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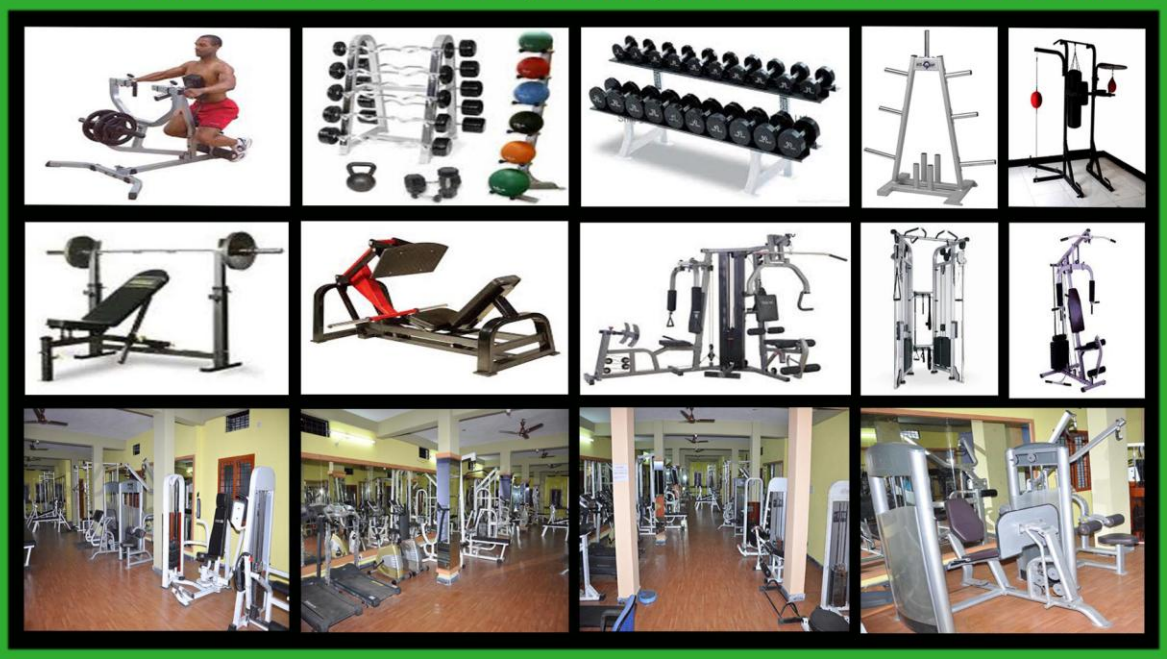

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Physical Education in India – A Study

By

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Physical Education not only fulfills a unique role in education, but is also an integral part of Education. It is sum of total experience and their related responses. Experience grown and responses developed out of participation in big muscular activities. All-round development of individual – physical, mental, social, moral is the real aim of Physical Education.

Physical Education in India: India is having a rich Back ground of Physical Education (PE). In the year **1882**, for the first time it was the Indian Education Organization that recommended Physical Training be promoted in the interest of youth in each class of School, **Y.M.C.A,** college of Physical Education, Madras was founded in 1920 by **H. C. Buck**. Since its inception this college has been working to promote and systematize Physical Education in India. In the year 1927 (I.O.A) was formed with the efforts of Dr. A. G. Noehren and Mr. H. C. Buck. In the year 1931, Government College of Physical Education, Hyderabad, India was established. In the year 1948, Asian Games Committee Constituted. In the year 1953 Government of India introduced the Rajkumari Coaching Scheme for Games and Sports with the objective of training good athletes and sportsmen. This scheme received wide popularity since famous players like Major. Dhayan Chand, Dr. Ram Singh was working under this scheme.

Laxmibai National college of Physical Education (PE) at Gwalior (M.P.) was established in the year 1957. LNCPE is the only PE College being sum by Central Govt. This Deemed University facilitates Research Programs, training and teaching for PE personals. NCERT developed the national curriculum for elementary & secondary education in the year 1988 to reflect the postulates of the NPE. The main thrust of this exercise was to provide for the national core curriculum in the school syllabi as postulated in the national policy and to integrate PE with the academic program of the schools. The core curriculum states that Health and PE & sports should be integral part of learning process and be included as the evaluation of performance. In this curriculum includes; Health & PE as one of the core subjects in all levels of school education.

Physical Education classes are included in all Indian schools from primary to high school. Physical Education classes are offered for both genders, for all religions and for different strata of socio-economic background. Generally two classes of physical education subject being held in a week. Curriculum is revised by NCERT, in every five years. This apart it regulates under the Ministry of Education, Government of India. Qualified Physical Education teachers with Bachelor of PE appointed as teachers in schools.

The Sports Authority of India (SAI) is a body set up by the Ministry of Youth Affairs & Sports, Government of India. SAI was created in 1984 to promote sports in the country, headquarters at Jawaharlal Nehru Stadium Complex, New Delhi. SAI had established seven regional centers at Bangalore, Bhopal, Gandhinagar, Kolkata, Sonepat, Delhi, Mumbai and Imphal and two sub-centres at Guwahati and Aurangabad. Netaji Subhas National Institute of Sports , Patiala, the Lakshmibai National College of Physical Education, Thiruvananthapuram are the major sports institutes run by this body. It has also a High Altitude Training Centre at Shillaroo, Himachal Pradesh, India. SAI training centre for kayaking and canoeing, Alappuzha.

National Institute of Sports (NIS); (NIS) was established in the year 1961. The main aim of this Institute was to develop sports at the Motibagh Palace grounds in Patiala. Renamed Netaji Subhas National Institute of Sports (NSNIS), 1973.The origins of the Sports Authority of India, depends on the organizing committee formed to host the 1982 Asian Games in New Delhi. SAI was established by the Dept of Sports Ministry of Youth Affairs & Sports, Government of India, 1984. In the year 1987 the Society for National Institute of Physical Education and Sports (SNIPES) was merged with SAI. Netaji Subhas National Institute of Sports (NSNIS), Patiala and its allied centres at Bhopal, Bangalore, Kolkata and Gandhinagar and the Lakshmibai National College of Physical Education at Thiruvananthapuram came under SAI. The NSNIS, Patiala and the Lakshmibai National College of Physical Education, Thiruvananthapuram became its academic wings. In the year 1995, LNCPE Gwalior became a separate "Deemed University".

Sports Authority of India conducts various activities and schemes to promote sports in India. They include: National Sports Talent Contest Scheme (NSTC) for Sub-Junior level trainees, Army Boys Sports Company Scheme (ABSC)- for Sub-Junior level trainees, SAI Training Centers Scheme (STC) - for Junior level trainees, Extension Centre of STC /SAG , Special Area Games Scheme (SAG) - for Junior level trainees, Centre of Excellence Scheme (COX) - for Senior level trainees. Extension Centre of STC /SAG; the basic concept of the scheme is to develop sports standard in schools and colleges who organize specific sports and have shown commendable results. The trainees in the age group of 14-21 years are adopted under the scheme. The services of coaches will be provided to these Schools/Colleges on requirement basis. Annual maintenance grant up to Rs.1.00 lacs per centre per annum for 20 players. SAI has two Academic Wings which provide certificate courses in PE, sports and sports medicine, namely, a) Netaji Subhas National Institute of Sports (NSNIS), Patiala for coaches. b) Lakshmibai National College of Physical Education (LNCPE) at Thiruvananthapuram. **NSNIS, Patiala conducts the following programs:** Diploma Course in Sports Coaching, Masters Course in Sports Coaching, Certificate Course in Sports Coaching, Post-graduate Diploma Course in Sports Medicine, and Refresher Courses. Various seventeen courses were offered for sports coaching by NIS.

Sports and Physical Education Universities in India: LNCPE, Thiruvanathpuram established in the year 1985, It runs under the auspices of the Dept of Youth Affairs and Sports, Ministry of Human Resource Development,(HRD) Government of India. College is affiliated to the University of Kerala & its academic wing is at par with the NSIS Patiala. LNCPE, Thiruvananthapuram conducts the following courses: Bachelor of Physical Education (BPE), Master of Physical Education (MPE), and Regular and Part-time Ph.D programs. Sports & Physical Education Top Universities in India; Tamil Nadu Physical Education and Sports University, established in the year 2004, (**Areas offered**; PE, Exercise Physiology, Sports Nutrition, Sports Biomechanics, Sports Psychology, Sports Sociology, Yoga, Sports Management, Coaching and Training & Sports Technology). LNIPE Gwalior established in the year 1957, and YMCA College of Physical Education Madras, India, in the year 1920. The total number of universities in India is 682 according to the information by (UGC) university grants commission recently.

Recent Development & Participation in Physical Education, India; Presently Physical Education has become more research oriented, new trends are being implemented and old traditions have been changed, (for e.g. New technique, equipments, foreign coaches, New style, Physical Education teachers exchange programs). New PE curriculum delivered in Gram Vikas Kankia School in Odisha, India. This information was facilitated by David Morton on 21 February 2014. The new Physical Education structure in Kankia School has accelerated student development and inclusion after being adapted for use from International curricula. Students of 3rd -6th grade receive lessons based on Fundamentals and Learning to Train, which focus on adapted games to foster enjoyment, achievement & creativity. Targeted areas of focus in the adapted games include motor skills and key sport skills so that they can be adapted for use in the variety of sports that are now being taught to students in grades seven and eight. UK and Australia focus on refining skills and developing game play and cognitive and social skills as well. Range of sports experienced has been extended to include international favorites like handball & football while incorporating local favorites, badminton and volleyball.

Challenges in Physical Education in India; Negative attitude of society towards PE, Very few students select Physical Education as a career, Physical Education courses are offered in very few colleges and Universities with limited seats. Especially in schools Physical Education teachers are very less (one or two teachers for 500 -1000 students). Need more hours for PE classes in a week. Need to appoint more qualified PE teachers like other subjects. Need to improve and facilitate quality of Physical Education.

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IMPACT OF PHYSICAL ACTIVITY ON UNDER WEIGHT MALES

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ABSTRACT

Introduction: Physical activity is beneficial to one and all. Physical activity related to health and should be part of everyone's daily routine to maintain quality of life. Underweight status may be related to genetics, chronic under nutrition, or illness. Youth with chronic illness affecting the absorption, metabolism or loss of nutrients may lose a significant amount of weight from the catabolism of fat and muscles tissue, (Stang J, Story M, 2005). **Method:** 100 subjects were selected randomly from the group of 200 students undergoing orientation course to participate in the physical education program. The duration of the physical activity was 30 minutes twice per week in the game of volleyball and football for a period of 8 weeks. The variables which were considered for this study were body mass index, 50 M run, 550 M run, sit ups, standing long jump and sit and reach.. Pre and post test were conducted to find out the effect of physical activity on the fitness level of the participants. The statistical tools which were utilized for this study are mean, standard deviation and t- test with help of statistica software. **Results & Discussion:** The analysis of the data had shows an interesting results. The mean and S.D with regard to body mass index of the subjects from pre to post test were (17.74, 1.23) and (18.42, 1.32). The mean and S.D with regard to 50 M. Sprint performance of the subjects were (7.93, 0.93) and (7.17, 0.755). Mean and S.D with regard to 550 M. run were (3.00, 0.8) and (2.38, 0.57).Standing broad jump of the subjects from pre to post test were (174.15, 32.05) and (188.51, 29.36). The mean and S.D with regard to sit-ups from pre to post test were (19.30, 4.84) and (22.53, 5.36). The mean and S.D with regard to sit & reach test of the subjects from pre to post test were (24.14, 8.17) and (28.18, 7.98) respectively. **Conclusions**: It is concluded that the effect of physical activity had shown significant performance from pre to post test on the participants with regard to body mass index (BMI), 50.M sprint, standing broad jump, sit-ups (30 sec), and sits & reach test. Furthermore 550.M.run, had shows insignificant performance.

Keywords: Physical activity, body mass index, malnutrition, underweight.

INTRODUCTION

Physical activity is beneficial to one and all. Physical activity related to health and should be part of everyone's daily routine to maintain quality of life. Underweight status may be related to genetics, chronic under nutrition, or illness. Youth with chronic illness affecting the absorption, metabolism or loss of nutrients may lose a significant amount of weight from the catabolism of fat and muscles tissue, (Stang J, Story M, 2005). Although everyone's exercise program will vary according to personal needs, the general principles of physical fitness are

universal. The more you exercise, the greater the variety of activities you do, the more fit you will be. To improve physical fitness, systems of the body like the muscular and cardio respiratory must be stressed. The skeletal muscle to have increase in strength, the muscle must work against a heavier load than normal, which is one of the concepts of overload principle and which is the key to all conditioning programs (Williams A., 1988). A sport training is physical, technical, moral and intellectual participation of an athlete with help physical ex, moral and intellectual participation of an athlete with help physical excises. It is a planned process for the participation of athlete and players to achieve top level performance. Sports training are the basic form of preparation of sports man, (MATWEJEW-1981). Some individuals are underweight due to genetics; and others due to poverty. Severely underweight individuals may have poor physical stamina and a weak immune system, leaving them open to infection. According to Robert E. Black of the Johns Hopkins School of Public Health, "Underweight status ... and micronutrient deficiencies also cause decreases in immune and non-immune host defenses, and should be classified as underlying causes of death if followed by infectious diseases that are the terminal associated causes. People who are mal-nutritive underweight raise special concerns, as not only gross caloric intake may be inadequate, but also intake and absorption of other vital nutrients, especially essential amino acids and micro-nutrients such as vitamins and minerals. Exercise itself is catabolic, which results in a brief reduction in mass. The gain in weight that can result of it comes from the anabolic over-compensation when the body recovers (via rest and eating) and overcompensates via muscle hypertrophy. This can happen via an increase in the muscle proteins, or through enhanced storage of glycogen in muscles. Exercise can help stimulate people's appetite if they are not inclined to eat. The purpose of the study was to find out the effect of physical activity on the selected fitness variables on the underweight students of KFUPM.

METHOD

A number of 100 subjects were selected randomly from the group of 200 students undergoing orientation course to participate in the physical education program. The duration of the physical education program was 30 minutes twice per week in the game of volleyball and football for a period of 8 weeks. The variables which were considered for this study were body mass index, 50 M run, 550 M run, sit ups, standing long jump and sit and reach.. Pre and post

test were conducted to find out the effect of physical activity on the fitness level of the participants. The statistical tools which were utilized for this study are mean, standard deviation and t- test with help of statistica software.

Table-1

Test Items for Underweight group

Sl.no	Test items	Purpose
1	Body composition	To find out Body mass index (BMI)
2	50 M.Sprint	To find out speed
3	550 M, run	To find out cardio-vascular endurance
4	Standing broad jump	To find out the explosive power
5	Sit-ups (30 sec)	To find out muscular endurance
6	Sit & reach	To find out hip & trunk flexibility

RESULTS AND DISCUSSION

The analysis of data shows the effect of physical activity on the fitness performance of underweight participants from pre to post test.

Table:2

	Pre-test N= 100		Post-test N=100		't'-value	P-value
	Mean	S.D	Mean	S.D		
Body mass index	17.74	1.23	18.42	1.32	8.42	0.000000
50 M. Sprint	7.93	0.93	7.17	0.755	8.46	0.000000
550 M.run	3.00	0.8	2.38	0.57	0.58	0.56
Standing broad jump	174.15	32.05	188.51	29.36	4.69	0.0000
Sit –ups test (30 sec)	19.30	4.84	22.53	5.36	5.80	0.0000
Sit & reach test	24.14	8.17	28.18	7.98	6.09	0.0000

The mean and standard deviation with regard to body mass index of the subjects from pre to post test were (17.74, 1.23) and (18.42, 1.32) respectively. The mean and standard deviation with regard to 50 M. Sprint performance of the subjects were (7.93, 0.93) and (7.17, 0.755) respectively. Mean and standard deviation with regard to 550 M. run were (3.00, 0.8) and (2.38, 0.57) respectively. With regard to Standing broad jump of the subjects from pre to post test the Mean and standard deviation were (174.15, 32.05) and (188.51, 29.36) respectively. The mean and standard deviation with regard to sit-ups from pre to post test were (19.30, 4.84) and (22.53, 5.36) respectively. The mean and standard deviation with regard to sit & reach test of the subjects from pre to post test were (24.14, 8.17) and (28.18, 7.98) respectively.

In improving one's body weight the intervention of three things are very important exercise, diet, and lifestyle. In this study the two aspects were not touched i.e. diet and lifestyle. The participant had inform that after participating in the physical activity they feel very energetic and feel to eat more now and then. The underweight participants had shown improvement with regard to body mass index from pre to post test.. The underweight participants had also improved their fitness performance with regard to 50 M sprint, standing broad jump, sit-ups and sit & reach test. This is very encouraging for the underweight participants that they had shown interest and commitment towards the performance level which shows their capacity and commitment.

The subjects had not shown improvement with regard to 550 M. run this is may be because of the nature of volleyball and football. This gives an impression that volleyball and football will not have much effect on cardio-vascular fitness. This is evident if the walking, jogging and running is included in the program it may help the participants to improves the cardio-vascular endurance.

CONCLUSION

It is concluded that the effect of physical activity had shown significant performance from pre to post test on the participants with regard to body mass index (BMI), 50.M.sprinting performance, standing broad jump, sit-ups (30 sec), and sits & reach test. Furthermore 550.M.run, had shows insignificant performance.

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EFFECT OF PERIODIZED AEROBIC TRAINING AND PERIODIZED RESISTANCE TRAINING ON SELELCTED MOTOR FITNESS AND PHYSIOLOGICAL VARIABLES

BY

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INTRODUCTION

Higher Secondary School girls must participate to in year round conditioning programs to have the utmost efficiency, consistent improvement and balanced abilities. For that they must put their bodies under a certain amount obesity and stress to increase physical capabilities physical exercise is extremely important for maintaining physical fitness, including healthy weight healthy bones, muscles promoting physiological well being and strengthening they immune system

PURPOSE OF THE STUDY

The purpose of the study was to find out the effect of Periodized resistance training and Periodized Aerobic training on selected motor fitness and physiological variables among higher secondary school girls.

HYPOTHESIS

It was hypothesized that there would be significant difference on selected motor fitness muscular strength and endurance and cardio vascular endurance and physiological variables Maximum oxygen consumption.

METHODOLOGY

In this study 60 higher secondary school girls, age 12 to 14 years studying in VII to VIII from Government higher secondary school Ramanagara, Karnataka were randomly selected as lot method from a total of 150 students. The age, height and weight of the selected subjects were ranged from 120 to 130 cms and 30 to 40 kg respectively. Subjected were divided into three groups Periodized Aerobic training Group I, Periodized Resistance Training Group II, and Control Group III. Each group was measured on criterion variables. The respective treatment program for four days a week for 12 weeks, the subjects of control group did not undergo any special training programmed apart for their regular physical education programmed of the curriculum. **Statistical Technique:** The Analysis of covariance (ANCOVA) was used to find out the pre-test and post-test significance difference among the three groups. To find out the paired mean difference Schiff's Post Hoc test was used.

RESULTS AND DISCUSSIONS

Table 1: Criterion Variables and Test

Sl.No	Variables	Test/Instrument	Unit of Measurement
01	Cardio vascular Endurance	1.5 mil run	Minutes
02	Muscular strength and endurance	Bent Knee sit ups	Counts
03	Maximum oxygen consumption	3 minutes step test	ml/kg/min

Table II ANALYSIS OF COVARIANCE FOR PRE AND POST TESTS ON PERIODIZED AEROBIC TRAINING, PERIODIZED RESISTANCE TRAINING GROUPS AND THE CONTROL GROUP IN MOTORFITNESS AND PHYSIOLOGY VERIABLES

Variables	Groups	PAT-I	PRT-II	CONTROL-III	Source 0f variance	Sum of squares	Degree of freedom	Means of squares	Obtained F-value
Cardio vascular endurance (minutes	Pre-Test	13.15	13.53	13.37	B	1.12	2	0.56	1.24
					W	25.44	57	0.45	
	Post-Test	12.04	12.69	13.34	B	23.26	2	11.63	37.52*
					W	17.40	57	0.31	
	Adjusted means	12.15	12.58	13.29	W	20.20	2	10.10	77.69*
					B	7.54	56	0.13	
	Mean gain	1.11	0.84	0.03					
Muscular strength and Endurance (Counts)	Pre-Test	9.33	9.60	9.87	B	4.58	2	2.29	2.60
					W	50.40	57	0.88	
	Post-Test	11.40	12.40	9.93	B	62.98	2	31.49	37.49*
					W	47.87	57	0.84	
	Adjusted means	11.47	12.34	9.93	B	72.09	2	36.05	55.46*
					W	36.12	56	0.65	
	Mean gain	2.07	2.8	0.06					
Max.Oxygen consumption (in ml/kg/min)	Pre-test	35.07	34.87	34.47	B	4.60	2	2.3	0.77
					W	168.80	57	3.0	
	Post-Test	37.47	36.47	34.93	B	167.53	2	83.77	25.31*
					W	188.80	57	3.31	
	Adjusted means	37.65	36.50	34.93	B	120.25	2	60.12	63.28*
					W	53.36	56	0.95	
	Mean gain	2.4	1.6	0.46					

- **Significant at 0.05 level (2.14)**

F- Ratio at 0.05 level of confidence for 2 and 57 (df) =2.77 2 and 57 (df)=2.48

TABLE-III Results of Scheffe's test for the differences between the adjusted means on cardiovascular endurance, explosive strength and endurance and maximum oxygen consumption.

Sl.no	Variable	PAT-I	PRT-II	CONTROL-II	MEAN VALUE	'F' ratio	CRITICAL VALUE
1	Cardio vascular endurance	12.15	12.58	--	0.43	9.56	8.28
		12.15	--	13.29	1.14	76.91	8.28
		--	12.58	13.29	0.71	32.23	8.28

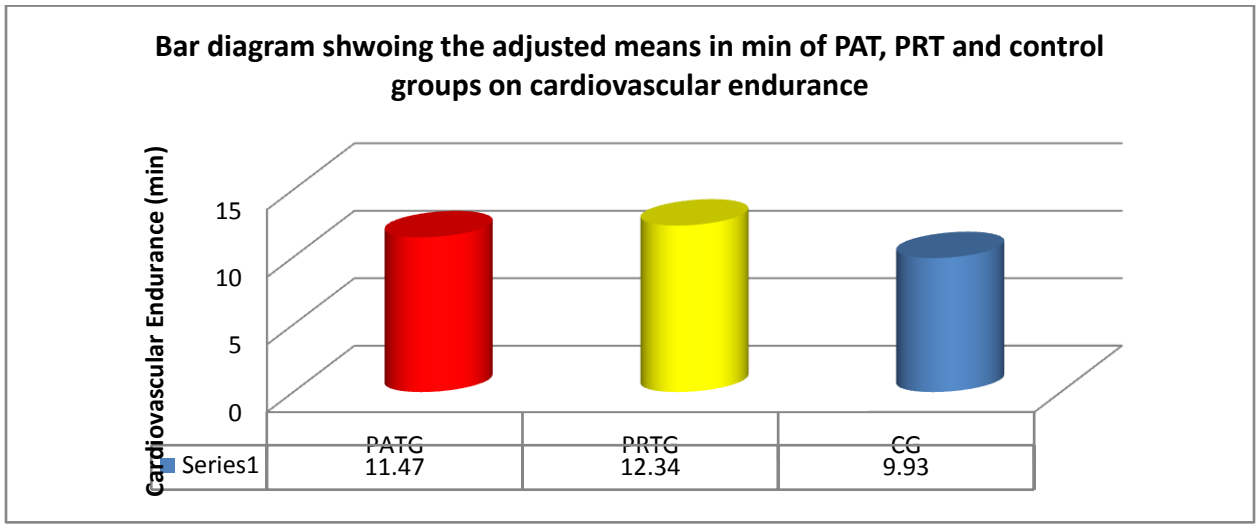


TABLE-IV Results of Scheffe's test for the differences between the adjusted means on Muscular strength and Endurence

SL.NO	VERIABLES	PAT-I	PRT-II	CONTROL-II	MEAN VALUE	'F' ratio	CRITICAL VALUE
2	Muscular strength and Endurance	11..47	12.34	--	0.84	8.67	8.28
		11.47	--	9.93	1.54	27.05	8.28
		--	12.34	9.93	0.71	66.35	8.28

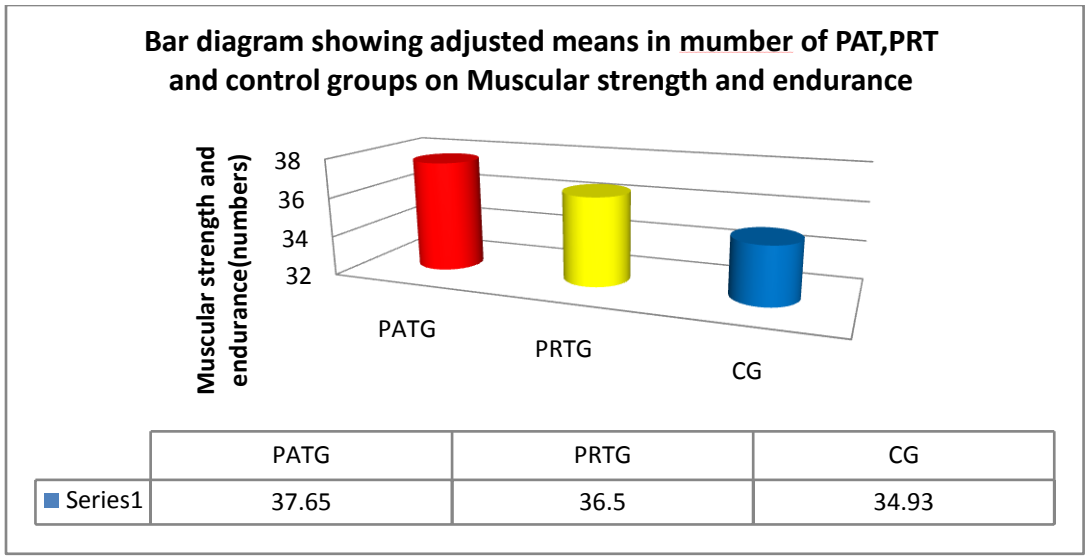
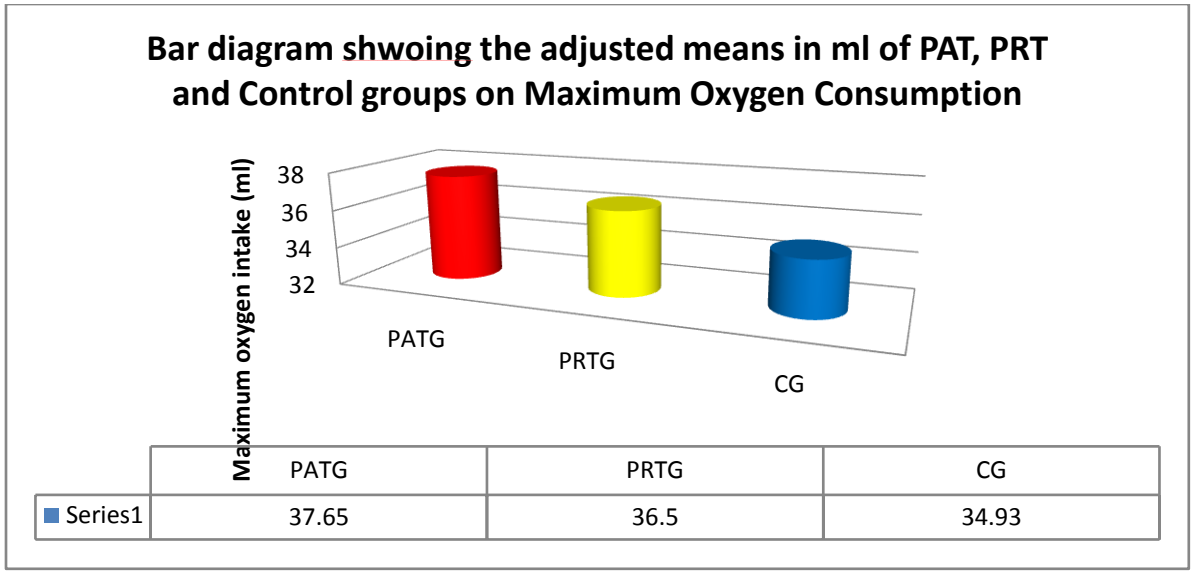


TABLE-V Results of Scheffe's test for the differences between the adjusted means on maximum oxygen consumption

SL.NO	VERIABLES	PAT-I	PRT-II	CONTROL-II	MEAN VALUE	'F' ratio	CRITICAL VALUE
3.	Max. Oxygen consumption	37.65	36.50	--	1.15	10.30	8.28
		37.65	--	34.93	2.72	57.08	8.28
		--	36.50	34.93	1.57	18.89	8.28



The results of Scheffe's test on paired adjusted means of PAT and PRT, the observed 'F' ratio were and 9.95 for cardio vascular endurance, 8.67 for muscular strength and endurance, 10.30 for Maximum oxygen intake. The observed 'F' ratios were significant only in the case of cardio vascular endurance, muscular strength and endurance, and maximum oxygen intake since they were greater than the needed critical value of (8.28) for significant at 0.05 level.

CONCLUSIONS

Within the limitation and delimitations of the present study, the following conclusions were drawn after giving training in periodized aerobic training and periodized resistance training and for four days a week for twelve weeks three groups compared to control group.

1. Periodized aerobic, periodized resistance training a significant improvement in the development of selected motor fitness and physiological variables.
2. Periodized aerobic training produced a significant improvement in cardiovascular endurance and maximum oxygen consumption better than the periodized resistance training.
3. The periodized resistance training and periodized aerobic training increasing explosive strength, cardio vascular endurance and maximum volume of oxygen.
4. The periodized resistance training significantly increasing muscular strength as compared to periodized aerobic training.

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COMPARATIVE STUDY ON ANTHROPOMETRICAL VARIABLES AMONG BATSMEN AND BOWLERS OF GOA STATE SENIOR CRICKET TEAM

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Abstract

The main purpose of the present study was to compare the anthropometrical variables among batsmen and bowlers in cricket of Goa state cricket team. A total of 30 cricketers were examined, all the subjects had competed at the state and national level. The subjects were divided in to two groups 15 in each Batsman n= 15 and Bowlers n=15, the anthropometric measurement was measured and recorded for the study. Toachieve the results independent t-test was used. The level of significance was set to 0.05 levels. Result of this study revealed that there was significant difference exit between the standing height (3.228) , arm length (3.991) body weight (3.955), body composition (4.657) of batsmen and bowlers as the tabulated 't' (2.021) on the other insignificant difference was exit between leg length (.669), chest girth (1.725), thigh girth (.818),calf girth (1.811).
Key words: Anthropometrical, Body Composition, Cricket Players,

INTRODUCTION

The popularity of cricket stands next to Football in Goa, in Goan sports society big extravaganza sporting events like ISL, National Football league and many other Football tournaments rake up the emotions of sports lovers of Goa. Popularity of Cricket has come in recent past when couple of local cricket made a mark in IPL has made cricket more popular among kids and parents.(Lamani, Chandu.2010) Success in sports is partly attributed to physique the psychological makeup and a many of other factors. While the knowledge of morphology of sportsmen belonging to various discipline is abundant, that of cricketers is very scantly this prompted the present investigation.

Anthropometry and Cricket

To predict superior performance in any sports, a number of studies have been done in which performances from various sports have been compared with regard to some of these factors; there are numerous factors which are responsible for the performance of a sportsman. The physique and body composition, including the size shape and form are known to play a significant role in this regard.At present, sportsman for superior performance in any sports is selected on the basis of physical structure and body size. structural measurement include

anthropometric measurement which consist of objective measurement of structures such as height, weight, width, depth and the circumference of the various part of the body. The anthropometric measurements most commonly used for assessing nutritional status are height, body weight, mid-arm circumference and triceps skin fold thickness (Blackburn, et al. 1977).

Purpose of the Study

The main purpose of the present study was to compare Anthropometrical variables among batsman and bowlers of Goa state team who are actively participating state and national tournaments.

1. Do the anthropometrical variables differ among batsmen and bowlers in cricket of Goa state cricket team?

Significance of the Study

It is hoped that the data generated and interpreted in this study will one day help the Goan cricket. The information collected can be used for monitoring the training program as well as counseling, providing information about the choice between bowler, batsman and wicket keeper. The author also assumes that this study will help the Goan cricket to improve the standard of cricket in the state.

METHOD

Subject- A total of 30 cricketers were examined, total 12 Anthropometric tests were measured and recorded under the supervision of investigator at BITS Pilani K.K.Birla Goa Campus Deemed University Gym, and the tests were generally conducted between 6:00 am to 8.30 am. All the subjects had competed at the state and national level. The subjects were divided in to two groups 15 in each Group, Batsman n= 15 and Bowlers n=15 their age was ranged between 18 to 22 years. Table No – 1 Classification of Group for Test

Sr. No	Group	Total Number
01	Batsman	15
02	Bowler	15
Total Subjects for the Study :		30

Table No-2 Number of Test measured and recorded

Anthropometric Tests In CM	Stature – Standing Height		Sitting Height	Body Weight in KG
Girth Measurements In CM	Chest Girth	Thigh Girth	Calf Girth	
Skinfold In MM	Biceps	Triceps	Subscapular	Suprailliac crest
Length Measurements In CM	Thigh Length		Arm length& leg length	

Statistical Procedure

For analysis of the data, collected from 30 cricketers Cricket 15 Bowlers and 15 Batsman and of Goa State, Mean and Standard Deviation was computed. Comparison was made on the basis of activity i.e. Bowler and Batsman. For this purpose 'T' test was applied. For testing the hypothesis the Level of confidence was set at.05 Level of significance. The SPSS XI^{Ith} version American Computer Software was used for the statistical computation.

RESULTS

The value of calculated t-test was compared with the tabulated significant value at 0.05 level of confidence with 28 degree of freedom. The details for comparative mean value and SD values of anthropometrical variables were tabulated and presented below

Table -3. Comparison of Means, Standard deviation and T-Test of Selected Anthropometric Variables of Batsman and Bowler of Cricket Players of Goa State

Sr. No	Variable	Batsman			Bowler			T Ratio
		Mean	SD	SE	Mean	SD	SE	
1	Standing length	176.55	5.336	1.193	171.15	5.244	1.173	3.228*
2	Arm length	72.35	1.843	.412	69.85	2.110	.472	3.991*
3	Thigh length	41.85	3.498	.782	42.90	2.125	.475	1.147
4	Leg length	90.25	4.482	1.002	89.25	4.962	1.109	.669
5	Chest girth	86.20	3.397	.760	84.70	1.895	.424	1.725
6	Thigh girth	52.75	2.049	.469	52.15	2.519	.563	.818
7	Calf girth	33.90	1.483	.332	33.00	1.654	.370	1.811
8	Body weight	70.75	3.7121	.830	63.35	4.848	1.084	3.955*
9	Body composition	15.32	1.227	.274	13.54	1.187	.265	4.657*

Table-3. Clearly indicate that there is significant difference in standing height, arm length, body weight, and Body composition of batsmen and medium pace bowlers of cricket at 0.05 level of

significance. Non-significant difference was found on leg length, chest girth, thigh girth and calf girth of batsmen and medium pace bowlers.

CONCLUSION

The findings reveal that the anthropometric variables of standing height, arm length, body weight, and body composition have shown significant difference between batsmen and medium pace bowlers at 0.05 level of significance.

The anthropometric variables of leg length, chest girth, thigh girth and calf girth have not shown any difference.

1. Significant difference was found in Standing Height of Batsmen and Medium pace bowlers of Cricket.
2. Significant difference was found in weight of Batsmen and Medium pace bowlers of Cricket.
3. Significant difference was found in Arm Length of Fast and Medium bowlers of Cricket.
4. Significant difference was found in Body Composition of Batsmen and Medium pace bowlers of Cricket.
5. Insignificant difference was found in Leg Length of Batsmen and Medium pace bowlers of Cricket.
6. Insignificant difference was found in Chest Girth of Batsmen and Medium pace bowlers of Cricket. I
7. Insignificant difference was found in Thigh Girth of Batsmen and Medium pace Bowlers of Cricket
8. Insignificant difference was found in Calf Girth of Batsmen and Medium pace Bowlers of Cricket
9. Insignificant difference was found in Thigh Length of Batsmen and Medium pace Bowlers of Cricket

Recommendation for Future Research work

Extensive research have been undertaken in several sports disciplines to identify morphological characteristics of young sports children which enables coaches to identify promising talent in their respective sports disciplines. However, no research is traceable which identify morphological and other characteristics of young cricketers. Therefore it is recommended to undertake research which might identify the morphological, physiological, psychological profiles of young cricketers from normal population or other sporting population.

1. In the present study sample size of young cricketers was very small. Therefore, it is recommended to replicate such an investigation with larger sample size.
2. Therefore Investigation of morphological, physiological and psychological profiles of cricketers specializing in bowling, batting, wicket keeping is recommended.

3. The present investigation involved cricketers at state level. The morphological profile at national and international level may be accentuated for various reasons.

Recommendation for Coaches and Administrators

1. Therefore it is recommended that either training regime be made demanding or select candidates with suitable body types. Based on the research findings involving young children in sports, identify talented cricketers at early age and coach them right.
2. It is recommended that coaches based on their knowledge of morphological and physiological profile required for various departments of the game of cricket.

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THE EFFECT OF YOGIC AND PHYSICAL EXERCISES ON BLOOD PRESSURE VARIABLES OF SECONDARY SCHOOL STUDENTS IN VIJAYAPUR DISTRICT OF KARNATAKA

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Abstract

Back ground: Study on Physiological Variables of secondary school students in Vijayapur district of Karnataka State. The purpose of the present study was to find the effect of yogic practice and physical exercises on blood pressure (both systolic and diastolic) variables of secondary school students. For this purpose 150 students studyining in various classes of Nagthan composite junior college Vijayapur in Karnataka students in the age group of 14 to 16 were selected using purpose random techniques. They were divided into three equal group, each group consisted of fifteen subjects, in which group -I underwent yoga practice, group –II underwent training physical exercises and group-III acted as control group who are not allowed to participate in any special training apart from their regular curricular activities. The training period for this study was six days a week for eight weeks. Prior and after the training period, the subjects were tested for blood pressure (systolic and diastolic). The Analysis of Covariance (ANCOVA) was applied to find out which group has better in performance. Whenever, 'F' ratio for adjusted test was found to be significant for adjusted post-test means Scheffe's test was followed, as a post-hoc test to determine which of the paired mean differ significantly. It was concluded from the results of the study that after yoga practice and physical exercises periods, both the training has improves the blood pressure (both systolic and diastolic) for both the experimental group. But yoga group has noticed better performance in blood pressure comparing the physical exercises group The results of the study also shown that there was a significant difference was found between yoga and Physical execercises the control groups

Key words: yoga, Physical exercises, cardiovascular endurance and blood pressure

INTRODUCTION

Yoga is the science of right living and as such, is intended to be incorporated in daily life. It works on all aspects of the person: the physical, vital, mental, emotional, psychic and spiritual. Yoga aims at bringing the different bodily functions into perfect coordination so that they work for the good of the whole body. Yoga focuses on harmony between mind and body, yoga derives its philosophy from Indian metaphysical beliefs. The word yoga comes from Sanskrit language and means union or merger. The ultimate aim of this philosophy is to strike a balance between mind and body and attain self attinghtment. The achieve this, yoga use movement, breath, posture, relaxation and mediation in order to establish a healthy, lively and balanced approach to life. According to Swami satayananda Saraswathi "yoga is not an ancient myth buried in oblivion. It is the most valuable inheritance of the presents. It is the essential need of today and the culture of tomorrow". Regular practice of asana maintains the physical body in an optimum condition and promotes health even in an unhealthy body. Through asana practice, the dormant energy potential is released and experienced as increased confidence in all areas of life. Yoga

asana have a deeper a significant value in the development of the physical, mental and spiritual personality, whereas pure exercises only have a physical effect on the blood pressure.

Physical exercises are performed quickly and whit a lot of heavy breathing. Yoga asana are performed slowly with relaxation. The benefits of various yoga techniques have been professed to improve body muscular strength, performance, stress reduction, attainment of inner peace and self-realization. It is well established fact that participation in physical education and sports activities if highly beneficial to one's health and leads to improved performance by students in schools, in addition to helping them in developing many life skills. In general, children need at least 30 minutes of vigorous activity every day. Unfortunately today children are three to four times less active than they were 30 years ago. As children grow elder, their lives become more sedentary. Many take to bus or driven to schools where they sit behind a desk all day. In the evening they watch TV or play computer games. Computers may have become a necessary for today's kids, but a study says that the Machines are producing a ''generation of weaklings'' as children swap outdoor play for screen games and the internet, reports PTI from London.

METHOD

This study under investigation involves the experimentation of yoga practice and physical exercise on muscular strength and blood pressure [systolic and diastolic]. Only boys student those who were studying in various clasess of Nagathan PU Composite junior college of Vijayapur in Karnataka and aged between 14 and 17 years were selected. The selected 150 subjects were randomly divided into three groups of fifteen each, out of which group- I[n=50] underwent yogic practice, group-II[N=50] underwent physical exercise training and group – III[N=50] remained as control.

The training programme was carried out for five days per week during morning session only (6 am to 8 am) for twelve weeks. Cardiovascular endurance was measured by skipping test, se and blood pressure was measured by using sphygmomanometer

The study was to find out the effect of yogic exercises on selected 150 students of high school, aging 14 to 16 years are selected randomly, The Control random group 50 subjects Experimental group-1(Yogic exercise) 50 subjects Experimental group-2 (Physical exercise) 50 subjects. Physiological Variables Cardiovascular endurance and blood pressure

Human bodies are designed for regular physical activity. The sedentary nature of much of modern life probably plays a significant role in the epidemic incidence of depression today. Many studies show that depressed patients who stick to a regimen of aerobic exercise improve as much as those treated with medication.

Hence the Researcher has selected secondary school students for this particular research work. In these study secondary school students has given various yogic exercises. On the effect of yogic exercises finally researcher has succeeded on get the result in this particular study. Mainly in this study the researcher has taken secondary school children hence the physiological condition will change in this age then also the researcher has given the particular training and he has got improvement in the particular physiological variables

Discussion on Blood pressure

7. Diastolic blood pressure:

It was also hypothesised that yoga training may reduce the blood pressure diastolic than physical exercises

TABLE-VII, Computation of Covariance of physiological variables of Blood pressure (Diastolic) of control Group, Experimental group 1(Yogic Exercises) and Experimental group 2 (Physical Exercises) of Secondary school students.

Source Variance	Df	Sum of the Square	Mean square	Remarks
Between the group	2	350.46	175.23	Sig
Within the group	296	10477.51	35.39	
TOTAL	148			

Significant at 0.05 level

TABLE- VII A, Blood pressure (Diastolic mean differences of control group (A), Experimental group 1(B) (Yogic Exercise) and experimental group 2(C) (Physical Exercise)

GROUP	M1	M2	Diff
Group C & E1	72.273	74.966	-2.693
Group C & E2	72.273	73.711	-1.438
Group E1 & E2	74.966	773.711	1.254

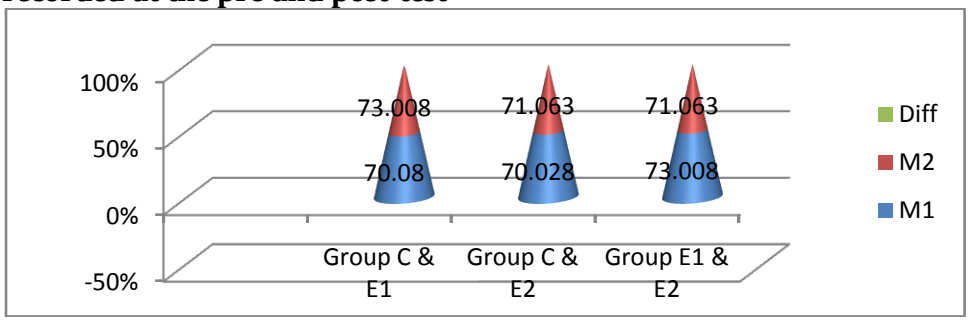
Discussion and Findings (Blood Pressure Diastolic)

When we refer Table VII, it was found that the computed 'F' ratio was 1.691 As this value was more than table value it was considered significant at 0.05 level. In order to find out the difference between the adjusted paired means Scheffe's Post Hoc test was employed.

Table VII A reveals the Scheffe's Post Hoc test result of 1.4608 which was not found significant. Table VII A also reveals that the difference between group A and group B(-2.980). The difference between group A and group C(-1.035) and also the difference between group B and group C(1.945).

From the Statistical Analysis, it was shown that slight mean difference has reveals that Yogic exercise reduced Blood Pressure (diastolic) than the control group and experimental group II (Physical exercise groups). It may be due to the reason that the yogic exercise and physical exercises both is better for better functioning of the internal organs especially the circulatory system of the body. Hence the diastolic blood pressure was slightly reduced comparing to Yogic exercise, hence formulated hypothesis there would be significant influence on the reducing diastolic rate of the .yoga practitioners was rejected alternative hypothesise was accepted

The graph showing the mean differences of blood pressure diastolic of experimental group recorded at the pre and post-test



8. Systolic blood pressure:

To determine the influence of yogic and physical exercise on blood pressure (systolic) ANACOVA was employed. The obtained results pertaining to this has been presented in the table

It was also hypothesised that yoga training may reduce the blood pressure systolic than physical exercises

TABLE-VII: Computation of Covariance of physiological variables of Blood pressure (Systolic) of control Group, Experimental group 1(Yogic Exercises) and Experimental group 2 (Physical Exercises) of Secondary school students.

Source Variance	Df	Sum of the Square	Mean square	Remarks
Between the group	2	217.15	108.57	
\Within the group	296	3567.76	12.05	9.08
TOTAL	298			

Significant at 0.05 level

TABLE- VII A:Blood pressure (Systolic)

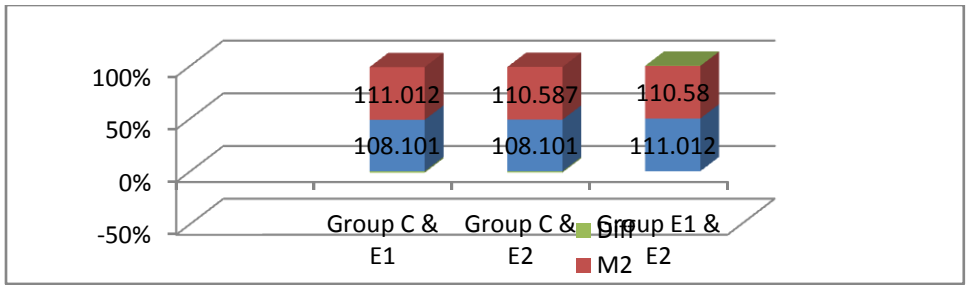
Mean differences of control group (A), Experimental group 1(B) (Yogic Exercise) and experimental group 2(C) (Physical Exercise)

GROUP	M1	M2	Diff
Group C & E1	107.895	110.018	-2.123
Group C & E2	107.895	109.566	-1.671
Group E1 & E2	110.018	109.566	0.452

Results and Findings. (Blood Pressure Systolic)

Table VII shows the F ratio of 9.448 which was significant at 0.05 level. Hence Scheffe's Post Hoc test was employed 0.3787 which was found significant. Table VII (shows Scheffe's Post Hoc test) shows the mean difference between the three groups. The difference between group A (control group) and group B (Experimental Group I, Yogic Exercise) was -2.912. The difference between the group A (control Group) and group C (Experimental group II, Physical Exercise group) was -2.486. The difference between group B (Experimental group I, Yogic exercise) and experimental group II(Physical Exercise) was 0.425.

The graph showing the mean differences of blood pressure of systolic of experimental group recorded at the pre and post-test



Discussion and Findings (Blood Pressure Systolic)

When we refer Table VII, it was found that the computed 'F' ratio was 9.448. As this value was more than table value it was considered significant at 0.05 level. In order to find out the difference between the adjusted paired means Scheffe's Post Hoc test was employed. Table VII A reveals the Scheffe's Post Hoc test result of 0.3787 which was significant. Table VII A also reveals that the difference between group A and group B(-2.912). The difference between group A and group C(-2.486) and also the difference between group B and group C(0.425).

Conclusion: It was concluded from the results of the study that after yoga practice and physical exercises periods, both the training has improves the blood pressure (both systolic and diastolic) for both the experimental group. But yoga group has noticed better performance in blood pressure comparing the physical exercises group, The results of the study also shown that there was a significant difference was found between yoga and Physical exercises the control groups.

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Relationship of Psychological Variables and Playing Ability among Hockey 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 hockey players as a function of gender. To achieve the purpose of this study the investigator selected 100 hockey players consisting of 50 men and women. The subjects were randomly selected from players who competed at intercollegiate level competitions held at Puducherry. 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 hockey was assessed subjectively through three experts in hockey in a playing situation. To examine the relationship between playing ability in hockey 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 hockey players‟ psychological levels in team cohesion and mental toughness were positively related with their playing ability, comparing between men and women hockey players, it was found that men hockey players were found to me more accurately related with the selected psychological variables than the women hockey players.

Key words: Hockey, Gender, Performance, Psychology

INTRODUCTION

According to Whitakar (1986) , in every tactical move in hockey one depends on team work and the individual skills such as good pushing, hitting, dribbling, stopping the ball, controlling 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. There is no definite origin of the game hockey. About 5000 years ago the Persians were known to have played from the horse back a game like polo. The young ones imitated the game with short stick and stones. A base relief unearthed in 478 B.C. from wall built by the Mistocles (514-449 B.C.) shows some Athenians at play that is two players actually engaged in a Hockey Bully.

Hockey is the national game of India and it also has decent amount of fans in India. In the beginning this game was played more or less in a crude form. But later on the game gradually became popular and spread over the country. The first hockey club in India was established in Calcutta in 1895. After that slowly hockey clubs were also formed in other parts of the country. As a result of great interest in these days two tournaments namely the Beighton cup (Calcutta) and the Aha-Khan Tournament (Bombay) were conducted. Simultaneously the game also became popular in Punjab particularly in the educational institutions. In the year 1905 in Calcutta a tournament was conducted by the Gymkhana club. In 1908 a State level controlling body was formed in Calcutta. Similarly many other such associations came into existence that is Sind in 1920, Bihar, Gwalior and Bombay in 1923, Uttar Pradesh in 1926, Railway in 1928, Bhopal in 1934, Patiala and Mysore in 1937.

Field Hockey is a thrilling game to play. It is a team game that provides good satisfaction to all players. The game hockey provides a wide range of opportunity for the development of strength, speed, endurance, agility to all parts of the human body. It has also proved to be a highly competitive sport around the world. Now-a-days both men and women are taking part in world level competitions. Therefore like other sport, hockey can also be taught effectively.

Mccue (1969) explains that the field hockey is the only game where players must be exclusively right handed. The stick has a flat side and a rounded side and the ball must only be played with the flat surface. No left handed sticks are made. According to Singer (1982) "skill is knowledge of any art to get her with expert ability to put that knowledge to use". Whitakar (1986) says that "skill is the combination of brain and body and it is the sequential movements of the various parts of the body according to the need of the situation" Hudson describes that the game of Hockey is very complicated in terms of skills and team work. Control of the Hockey ball is perfected by the development of fundamental skills and there are lot of drills and training methods to improve the skills of the game, Hockey.

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

well being. Thus high level of performance in Hockey 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 hockey player must have speed, 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 hockey, there are many skills such as hitting, pushing, dribbling, passing, flicking, scooping, tackling, dodging, stopping 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 hockey players as a function of gender. To achieve the purpose of this study the investigator selected 100 hockey players consisting of 50 men and women. The subjects were randomly selected from players who competed at intercollegiate level competitions held at Puducherry. 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 hockey was assessed subjectively through three experts in hockey in a playing situation. To examine the relationship between playing

ability in hockey and psychological variables, mental toughness and team cohesion simple correlation using Pearson Coefficient of Correlation was used.

RESULTS

Table-1, Showing Descriptive Statistics, Number of Subjects, Means and SD on Selected Psychological Variables and Playing Ability of the Hockey Players

S.No	Variables	No. of Subjects	Mean	Standard Deviation
MEN HOCKEY 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 HOCKEY 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 were 90.6 with standard deviation ± 12.40. The mean values of playing ability of men hockey players were 38.10 with standard deviation ± 5.63.

Table I shows that the mean values of team cohesion of hockey women players" was 66.34 with standard deviation ± 5.94. The mean value of mental toughness was 87.74 with standard deviation ± 8.97. The mean value of playing ability of women hockey players was 36.76 with standard deviation ± 5.94.

RESULTS ON COEFFICIENT OF CORRELATION HOCKEY PLAYERS

The obtained Pearson Correlation Coefficient between criterion variable (playing ability) and independent psychological variables of men hockey players are presented in Table II.

Table-II, Showing Pearson Coefficient Correlation between Criterion and Independent Variables of Men Hockey 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 hockey players.

The obtained Pearson Correlation Coefficient between criterion variable (playing ability) and independent psychological variables of women hockey players are presented in Table III.

Table III, Showing Pearson Coefficient Correlation Between Criterion and Independent Variables of Women Hockey 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 hockey players.

CONCLUSION

The results proved that though men and women hockey players‟ psychological levels in team cohesion and mental toughness were positively related with their playing ability, comparing between men and women hockey players, it was found that men hockey players were found to me more accurately related with the selected psychological variables than the women hockey players.

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Using ICT and Development of Homework Materials in Physical Education Classes in Japan

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Abstract

The objective of this study was to examine, by preparing video data of the physical movements of individual students and having them analyze and evaluate the videos of their own movement, to find out how that would contribute to improving their athletic skills, and to look into the potential of regular implementation of this method in physical education classes. The experiments seemed to have offered the students an opportunity to realize differences in the movement images, and promoted students' motivations for learning thereafter.

Keywords: Athletics, ICT, university physical education, homework, baseball type, target type

INTRODUCTION

Physical education classes with usage of ICT are becoming common, not only in college level, but also in other school levels, and the system has been greatly advanced as well.

The author et al. have been reporting on actual condition surveys [1)] and education methods2) in the classes that used ICT. Recently, we have conducted experiments of assigning homework of evaluating students' own movements taken by video, and reported their effects [3)4)5)]. Although the methods of using tablets and such terminals in physical education classes are becoming common in recent years, as the reports on reverse teaching methods in athletics were not found in other school education than in college level, we conducted the reverse teaching methods in college athletic classes to consider their issues and potentials[6)] as well.

These days in sports training fields, drones (compact unmanned aircrafts) are used in team trainings. For instance, Japan's rugby national team in their training camps has been using drones since April of 2015 to take videos on the movements of players from above to see the positioning of players and where the opening spaces were to help feedback and skill-up of the team7). This method of evaluating the movements of the players should be useful for many other sports such as succor and basketball as well. It also has a potential to be utilized in learning strategies and to have feedbacks on the athletic movements in sports.

So far, the author et al. have been reporting on physical education classes that used ICT mainly incollege physical education. We reported, for instance, actual condition surveys of ICT and

video material usages and their methods, as well as cases of classes that utilized tablets and movement simulation application to learn physical movements. Also, for preparing practice content and movements, we created a specific websites to conduct flip teaching and examined its problems and potentials. As we tried to develop an immediate feedback system by ICT and homework (material for review) that used its video, we report the implementation cases here.

Selection Criteria for Drones to be Used in Athletic Classes

Today, there are various types of drones available in the market, but most of them are with a function of taking only frontal images (bird's view). However, for evaluations of movements and players positioning in sports, the drones must [① have a function of taking images of straight below]. Also, they have to [② be able to hover still in the air] once they are up above to be used in classes. Moreover, it is preferable they [③ have monitors that one can check the image during recording]. After having searched for such models of drones, we decided to use DJI Phantom 2 Vision Plus that fulfilled our needs. (Fig.1)

Fig.1: A model being used in a class (from DJI website)

METHOD

The studied subjects were athletic education classes of 4-year colleges in Tokyo (golf and baseball classes).

[Golf Class]

We created a check note of eleven items showed in graphics for approach shot techniques of golf. Specifically; 6 items for address, 3 items for swing, 2 items for follow through. Each student receives USB that has data of your form of an approach shots and the check note to do homework. We had the check notes submitted in the following week and after. And as a questionnaire research after the assignment, we let them evaluate themselves in the differences between their own images of their movements and actual movements, and improvements of the technique accuracy. The image recording was done by iPad2.

[Baseball Class]

We recorded students' forms of pitching and batting from the front and above. iPad2 was used for the image recording from the front. In the pitching form and batting form of baseball type, the step-in direction and angle of the leg, and rotation of the hips are important, and to check tem, evaluation from the above would be effective. Thus, in the presenter's class, we used DJI Phantom 2 Vision Plus. We used the method of having students search for the data of athletic movements that would be a model for them, and had them submit the evaluation report.

RESULTS

[Golf Class]

We conducted a questionnaire after having the students submit the check note of 11 items. To the question; "Was your recorded movement different from what you had an image on your own movement?", we had them answer in the select-one-of-four method of 'exactly the same as my image', 'almost the same as my image', 'somewhat different from my image', and 'totally different from my image'. As a result, 68.1% answered; "It was different from what I had an image on my movement" ('totally different' and 'somewhat different' combined) (Fig. 2).

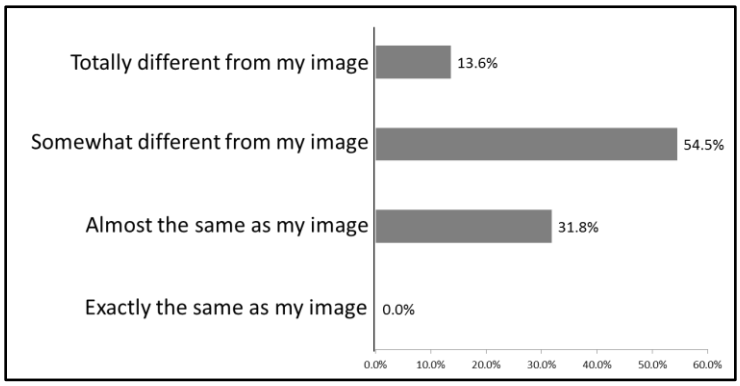

Fig. 2: Was your movement the same as you had an image of?

To the question; "Do you think your form has been improved after the assignment?", we had them answer in the select-one-of-four method of 'greatly improved', 'somewhat improved', 'not much improved' and 'not improved at all'. And, as a result, 90.9% answered; "It has been improved" (including both 'greatly improved' and 'somewhat improved') (Fig.3).

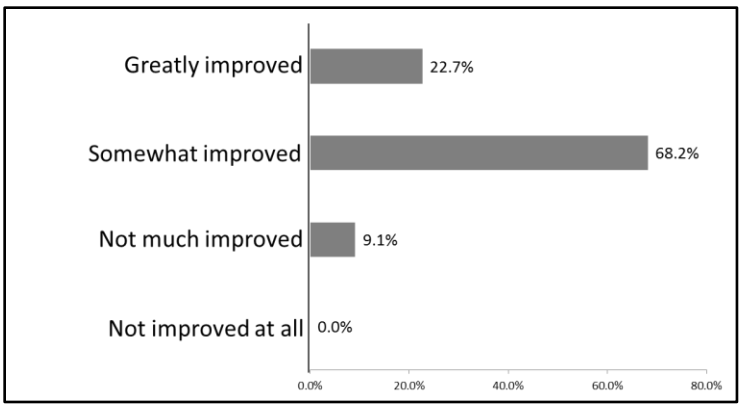

Fig. 3: Do you think your form has been improved?

[Baseball Class]

We had the students take home the USB with two different movements recorded (Fig.4 – 6), and asked them to submit a report on the theme of 'evaluating the videos of their own forms (from the front and the above) using the reference material'. The content of the reports contained multiple descriptions of how to use arms and hips that could not be realized without seeing from above, it was thought that, in addition to the view from the front, evaluating their own forms from the view from above had some efficacy. Major part of the students submitted reports with video images, and they were trying to explain concretely as well (Fig. 6).

Fig. 4: An example of batting video (front view)

Fig. 5: An example of pitching video (above view)

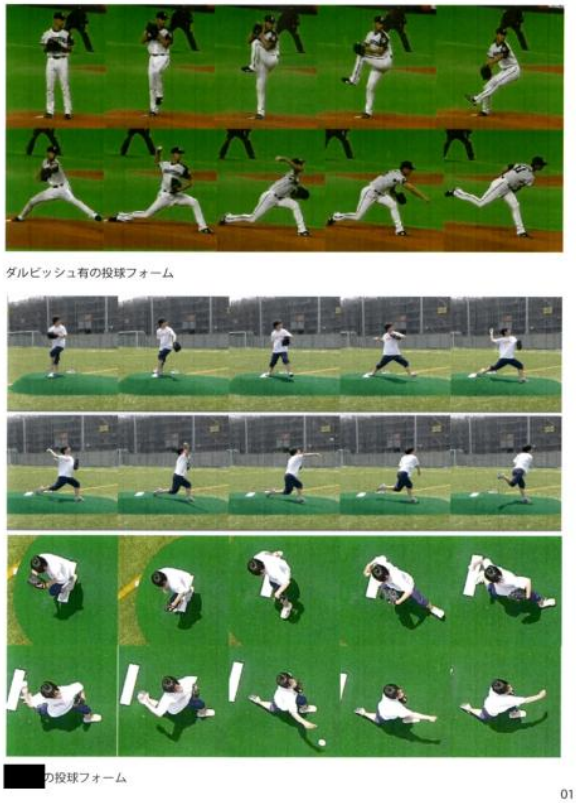

Fig. 6: Part of a student's report (on pitching movement)

DISCUSSION AND FUTURE ISSUES

The faculty members checked the submitted check notes and reports and if there were some misunderstandings or needs for modifications, we advised the students individually. After the submission of the assignments, we asked them to check each item and work on the athletics. In this study, the self evaluation of the athletic movements by work at home brought about some

realizations for the students that there were differences between their actual movements and what they had images on their own movements. It is thought that this promoted students' motivations to learn after the assignment. Recently, there have been increased topics and news about drones, and most of them are about wrong usages and accidents. However, there is no doubt that they are rapidly improving, and they will be used in sports more and more.

The model we used this time is said to be: the maximum speed 15m/sec. equivalent to 54km/hr. the maximum ascending and descending speed 6m/sec. and 3m/sec. respectively, the maximum flight time is 25 min. and the maximum distance is 15km, and the remote control range is up to 700m. It also has a function, when it goes out of the remote control range, it returns to the take-off spot, but for the safety, we must avoid using on windy and rainy days. As it also has maximum flight duration of only 25 minutes with fully charged battery, we need to consider carefully in which part of the class we use it in order to create a class plan of high educational effect.

In February of 2016, there will be a drone available in the market that, once you set the camera on and throw it into the air, is able to track down a moving target from its front or rear with a small tracking terminal with GPS and take video of it (product name: Lily). This product pursues the target, not only by GPS but also by computer vision, and there is not need for piloting it either. It is totally water proof, and is said to be able to take video, pursuing moving targets such as canoes, bicycles and skiers, and it is expected to be highly useful for intensive courses of skiing and snowboarding in educational field as well.

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PSYCHOLOGICAL SKILLS AND SENSATION SEEKING BEHAVIOR OF BADMINTON PLAYERS

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Abstract

Psychological characteristics are considered essential determinants for athletic performance and success (Smith et al, 1995). Sensation seeking is part of a broader personality dimension as 'the pursuit of novel, intense and complex sensations and experiences, and the willingness to take risks for the sake of such experience' (Zuckerman, 2000). The aim of the study was to examine and compare the psychological characteristics of badminton players. Participants were 15 male and 15 female badminton players aged between 13-19 years. Further the players were divided into medalists (male 5; female 7) and non-medalists. Athletic coping skills inventory-28 (Smith et al, 1995) and online Zuckerman–Kuhlman Personality Questionnaire were administered to collect data. A strong association between gender and sensation seeking behavior was found $\chi^2(2)=13.71$, $p<.05$. Male badminton players (73.4%) demonstrated a moderate level of sensation seeking or risk taking behavior than female players (20%). MANOVA showed statistically significant difference between psychological characteristics based on their gender and performance. Gender $F(7, 20) = 3.52$, $p < .05$; Wilk's $\Lambda = 0.448$; Performance $F(7, 20) = 3.02$, $p < .05$; Wilk's $\Lambda = 0.486$. Analysis of Variance confirmed significant differences on peaking under pressure $F(1,26)=12.58$, $p<.05$ and coachability $F(1,26)=7.61$, $p<.05$ when compared gender. Other hand performance had significant difference on confidence and achievement motivation $F(1,26)=5.63$, $p<.05$ and coachability $F(1,26)= 13.67$, $p<.05$. These finding are supported by Kimberg et al (2007) found strong relationship between performance and psychological variable peaking under pressure and "coachability". Geczi et al; 2008 reported medal winners could better manage unexpected events. Successful athletes showed better coachability (Bebestos&Antonious, 2003). Study concluded that badminton male players had a moderate risk taking behavior, coachability was higher among female non-medalist players; peaking under pressure and confidence & achievement motivation was higher among male medalist players.

Keywords: *Psychological skills, Sensation seeking, Medalists, Badminton players*

INTRODUCTION

Elite athletes repeatedly have to perform under high pressure, and it is therefore not surprising that psychological characteristics often distinguish those successful at the highest standard from their less successful counterparts (Morris, 2000). Understanding the psychological factors that accompany successful athletic performance is a high priority for applied sports psychology, and mental links to optimal performance have become a major focus, Jackson et al., 2001. The mental skills are most important for the athlete to develop in order to enhance and optimize their coping skills. These psychological skills of athletes can influence their capability to perform successfully in a competition. These coping skills refer to the cognitive and behavioral efforts to overcome, reduce or tolerate internal and/or external demands caused by a stressful situation. Coping with stress is not directly related to the final outcome of the effort. So coping is defined by the efforts to control the challenge of a situation, regardless of an athlete's success, Folkman (1984).Williams and Krane (2001) identified a number of psychological characteristics of highly successful athletes, as well as the mental skills these athletes used to achieve optimal

psychological states. Athletes must develop a range of cognitive and behavioral coping skills to manage the competitive stressors they face (Scanlan, Stein, &Ravizza, 1991). Different coping strategies have to be employed by athletes as they face different critical situation. Kristiansen et al., 2007, said that different sports have different sources of stress, and consequently participants require special strategies to cope successfully in their particular field. Psychological characteristics are considered essential determinants of athletic performance and success (Meyers et al, 1991; Smith et al, 1995).

According to the literature, becoming a successful athlete requires a high level of persistence, dedication, effort and also a supportive environment for all parties involved (Géczi, Bognár, Tóth, Sipos and Fügedi 2008). Studies comparing and contrasting elite and non-elite athletes found that successful athletes are more committed to their sport (Davis and Mogk 1994), usually set more specific and measurable goals (Goudas, Theodorakis and Karamousalidis 1998, Orlick and Partington 1988), demonstrate a higher concentration level (Goudas, Theodorakis and Karamousalidis 1998, Junge, Dvorak, Rosch, Graf-Baumann, Chomiak and Peterson 2000), a higher confidence level (Gould, Dieffenbach and Moffat 2002), higher coachability (Bebestos and Antonious 2003) and a more stable anxiety level (Kais and Raudsepp 2005) than less successful athletes.

The personality trait known as 'Sensation Seeking' (SS) is defined as 'the seeking of varied, novel, complex and intense sensations and experiences and the willingness to take physical, social, legal and financial risks for the sake of such experiences' (Zuckerman, 1983). Sensation seeking is a part of a broader personality dimension, called impulsive sensation seeking (Zuckerman, 1994), which would actually connect impulsivity as a personality trait and sensation seeking. He found high risk sports athletes were high sensation seekers and non-risk sports athletes were low sensation seekers.

Zuckerman (1983) classified sports according to the associated risks involved[At one end of the sport risk continuum are sports such as sky diving, motorcar racing and hang gliding[What characterizes these sports is the acute danger associated with accidents (i.e. risk of fatal injury) At the other end of the classification are sports such as golf, swimming and marathon running where injuries can occur, but the probability of fatalities is fairly remote Between these two groups (Medium- Risk sport) are the contact sports, such as American football or rugby, wherein serious injuries are possible but the chances of death are remote.

Lower risk sports, such as running and gymnastics were negatively related to sensation seeking. That is, these sports have been generally found to be more commonly pursued by persons low in sensation seeking (McCutcheon, 1980). Potgieter and Bisscho (1990) concluded that the trait of sensation seeking serves as a possible underlying explanation for the motivation of many individuals to participate in high-risk vs low-risk sports.

Cogan and Brown (1999) used the sensation seeking scale to compare freestyle snowboarders (high risk sport) and badminton players (non-risk sport) and came to similar findings. Non-risk sports athletes displayed more stimulus avoidance that the other group. They also concluded that

high sensation seekers look for complex environments that provide much more opportunities for excitement. Sensation seeking is a part of a broader personality dimension as 'the pursuit of novel, intense and complex sensations and experiences, and the willingness to take risks for the sake of such experience' (Zuckerman, 2000).

Badminton had developed into a highly competitive sport which requires a high level of physical and psychological skills. In this study authors examined the psychological skills and sensation seeking behavior of badminton players and it was hypothesized that there would be a significant difference between performance and psychological skills.

METHOD

Participants

Thirty badminton players (male 15; female 15) aged between 13-19 years who participated in the National School Games for Hyderabad Region was selected for this study. Further the players were divided into medalists (male 5; female 7) and non-medalists. The investigators explained clearly the questionnaire to the participants and were asked to complete all test items. Participants were informed the purpose of the study prior to the collection of data.

Instruments

Athletic Coping Skill Inventory-28

The Athletic Coping Skill Inventory-28 (ACSI-28: Smith, Schultz, Smoll&Ptacek 1995) were used to assess the psychological coping skill for each athlete. The ACSI-28 is a self-report questionnaire developed using exploratory and confirmatory factor analysis. The instruments consisted of a 28-item scale measuring' seven classes of sport-specific psychological coping skills, including coping with adversity, peaking under pressure, goal setting and mental preparation, concentration; freedom from worry, confidence and achievement motivation and coachability. Individuals were asked to respond to each statement by indicating how often they experienced different situations using a 4 point scale ("0' = almost never to "3"= almost always). The subscales were found to be internally consistent with alpha levels ranging from 0.62 to 0.78 and a total (personal coping resources) scale alpha of 0.86 as reported in Smith et al 1995.

Zuckerman–Kuhlman Personality Questionnaire

Zuckerman–Kuhlman Personality Questionnaire – onlinewas administered to the players to collect the data during their training camp. This test determined the level of sensation seeking disposition of players.

Data Analysis

Data obtained in the study were analyzed using SPSS software (version 16.0). The Pearson Chi - squarewas used to measure the association of sensation seeking behavior and performance. MANOVA was carried out to see the effect of gender and performance on psychological skill variables. Further, follow-up univariate analysiswas suggested tocompare the significant

differences among psychological skills on the basis of gender and performance.The criterion for statistical difference was set at.05 level of confidence.

RESULTS

Table 1 showed a strong association between gender and sensation seeking behavior found as the Pearson Chi-square showed 13.71, p<.05. Male badminton players (73.4%) demonstrated a moderate level of sensation seeking or risk taking behavior than female players (20%). No association was found between performance and risk taking behavior as the Chi-square 1.80, p>.05. MANOVA suggested that a significant difference in gender, performance and psychological skills. Gender F (7, 20) = 3.52, p < .05; Wilk's Λ = 0.448; Performance F (7, 20) = 3.02, p < .05; Wilk's Λ = 0.486 as shown in table 2. Univariate ANOVA (table 3) for gender showed significant difference on peaking under pressure (F (1,26)= 12.58, p<.05) where the mean of male players were higher than female M=8.27 (1.94) and M=5.33 (1.98) and coachability (F (1,26)= 7.61, p<.05) in which mean of female players M=9.87 (2.36) were higher than male players M=8.07 (2.19). Performance had a significant effect on confidence and achievement motivation (F (1,26)=5.63, p<.05) where medalist M=9.61 (2.28) had a higher mean than non-medalist M=8.08 (1.83) and coachability (F (1,26)= 13.67, p<.05) the mean of non-medalist M=9.89 (2.22) were higher than medalists M=7.58 (2.07).

Table 1
Frequency and Association of Sensation Seeking Behavior of Badminton Players

Variables		Sensation Seeking Behavior					
		0% - 27% (very low)	28%-41% (low)	42%-70% (average)	Df	Chi-square	Sig
Gender	male	0 .0%	4 26.7%	11 73.3%	2	13.71	0.001
	female	9 60.0%	3 20.0%	3 20.0%			
Performance	male	2 16.7%	3 25.0%	7 58.3%	2	1.801	0.408
	female	7 38.9%	4 22.2%	7 38.9%			

Statistically Significant at the .05 levels

Table 2, Multivariate Analysis of Variance (MANOVA)

Effect of Psychological Skill Variables on Gender and Performance

		Coping with Adversity	Coachability	Concentration	Confidence and Ach.Moti	Goal setting and MP	Peaking under pressure	Freedom from worry	MANOVA Results	
		Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mea (SD)	Mean (SD)	Mean (SD)	F-value	P-Value
Gender										
	Male	8.40 (2.75)	8.07 (2.19)	7.60 (1.30)	9.53 (2.56)	7.60 (2.38	8.27 (1.94)	7.47 (2.95)	F(7,20) =3.52	0.013*
	Female	8.87 (2.33)	9.87 (2.36)	7.47 (2.72)	8.47 (1.73)	8.20 (2.62	5.33 (2.87)	7.20 (2.34)		
Performance										
	Medalist	7.92 (2.68	7.58 (2.07)	6.75 (1.14)	9.61 (2.28)	7.25 (3.08	7.33 (3.20)	6.83 (2.33)	F(7,20) =3.02	0.024*
	Non-Medalist	9.11 (2.35	9.89 (2.22)	8.06 (2.44)	8.08 (1.83)	8.33 (1.97	6.44 (2.59)	7.67 (2.81)		

*statistically significant at the 0.05 Level

Table 3, Analysis of Variance of Psychological Skill Variables of Badminton Players on Gender and Performance

Source of Variance	Dependent Variable	Sum of Square	Mean square	ANOVA Result F value	p-value
Gender	Coping with adversity	2.720	2.720	F(1,26) =.417	.524
	Coachability	25.190	25.190	F(1,26) = .7613	.010*
	Concentration	.003	.003	F(1,26) =.001	.980
	Confidence and achievement motivation	5.218	5.218	F(1,26) =.1.652	.210
	Goal setting and mental preparation	4.076	4.076	F(1,26) =..638	.432
	Peaking under pressure	74.076	74.076	F(1,26) =12.586	.002*
	Freedom from worry	.022	.022	F(1,26) =.003	.957
Performance	Coping with adversity	11.515	11.515	F(1,26) =1.765	.196
	Coachability	45.228	45.228	F(1,26) =13.669	.001*
	Concentration	12.003	12.003	F(1,26) =2.711	.112
	Confidence and achievement motivation	17.792	17.792	F(1,26) =5.634	.025*
	Goal setting and mental preparation	9.963	9.963	F(1,26) =1.560	.223
	Peaking under pressure	12.974	12.974	F(1,26) =2.204	.150
	Freedom from worry	5.327	5.327	F(1,26) =.745	.396

**Statistically Significant at the .05 levels*

DISCUSSION

The current research report shows that badminton players demonstrate some psychological skills for their success and male players are moderate in their sensation seeking behavior. The present results show some clear-cut differences in a number of psychological skill variables among gender and performance. As mentioned earlier, psychological characteristics are considered essential determinants for athletic performance and success (Meyers et al, 1999; Smith et al, 1995).

High risk sports athletes were high sensation seekers and non-risk sports athletes were low sensation seekers. Badminton male players showed a moderate level of sensation seeking behavior and the female players showed very low risk taking ability. These results are consistent with the Findings of Cronin 1991, Fowler et al., 1980, Freixanet, 1991, Hymbaugh and Garrett, 1974, Robinson, 1985, Straub 1982 and Wagner and Houlihan 1994 who all found that their high risk sport samples tended to score higher on total sensation seeking than their low risk sport samples or norm groups.

In this study psychological variables coachability, peaking under pressure, confidence and achievement motivation had a significant difference with gender and performance.This was supported by Kimberg et al (2007) who found a strong relationship between performance and psychological variables peaking under pressure and coachability. Geczi et al; 2008 reported experienced medal winners could better manage unexpected events or stress situations. Successful athletes showed easier or better coachability (Bebestos&Antonious, 2003). A study by Tamres, Janicki and Helgeson (2002) found that female players reported greater use of coping behaviors compared to men. According Smith and Christensen (1995), the meaning of coachability is open to and learns from instruction; accepts constructive criticism without taking it personally or becoming upset. Therefore, it might be a reason why female non-medalist players need more advice, support and guidance to go further and accept criticism positively from her coach to become a medalist or successful athlete.

Contrary to earlier findings (Bebestos&Antonious, 2003; Goudas, Theodorakis, & Karamousalidis, 1998), we have found that elite athletes' goal setting/mental preparation does not seem to be at a high level, in fact, no significant difference was observed between gender and performance. This shows that these young badminton players do not plan in advance and preparementally for their training and competition. It was also evident that peaking under pressure was considerably higher in the male players. In accordance with past research (Gould, Dieffenbach & Moffet, 2002; Junge et al, 2000), the current results strengthen the conjecture that young elite athletes demonstrate relatively high scores of peaking under pressure and coping with adversity.

CONCLUSIONS

1. Badminton male players had a moderate level of risk taking behavior and the female players had a low sensation seeking behavior.
2. There was a significant difference on coachability among gender; and female non-medalist badminton players exhibited higher scores than male players.
3. Medalist male badminton players demonstrated higher scores on peaking under pressure.
4. Medalist badminton players exhibited higher confidence and achievement motivation than the non-medalist players.

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EFFECTS OF MUSCLE FATIGUE ON SHOOTING ACCURACY IN HANDBALL PLAYERS

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ABSTRACT

The study is an experimental research which is concluded with the purpose to see the effect of Muscle fatigue on shooting accuracy in handball players. To achieve this purpose of the study sixteen elite young male handball players volunteered to participate in the study. The current study composed of 2 sessions such as laboratory and field test sessions. Each subjects visited the laboratory or sports hall 1 times on at approximately the same time of the day. Measurements applied morning sessions and first day 5 subjects, second day 5 subjects and third day 6 subjects participated to tests separated 30 minutes periods each other's. There were 48 hours between laboratory and field test for each subjects. Subjects who completed laboratory tests, passed through the field tests at the same order. All laboratory and field measurements were completed within 6 days. The analysis of covariance ('t') was used to find out significant differences between elite young male players. The results showed that there was no significant differences between pre-fatigue and post-fatigue protocols in terms of accurate and inaccurate shots (p>0,05). According to this result, accurate and inaccurate shooting performance has not been affected by fatigue.

Key words: Accuracy, Fitness, Fatigue, **S**hooting

INTRODUCTION

Competitive team handball is an intermittent high intensity body-contact team sport that requires a combination of aerobic and anaerobic fitness to perform a sequence of well-coordinated activities Team handball places a heavy emphasis on sprinting, running, jumping and throwing (Gorostiaga, 2006). Motor ability, sprinting, jumping, flexibility and throwing velocity represent physical activities that are considered as important aspects of the game and contribute to the high performance of the team (Zapartidis et al., 2009). Passing and catching are the most important components of ball control in team handball. Offensive success revolves around a team's ability to move the ball quickly and accurately from one player to another. Consistent, accurate passing ensures the paces and continuity of team play and keeps pressure on the defense by allowing each attacker the opportunity to be a scoring threat (Clanton & Dwight, 1997). The set shot to be effective it must be performed quickly. In preparation phase of movement, player runs to receive to get into shooting position. The momentum created from being in motion will increase the power of player's shot. Players attacks using three steps and during the second step,

ball is brought up to head height. Elbow is flexed to 90 degrees or greater. At that time, all of body weight should be on back foot, upper body should be upright and shoulders perpendicular to the goal. Player should keep head up and eyes on goalie. In execution phase of movement, to shoot step forward and transfer body weight from rear foot to front foot. Shoulders are rotated and opened for being parallel to the goal. Player begins moving arm forward by leading with elbow, then whip forearm and snap the wrist. In follow-through phase of movement, momentum of body continues forward and the motion of throwing arm continues across body (Clanton & Dwight, 1997).

METHOD

To achieve this purpose of the study sixteen elite young male handball players volunteered to participate in the study. The current study composed of 2 sessions such as laboratory and field test sessions. Each subjects visited the laboratory or sports hall 1 times on at approximately the same time of the day. Measurements applied morning sessions and first day 5 subjects, second day 5 subjects and third day 6 subjects participated to tests separated 30 minutes periods each other's. There were 48 hours between laboratory and field test for each subjects. Subjects who completed laboratory tests, passed through the field tests at the same order. All laboratory and field measurements were completed within 6 days.

According to study design, first of all subjects participated to laboratory tests including blood lactate concentration measurement, heart rate monitoring and treadmill test. VO_2max values of participants obtained from treadmill tests in order to determine relative running speed (75% of VO_2max) for 30-15 intermittent fitness test. In the field tests, firstly optimum shooting velocities of participants were determined. In pre-fatigue shooting test, participants shots to each target 4 times (totally 16 times). After that, blood lactate concentration of participant was measured and participant was begun to perform $30\text{-}15_{IFT.}$ At the end of the $30\text{-}15_{IFT,}$ blood lactate concentration was measured again and participant was repeated shooting to target procedures as post-fatigue shooting test as soon as possible. During all shooting procedures, acceleration of wrist and speed of ball were recorded.

Laboratory Tests - Height measurement of handball players was performed by a stadiometer (Holtain, England, sensitivity ± 1mm). Body mass and percentage of body fat measurement were performed by a body composition analyzer (Tanita TBF 300, Japan).

Heart Rate Monitoring - Heart rate (HR) monitoring System (Polar S 810İ Polar Electro OY, Finland) was fitted to each players before the treadmill test and $30\text{-}15_{IFT}$ test. During all testing sessions including laboratory and field tests, resting HR and maximum

HR values of each participant were recorded. In addition, every 3 minutes during treadmill test and at the end of every 30 s running session during 30-15_{IFT} test HR values of participant recorded also by using heart rate monitoring system. 90% of maximal HR of subjects' was accepted as ending criteria for the test.

Blood Lactate Concentration Measurement - 25µl capillary blood sample were taken from an earlobe and analyzed samples immediately by using a lactate analyzer (YSI Sport 1500, Yellow Springs Instrument Co, USA). La was taken every 3 min in treadmill test. Analyzer was calibrated for every 5 subject. Before the tests and changes membrane and solution, 5.0 mmol/L and 30.0 mmol/L standard lactate solutions were used.

Shooting to Target - Players throwed to the target from 7m line. A standard handball and goal specified by the International Handball Federation (IHF) guidelines were used (ball: diameter=58-60cm, weigth= 425-475gr, goal: width=3 m, height=2 m). The four equal sized targets (50cmx50cm) hollow and made of iron was mounted at each corner of the goal. Each target is dressed by fish net like a cone in order to hold balls throwed to the target. Visual stimulus was used to designate the target. Four separate light panels assembled with 15 x 15 green LEDs with 3mm gap in between were attached to 1 m behind the goal where they were appeared by subjects as in the center of each target. A total of 16 shots were completed by each participant four times for each of four target locations. Participants were instructed that their feet had to remain in contact with the ground just behind the 7-m line and for using correct techniques and shooting with optimum velocity during the sixteen consecutive trials. Between each trial, there were 3 seconds for the subject to handle the ball given by a designated people standing one meter away from the subject and to be ready to react for the next visual stimulus in standardized shooting position. Accurate and inaccurate shots, shooting velocity of all shots and success of the target regions were recorded also.

Measurement of ball speed - Ball velocity was measured by a Sports Radar Gun (SR 3600, USA). The height of the radar gun was adjusted individually according to the player's throwing arm height. The velocity of ball recorded as $km.h^{-1}$.

RESULTS

Table 1 Paired sample t-test results for differences between accurate and inaccurate shots total points of handball players (n=16) during pre-fatigue and post-fatigue protocols.

Measurement	Mean	Sd	T	P
Accurate Pre-test	5.31	2.08		
			-.83	.415
Accurate Post-test	5.87	2.06		
Inaccurate Pre-test	10.68	2.08		
			.76	.459
Inaccurate Post-test	10.18	1.97		

Table 2. Regression analysis results for prediction of inaccurate shots before fatigue protocol (Mean=10.78±1.88).

Variables	B	Std Error	B	T	p	Part
Constant	32.16	8.24		3.90	.005	
SCon (Mean=.0021±.0004)	-2333.09	1208.89	-.52	-1.93	.442	-.04
Ball speed (Mean=67.26±4.87)	-.46	.12	-1.18	-3.65	.006	-.37
Xpre-inaccurate (Mean=36.11±3.71)	.27	.20	.45	1.34	.217	.21
Ypre-inaccurate(Mean=33.12±4.40)	.08	.23	.20	.37	.718	.18
Zpre-inaccurate (Mean=3.45±1.30)	.44	.52	.30	.83	.428	.06
R=.80	R^2=.64					
$F=_{(6,15)}$=2.90	p=.038	Note: SCon= Shooting consistency				

Table 3 Regression analysis results for inaccurate shots after fatigue protocol (Mean= 10.53±1.85).

Variables	**B**	**Std Error**	**B**	**T**	**p**	**Part**
Constant	2.43	9.44		.25	.804	
SCon (Mean=.0022±00)	.06	.14	.17	.44	.668	.31
Ball speed (Mean=67.65±4.74)	-139.61	1513.74	-.03	-.09	.929	.06
Xpost-inaccurate (Mean=37.72±4.11)	-.19	.27	-.44	-.73	.489	.16
Ypost-inaccurate (Mean=35.25±3.73)	.31	.32	.64	.99	.352	.36
Zpost-inaccurate (Mean=3.32±1.32)	.05	.50	.04	.11	.915	.08
R= .46	R^2=.21					
$F=_{(6,15)}$=.38	p=.023					

Table 1 results showed that there was no significant differences between pre-fatigue and post-fatigue protocols in terms of accurate and inaccurate shots (p>0,05). According to this result, accurate and inaccurate shooting performance has not been affected by fatigue.

Table 2 showed that, there is a significant and high correlation in inaccurate shots values together with shooting consistency, ball speed, acceleration of wrist at X, Y, Z axis of handball players before fatigue protocol (R=,80 R^2=.64). Variables that are mentioned above explained 64% of total variance.

Table 3 it is seen that, there is significant and moderately correlation in inaccurate shot values together with shooting consistency, ball speed, acceleration of wrist at X,Y,Z axis after fatigue protocol (R=.46, R^2=.21). Variables that are mentioned above explained 21% of total variance.

According to standardized regression quotient (β), relative priority of predictive variables on shooting accuracy; exchange at Y axis, exchange at X axis, shooting consistency, exchange at Z axis and ball speed. When the results of t-test for significant of regression quotient examined it was seen that none of variables have important effects on accurate shot values.

DISCUSSION

On the other hand, the acceleration of wrist showed a difference between pre-fatigue and post-fatigue conditions. In pre-fatigue conditions, right to left motion of wrist (X axis) was the most important motion, then Z axis (up to down) and Y axis (back to forward) accompanied respectively. However, after fatigue condition, priority of X and Y axis was changed places and

back to forward motion (y axis) was became more important than right to left motion. Players were tent to change their throwing movement and did back to forward motion more forcefully than right to left motion as a result of fatigue condition. It can be explained by players should be preferred performing movement more easily or economically. Al though the effects of fatigue reaching goal could be easiest after fatigue condition. This study was limited to whole body fatigue protocol, it is recommended that research set up can be performed by using local fatigue protocol consist of sport specific movement.

CONCLUSION

There were many researches which were aimed to develop performance. Shooting effectiveness and accuracy are the critical points of performance in team handball for reaching best result. Current study investigated the effects of fatigue on shooting accuracy. At the end of the study, as a main result, no significant differences were found between pre-fatigue and post-fatigue protocols in terms of accurate and inaccurate shots. According to the results shooting consistency, ball speed, response time, X, Y, Z axis of wrist acceleration variables highly correlated each other in terms of shooting accuracy both in pre and post fatigue conditions. Shooting consistency has an effect on accurate shots. Ball velocity has effect on inaccurate shots in pre-fatigue condition. However, none of variable has effect on accurate and inaccurate shots in post-fatigue conditions.

On the other hand, the acceleration of wrist showed a difference between pre-fatigue and post-fatigue conditions. In pre-fatigue conditions, right to left motion of wrist (X axis) was the most important motion, back to forward motion (y axis) was became more important in post fatigue condition.

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Should Kids lift weights: A Theoretical Review

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INTRODUCTION

Two of the most asked questions about children are; "Is it safe for kids to lift weights?" And "At what age can kids start lifting weights?" The sad truth is, many doubts surround the safety and validity of weight training for children. Many would even have you believe that kids have no place at all in the weight room. Despite this conservatism, exercise physiologists and the American Academy of Pediatrics both support the implementation of strength training programs for young children.

Back in the 1970s, researchers in Japan studied child laborers and discovered that, among their many misfortunes, the juvenile workers tended to be abnormally short. Physical labor, the researchers concluded, with its hours of lifting and moving heavy weights, had stunted the children's growth.

Somewhat improbably, from that scientific finding and other similar reports, as well as from anecdotes and accreting myth, many people came to believe "that children and adolescents should not" practice weight training, said Avery Faigenbaum, a professor of exercise science at the College of New Jersey. That idea retains a sturdy hold in the popular imagination. As a recent position paper on the topic of children and resistance training points out, many parents, coaches and pediatricians remain convinced that weight training by children will "result in short stature, growth plate "damage, lack of strength increases due to a lack of testosterone and a variety of safety issues."

Is it safe for kids to lift weights?

The answer from today's top research authorities is a resounding "**YES**." Studies show that a moderate intensity strength training program can help increase strength, decrease the risks of

Injury while playing sports and increase bone density in children, Exercice physiologist aren't the only ones recommending resistance training but even American Academy of Pediatrics has also put forth a pro-strength training for children.

The American Academy of Pediatrics position on strength training supports the implementation of strength program, even for prepubescent children, that are monitored by well-trained adults and take into account the child's maturation level. The only limitation the AAP suggests is to avoid repetitive maximal lifts (lifts that are one repetition maximum lifts or are within 2-3 repetitions of a one repetition maximum lift) until they have reached Tanner Stage 5 of developmental maturity

Tanner Stage 5 is the level in which visible secondary sex characteristics have been developed. Usually, in this stage adolescents will also have passed their period of maximal velocity of height growth. The AAP's concern that children wait until this stage to perform maximal lifts is that the epiphyses, commonly called "growth plates", are still very vulnerable to injury before this developmental stage. It is repeated injury to these growth plates that may hinder growth. For this same reason, two of the leading researchers in the field of youth fitness, Fleck and Kraemer, agree that maximal lifts should be avoided. However, Fleck, Kraemer and the AAP agree that a strength training program that doesn't include maximal lifting is beneficial for prepubescent and pubescent youth. In fact, a strength and resistance training program should be required in certain instances.

Let's take a moment to review some of the research:

- "If appropriate training guidelines are followed, regular participation in a youth strength training program has the potential to increase bone mineral density, improve motor performance skills, enhance sports performance, and better prepare young athletes for the demands of practice and competition." (2)
- A study of young male powerlifters found that high-intensity resistance training is effective in increasing lumbar spine and whole body bone mineral density. (3)

- Resistance training enhances strength and muscular endurance in youth and children. (4) In pre-pubescent children, this increase in strength appears to be the result of neuromuscular activation and coordination supporting evidence that androgens (the hormones largely responsible for increased strength and muscle mass) are not needed for strength gain.(5)
- With proper supervision, children and youth who participate in a strength training program are not at an increased risk for injury compared to children and youth who do not participate in such a program.(6)

These few examples also make a strong statement that a strength and conditioning program reduces the possibility of injuries in children by increasing bone mass.

At what age can kids start lifting weights?

Neither the AAP or exercise physiologists have a minimum age set for a child to begin a resistance training program. Research has been done on moderate weight training programs with children as young as 8 years. However, researchers also recognize the use of calisthenic-type exercises such as push-ups and sit-ups that are commonly used in elementary school physical education classes. Body-weight resistance exercises are a good starting point for most children under the age of 8, or those at any age who are just starting a strength training program. The object of this type of program is to introduce the body to the stresses of training and to teach basic technique. After a foundation is established, light weight training can be introduced.

Fleck and Kraemer recommend a training scheme of 10-15 repetitions and 1-3 sets per muscle group. The weight should be one that the child can lift for 10-15 repetitions without going to muscular failure. Once a base has been established, the amount of exercises and the weight lifted can be increased. When a child has reached puberty (around age 13 for girls and 15 for boys) and

a training foundation has been established, a more advanced periodized routine can be incorporated.

The Benefits of Weight Training for Children

(8)The studies covered boys and girls from age 6 to 18. The researchers found that, almost without exception, children and adolescents benefited from weight training. They grew stronger. Older children, particularly teenagers, tended to add more strength than younger ones, as would be expected, but the difference was not enormous. Over all, strength gains were "linear," the researchers found. Their strength gains seem generally to involve "neurological" changes, Dr. Faigenbaum said their nervous systems and muscles start interacting more efficiently. A few small studies have shown that children develop a significant increase in motor-unit activation within their muscles after weight training. A motor unit consists of a single neuron and all of the muscle cells that it controls. When more motor units fire, a muscle contracts more efficiently. So, in essence, strength training in children seems to liberate the innate strength of the muscle, to activate the power that has been in abeyance, unused. And that fact, from both a physiological and philosophical standpoint, is perhaps why strength training for children is so important, a growing chorus of experts says. by strength training, young athletes can reduce their risk of injury, not the reverse.

(9) In addition to the obvious goal of getting stronger, strength-training programs may be undertaken to try to improve sports performance and prevent injuries, rehabilitate injuries, and/or enhance long-term health. Similar to other physical activity, strength training has been shown to have a beneficial effect on several measurable health indices, such as cardiovascular fitness, body composition, bone mineral density, blood lipid profiles, and mental health. Recent studies have shown some benefit to increased strength, overall function, and mental well-being in children with cerebral palsy. The geriatric population, strength training in youth may stimulate bone mineralization and have a positive effect on bone density. Multiple studies have shown that strength training, with proper technique and strict supervision, can increase strength in preadolescents and adolescents. Frequency, mode (type of resistance), intensity, and duration all contribute to a properly structured program. Increases in strength occur with virtually all modes of strength training of at least 8 weeks' duration and can occur with training as little as once a

week, although training twice a week may be more beneficial. Appropriately supervised programs emphasizing strengthening of the core (focusing on the trunk muscles, eg, the abdominal, low back, and gluteal muscles) are also appropriate for children and theoretically benefit sports-specific skill acquisition and postural control. Unfortunately, gains in strength, muscle size, or power are lost ∼6 weeks after resistance training is discontinued.

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Longitudinal Relations between Peer Victimization in High Schools and Mental Health in College

By

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Abstract

This study examined the longitudinal relationship between peer victimization experience of high school students and depression and suicidal ideation. We analyzed the data of the Youth Panel which were collected by the Ministry of Employment and Labor in Korea. Twenty victimized students were compared with twenty non-victimized peers. Results showed that victimized students in their high school period experienced depression and suicidal ideation more frequently than did non-victimized peers in their college years.

Keywords— peer victimization, depression, suicidal ideation, longitudinal study adolescents

INTRODUCTION

Peer victimization is one of common types of school violence, and includes being target of various aggressive behaviors by peers or age-mates (Flannery et al., 2007). School violence includes physical and psychological forms of aggressive behaviors, and in some cases, an entire peer group as well as a few bullies was involved in peer victimization (Flannery et al., 2004).

Although the prevalence, patterns, and related causes and effects of bullying and victimization vary with cultural characteristics, peer victimization has been shown across culture and countries in the world (Park., 2000). Within the Korean context, “wang-dda (bullying in Korean)” is one of major forms of school violence, and wang-dda students were rejected and isolated by peer groups(Kim., 2004). Thus, victims of wang-dda have suffered from loneliness, anxiety, depression, and low self-esteem.

Especially, in Korea, the third year of high school is an important and stressful period during which most students take

College Scholastic Ability Test (CSAT) or college entrance exams. Third-year-students are asked to decide making a transition toward either academic career or working career. As a result, high levels of stress by entrance exam might interact with stress by peer victimization, and furthermore, could interfere with students’ adaptation to college and mental health. Thus, this study aimed at investigating the association between peer victimization in the third year of high schools and adaptation to college.

Many previous studies have reported that experience of peer victimization in childhood and adolescence has affected psychosocial problem such as depression and anxiety. In a meta-

analytic review of Hawker and Boulton (2000), depression, loneliness, and self-esteem reported larger effect sizes in relations to peer victimization than did social and general anxiety.

In addition, Klomek, Marrocco, Kleinman, and Schonfeld (2008) also reported that the students who were victimized by peers were more likely to experience depression and suicidal ideation than did those who were not victimized. In this study, various risk factors for peer victimization were suggested; religion, race, prejudice, language, domestic violence, rumor, sexual joke and cyber bullying. Moreover, victimized students reported higher levels of depression and suicidal ideation even four years later. Similarly, Lawrence (2011) reported that the victims of bullying in high school were more likely to experience depression and suicidal ideation during their college years. Gu and Kim (2013) also showed that peer victimization in high school lead to suicidal ideation in Korea.

The purpose of this study was to examine whether peer- victimization experiences of high school students is related to the mental health in their first years of college. Specifically, we examined longitudinal links between peer victimization and the risk of depression, suicidal ideation, and the level of stress.

METHOD

Participants

The data of 20 college students who experienced peer victimization in their high school period were analyzed in this study. These students were selected from the Youth Panel of The Ministry of Employment and Labor, a longitudinal survey project conducted annually from 2007 through up to now. Initially, 10,206 Korean adolescents aged from 15 to 29 years participated in the study. Out of 864 participants in 2008 data, twenty students identified as victims of school violence were selected.

In addition, we intended to compare victimized students with non-victimized peers in this study, and thus, 20 students without victimized experience in a control group were randomly selected.

Measures

We used the longitudinal panel to do a comparative analysis between data of 2008 and 2009. We asked a question to participants to identify victimized students in 2008. “Do you have experience of peer victimization in high school years?” Students answered yes or no. We also asked the participants whether they had a depression or a suicidal ideation problem in 2009.

RESULTS

Frequencies and percentages of research variables between 2008 and 2009 were reported in table 1 and figure 1.

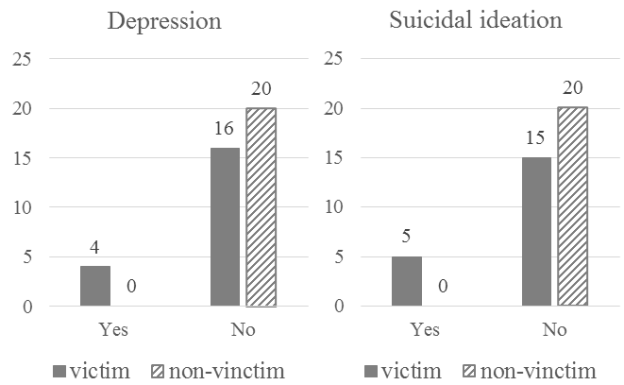

Fig. 1 Frequency of depression and suicidal ideation

Four out of 20 students in the victimized group (20%) reported that they were depressed by e and five out of twenty students (25.5%) had suicidal ideation as well. But, none of students experienced depression or suicidal ideation in the non- victimized group.

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CHI-SQUARE 0F THE EFFECT PEER VICTIMIZATION GIVES ON DEPRESSION AND SUICIDAL IDEATION

Variable	2008 peer victimization involved		x^2
	yes(*N*=20)	no(*N*=20)	
2009 depression			
Yes	4(20%)	0(0%)	
No	16(80%)	20(100%)	*4.44**
2009 suicidal ideation			
Yes	5(25%)	0(0%)	
No	15(75%)	20(100%)	*5.71**

**P*<.05

Then, Chi-square analysis was conducted to examine the longitudinal relationship between peer victimization in high school period and depression and suicidal ideation in the first year of college. The results indicated that peer victimization was significantly related to depression and suicidal ideation.

CONCLUSION

This examined whether peer- victimization experiences of high school students is related to depression and suicidal ideation in their first years of college. Results showed that students who were victimized by peer in their high school were more likely to experience internalizing behavior problems such as depression and suicidal ideation. This implies that peer victimization is a significant risk factor for mental health of college students.

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RESISTANCE TRAINING: BENEFITS ON HEALTH & FITNESS

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Abstract

Resistance training is the method to use of resistance for muscular contraction to build the strength, anaerobic endurance and size of skeletal muscles. Resistance training is based on the principle that muscles of the body will work to overcome a resistance force when they are required to do so. Moreover when resistance training repeatedly and consistently performed, your muscles become stronger. Muscular strength is an important component of fitness variable that is necessary for best possible health and Fitness level. A well- rounded fitness program includes strength training to improve bone, joint function, bone density, muscle tendon and ligament strength, as well as aerobic exercise to improve your heart and lung fitness, flexibility and balance level. Resistance training doesn't have to involve going to the gym or using weights. We can do strength training just by using our own body weights.

Key words: Fitness, Resistance Training, Muscles, Hypertrophy

INTRODUCTION

Strength is an important variable of health related fitness. Resistance training is a key for developing the strength and size of the muscles. Resistance training uses a variety of specialized equipment to target specific muscle groups and types of movement. (Kaukab Azeem, 2013), revealed that the muscular strength includes a variety of training modalities, including body weight exercises, elastic bands, plyometric exercises for (upper and lower body), multi machines, free weight machines and hydraulic machines. (Kaukab Azeem 2015), opined that the **e**xercise is a medicine and resistance training in particular is one of the most important medicine in controlling certain types of diseases, i.e., obesity, joint pains, muscle weakness, neuro-muscular coordination, etc. (K.Azeem, et.al 2006) stated that the resistance training is beneficial for athletes and important and part of the athlete's training program. Upper body strength is very important and part of the training program for the following sports men and women globally i.e., cricketers, basketball players, boxers, baseball players, wrestlers, judo players, etc.

(Kaukab Azeem, 2015) reveals that the pushups are one of the basic and most common exercises for the human body. Pushups are great exercise for the chest, and also help tremendously for shaping and defining abs, triceps, shoulders and torso. The basic principles of weight training are essentially identical to those of strength training, and involve a manipulation of the number of repetitions reps, sets, rest, exercise types, and weight moved to cause desired increases in

strength, endurance, and size. The specific combinations of reps, sets, exercises, and weights depend on the aims of the athletes performing the exercise; sets with fewer reps can be performed with higher weights.

BASIC PRINCIPLE OF RESISTANCE TRAINING

Progressive overload principle: To continue to gain benefits, strength activities need to be done to the point where it's hard for you to do another repetition. The aim is to use an appropriate weight or resistant force that will challenge you while maintaining good technique. Furthermore a regular adjustment to the training variables such as frequency and duration is needed for better performance. Exercises for each muscle group, number of exercises for each muscle group, sets and repetitions help to make sure you progress and improve.

Program: your overall fitness program is composed of various exercise types such as aerobic training, flexibility training, strength training and balance exercise.

Weight: different weights or other types of resistance. For example a 3 kg hand weight or fixed weight, body weight or rubber band will be used for different exercises during your strength training session.

Exercises: a particular movement, for example a calf-raise, is designed to strengthen a particular muscle or group of muscles.

Repetitions or reps: - refer to the number of time continuously repeat each exercise in a set.

- **Set: -** is a group of repetitions performed without resting, for example, two sets of squats by 15 reps would mean you do 15 squats then rest muscles before doing another 15 squats.
- **Rest: -** you need to rest between sets. Rest periods vary depending on the intensity of exercise being undertaken.
- **Variety:** switching around your workout routine, such as regularly introducing new exercise, challenges your muscles and forces them to adapt and strengthen.
- **Recovery:** muscle needs time to repair and adapt after a workout. A good rule of thumb is to rest the muscle group for about 48 hours before working the same muscle group again.

Adapting Resistance Training program have several benefits

Physiological

1. Improved cardiovascular efficiency
2. Beneficial endocrine (hormone) and serum lipid (cholesterol) adaptations
3. Increased bone density
4. Increased metabolic efficiency (metabolism)

Physical

1. Increased tissue (muscles, tendons, ligaments,) tensile strength
2. Increased cross sectional area of muscle fibers

3. Decreased body fat

Performance

1. Increased neuromuscular control (coordination)
2. Increased endurance
3. Increased strength

PHYSIOLOGICAL BENEFITS

1. **Improved cardiovascular efficiency**:

Cardiac efficiency is often expressed as a measure of the amount of cardiac work produced per amount of energy (O2) consumed by the heart (cardiac work/MVO2 ratio). It is not surprising those alterations in energy metabolism can alter cardiac efficiency, since cardiac work requires ATP and production of ATP via mitochondrial oxidative metabolism requires O2. The type of substrate utilized in the production of ATP via oxidative metabolism affects cardiac efficiency. In addition, metabolic by-products produced during ATP productions also have the potential to alter cardiac efficiency.

2. **Beneficial endocrine (hormone) and serum lipid (cholesterol) adaptations:**

Resistance Training skeletal muscle tissue serves as a repository of protein and free amino acids, in addition to providing precursors for glucose via gluconeogenesis. Resistance exercise initiates neuro-endocrine responses, including the hypothalamic-pituitary axis and sympathetic nervous system activation, which regulate the utilization of metabolic substrates to meet drastic increase of the energy requirements at muscle level resistance exercise induces increases in serum lipid hormone concentrations, it is also possible that the magnitude and/or duration of the acute hormone response may change due to prolonged resistance training.

3. **Increased bone density**

Resistance training can build bones, resistance training increased bone density, Bone is a complex tissue that provides lifelong structural support for muscles, protection of vital organs, and stores calcium, which is essential for bone density. Resistance training its increased bone density indicated that bone formation can be stimulated by placing a strain on the bone as is seen during resistive exercise forms of exercise can increase the increase is site-specific to the joints. Resistance exercise can positively affect, but that this influence is site-specific to the mode of exercise.

4. **Increased metabolic efficiency (metabolism)**

The resistance training is a good option for fat loss is because it boosts metabolic rate both over the short term as well as over the long term. In the hours after an intense weight-lifting session will experience resistance training an increase in metabolic rate will help you to maintain your total amount of lean muscle mass, creating a permanent increase in metabolic rate. The energy for the movement is provided by intake of food which is then metabolized to their constituents. Three classes of food stuff consumed are carbohydrates, fats and proteins. The main energy

source is carbohydrate and then fats. The contribution of proteins to energy production is considered to be minimal.

Metabolic and heart health strength training helps prevent and manage both cardiovascular disease (CVD) and diabetes by: Improving glucose metabolism, increasing maximal oxygen consumption, reducing blood pressure, increasing HDL cholesterol and reducing LDL, Cholesterol (in some people) and Improving blood vessel health.

PHYSICAL BENIFITS

1. **Increased tissue**
   (Muscles, tendons, ligaments)

Muscle is a soft tissue found in most animals. Muscle cells contain protein filaments of actin and myosin that slide past one another, producing a contraction that changes both the length and the shape of the cell. Muscles function to produce force and motion. They are primarily responsible for maintaining and changing posture, locomotion as well as movement of internal organs such as the contraction of the heart and the movements.

2. Increased cross- sectional area of muscle fibers

Resistance training increases the size and number of myofibrils, resulting in larger individual muscle fibers. Larger muscle fibers mean a larger and stronger muscle production of enzymes and structural proteins required for muscle contraction. Muscle fibers are classified as slow-twitch or fast-twitch fibers according to their strength, speed of contraction, and energy source.

3. Decreased body fat;

Resistance training decreases glycosylated hemoglobin and total fat reduces abdominal fat mass and increased muscle strength. In intensive resistance exercise program using free weights (dumbbells) or weight machines. Resistance training can control strength according to physical condition to provide the proper, individualized load by increasing as muscle strength increases. Exercise modality for enhancing muscle and physical strength without placing excessive stress on each joint or muscle used resistance training an increase in motor ability. Resistance exercise is generally prescribed as a measure to reduce obesity and abdominal fat mass.

PERFORMANCE BENEFITS

1. **Increased neuromuscular control (co-ordination)**

Resistance training is increased physical performance muscles also function as shock absorbers and serve as important balancing agents throughout our body. Well-conditioned muscles help to lessen the repetitive landing forces in weight-bearing activities such as jogging or playing basketball. Well-balanced muscles reduce the risk of injuries that result.

1. **Increased Endurance**

Endurance – Endurance exercise is performed at a sub maximal effort, the muscles' ability to use oxygen to produce energy in the form of ATP goes a long way towards determining our performance. When we train, we improve the aerobic production (i.e., with oxygen) of ATP by

increasing the number of fat and sugar transports, as well as metabolic enzymes and mitochondrial proteins.

Resistance training is increased physical performance. Muscles quite literally utilize energy to produce movement, functioning as the engine or powerhouse of the body. Resistance training increases the muscles' size, strength, and endurance.

2. **Increased strength**

Resistance training physically increases Muscular strength Vertebrate muscle produces approximately of force per square centimeter of muscle cross-sectional area when isometric and at optimal length. Some invertebrate muscles, such as in crab claws, have much longer sarcomeres than vertebrates, resulting in many more sites for actin and myosin to bind and thus much greater force per square centimeter at the cost of much slower speed. The force generated by a contraction muscle is determined by a number of factors including limb length, muscle fiber angle (pin nation), muscle and tendon, and the number of muscle proteins in parallel (muscle cross- selection area) To increase muscle strength**).**

OTHER BENEFITS OF RESISTANCE TRAINING INCLUDE

- Prevention and control of health conditions.
- Pain management
- Improved posture
- A better night's sleep and avoidance of insomnia
- Enhance mood and decrease feelings of depression
- Increased self-esteem
- Improve functional strength (Imagine doubling or tripling your strength in just 90 days)
- Strengthen your tendons, ligaments and bones and increased bone density and strength and reduced
- Risk of osteoporosis.
- Toned muscles make you look better
- Increase your metabolism for up to 24 hours after workout
- Relieve tension and stress
- Improved mobility and balance
- Improved sense of wellbeing: - resistance training may boost your self-confidence, improve your
- body image and your mood
- Enhanced performance of everyday tasks.

CONCLUSION

The effectiveness of resistance training performance-related benefits, the effects of resistance training on selected health-related measures including bone health body composition, and sports injury reduction should be recognized by teachers, coaches, parents, and health care

providers. These health benefits can be safely obtained by most children and adolescents when prescribed age-appropriate resistance training guidelines.

We now have the information to support the consideration of incorporating resistance training into a health-oriented approach to lifelong physical activity. Important future research goals should be to elucidate the mechanisms responsible for the health-related benefits associated with youth resistance exercise, to establish the combination of program variables that may optimize long-term training adaptations and to explore the potential benefits of resistance training on youth with various medical conditions including obesity, diabetes, cancer, severe burns, and physical limitations, and intellectual disabilities.

Finally, a resistance training program can not only increase the size or strength of an individual, it can also improve components of fitness (e.g., speed, strength and power) that affect the performance potential of the athlete.

It is also concluded that one has to understand the delicacy of the resistance training and has to follow proper training program under the able guidance of a fitness trainer for proper improvement and to maintain quality of life.

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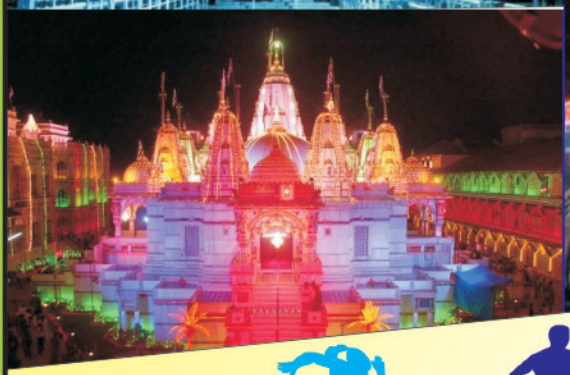

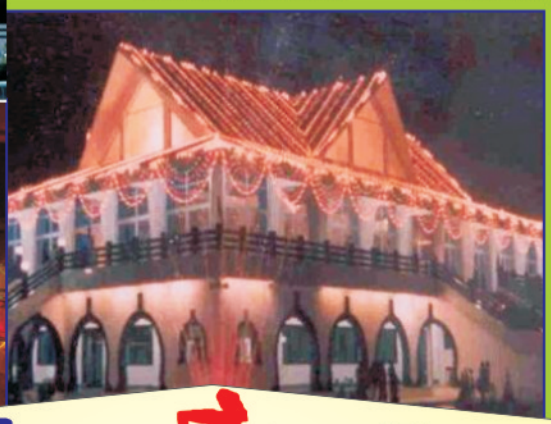

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