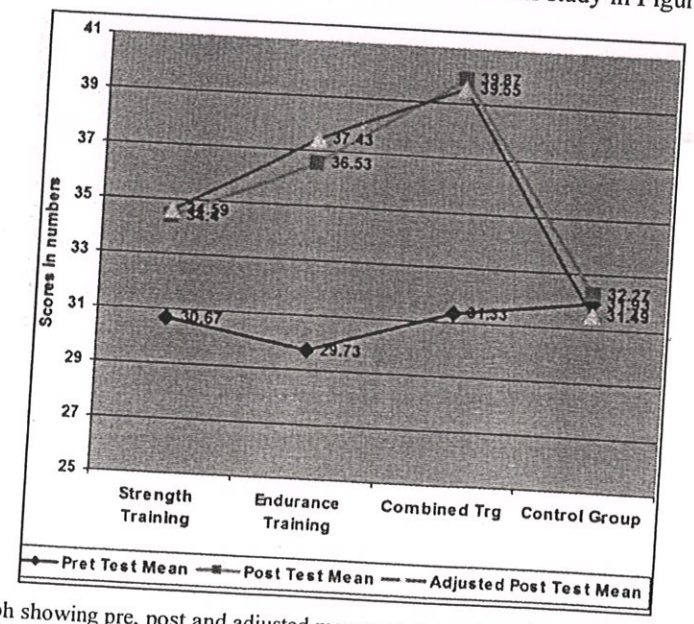

Fig 3: Line graph showing pre, post and adjusted means on muscular endurance among college women

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6. Conclusion

In the present study, the effects of 12 week of exercise (Isolated strength training and isolated endurance training, combined strength endurance training), were studied in college level women. The data shows thatthere is a significant deference in thedue to body weight and lean body mass among college level women.

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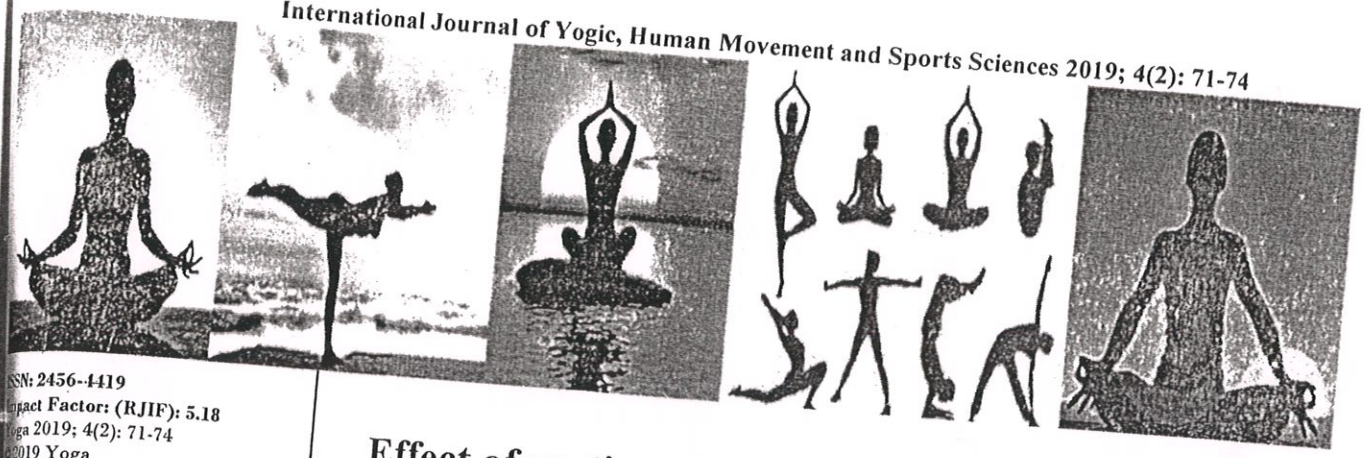
International Journal of Yogic, Human Movement and Sports Sciences 2019; 4(2): 71-74



ISSN: 2456-4419
Impact Factor: (RJIF): 5.18
Yoga 2019; 4(2): 71-74
©2019 Yoga
www.theyogicjournal.com
Received: 11-05-2019
Accepted: 15-06-2019

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Effect of continuous training and interval training on selected flexibility and muscular strength among college level men boxers

M Girinathan and Dr. I Lillypuspam

Abstract
Aim: The objective of the present study is to identify the effects of continuous training and interval training performances on flexibility and muscular strength among college level boxers.
Methodology: Twelve weeks of continuous training was studied with constant-flexibility and muscular strength procedure and constant-time procedure. Twelve weeks of interval training was studied. ANCOVA statistical analyses have been used to analyses the performance and outcome of the men boxers and Scheffe's post hoc test was used to find out the mean difference of confidence continuous training and Interval training.
Result: The submaximal-performance effects on flexibility F-ratio at 0.05 level of confidence for 2 and 87 (df) =3.06, 2 and 86 (df) =3.06. Significant is better than control group. These effects have been compared for muscular strength boxers F-ratio at 0.05 level of confidence for 2 and 87 (df) =3.06, 2 and 86 (df) =3.06. Significant is better than control group.

Keywords: flexibility, muscular strength, continuous and interval training

1. Introduction
The present study sought to evaluate the inconsistencies previously observed regarding the pre dominance of continuous and interval training for improving fitness. The experimental design initially equated and subsequently maintained the same relative exercise intensity by both groups throughout the programs. Thirty subjects were equally divided into continuous training (continuous training, exercise at 50% to 60% maximal work) or interval training (30 subject as working group and control group respectively at 100% maximal work) training groups that performed 30 min per day for 3 days in all 12 weeks. Following continuous training and interval training, exercising work rates were parallel examined both the interval training and continuous training. Three equated groups were performed to measure the performance of flexibility and muscular strength; one group act as control group and another two group act as experimental group. Interval training and continuous training regimens are used to improved physical fitness. There is conflicting evidence as to which is the more effective in improving biochemical, physiological, and performance measures (Cunningham *et al*. 1979). The purpose of this study were to compare the effects of using the same relative work intensities in the two training modes and examine their effect in continuous training and Interval training tests.

2. Methodology
2.1 Sample selection
Simple random procedure was used to select the subjects for the present study. To delimit the present study only male boxers of Tamil Nadu were selected. Totally, 90 members have been taken as sample size. The sample size was divided into three groups namely; continuous training group, interval training group and control group.

2.2 Collection of data
A selected package of continuous training and interval training were administered to collect the data. 12 weeks was administered to all three groups. The performance of all groups was administered for only 30 min per day especially for continuously 3 days in all 12 weeks.

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2.3 Analysis

ANCOVA and Scheffe's post hoc test were used for the study. The mean, sum of squares, mean square and f-ratio are identified by using the SPSS package and Microsoft version is used to all the tabular columns and figures.

2.4 Selection of variables

The various scientific literatures have been reviewed, based on the review flexibility and muscular strength among college level boxers in Tamil Nadu was selected as variables of the present study.

3. Computation of analysis of covariance and post hoc test Results on flexibility

The statistical analysis comparing the initial and final means of flexibility due to Continuous training and Interval training among college level boxers is presented in Table 1.

Table I: Ancova results on effect of continuous training and interval training compared with controls on flexibility

	Continuous training	Interval training	Control group	Source of variance	Sum of squares	df	Mean squares	Obtained F
Pre Test Mean	14.37	15.17	14.90	Between	9.96	2	4.98	1.90
Post Test Mean	18.57	17.23	15.57	Within	227.83	87	2.62	
Adjusted Post Test Mean	18.81	17.04	15.52	Between	135.56	2	67.78	18.31*
Mean Diff	4.20	2.07	0.67	Within	322.10	87	3.70	
				Between	159.09	2	79.54	26.67*
				Within	256.45	86	2.98	

ble F-ratio at 0.05 level of confidence for 2 and 87 (df) =3.06, 2 and 86 (df) =3.06. *Significant

s shown in Table 1, the obtained pre-test means on exibility on Continuous training group was 14.37, Interval ining group was 15.17 was and control group was 14.90. e obtained pre-test F value was 1.90 and the required table alue was 3.06, which proved that there was no significant ference among initial scores of the subjects.

e obtained post-test means on Flexibility on Continuous ning group was 18.57, Interval training group was 17.23 and control group was 15.57. The obtained post-test F ue was 18.31 and the required table F value was 3.06, ch proved that there was significant difference among post test scores of the subjects.

Taking into consideration of the pre-test means and post-test means adjusted post-test means were determined and analysis of covariance was done and the obtained F value 26.67 was greater than the required value of 3.06 and hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table 2.

Table 2: Multiple comparisons of paired adjusted means and scheffe's confidence interval test results on flexibility

Means				Required . C I
Continuous training Group	Interval training Group	Control Group	Mean Difference	
18.81	17.04		1.76*	1.10
18.81		15.52	3.29*	1.10
	17.04	15.52	1.52*	1.10

* Significant

post hoc analysis of obtained ordered adjusted means ed that there was significant differences existed between inuous training group and control group (MD: 3.29). was significant difference between Interval training and control group (MD: 1.52). There was significant difference between treatment groups, namely, Continuous training group and Interval training group. (MD: 1.76).

The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure 1.

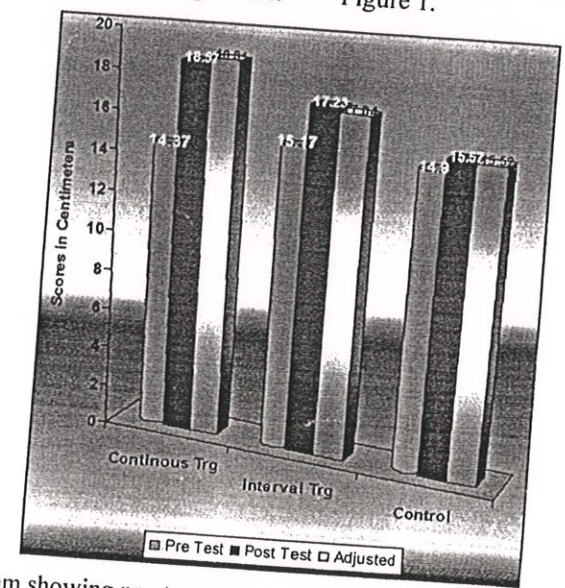

Fig 1: Bar diagram showing pre-test, post-test and ordered adjusted means on flexibili

3.1 Discussions on findings on flexibility

In order to find out the effect of Continuous training and Interval training on Flexibility the obtained pre and post-test means were subjected to ANCOVA and post hoc analysis through Scheffe's confidence interval test.

The effect of Continuous training and Interval training on Flexibility is presented in Table 2. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 26.67 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to post hoc analysis and the results presented in Table 2 proved that there was significant difference between Continuous training group and control group (MD: 3.29) and Interval training group and control group (MD: 1.52). Comparing between the treatments groups, it was found that there was significant difference between Continuous training and Interval training group among college level boxers.

Thus, it was found that continuous training was significantly better than interval raining and control group in improving Flexibility of the college level boxers

4. Results on muscular strength

The statistical analysis comparing the initial and final means of muscular strength Due to Continuous training and Interval training among college level boxers is presented in Table 3.

Table 3: Ancova results on effect of continuous training and interval training compared with controls on muscular strength

	Continuous training	Interval training	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	33.20	30.93	31.87	Between	77.87	2	38.93	2.88
				Within	1176.13	87	13.52	
Post Test Mean	36.10	35.93	31.73	Between	367.36	2	183.68	11.48*
				Within	1392.43	87	16.00	
Adjusted Post Test Mean	34.94	36.96	31.86	Between	393.86	2	196.93	57.83*
				Within	292.88	86	3.41	
Mean Diff	2.90	5.00	-0.13					

Table F-ratio at 0.05 level of confidence for 2 and 87 (df) =3.06, 2 and 86 (df) =3.06. *Significant

As shown in Table 3, the obtained pre-test means on Muscular strength on Continuous training group was 33.20, Interval training group was 30.93 was and control group was 31.87. The obtained pre-test F value was 2.88 and the required table F value was 3.06, which proved that there was no significant difference among initial scores of the subjects.

The obtained post-test means on Muscular strength on Continuous training group was 36.10, Interval training group was 35.93 was and control group was 31.73. The obtained post-test F value was 11.48 and the required table F value was 3.06, which proved that there was significant difference among post test scores of the subjects.

Taking into consideration of the pre-test means and post-test means adjusted post-test means were determined and analysis of covariance was done and the obtained F value 57.83 was greater than the required value of 3.06 and hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table 4.

Table 4: Multiple comparisons of paired adjusted means and scheffe's confidence interval test results on muscular strength

Means				
Continuous training Group	Interval training Group	Control Group	Mean Difference	Required. C I
34.94	36.96		-2.02*	1.18
34.94		31.86	3.08*	1.18
	36.96	31.86	5.10*	1.18

* Significant

Post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between Continuous training group and control group (MD: 3.08). There was significant difference between Interval training group and control group (MD: 5.10). There was significant difference between treatment groups, namely, Continuous training group and Interval training group. (MD: -2.02).

The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure 2.

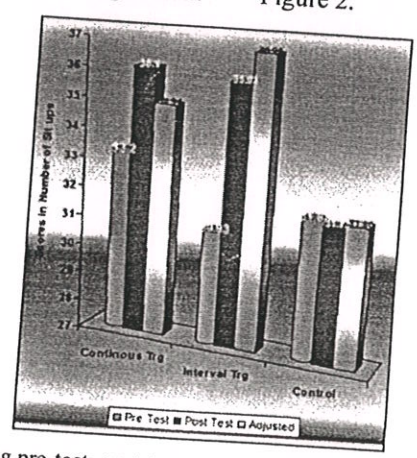

Fig 2: Bar diagram showing pre-test, post-test and ordered adjusted means on muscular strength

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4.2 Discussions on findings on muscular strength

In order to find out the effect of Continuous training and Interval training on Muscular strength the obtained pre and post-test means were subjected to ANCOVA and post hoc analysis through Scheffe's confidence interval test.

The effect of Continuous training and Interval training on Muscular strength is presented in Table 4. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 57.83 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to post hoc analysis and the results presented in Table 4 proved that there was significant difference between Continuous training group and control group (MD: 1.08) and Interval training group and control group (MD: 5.10). Comparing between the treatments groups, it was found that there was significant difference between Continuous training and Interval training group among college level boxers.

Thus, it was found that Interval training was significantly better than Continuous training and control group in improving Muscular strength of the college level boxers.

5 Conclusion

In the present study, the effects of 12 week of exercise (Continuous training and interval training), were studied in college level men boxers. The data shows that there is a significant increase in the performance of flexibility and muscular strength sports training of the college level male boxers.

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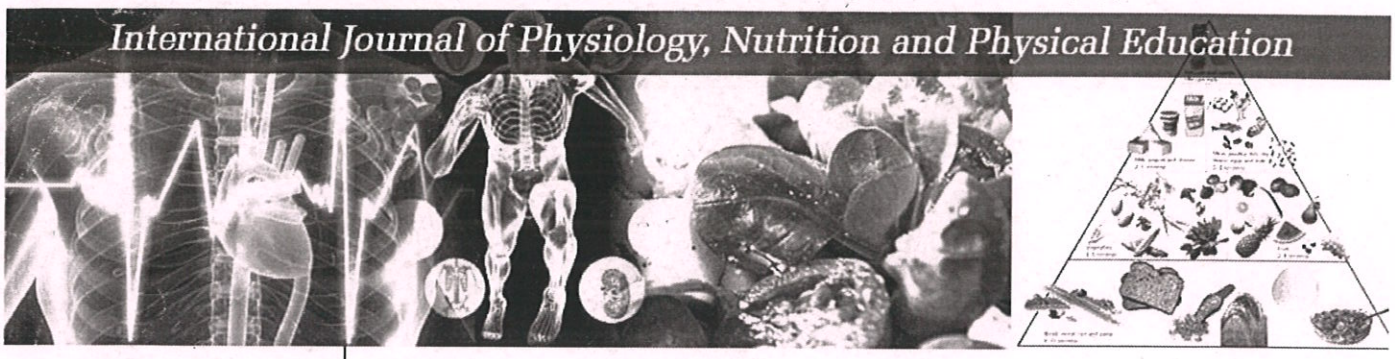
International Journal of Physiology, Nutrition and Physical Education 2019; 4(1): 2109-2111



ISSN: 2456-0057
IJPNPE 2019; 4(1): 2109-2111
© 2019 IJPNPE
www.journalofsports.com
Received: 21-11-2018
Accepted: 25-12-2018

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Effect of wall ladder exercise and circuit training on selected bio motor variables

T Elias, Dr. P Uma and Dr. Grace Helina

Abstract
The purpose of the research was to find out the effect of wall ladder exercise and circuit training on bio motor variables. To achieve the purpose of this research, 60 students at school level, male football players in the age group of 13 to 17 years. The selected subjects were divided into three groups of twenty each. Thus, wall ladder exercise and circuit trainings were selected as independent variables and bio motor variables namely Agility, Leg Strength, Abdominal Strength were selected as dependent variables. The training period was delimited to twelve weeks, in which wall ladder exercise and circuit trainings were given to respective experimental groups (Group-I & Group-II). The group-III acted as control and did not participate any systematic training. Data were collected before and after training programme on acceleration speed and speed endurance. The collected data were statistically treated by using ANCOVA. When the obtained 'F' ratio was significant, Scheffe's post hoc test was used to find out the significant paired mean differences. In all the cases, 0.05 level of confidence was fixed to test the significance. It is inferred that the twelve weeks of wall ladder exercise and circuit training programs have significantly improved Agility, Leg Strength and Abdominal Strength. The result further reveals that the wall ladder exercise group has shown significant improvement in Leg Strength, Abdominal Strength as compared to the circuit training group, circuit training group shows significant improvement in Agility when compared to wall ladder exercise group. Participation in wall ladder exercise and circuit trainings resulted in a significant development in experimental groups when compared to control group.

Keywords: Wall ladder exercise, circuit training, agility, leg strength, abdominal strength

Introduction
Physical training is one of the most important requirements to achieve high performance. The purpose of physical training are to develop the athlete's Physiological potential, to develop bio-motor abilities to the highest standards (Tudor O. Bompa, 2005) [2].
Football is most likely the most popular game worldwide and millions of people play football across the world. In many countries, it has been ranked as one of the top-level competition sports. However, In India, the pace of football was a failure to appreciate the commercial and professional value attached to the sport. Also, there was little effort to become integrated with mainstream professional football centering on the World Cup (Gautam Ahuja & Eric, 2018) [1]. Since then, the advancements made have been impressive but there is still limited precise information available about advancement in training and. Football involves frequent bouts of intense activities such as dribbling, passing, shooting, jumping, and sudden change of direction, etc. the players need a good bio motor components to perform those skills. By the use of wall ladder exercises one can improve their bio motor skills like Agility, leg strength and abdominal strength. By doing a circuit training workouts one can improve their endurance and strength.

Wall Ladder Exercise
Wall ladder (also known as gymnastic wall bar, Swedish ladder or stall bars) was invented during the 19th century which is used for therapeutic needs (Broomfield, 2011) [9]. It is a multifunctional device which is used for resistance training, abdominal exercise, coordination skills and flexibility training. It can be used for advanced training in sports (Rouchhausen, 2009) [11]. Football players can make great use of the wall ladder for improving isometric strength and also a great tool for improving overall fitness (Mitchell & Wildenthal, 1974) [5]

Circuit training

Circuit training is the most and efficient way to enhance cardiovascular fitness and muscle endurance. Circuit training is a method of body conditioning or resistance training using high intensity aerobic exercise. It targets strength building and muscular endurance. Circuit is an exercise in one completion of all prescribed exercises in the program. When one circuit is completed, the subject begins the first exercise again for the next circuit. Traditionally, the time between the exercises in circuit training is shorter, often with faster movement to the next exercise. Circuit training is often erroneously portrayed as an intensive and stressful form of exercise, with a drill sergeant-type in the middle of a circuit bellowing orders at weary recruits. Circuit training is very safe and effective but fun approach to training that can be enjoyed by variety of people: it is attractive to men and women, younger and older age groups, sports people and the general populations. (Lawrence and Hope, 2002) [7] Agility has recently been defined as a rapid, whole body change of direction or speed in response to a stimulus, and can be broken down into subcomponents of agility, therefore is the ability to change the direction rapidly and accurately (Jay Dawes, 2019) [8].

Methodology

The purpose of the study was to find out the effect of wall ladder exercises and circuit training on selected bio motor variables among school level male football players. The subjects selected were sixty students at school level, male football players in the age group of 13 to 17 years. The subjects were from the St. Peter's (ICSE) School, Mumbai, Maharashtra, India. The selected subjects were assigned into two experimental group and a control group. Each group consisted of twenty subjects (n=20). Group I acted as Experimental Group I - (Wall Ladder Exercise), Group II acted as Experimental Group II - (Circuit Training) for a period of 12 weeks and Group III acted as a Control group. Pre-test was conducted for all the subjects on selected bio motor variables namely Agility, Leg Strength, Abdominal Strength.

For both experimental group, exercise were explained and demonstrated to the subjects.10 minutes was allotted for warm up and 5 minutes for stretching was performed by the subjects prior to the training sessions. After the warm up the wall ladder exercise were given for 45 minutes. During the first three weeks the intensity was fixed 60% for their training and the subjects was performed in 45 minutes. The intensity was increased by 5% once in every three weeks.

Results on Agility

Table I: Computation of Analysis of Covariance on Agility

Test	EX1	EX2	CG	SV	SS	df	MS	F
Pre test	20.16	20.11	20.37	Between	0.80	2	0.399	0.50
				Within	45.24	57	0.79	
Post test	19.12	19.48	20.07	Between	9.18	2	4.59	10.14
				Within	25.79	57	0.45	
Adjusted	19.15	19.54	19.97	Between	6.59	2	3.29	21.15
				Within	8.721	56	0.16	

*Significant at 0.05 level of confidence for df (2, 57) and (2, 56) are 3.16

The table I shows that the obtained F value on pre test scores on Agility was 0.50 lesser than the required value of 3.16 to be significant at 0.05 level. This proves that there is no significant difference between the groups at the initial stage and the randomization at the initial level are equal. The obtained post test F value of 10.14 was greater than the required F value of 3.16. Further the obtained F value of 21.15 was greater than the required F value of 3.16.

Table II: Scheffe's Post Hoc Test On Agility

EX1	EX2	CG	MD	CI
19.15	19.54	-	0.39	0.31
19.15	-	19.97	-0.43	0.31
-	19.54	19.97	-0.82	0.31

*Significant at 0.05 level of confidence

The multiple mean comparison showed in Table II proved that there were significant differences exists between the adjusted means of wall ladder training group, circuit training group and control groups, and there was significant difference between wall ladder training group and circuit training group as the mean difference were greater than the obtained confidence interval 0.31.

Results on Leg Strength

Table III: Computation of Analysis of Covariance on Leg Strength

Test	EX1	EX2	CG	SV	SS	df	MS	F
Pre test	2.06	2.01	2.00	Between	0.05	2	0.025	1.13
				Within	1.26	57	0.02	
Post test	2.48	2.25	2.00	Between	2.28	2	1.14	35.92
				Within	1.81	57	0.03	
Adjusted	2.44	2.26	2.02	Between	1.71	2	0.85	58.39
				Within	0.818	56	0.01	

*Significant at 0.05 level of confidence for df (2, 57) and (2, 56) are 3.16

The table III shows that the obtained F value on pre test scores on Leg strength was 1.13 lesser than the required value of 3.16 to be significant at 0.05 level. This proves that there is no significant difference between the groups at the initial stage and the randomization at the initial level are equal. The obtained post test F value of 35.92 was greater than the required F value of 3.16. Further the obtained adjusted post mean F value of 58.39 was greater than the required F value of 3.16. This proved that the differences between the posttest means and adjusted mean of the subjects were significant.

Table IV: Scheffe' s Post Hoc Test on Leg Strength

EX1	EX2	CG	MD	CI
2.44	2.26	-	0.18	0.10
2.44	-	2.02	0.42	0.10
-	2.26	2.02	0.23	0.10

*Significant at 0.05 level of confidence

The multiple mean comparison showed in Table IV proved that there were significant differences exists between the adjusted means of wall ladder training group, circuit training group and control groups, and there was significant difference between wall ladder training group and circuit training group as the mean difference were greater than the obtained confidence interval 0.10.

Results on abdominal strength

Table V: Computation of Analysis of Covariance on Abdominal

Strength

Test	EX1	EX2	CG	SV	SS	df	MS	F
Pre test	24.25	23.75	23.80	Between	3.03	2	1.517	0.56
				Within	154.70	57	2.71	
Post test	35.45	29.60	23.70	Between	1380.63	2	690.32	213.91
				Within	183.95	57	3.23	
Adjusted	35.41	29.62	23.72	Between	1351.26	2	675.63	207.93
				Within	181.959	56	3.25	

*Significant at 0.05 level of confidence for df (2, 57) and (2, 56) are 3.16

The table V shows that the obtained F value on pre test scores on Leg strength was 0.56 lesser than the required value of 3.16 to be significant at 0.05 level. This proves that there is no significant difference between the groups at the initial stage and the randomization at the initial level are equal. The obtained post test F value of 213.91 was greater than the required F value of 3.16. Further the obtained adjusted post mean F value of 207.93 was greater than the required F value of 3.16. This proved that the differences between the posttest means and adjusted mean of the subjects were significant.

Table VI: Scheffe's Post Hoc Test on Abdominal Strength

EX1	EX2	CG	MD	CI
35.41	29.62	-	5.79	1.42
35.41	-	23.72	11.70	1.42
-	29.62	23.72	5.91	1.42

*Significant at 0.05 level of confidence

The multiple mean comparison showed in Table VI proved that there were significant differences exists between the adjusted means of wall ladder training group, circuit training group and control groups, and there was significant difference between wall ladder training group and circuit training group as the mean difference were greater than the obtained confidence interval 1.42.

Conclusion

Within the limitations and delimitations of this study, the following conclusions were drawn based on the results of the study. It was concluded that the wall ladder exercise and circuit training groups significantly improved Agility, Leg strength and Abdominal strength. However, Group I (wall ladder exercise) has significant increase in Leg strength and Abdominal strength, when compared to Group II (circuit training). Group II (circuit training) significant increase in Agility when compared to Group I (wall ladder exercise). Hence, it is put forward that, performed appropriately, the wall ladder exercise and circuit training can afford significant improvement on selected biomotor variables on experimental group compared to the control group.

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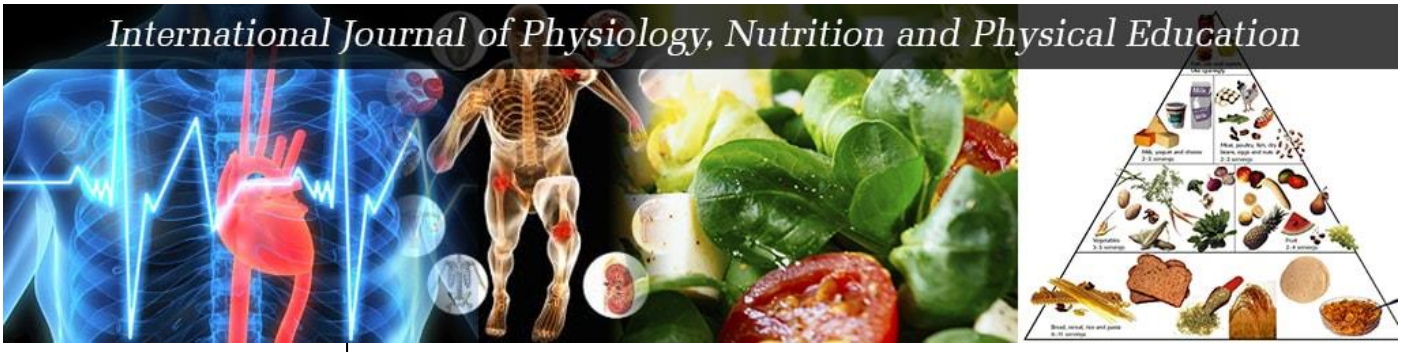
International Journal of Physiology, Nutrition and Physical Education 2019; 4(1): 2109-2111



ISSN: 2456-0057
IJPNPE 2019; 4(1): 2109-2111
© 2019 IJPNPE
www.journalofsports.com
Received: 21-11-2018
Accepted: 25-12-2018

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Effect of wall ladder exercise and circuit training on selected bio motor variables

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Abstract
The purpose of the research was to find out the effect of wall ladder exercise and circuit training on bio motor variables. To achieve the purpose of this research, 60 students at school level, male football players in the age group of 13 to 17 years. The selected subjects were divided into three groups of twenty each. Thus, wall ladder exercise and circuit trainings were selected as independent variables and bio motor variables namely Agility, Leg Strength, Abdominal Strength were selected as dependent variables. The training period was delimited to twelve weeks, in which wall ladder exercise and circuit trainings were given to respective experimental groups (Group-I & Group-II). The group-III acted as control and did not participate any systematic training. Data were collected before and after training programme on acceleration speed and speed endurance. The collected data were statistically treated by using ANCOVA. When the obtained 'F' ratio was significant, Scheffe's post hoc test was used to find out the significant paired mean differences. In all the cases, 0.05 level of confidence was fixed to test the significance. It is inferred that the twelve weeks of wall ladder exercise and circuit training programs have significantly improved Agility, Leg Strength and Abdominal Strength. The result further reveals that the wall ladder exercise group has shown significant improvement in Leg Strength, Abdominal Strength as compared to the circuit training group, circuit training group shows significant improvement in Agility when compared to wall ladder exercise group. Participation in wall ladder exercise and circuit trainings resulted in a significant development in experimental groups when compared to control group.

Keywords: Wall ladder exercise, circuit training, agility, leg strength, abdominal strength

Introduction
Physical training is one of the most important requirements to achieve high performance. The purpose of physical training are to develop the athlete's Physiological potential, to develop bio-motor abilities to the highest standards (Tudor O. Bompa, 2005) [2].
Football is most likely the most popular game worldwide and millions of people play football across the world. In many countries, it has been ranked as one of the top-level competition sports. However, In India, the pace of football was a failure to appreciate the commercial and professional value attached to the sport. Also, there was little effort to become integrated with mainstream professional football centering on the World Cup (Gautam Ahuja & Eric, 2018) [1]. Since then, the advancements made have been impressive but there is still limited precise information available about advancement in training and. Football involves frequent bouts of intense activities such as dribbling, passing, shooting, jumping, and sudden change of direction, etc. the players need a good bio motor components to perform those skills. By the use of wall ladder exercises one can improve their bio motor skills like Agility, leg strength and abdominal strength. By doing a circuit training workouts one can improve their endurance and strength.

Wall Ladder Exercise
Wall ladder (also known as gymnastic wall bar, Swedish ladder or stall bars) was invented during the 19th century which is used for therapeutic needs (Broomfield, 2011) [9]. It is a multifunctional device which is used for resistance training, abdominal exercise, coordination skills and flexibility training. It can be used for advanced training in sports (Rouchhausen, 2009) [11]. Football players can make great use of the wall ladder for improving isometric strength and also a great tool for improving overall fitness (Mitchell & Wildenthal, 1974) [5]

Circuit training

Circuit training is the most and efficient way to enhance cardiovascular fitness and muscle endurance. Circuit training is a method of body conditioning or resistance training using high intensity aerobic exercise. It targets strength building and muscular endurance. Circuit is an exercise in one completion of all prescribed exercises in the program. When one circuit is completed, the subject begins the first exercise again for the next circuit. Traditionally, the time between the exercises in circuit training is shorter, often with faster movement to the next exercise. Circuit training is often erroneously portrayed as an intensive and stressful form of exercise, with a drill sergeant-type in the middle of a circuit bellowing orders at weary recruits. Circuit training is very safe and effective but fun approach to training that can be enjoyed by variety of people: it is attractive to men and women, younger and older age groups, sports people and the general populations. (Lawrence and Hope, 2002) [7] Agility has recently been defined as a rapid, whole body change of direction or speed in response to a stimulus, and can be broken down into subcomponents of agility, therefore is the ability to change the direction rapidly and accurately (Jay Dawes, 2019) [8].

Methodology

The purpose of the study was to find out the effect of wall ladder exercises and circuit training on selected bio motor variables among school level male football players. The subjects selected were sixty students at school level, male football players in the age group of 13 to 17 years. The subjects were from the St. Peter's (ICSE) School, Mumbai, Maharashtra, India. The selected subjects were assigned into two experimental group and a control group. Each group consisted of twenty subjects (n=20). Group I acted as Experimental Group I - (Wall Ladder Exercise), Group II acted as Experimental Group II - (Circuit Training) for a period of 12 weeks and Group III acted as a Control group. Pre-test was conducted for all the subjects on selected bio motor variables namely Agility, Leg Strength, Abdominal Strength.

For both experimental group, exercise were explained and demonstrated to the subjects.10 minutes was allotted for warm up and 5 minutes for stretching was performed by the subjects prior to the training sessions. After the warm up the wall ladder exercise were given for 45 minutes. During the first three weeks the intensity was fixed 60% for their training and the subjects was performed in 45 minutes. The intensity was increased by 5% once in every three weeks.

Results on Agility

Table I: Computation of Analysis of Covariance on Agility

Test	EX1	EX2	CG	SV	SS	df	MS	F
Pre test	20.16	20.11	20.37	Between	0.80	2	0.399	0.50
				Within	45.24	57	0.79	
Post test	19.12	19.48	20.07	Between	9.18	2	4.59	10.14
				Within	25.79	57	0.45	
Adjusted	19.15	19.54	19.97	Between	6.59	2	3.29	21.15
				Within	8.721	56	0.16	

*Significant at 0.05 level of confidence for df (2, 57) and (2, 56) are 3.16

The table I shows that the obtained F value on pre test scores on Agility was 0.50 lesser than the required value of 3.16 to be significant at 0.05 level. This proves that there is no significant difference between the groups at the initial stage and the randomization at the initial level are equal. The obtained post test F value of 10.14 was greater than the required F value of 3.16. Further the obtained F value of 21.15 was greater than the required F value of 3.16.

Table II: Scheffe's Post Hoc Test On Agility

EX1	EX2	CG	MD	CI
19.15	19.54	-	0.39	0.31
19.15	-	19.97	-0.43	0.31
-	19.54	19.97	-0.82	0.31

*Significant at 0.05 level of confidence

The multiple mean comparison showed in Table II proved that there were significant differences exists between the adjusted means of wall ladder training group, circuit training group and control groups, and there was significant difference between wall ladder training group and circuit training group as the mean difference were greater than the obtained confidence interval 0.31.

Results on Leg Strength

Table III: Computation of Analysis of Covariance on Leg Strength

Test	EX1	EX2	CG	SV	SS	df	MS	F
Pre test	2.06	2.01	2.00	Between	0.05	2	0.025	1.13
				Within	1.26	57	0.02	
Post test	2.48	2.25	2.00	Between	2.28	2	1.14	35.92
				Within	1.81	57	0.03	
Adjusted	2.44	2.26	2.02	Between	1.71	2	0.85	58.39
				Within	0.818	56	0.01	

*Significant at 0.05 level of confidence for df (2, 57) and (2, 56) are 3.16

The table III shows that the obtained F value on pre test scores on Leg strength was 1.13 lesser than the required value of 3.16 to be significant at 0.05 level. This proves that there is no significant difference between the groups at the initial stage and the randomization at the initial level are equal. The obtained post test F value of 35.92 was greater than the required F value of 3.16. Further the obtained adjusted post mean F value of 58.39 was greater than the required F value of 3.16. This proved that the differences between the posttest means and adjusted mean of the subjects were significant.

Table IV: Scheffe' s Post Hoc Test on Leg Strength

EX1	EX2	CG	MD	CI
2.44	2.26	-	0.18	0.10
2.44	-	2.02	0.42	0.10
-	2.26	2.02	0.23	0.10

*Significant at 0.05 level of confidence

The multiple mean comparison showed in Table IV proved that there were significant differences exists between the adjusted means of wall ladder training group, circuit training group and control groups, and there was significant difference between wall ladder training group and circuit training group as the mean difference were greater than the obtained confidence interval 0.10.

Results on abdominal strength

Table V: Computation of Analysis of Covariance on Abdominal

Strength

Test	EX1	EX2	CG	SV	SS	df	MS	F
Pre test	24.25	23.75	23.80	Between	3.03	2	1.517	0.56
				Within	154.70	57	2.71	
Post test	35.45	29.60	23.70	Between	1380.63	2	690.32	213.91
				Within	183.95	57	3.23	
Adjusted	35.41	29.62	23.72	Between	1351.26	2	675.63	207.93
				Within	181.959	56	3.25	

*Significant at 0.05 level of confidence for df (2, 57) and (2, 56) are 3.16

The table V shows that the obtained F value on pre test scores on Leg strength was 0.56 lesser than the required value of 3.16 to be significant at 0.05 level. This proves that there is no significant difference between the groups at the initial stage and the randomization at the initial level are equal. The obtained post test F value of 213.91 was greater than the required F value of 3.16. Further the obtained adjusted post mean F value of 207.93 was greater than the required F value of 3.16. This proved that the differences between the posttest means and adjusted mean of the subjects were significant.

Table VI: Scheffe's Post Hoc Test on Abdominal Strength

EX1	EX2	CG	MD	CI
35.41	29.62	-	5.79	1.42
35.41	-	23.72	11.70	1.42
-	29.62	23.72	5.91	1.42

*Significant at 0.05 level of confidence

The multiple mean comparison showed in Table VI proved that there were significant differences exists between the adjusted means of wall ladder training group, circuit training group and control groups, and there was significant difference between wall ladder training group and circuit training group as the mean difference were greater than the obtained confidence interval 1.42.

Conclusion

Within the limitations and delimitations of this study, the following conclusions were drawn based on the results of the study. It was concluded that the wall ladder exercise and circuit training groups significantly improved Agility, Leg strength and Abdominal strength. However, Group I (wall ladder exercise) has significant increase in Leg strength and Abdominal strength, when compared to Group II (circuit training). Group II (circuit training) significant increase in Agility when compared to Group I (wall ladder exercise). Hence, it is put forward that, performed appropriately, the wall ladder exercise and circuit training can afford significant improvement on selected biomotor variables on experimental group compared to the control group.

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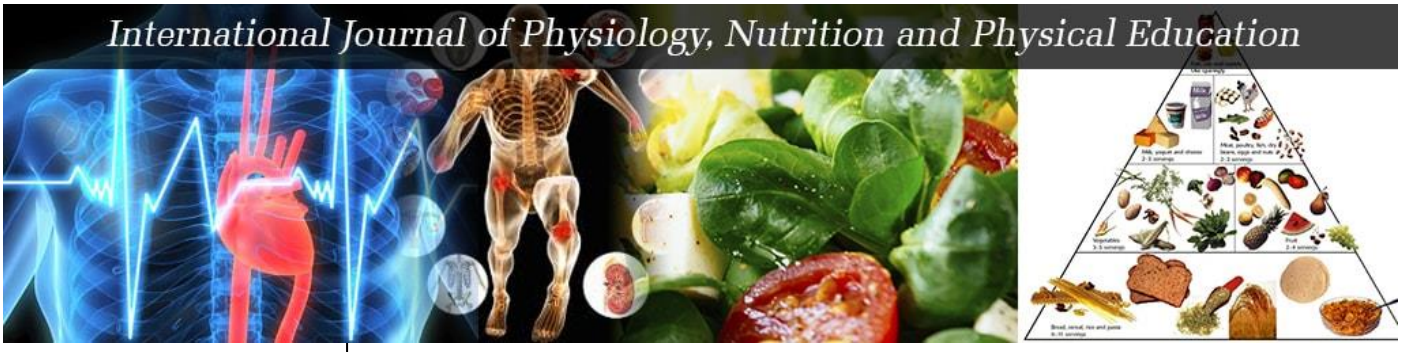
International Journal of Physiology, Nutrition and Physical Education 2019; 4(1): 345-348



ISSN: 2456-0057
IJPNPE 2019; 4(1): 345-348
© 2019 IJPNPE
www.journalofsports.com
Received: 22-11-2018
Accepted: 24-12-2018

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Influence of wall ladder exercise and circuit training on selected physiological variables

T Elias, Dr. P Uma and Dr. Grace Helina

Abstract
The purpose of the research was to find out the influence of wall ladder exercise and circuit training on physiological variables. To achieve the purpose of this research, 60 students at school level, male football players in the age group of 13 to 17 years. The selected subjects were divided into three groups of twenty each. Thus, wall ladder exercise and circuit trainings were selected as independent variables and physiological variables namely Vital capacity and cardiovascular endurance were selected as dependent variables. The training period was delimited to twelve weeks, in which wall ladder exercise and circuit trainings were given to respective experimental groups (Group-I & Group-II). The group-III acted as control and did not participate in any systematic training. Data were collected before and after training programme on Vital capacity and cardiovascular endurance. The collected data were statistically treated by using ANCOVA. When the obtained 'F' ratio was significant, Scheffe's post hoc test was used to find out the significant paired mean differences. In all the cases, 0.05 level of confidence was fixed to test the significance. It is inferred that the twelve weeks of wall ladder exercise and circuit training programs have significantly improved Vital capacity and cardiovascular endurance. The result further reveals that the wall ladder exercise group has shown significant improvement in Vital capacity has compared to the circuit training group, circuit training group shows significant improvement in cardiovascular endurance when compared to wall ladder exercise group. Participation in wall ladder exercise and circuit trainings resulted in a significant development in experimental groups when compared to control group.

Keywords: Wall ladder exercise, circuit training, vital capacity, cardiovascular endurance

Introduction
Football is most likely the most popular game worldwide and millions of people play football across the world. In many countries, it has been ranked as one of the top-level competition sports. Football stands ahead in the list of professionally played sports and is widely accepted amongst people of all ages. It is reported that in every sports event, top level performers require a particular body size and shape, while other aspects could be nearly similar (De Garay *et al*., 1974).

Football is characterized as vigorous, high intensity, intermittent, ball and contact sport. Well-designed activities include acceleration, deceleration, jumping, pivoting, kicking and heading the ball. It is obvious that the game of football puts many demands on the technical and physical skills of the individual player. Football is one of the most popular sports with over approximately 1, 28, 983 professional players and 3, 903 clubs in 186 countries registered with the International Federation of Football Association (FIFA, 2019). Further there is estimated to be more number of unlicensed football players worldwide.

In Asian football confederation, there are 16, 533 professional players and 681 clubs where India is at 5th place with 33 professional clubs. In India, there are 88% in domestic and 12% foreign players in the top tier competition. As per FIFA, there is not even one professional player and India have never participated in the world cup till now. However, In India, the pace of football was a failure to appreciate the commercial and professional value attached to the sport. Also, there was little effort to become integrated with mainstream professional football centering on the World Cup (Gautam Ahuja & Eric, 2018). Since then, the advancements made have been impressive but there is still limited precise information available about advancement in training

Wall ladder exercise

Wall ladder (also known as gymnastic wall bar, Swedish ladder or stall bars) was invented during the 19th century which is used for therapeutic needs (Broomfield, 2011) [8]. It is a multifunctional device which is used for resistance training, abdominal exercise, coordination skills and flexibility training. It can be used for advanced training in sports (Rouchhausen, 2009) [9]. Football players can make great use of the wall ladder for improving isometric strength and also a great tool for improving overall fitness (Mitchell & Wildenthal, 1974) [5]

Wall Ladder training is the multi-directional training, because the elements of strength, power, balance, agility, co-ordination, proprioception, core and joint stability, foot speed, hand eye co-ordination, reaction time and mobility. Each component should be combined into daily training session. Ladder exercise are exciting and efficient ways to teach movement skills. Even though linear and lateral movements are modest in biomechanical, their combination can be compound and many times overwhelming for the athlete. By teaching the mind and body to understand a variety of foot combinations, the chance for confusion and subsequent error decreases. Ladder drills are learned in a slow controlled pace. Introducing movement skills too rapidly can ingrain poor motor patterns that may be difficult to override. Skilled movement should be optimized before the drill is advanced. These drills focus on quickness endurance and utilize a constant rhythm throughout the ladder and also focus on improving the reactive speed components of the lower leg.

Circuit training

Circuit training is the most and effectual way to enhance cardiovascular fitness and muscle endurance. Circuit training is a method of physical conditioning or resistance training using high intensity training. It aims to build the strength and muscular endurance. An exercise circuit is one accomplishment of all suggested exercises in the training. When one circuit is completed, again the first exercise for the next circuit will be started. By tradition, in circuit training, the time between exercises is very short, with the rapid movement to the next exercise. (Tapp & Signorile, 2014) [1].

Circuit training is often erroneously portrayed as an intensive and stressful form of exercise, with a drill sergeant-type in the middle of a circuit bellowing orders at weary recruits. Circuit training is an effective, fun and very safe approach to training that can be enjoyed by sports person. It is very attractive to men and women, younger and older age groups, sports people and the general populations. (Monaco, 2018) [2]

Circuit training may be designed to increase muscular strength and power, muscular endurance, flexibility. Though the physiological effects depend to a large extent on the type of circuit exercise that is planned Circuit consisting only of weight resistance exercise produces substantial gain in strength but very minimal improvements in cardio respiratory endurance. Circuit training is an effective training technique for altering muscular strength and cardio respiratory endurance, and to a limited extent, flexibility and cardio respiratory endurance.

Importance of physiological variables on football performance

Physiological parameters influence a lot on the performance of football players. Physiological system of the body must function well enough to support the specific activity that is performed by an individual. High level of performance in sports and games might be dependent upon the physiological make up and it was recognized that physiological proficiency was needed for the high level performance.

The Vital capacity test is the oldest and best common respiratory tests. The measurement of vital capacity (VC) requires large breath of air expelled from the lungs into a spirometer. Thus, the three components of the total lung volume, are inspiratory reserve volume (IRV), tidal volume (TV) and expiratory reserve volume (ERV). While performing the vital test, it provides an indirect indication of the lung size, even though it is not a complete measure of the entire lung size because it does not account for residual volume. Vital capacity relate to three uncontrolled physiognomies which are age, stature and gender. The static and dynamic components of cardiovascular stress vary depending upon the demands of football, involve substantial dynamic and static (or resistance) components.

Methodology

The purpose of the study was to find out the effect of wall ladder exercises and circuit training on selected physiological variables among school level male football players. The subjects selected were sixty students at school level, male football players in the age group of 13 to 17 years. The subjects were from the St. Peter's (ICSE) School, Mumbai, and Maharashtra, India. The selected subjects were assigned into two experimental group and a control group. Each group consisted of twenty subjects (n=20). Group I acted as Experimental Group I-(Wall Ladder Exercise), Group II acted as Experimental Group II-(Circuit Training) for a period of 12 weeks and Group III acted as a Control group. Pre-test was conducted for all the subjects on selected physiological variables namely vital capacity and cardiovascular endurance.

For both experimental group, exercise were explained and demonstrated to the subjects.10 minutes was allotted for warm up and 5 minutes for stretching was performed by the subjects prior to the training sessions. After the warm up the wall ladder exercise were given for 45 minutes. During the first three weeks the intensity was fixed 60% for their training and the subjects was performed in 45 minutes. The intensity was increased by 5% once in every three weeks.

Results on vital capacity

Table 1: Computation of Analysis of Covariance on Vital Capacity

Test	EX1	EX2	CG	SV	SS	df	MS	F
Pre test	1954.50	1995.00	2046.75	Between	85522.50	2	42761.250	2.54
				Within	960808.75	57	16856.29	
Post test	2178.00	2050.00	2019.00	Between	284173.33	2	142086.67	7.51
				Within	1077900.00	57	18910.53	
Adjusted	2221.14	2053.66	1972.20	Between	595414.72	2	297707.36	101.36
				Within	164479.567	56	2937.14	

*Significant at 0.05 level of confidence for df (2, 57) and (2, 56) are 3.16

Table 1: Shows that the obtained F value on pre test scores on Vital capacity was 2.54 lesser than the required value of 3.16 to be significant at 0.05 level. This proves that there is no significant difference between the groups at the initial stage and the randomization at the initial level are equal. The obtained posttest F value of 7.51 was greater than the required F value of 3.16. Further the obtained F value of 101.36 was greater than the required F value of 3.16.

Table 2: Scheffe's post hoc test on vital capacity

EX1	EX2	CG	MD	CI
2221.14	2053.66	-	167.49*	42.67
2221.14	-	1972.20	248.95*	42.67
-	2053.66	1972.20	81.46*	42.67

*Significant at 0.05 level of confidence

The influence of Wall ladder exercise and Circuit training on Cardiovascular Endurance is presented in Table 3. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F-value 101.36 was greater than the required table F-value to be significant at 0.05 level. Since significant F-value was obtained, the results were further subjected to post-hoc analysis and the results presented in Table 4 proved that there was significant difference between Wall ladder exercise group and Circuit training group (MD: 167.49), Wall ladder exercise group and control group (MD: 248.95) and Circuit training group and Control group (MD: 81.46). Thus, it was found that Wall ladder exercise was significantly better than Circuit training and control group of the school level male football players.

Results on cardiovascular endurance

Table 3: Computation of analysis of covariance on cardiovascular endurance

Test	WLTG	CTG	CG	SV	SS	df	MS	F
Pre test	1745.00	1760.00	1825.00	Between	72333.33	2	36166.667	1.42
				Within	1455000.00	57	25526.32	
Post test	2185.00	2015.00	1714.00	Between	2754333.33	2	1377166.67	51.21
				Within	1533000.00	57	26894.74	
Adjusted	2199.59	2022.68	1718.73	Between	3028881.29	2	1514440.64	69.29
				Within	1224017.010	56	21857.45	

*Significant at 0.05 level of confidence for df (2, 57) and (2, 56) are 3.16

Table 3: Shows that the obtained F value on pre test scores on Cardiovascular Endurance was 1.42 lesser than the required value of 3.16 to be significant at 0.05 level. This proves that there is no significant difference between the groups at the initial stage and the randomization at the initial level are equal. The obtained posttest F value of 51.21 was greater than the required F value of 3.16. Further the obtained adjusted post mean F value of 69.29 was greater than the required F value of 3.16. This proved that the differences between the posttest means and adjusted mean of the subjects were significant.

Table 4: Scheffe's post hoc test on cardiovascular endurance

WLEG	CTG	CG	MD	CI
2199.59	2022.68	-	101.91	116.41
2199.59	-	1718.73	551.87*	116.41
-	2022.68	1718.73	374.95*	116.41

*Significant at 0.05 level of confidence

The influence of Wall ladder exercise and Circuit training on Cardiovascular Endurance is presented in Table 3. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F-value 69.29 was greater than the required table F-value to be significant at 0.05 level. Since significant F-value was obtained, the results were further subjected to post-hoc analysis and the results presented in Table 4 proved that there was significant difference between Wall ladder exercise group and control group (MD:551.87) and Circuit training group and Control group (MD: 374.95). Comparing between the treatments groups, it was found that there was no significant difference between Wall ladder exercise and Circuit training group. Thus, it was found that Wall ladder exercise and Circuit training were significantly better than control group in Cardiovascular Endurance of the school level male football players.

Conclusion

Within the limitations and delimitations of this study, the following conclusions were drawn based on the results of the study. It was concluded that the wall ladder exercise and circuit training groups significantly improved Vital capacity and cardiovascular endurance. However, Group I (wall ladder exercise) has significant increase in vital capacity, when compared to Group II (circuit training). Group II (circuit training) significant increase in cardiovascular endurance when compared to Group I (wall ladder exercise). Hence, it is put forward that, performed appropriately, the wall ladder exercise and circuit training can afford significant improvement on selected physiological variables on experimental group compared to the control group.

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