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INTERNATIONAL JOURNAL OF PHYSICAL EDUCATION AND APPLIED EXERCISE SCIENCES

A Comparison between Male Sprinters and Long Distance Runner within Body Composition

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Abstract:
The purpose of the study was to compare the body composition between male Sprinters and Long distance runner. The subjects were selected from the male Sprinters and Long distance runner of different colleges and training centers, who had participated last two years at Assam state level competitions for this study. Ten (10) male Sprinters and Long distance runners were selected as the subject for the study. Selected body composition such as Standing Height, Weight, Humerus Biepicondylar, Wrist Diameter, Femur Biepicondylar, Ankle Diameter, Upper arm Circumference, Forearm Circumference, Thigh Circumference, Calf Circumference, Bicep Skinfold, Forearm Skinfold, Suprailiac Skinfold, Subscapular Skinfold, Thigh Skinfold, Calf Skinfold were presented to compare the Sprinters and Long distance runners. To see the significant difference of selected body composition variables among the Sprinters and Long distance runners, the analysis of "mean, standard deviation and t test" was applied at .05 level of significance. The Sprinters are found to be taller and having greater diameters and circumferences and leaner in all skinfolds except suprailiac skinfold. The Long distance runners found to be heavier and having greater upper arm and forearm circumferences and leaner in suprailiac skinfold than sprinters. However, the Sprinters have greater bone mass, muscle mass and less fat percentage than Long distance Runners.

Keywords:
Body Composition, Sprinters, Long Distance Runners

1. INTRODUCTION

The scientifically proved that the body composition of two persons is never alike. It may differ in many ways like body size, structure, shape, weight, fat etc. By nature human beings are competitive and aspires from excellence in every field. Sport is not an exception, changes are the order of the day. Changes are taking place every day in every walk of life. Life of people, their philosophy, ways of living etc. are undergoing changes due to basic and applied research in various fields. New techniques are developed in laboratories and scientific methods are applied to obtain the level of performance. Sports by their very nature are enjoyable, challenging, absorbing and require a certain amount of skill and physical condition. With all round advancement in the science of sports the new disciplines are emerging with micro-specialization. The elements, of scientific basis of selection are being inducted in the procedure of selection of athletes at various levels in some of the advanced countries. The knowledge from many scientific disciplines is being used for improving criteria for the selection of talents. The physical educationists have designed test procedures for evaluating the fitness of young children. This difference influences their performance in some different sports events. The human body consists of several levels of structural organization. Considering the increasing stages of complexity, five levels of body composition can be envisioned. The human body is characterized by size, shape and its various dimensions. Body composition is used to describe the percentages

of fat, bone and muscular in human body. Body composition has become a major field of interest, for the sport scientists and proper assessment of body composition can help in profiling and counseling sportsperson. Body composition makes an important contribution to an individual's level of physical fitness for performance describes it as a state which characterizes the degree to which a person is able to function efficiently through these physical, mental, emotional, moral and spiritual components. So investigator tried to such hidden factors which help to increase the level of performance of Sprinters and Long Distance Runners.

2. MATERIALS AND METHODS

2.1. Participants

Sixty (60) male subjects which were divided into two groups 30 sprinters and 30 long distance runners and both groups having equally distributed. They were ranging in age from 18.3+5.5 years old. The sample had participated last 2 years at state level competitions. The sixty (60) sprinters and long distance runners were selected from different colleges and training centers. The investigator firstly divided the sprinters and long distance runners, random sampling technique was used.

2.2. Statistical Analysis

To analysis the significant difference of selected body composition variables among the male sprinters and long distance runners, the analysis of "mean, standard deviation and 't' test was applied at.05 level of significance.

2.3. Instruments

The following instruments used for collection of data were anthropometric rod, Weighing machine, Sliding caliper, Steel tape, Skinfold caliper, Stopwatch, Measuring tape and Shot Put.

The following standardized anthropometric measurements used method for data collection were Standing Height (cms), Weight (kg), Humerus Biepicondylar (cms), Wrist Diameter (cms), Femur Biepicondylar (cms), Ankle Diameter (cms), Upper arm Circumference (cms), Forearm Circumference (cms), Thigh Circumference (cms), Calf Circumference (cms), Bicep Skinfold (mm) Forearm Skinfold (mm), Suprailiac Skinfold (mm), Subscapular Skinfold (mm), Thigh Skinfold (mm), Calf Skinfold (mm).

Body composition components i.e. bone mass and muscle mass, percentage of body fat and body density were calculated using the formula.

3. RESULTS

The results pertaining to body composition, if any, between sprinters and long distance runners were assessed using the Student's t test and the results are shown in tables-1.

The comparison of their Standing Height, Weight, Humerus Biepicondylar, Wrist Diameter, Femur Biepicondylar, Ankle Diameter, Upper arm Circumference, Forearm Circumference, Thigh Circumference, Calf Circumference, Bicep Skinfold, Forearm Skinfold, Suprailiac Skinfold, Subscapular Skinfold, Thigh Skinfold, Calf Skinfold of male Sprinters and Long distance runners were shown in table 1. The mean values of Humerus Biepicondylar, Wrist Diameter, Femur Biepicondylar, Ankle Diameter, Upper arm Circumference, Thigh Circumference, Calf Circumference, Bicep Skinfold, Bone mass and Fat percentage of Sprinters and Long distance runners were (7.01 and 5.97)cms, (5.99 and 5.54)cms, (8.64 and 8.31)cms, (6.83 and 6.51)cms, (25.53 and 26.90)cms, (48.57 and 47.27)cms, (35.10 and 33.92)cms, (9.72 and 11.23)mm, (10.28 and 8.73) and (23.71 and 30.24) respectively. In statistically term cal. t (=6.70, 3.24, 2.40, 2.78, 2.13, 2.01, 2.03, 2.05, 4.56 and 6.86)> tab t .05 (59) (=2.01), Ho (null hypothesis) is rejected at .05 level of significance.

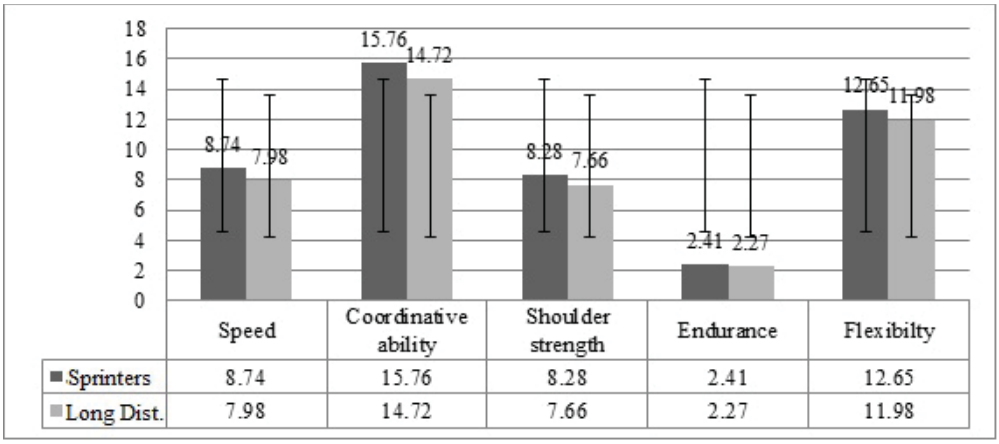
Table 1: Mean Value (SD) of Body Composition In The Sprinters And Long Distance Runners

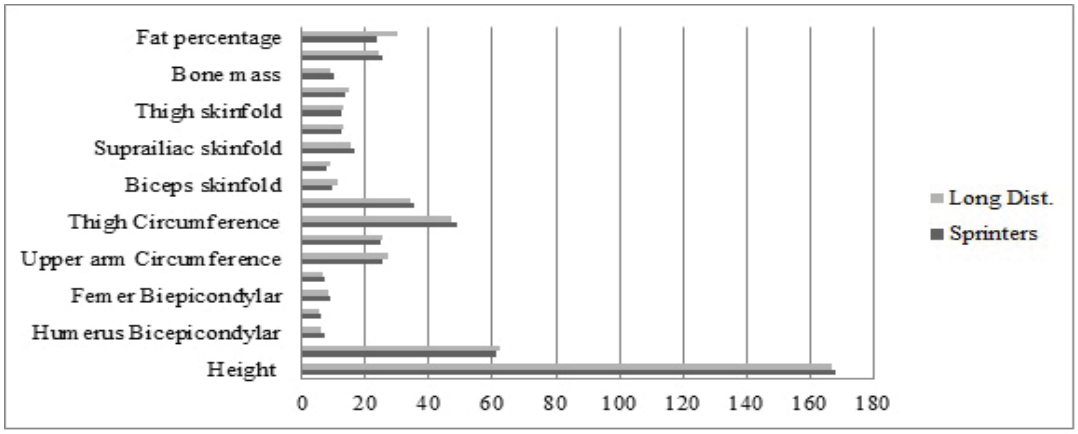
Dimensions	Mean		Sd		T-Value
	Sprinters	Long Distance	Sprinters	Long Distance	
Height (cms)	168.2	166.8	166.8	166.87	0.68
Body weight (Kg)	61.20	62.25	9.37	10.54	0.41
Humerus biepicondylar (cms)	7.01	5.97	0.60	0.60	6.70*
Wrist diameter (cms)	5.99	5.54	0.53	0.54	3.24*
Femer biepicondylar (cms)	8.64	8.31	0.45	0.59	2.40*
Ankle diameter (cms)	6.83	6.51	0.44	0.45	2.78*
Upper arm circumference (cms)	25.53	26.90	2.59	2.38	2.13*
Forarm circumference (cms)	24.80	25.47	2.31	1.98	1.20
Thigh circumference (cms)	48.57	47.27	1.82	3.05	2.01*
Calf circumference (cms)	35.10	33.92	1.93	2.55	2.03*
Biceps skinfold (mm)	9.72	11.23	2.31	3.32	2.05*
Forearm skinfold (mm)	7.68	8.93	2.27	3.14	1.77
Suprailiac skinfold	16.37	15.60	7.35	6.64	0.42
Subscapular skinfold (mm)	12.23	13.03	5.18	5.81	0.58
Thigh skinfold (mm)	12.13	13.03	2.86	3.00	1.19
Calf skinfold (mm)	13.53	14.57	2.49	2.19	1.38
Bone mass	10.28	8.73	1.41	1.22	4.56*
Muscle mass	25.25	24.29	3.42	3.51	1.07
Fat percentage	23.71	30.24	3.99	3.36	6.86*

The comparison of their height, body weight, forarm circumference, forarm skinfold, suprailiac skinfold, subscapular skinfold, thigh skinfold, calf skinfold and muscle mass of Sprinters and Long distance runners were (168.2 and 1.66.8)cms, (61.20 and 62.25)kg, (24.80 and 25.47)cms, (7.68 and 8.93)mm, (16.37 and 15.60)mm, (12.23 and 13.03)mm, (12.13 and 13.03)mm, (13.53 and 14.57)mm and (25.25 and 24.29) respectively. The cal "t" value (=0.68, 0.41, 1.20, 1.77, 0.42, 0.58, 1.19, 1.38 and 1.07)< tab t.o5 (59)(=2.01), Ho (null hypothesis) is accepted at .05 level of significance.

Result indicates that male sprinter were found to be taller than long distance runner, male long distance runner were found to be heavier than sprinters, male sprinters has greater humerus biepicondylar diameter, wrist diameter, femur biepicondylar, ankle diameter, upper arm circumference, thigh circumference, calf circumference than sprinters, leaner biceps skinfold than long distance runner, greater bone mass and lesser fat percentage than long distance runners.

It may also concluded that no significant change was noted in the height, body weight, forarm circumference, forarm skinfold, suprailiac skinfold, subscapular skinfold, thigh skinfold, calf skinfold and muscle mass. As per the study the above remark can be given at 95% confidence.





4. DISCUSSION

4.1. Body Composition

Results of the present study revealed that male sprinters have taller, greater diameters, circumferences except upper-arm and fore-arm circumferences and leaner in skinfolds except suprailiac skinfold. Long distance runners have greater upper-arm and forearm circumferences and leaner in suprailiac skinfold. These finding substantiate the assertion that the several study have shown that comparison to other sports using body power, the sprinters in the present study has greater bone mass, more muscle mass and lesser fat percentage may be due to wider bone diameters, more developed girths; this may be effect of strenuous training, different skills movements, genetics factors and different diet pattern as compare to long distance runners.

5. CONCLUSION

Keeping the results and discussion in view the conclusions drawn that in comparison with long distance runners, sprinters are found to be taller and having greater diameters and circumferences. Sprinters are further found to be leaner in all skinfolds except suprailiac skinfold. Long distance runners are found to be heavier and having greater upper arm and forearm circumferences than Sprinters. Long distance runners are further found to be leaner in suprailiac skinfold. Sprinters have greater bone mass, muscle mass and less fat percentage than Long distance runners.

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Comparative Study of Self-concept and Sports Competition Anxiety Between High Achieving and Low Achieving National Level Footballers

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Abstract:
The purpose of the study was "Comparative Study of self-concept and sports competition anxiety between High Achieving and Low Achieving National Level Footballers". The subjects for this study were male National Football players. One hundred forty four subjects were selected for the study. Seventy two were those High Achieving National Level Footballers and Seventy two were those Low Achieving National Level Footballers. The age group of footballers was ranged between 19 to 28 years. To find out the self-concept, sports competition anxiety of different National level football players, the research scholar selected the questionnaires namely self-concept, sports competition anxiety Questionnaire. To determine the comparative differentials of self-concept, sports competition anxiety between High Achieving and Low Achieving National Level Footballers, the test of significance ('t'-Ratio) was employed. Further, the level of significance was set at 0.05 level of confidence. The findings of the study reveal that there was significant difference in case of self-concept where High Achieving National Level Footballers exhibited better self-concept in comparison with the Low Achieving National Level Footballers. The insignificant difference was found in case of sports competition anxiety test between High Achieving and Low Achieving National Level Footballers may be due to the reason that the players were almost of the same standard with a similar kind of experience which must have been a probable cause.

Keyword:
Self-concept and Sports Competition Anxiety

1. INTRODUCTION

Sports are as old as the human society and it holds a prominent place in the modern life. Millions of people participate in sports activities, watch and read about them and spend billions of dollars annually on sports activities and equipment. It now enjoys a popularity which outstrips any other form of social activity. It has become an integral part of the educational process as physical education and sports have been included in the regular curriculum. The students are taught various games and sports in a systematic manner. Besides teaching, the students are evaluated in their performance. Many people participate in games and sports for deriving physical, mental, social and emotional benefits. self concept as "An organized configuration of perception of the self which are admissible to awareness. It is compared of such elements as the perception of one's characteristics and abilities, the percept and concept of the self in relation to others and to the environment". The mental and conceptual awareness one holds of himself. Includes: physical, psychological, and social attributes; and can be influenced by its attitudes, habits, beliefs and

ideas. These components and attributes can each be condensed to the general concepts of self-image and the self-esteem. It is the state of mind in which the individual responds with discomfort to some event that has occurred or is going to occur. The person's worries about the event, their occurrence and consequences in general are the sources of anxiety; however the anxiety can be either somatic or cognitive in nature. The unpleasant emotional state consisting of psycho-physiological responses to anticipation of unreal or imagined danger, ostensibly resulting from unrecognized intra-psychic conflict. Physiological concomitants include increased heart rate, altered respiration rate, sweating, trembling, weakness and fatigue; psychological concomitants include feelings of impending danger, apprehension and tension. Anxiety is a state of emotional and physical disturbances included in a person by real or imagined threat. In psychology the term refers to disturbances caused by threats that are only apparent to the individual and cause him to behave in a way that is not relevant to the true situations. It is the state of mind in which the individual responds with discomfort to some event that has occurred or is going to occur. The person's worries about the event, their occurrence and consequences in general are the sources of anxiety; however the anxiety can be either somatic or cognitive in nature.

2. OBJECTIVES

- To explore the self-concept and sports competition anxiety of High Achieving and Low Achieving National Level Footballers.
- To compare the self-concept of High Achieving and Low Achieving National Level Footballers.
- To compare the anxiety of High Achieving and Low Achieving National Level Footballers.
- The results of the study and the quantum of knowledge in physical education especially in the area of sports psychology and football.

Hypothesis It was hypothesized that there may not be any significant difference in self-concept, Sports Competition anxiety, between High Achieving and Low Achieving National Level Footballers.

Methodology The study was confined to One hundred forty four Senior Level Footballers .Seventy two High Achieving and Seventy two Low Achieving National Level Footballers were selected (age group of 19 to 28 years). The data was collected in the 68th Shantosh Trophy National Football Tournament held Kanchanjangha Stadium Siliguri from 24th February to 9th March 2014. One hundred forty four subjects by administering the tests for the selected test items on the different National level football players.

Sampling The subjects for this study were male National Football players, One hundred forty four subjects were selected for the study. Seventy two were those High Achieving National Level Footballers and Seventy two were those Low Achieving National Level Footballers. The age group of footballers was ranged between 19 to 28 years.

3. PROCEDURES

The self-concept score of the subjects was obtained by using Self-Concept Questionnaire (SCQ) developed by Dr. Raj Kumar Saraswat. The sports competition anxiety score of the subjects was obtained by using Sports Competition Anxiety Questionnaire developed by Renier-Martin.

4. STATISTICAL PROCEDURE

To determine the comparative differentials of Self-Concept and The sports competition anxiety between High Achieving and Low Achieving National Level Footballers, the test of significance ('t'-Ratio) was employed. Further, the level of significance was set at 0.05 level of confidence.

5. RESULTS

Table 1: Significance of Difference Between High Achieving and Low Achieving National Level Footballers on Self Concept in Numbers

Variables	M-1	M-2	MD	SE	`t' Ratio	Required `t' Ratio
Self-Concept	186, 00	180.18	05.82	01.65	03.52*	01.98

* Significant at 0.05 level of Confidence

M_1 = Mean of High Achieving National Level Footballers

M_2 = Mean of Low Achieving National Level Footballers

From the above Table 1, it is revealed that there was significant difference in case of Self Concept Test as calculated 't' value (03.52) was greater than tabulated 't' value (1.98) at 0.05 level of significance with 142 degree of freedom. Thus, it may be concluded that there was significant difference between High Achieving and Low Achieving National Level Footballers related to Self Concept Test, in which mean Self Concept Test is significantly higher for High Achieving National Level Footballers than Low Achieving National Level Footballers at 0.05 level of significance. The findings of the Table 1 are presented in Fig. 1.

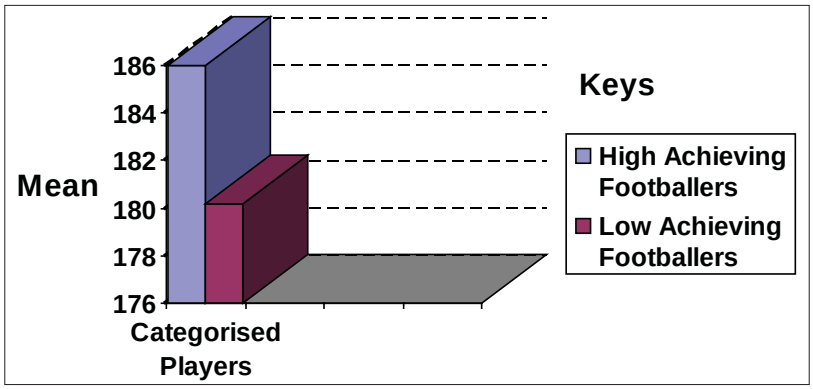

Figure 1: Graphical Depiction of Mean values of Self Concept Test between High Achieving and Low Achieving National Level Footballers

Table 2: Significance of Difference Between High Achieving and Low Achieving National Level Footballers on Sports Competitiion Anxiety in Numbers

Variables	M-1	M-2	MD	SE	`t' Ratio	Required `t' Ratio
Sports Competition Anxiety	20.46	19.84	00.62	00.56	01.10	01.98

* Significant at 0.05 level of Confidence

M_1 = Mean of High Achieving National Level Footballers

M_2 = Mean of Low Achieving National Level Footballers

From the above Table 2, it is revealed that there was insignificant difference in case of Sports Competition Anxiety Test as calculated 't' value (01.10) was less than tabulated 't' value (1.98) at 0.05 level of significance with 142 degree of freedom. Thus, it may be concluded that there was insignificant difference between High Achieving and Low Achieving National Level Footballers related to Sports Competition Anxiety Test, in which mean Sports Competition Anxiety Test is insignificantly higher for High Achieving National Level Footballers than Low Achieving National Level Footballers at 0.05 level of significance. The findings of the Table 2 are presented in Fig. 2.

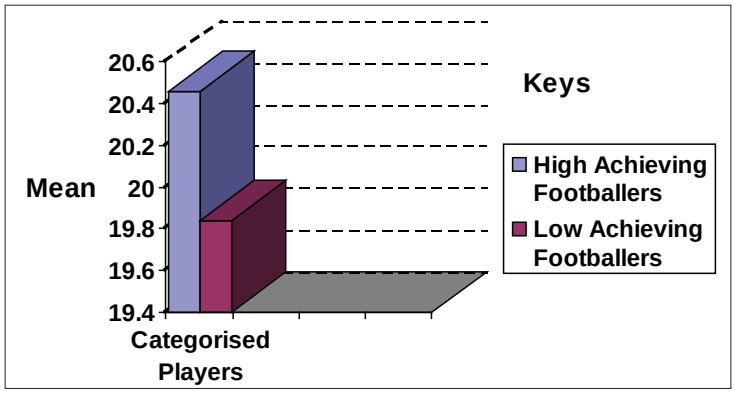

Figure 2: Graphical Depiction of Mean Values of Sports Competition Anxiety Test between High Achieving and Low Achieving National Level Footballers

6. DISCUSSION

Significant difference was found in case of self-concept where High Achieving National Level Footballers exhibited better self-concept in comparison with the Low Achieving National Level Footballers. It may be due to the greater awareness of High Achieving National Level Footballers towards physical, social, temperamental, educational, moral and intellectual ability. The insignificant difference in sports competition anxiety test between High Achieving and Low Achieving National Level Footballers may be due to the reason that the players were almost of the same standard with a similar kind of experience which must have been a probable cause. In addition, players have been coached by specialist coaches who must have played a significant role by imparting psychological aspects in the coaching which might have been a contributing factor in not finding out the significant difference. In addition, the High Achieving and Low Achieving National Level Footballers get a similar kind of exposure which also must be a contributing factor in the insignificant difference.

7. CONCLUSION

Within the limitations of the study and on the basis of the results of the study, the following conclusions may be drawn:

- There was Significant difference was found in case of self-concept where High Achieving National Level Footballers exhibited better self-concept and in comparison with the Low Achieving National Level Footballers.
- The insignificant difference was found in case of sports competition anxiety where High Achieving National Level Footballers exhibited less anxiety in comparison with the Low Achieving National Level Footballers.

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Study of Selected Respiratory Functions among Individual, Dual and Team Sport Players

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Abstract :

The purpose of this study was to study and compare the selected respiratory functions among inter-college level male individual, dual and team sport players. A sample of Ninety (N=90) male players, which includes thirty each individual, dual and team sport players of age ranging from 18 to 25 years, who actually participated in inter–college competitions of Guru Nanak Dev University, Amritsar, Punjab, India, was selected. All the participants were informed about aim and methodology of the study and they agreed to participate in this study. The study was conducted on selected respiratory function's variables i.e. vital capacity, expiratory reserve volume and inspiratory reserve volume. One way Analysis of Variance (ANOVA) was applied to find out the significance of differences with regard to selected respiratory functions among individual, dual and team sport players. Scheffe's post-hoc test (SPHT) was applied to see the direction and significance of differences where 'F' value found statistically significant. The level of significance was set at 0.05. Results revealed significant differences among inter-college level male individual, dual and team sport players with regard to vital capacity (p. 0.05), expiratory reserve volume (p. 0.05) and inspiratory reserve volume (p. 0.05) respectively. While comparing the means, it revealed that team sport players had better vital capacity, expiratory reserve volume and inspiratory reserve volume than their counterparts; individual and dual sport players. However, Individual sport players exhibited better vital capacity and inspiratory reserve volume than dual sport players.

Keywords:

Respiratory Functions, Vital Capacity, Expiratory Reserve Volume, Inspiratory Eserve Volume

1. INTRODUCTION

The performance of players is influenced by many factors such as physical, physiological and psychological variables. The physiological variables play an important role for the attainment of high level performance in sports. Respiratory functions values are influenced by race, age, sex, height, weight, physical activity, as well as environmental, genetic, socioeconomic and technical parameters (Woolcock *et al*., 1972; Budhiraja *et al*., 2010). Among the various physiological parameters, lungs functions form the basis to undertake sports efforts successfully. The respiratory function tests, like other physiological tests must be of the utmost importance for measuring the fitness of an individual from physiological point of view (Astrand and Rodahl, 1970). Singh *et al*., (2012) suggested that athletes had better respiratory functions then non-athletes. Adaptations of respiratory parameters achieved by players vary with the type of sports training involved in each discipline of games i.e. individual, dual and team. Respiratory functions increases by training depend upon the specific playing abilities. The individual, dual and team game players requires different types of physical and physiological demands. Respiratory function tests provide qualitative and quantitative evaluation of respiratory functions (Belman & Mittman, 1980; Robinson & Kjeldqard, 1982). Therefore, the purpose of this study was to compare the selected respiratory function variable between

individual sports and team sports athletes. Therefore, the purpose of the study was to compare the respiratory functions among inter-college level male individual, dual and team sport players.

2. MATERIALS AND METHODS

2.1. Subjects

A sample of Ninety (N=90) male players, which includes thirty each individual, dual and team sport players of age ranging from 18 to 25 years, who actually participated in inter–college competitions of Guru Nanak Dev University, Amritsar, Punjab, India, was selected. All the participants were informed about aim and methodology of the study and they agreed to participate in this study. The purposive sampling technique was used to select the subjects.

2.2. Methodology

2.2.1. Height and Weight

Height measurements were taken by using the standard anthropometric rod to the nearest 0.5 cm. Full attention was given to make sure that players' body was fully upright and their mandible was parallel to the ground. Taken values recorded in 'cm'. The subject's weight was measured with portable weighing machine to the nearest 0.5 kg. During measurements players were on bare feet and wearing underwear only. Measurements recorded in 'kg'.

2.2.2. Body Mass Index (BMI)

BMI was calculated by the formula of; Body Mass Index = Weight/Height^2.

2.2.3. Measurements of Respiratory Functions

Respiratory functions were measured with a computerized spirometer. Before recording the respiratory function tests, subjects were shown a demonstration of the tests. It was made sure that subject's vital capacity was measured when the subject was exhaling with maximal speed and effort. Consequently, a minimum of three readings were recorded of each test for every subject and the best of the three was considered for having reproducibility and validity of the recorded test. The Respiratory functions like, vital capacity (VC), expiratory reserve volume (ERV) and inspiratory reserve volume (IRV) were taken into consideration for this study.

2.2.4. Statistical Analysis

Values are presented as mean values and SD. One-way analysis of variance (ANOVA) was employed. Following the detection of a significant mean effect, Scheffe's post-hoc analysis was performed to locate where specific mean differences were laid. Data was analyzed using SPSS Version 16.0 (Statistical Package for the Social Sciences, version 16.0, SPSS Inc, Chicago, IL, USA.

3. RESULTS

Table 1 shows the demographic characteristics of inter-college level male individual, dual and team sport players. Table 2 exhibited the Mean and SD values of selected respiratory functions of inter-college level male individual, dual and team sport players. While comparing the means, it revealed that team sport players had better vital capacity, expiratory reserve volume and inspiratory reserve volume than their counterparts; individual and dual

sport players. Individual sport players exhibited better vital capacity and inspiratory reserve volume than dual sport players.

Table 1: Demographic Characteristics of Inter-College Level Male Individual, Dual and Team Sport Players

Sport Group	Age (yrs)		Height (m)		Weight (Kg)		BMI	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Individual Sport	20.97	1.13	177.27	4.92	68.53	8.73	21.79	2.53
Dual Sport	20.90	1.27	176.20	5.43	67.00	9.96	21.53	2.81
Team Sport	20.70	2.25	175.63	8.40	66.07	9.94	21.34	2.17
Total	**20.86**	**1.55**	**176.37**	**6.25**	**67.20**	**9.54**	**21.55**	**2.50**

Table: 2: Mean and SD values of Variables of Respiratory Functions of Inter-College Level Male Individual, Dual and Team Sport Players

Variables	Sports Groups					
	Individual Sports		Dual Sports		Team Sports	
	Mean	SD	Mean	SD	Mean	SD
Vital Capacity (VC)	4.44	0.44	4.05	0.34	4.96	0.17
Expiratory Reserve Volume (ERV)	1.45	0.29	1.49	0.28	1.97	0.35
Inspiratory Reserve Volume (IRV)	2.00	0.24	1.66	0.31	2.41	0.35

Table 3: Analysis of Variance (ANOVA) among Inter-College Level Male Individual, Dual and Team Sport Players with regards to selected Respiratory Functions

Variables	Source of Variance	Sum of Squares	df	Mean Square	F-value	Sig.
Vital Capacity	Between Groups	12.691	2	6.345	56.63*	0.00
	Within Groups	9.748	87	0.112		
	Total	22.439	89			
Expiratory Reserve Volume	Between Groups	5.068	2	2.534	26.17*	0.00
	Within Groups	8.425	87	0.097		
	Total	13.492	89			
Inspiratory Reserve Volume	Between Groups	8.570	2	4.285	45.85*	0.00
	Within Groups	8.130	87	0.093		
	Total	16.701	89			

***Significant at .05 level of Confidence** $F_{.05}$ *(2, 87) = 3.10*

In Table 3 analysis of variance (ANOVA) results revealed significant differences among inter-college level male individual, dual and team sport players with regard to vital capacity (p. 0.05), expiratory reserve volume (p. 0.05) and inspiratory reserve volume (p. 0.05) respectively.

Since the obtained F-values were found significant, therefore, the Post-hoc test (Scheffe's) was applied to see the direction and significance of difference between paired means of inter-college level male individual, dual and team sport players with regards to selected respiratory functions. The results of Post-hoc test (Scheffe's) have been presented in Table 4 below.

Table 4: Comparison of Mean Values of Post-hoc Test (Scheffe's) among Inter-College Level Male Individual, Dual and Team Sport Players with regards to selected Respiratory Functions

Variables	Sports Groups			Mean Difference	Sig.
	Individual Sports	Dual Sports	Team Sports		
Vital Capacity	4.44	4.05		0.39*	0.00
	4.44		4.96	0.52*	0.00
		4.05	4.96	0.91*	0.00

Expiratory Reserve Volume	1.45	1.49		0.04	0.88
	1.45		1.97	0.52*	0.00
		1.49	1.97	0.48*	0.00
Inspiratory Reserve Volume	2.00	1.66		0.34*	0.00
	2.00		2.41	0.41*	0.00
		1.66	2.41	0.75*	0.00

***Significant at .05 level of Confidence**

A glance at Table 4 showed that team sport players have exhibited statistically significant (p. 0.05) differences with individual and dual sport players on all the selected respiratory functions i.e. vital capacity, expiratory reserve volume and inspiratory reserve volume. However, individual and dual sport players have also shown statistically significant (p. 0.05) differences on vital capacity and inspiratory reserve volume, but statistically insignificant (p. 0.05) difference on expiratory reserve volume.

4. DISCUSSION

Respiratory system is an important system of human body where gaseous exchange takes place with diffusion of enormous amounts of oxygen into the blood during physical activity (Khurana, 2005). The current study was designed to compare the respiratory parameters, including vital capacity (VC), expiratory reserve volume (ERV) and inspiratory reserve volume (IRV) among inter-college level male individual, dual and team sport players. The respiratory parameters tests are very important in assessing a player's level of physiological fitness. Results of the present study indicated that significant differences among inter-college level male individual, dual and team sport players with regard to vital capacity, expiratory reserve volume and inspiratory reserve volume were found respectively. These differences may be the result of differences in the sporting activity and levels of training. Due to regular exercise, athletes tend to have an increase in respiratory capacity (Adegoke & Arogundade, 2002). While comparing the means, it revealed that team sport players had better vital capacity, expiratory reserve volume and inspiratory reserve volume than their counterparts; individual and dual sport players. This difference may be due to lower level of physical fitness in individual and dual athletes as compare to team game athletes. It is suggested that physically fit athletes possess superior respiratory functions relative to less fit subjects (Johnson *et al*., 1981; Johnson *et al*., 1991). The findings of the present study supported by the study of Holmen *et al*. (2002). They performed a study on non-smokers in athletes who were 13–19 years old, and they determined that athletes engaged with team sports like football, volleyball, basketball and handball had higher respiratory values in compare to individual sports i.e. swimmers, long-distance runners and skiers.

5. CONCLUSION

It is concluded that, significant differences were found among inter-college level male individual, dual and team sport players with regard to selected respiratory functions i.e. vital capacity, expiratory reserve volume and inspiratory reserve volume respectively. Team sport players had better vital capacity, expiratory reserve volume and inspiratory reserve volume than their counterparts; individual and dual sport players.

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Anthropometric Characteristics of Inter-University and Inter-College Level Basketball Players

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Abstract:
The purpose of this study was to find out the differences in anthropometric characteristics of basketball players in relation to their performance level (i.e. inter-university level and inter-college level). A sample of forty eight (N=48) male basketball players of age ranging from 18–25 years, which includes inter–university level (N_1=24) and inter-college level (N_2=24), was selected from various colleges and universities of North India. The purposive sampling technique was used to select the subjects. All the participants were informed about aim and methodology of the study and they volunteered to participate in this study. All the subjects were assessed for height, weight, lengths, circumferences and diameters. The independent samples t-test was applied to assess the differences of various anthropometric characteristics between inter–university and inter-college level basketball players. The level of significance was set at 0.05.Significant differences were found between inter-university and inter-college level basketball players with regard to height (p. 0.05), body weight (p. 0.05), leg length (p. 0.05), lower leg length (p. 0.05) and chest circumference (p. 0.05) but insignificant differences were found with regard to BMI (p. 0.05), arm length (p. 0.05), upper arm length (p. 0.05), forearm length (p. 0.05), upper leg length (p. 0.05), elbow diameter (p. 0.05), shoulder diameter (p. 0.05), hip width (p. 0.05), knee diameter (p. 0.05), calf circumference (p. 0.05), thigh circumference (p. 0.05), upper arm circumference (p. 0.05) and lower arm circumference (p. 0.05) respectively. While comparing the means, it revealed that inter-university level basketball players were taller and had more weight, longer leg length, longer lower leg length and also more chest circumference than their inter-college level counterparts.

Keywords:
Anthropometric Characteristics, Inter-university, Inter-college, Basketball Players

1. INTRODUCTION

Basketball is one of the most popular sport throughout the world. More than 70million people play basketball and over 210 countries are members of FIBA(Kamble *et al*., 2012). The skills of basketballgame are dribbling, passing, shooting, rebounding etc. These skill need to be enriched with anthropometric and physiological characteristic. These characteristicof a player will contribute to the success of the player as well as of the team (Ackland *et al*., 2003).It has been well established that specific physical characteristics or an anthropometric profile indicate whether a player would be suitable for the competition at the highest level in a specific sport (Claessens *et al*., 1999; Bourgois *et al*.,2000; Ackland *et al*., 2003). Anthropometric characteristics arealmost exclusively genetically determined thereforelength and breadth measurements cannot bechanged with training (Carter *et al*., 2005). Therefore, the knowledge of these characteristics is necessary to establish their importance

for the success in competitive sport (Lohman, *et al*., 1988). The influence of anthropometric characteristics on basketball performance has been confirmed by a number of studies delving into the anthropometric characteristics of male and female basketball players of different age groups (Carter *et al*., 2005; Ostojic *et al*., 2006; Piechaczek, 1990; Trninić *et al*., 1999). Moreover, to our knowledge, there were no studyhas compared the anthropometric characteristics ofIndian basketball players at inter-university andinter-college performance level. Hence, the purpose of this study was to compare the anthropometric characteristics of basketball players in relation to their performance level (i.e., inter-university and inter-college).

2. MATERIAL & METHODS

2.1. Subjects

A sample of forty eight (N=48) male basketball players of age ranging from 18–25 years, which includes inter–university level (N_1=24) and inter-college level (N_2=24), was selected from various colleges and universities of North India. The purposive sampling technique was used to select the subjects. All the participants were informed about aim and methodology of the study and they volunteered to participate in this study.

2.2. Instruments

The instruments used for collection of datawere anthropometric rod, weighing machine, slidingcaliper and steel tape.

2.3. Variables

Table 1: Variables and Measurement Units

Variables	Measurement Unit	Variables	Measurement Unit
Height	Centimeters	Elbow Diameter	Centimeters
Body Weight	Kilograms	Shoulder Diameter	Centimeters
Body Mass Index	(kg/m2)	Hip Diameter	Centimeters
Arm Length	Centimeters	Knee Diameter	Centimeters
Upper Arm Length	Centimeters	Calf Circumference	Centimeters
Forearm Length	Centimeters	Thigh Circumference	Centimeters
Leg Length	Centimeters	Chest Circumference	Centimeters
Upper Leg Length	Centimeters	Upper Arm Circumference	Centimeters
Lower Leg Length	Centimeters	Lower Arm Circumference	Centimeters

The subjects were assessed for height, weight, lengths, circumferences and diameters. Height measurements were taken by using the standard anthropometric rod (HG-72, Nexgen Ergonomics, Canada) to the nearest 0.5 cm. Body weight was measured with portable weighing machine to the nearest 0.5 kg. Body Mass Index (BMI) was calculated by the following formulae: BMI (Kg/m^2) = (Body mass in Kg)/ (Stature in Meters)^2. Girths and lengths were taken with the steel tape to the nearest 0.5 cm while widths and diameters of body parts were measured by using sliding caliper.

3. STATISTICAL ANALYSIS

Values are presented as mean values and SD. Independent samples t test was used to test if population means estimated by two independent samples differed significantly. The level of significance was set at 0.05. Data was analyzed using SPSS Version 16.0 (Statistical Package for the Social Sciences, version 16.0, SPSS Inc, Chicago, IL, USA).

4. RESULTS

Table: 2: Comparison of Anthropometric Characteristics between Inter-University Level (N_1=24) and Inter-College Level (N_2=24) Basketball Players

VARIABLES	Inter-University Players (N_1 = 24)		Inter-College Players (N_2 = 24)		Mean Difference	SEDM	t-value	Sig.
	Mean	*SD*	*Mean*	*SD*				
Height	182.17	5.58	176.29	5.80	5.88	1.64	3.57*	0.001
Body Weight	73.67	8.49	67.67	7.06	6.00	2.25	2.66*	0.011
BMI	22.18	2.21	21.77	2.04	0.41	0.61	0.67	0.504
Arm Length	80.21	4.13	79.42	4.18	0.79	1.20	0.66	0.512
Upper Arm Length	33.33	2.46	33.67	1.83	0.34	0.63	0.53	0.597
Forearm Length	28.29	1.73	28.33	3.02	0.04	0.71	0.06	0.954
Leg Length	105.25	5.09	91.58	18.84	13.67	3.98	3.43*	0.001
Upper Leg Length	51.50	5.74	50.54	2.73	0.96	1.30	0.74	0.464
Lower Leg Length	45.17	2.71	41.08	3.26	4.09	0.86	4.72*	0.000
Elbow Diameter	7.25	0.75	7.22	0.45	0.03	0.18	0.21	0.835
Shoulder Diameter	40.77	8.01	43.10	2.35	2.33	1.70	1.37	0.183
Hip Diameter	30.28	1.96	29.67	2.19	0.61	0.60	1.03	0.310
Knee Diameter	10.04	0.70	10.05	0.82	0.00	0.22	0.00	1.000
Calf Circumference	34.21	3.05	33.50	3.62	0.71	0.97	0.73	0.468
Thigh Circumference	52.21	4.91	49.12	9.75	3.09	2.23	1.38	0.175
ChestCircumference	92.33	5.98	85.58	11.93	6.75	2.72	2.48*	0.018
Upper Arm Circumference	26.58	2.00	26.37	2.46	0.21	0.65	0.32	0.749
Lower Arm Circumference	24.12	1.92	24.46	1.89	0.34	0.55	0.61	0.547

*Significant at0.05 level $t_{.05}$ *(46) =2.02*

Table 2. Depicts the results of descriptive statistics of various anthropometric characteristics between inter-university and inter-college level basketball players. It is evident from the results that significant differences were found between inter-university and inter-college level basketball players with regard to height (p. 0.05), body weight (p. 0.05), leg length (p. 0.05), lower leg length (p. 0.05) and chest circumference (p. 0.05) but insignificant differences were found with regard to BMI (p. 0.05), arm length (p. 0.05), upper arm length (p. 0.05), forearm length (p. 0.05), upper leg length (p. 0.05), elbow diameter (p. 0.05), shoulder diameter (p. 0.05), hip diameter (p. 0.05), knee diameter (p. 0.05), calf circumference (p. 0.05), thigh circumference (p. 0.05), upper arm circumference (p. 0.05) and lower arm circumference (p. 0.05) respectively. While comparing the means, it revealed that inter-university level basketball players were taller and had more weight, longer leg length, longer lower leg length and also more chest circumference than their inter-college level counterparts.

5. DISCUSSION

In the present study anthropometric characteristics of inter-university and inter-college level basketball players have been evaluated and compared with each other. The study indicates the existence of differences between inter-university and inter-college level basketball players with regard to some anthropometric characteristics. The inter-university level basketball players were taller and had more weight, longer leg length, longer lower leg length and also more chest circumference as compared to inter-college level basketball players. The overall results show that inter-university basketball players were taller and heavier as compared to the inter-college basketball players. Body height, being the most characteristic trait of players is significantly conditioned genetically (Milicerowa, 1973). The mean height of the inter-university basketball players (182.17±5.58cm) in the present study is lesser than the basketball players of the Indian national team (185.6 ± 13.1 cm) studied by Sodhi, (1980), players of Greece (199.50 ± 6.2cm) studied by Apostolidis *et al*. (2004) and USA (192.40 ± 11.7 cm) reported by Narazaki *et al*. (2008). In basketball, height is considered to be the most important physical attribute, because players compete by

handling the ball above the head (Tsunawake *et al*., 2003; Carter *et al*., 2005). Lower height of Indian basketball players might be the one of the reason for their dismal performances at the international level. The inter-university basketball players had more chest, calf, thigh and upper arm circumference than the inter-college basketball players. These differences might be due to regular trainingprogram of inter-university basketball players. Considering that in some of the variables there were significant differences between inter-university andinter-college basketball players and the inter-university players showed better anthropometric measurements, it is concluded that anthropometric characteristics has clear impact on the performance of the basketball players.

6. CONCLUSION

It is concluded from this study that the inter-university level basketball players were taller and had more weight, longer leg length, longer lower leg length and also more chest circumference as compared to inter-college level basketball players.

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Assessment of Muscular Strength and Cardio Respiratory Endurance between Sportsmen and Non-sportsmen

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Abstract:

The aim of present study was to asses the Muscular Strength and Cardio Respiratory Endurance between Sportsmen and Non- Sportsmen. The thirty (30) volunteer subjects were selected for the present study. They were 19–23 years old they were divided into two groups as Sportsmen (n=15) and Non- Sportsmen (n=15) groups. Subjects of the Sportsmen group participated continuously in ten sessions of sporting activity per week from LNIPE, Guwahati, while subjects of Non- Sportsmen group had no sporting exercises from Guwahati. The Muscular Strength and Cardio Respiratory Endurance selected as variable from the present study and were measured. Muscular Strength was measured by 1RM test Bench Press (in Kg) and Cardio Respiratory Endurance was measured by Cooper VO_2 max test (nearest 25 meters).

To asses Muscular Strength and Cardio Respiratory Endurance between Sportsmen and Non- Sportsmen level between Sportsmen and Non- Sportsmen t-test was used. The Level of Significance was set at .05 level.

The results of the present study showed significant differences in Cardio Respiratory Endurance between Sportsmen and Non- Sportsmen where Sportsmen were found better than Non- Sportsmen. The result of Muscular strength component of Sportsmen and Non- Sportsmen was insignificant.

Keyword:

Muscular Strength, Cardio Respiratory Endurance

1. INTRODUCTION

The state of being fit or "in condition" is of primary concern to any nation or people. The vigour of the individual depends upon his fitness for the task at hand and basic to any task is fitness for living itself. To the athlete the concept of training and fitness is a familiar one. Any athlete knows that in order to be good at his sport, he must undertaken training in skills, attitudes and physical well- being. For those who have few athletic aspirations, fitness is just essential although the ways it is acquired are not clearly marked out the physical fitness programme (Nyak, K.A.). Many people are currently involved in cardiorespiratory fitness and resistance training programs and efforts to promote participation in all forms of physical activity are being developed and implemented (Pollock, L., Michael., *et al*.).

Skeletal muscle strength has been defined as "the maximal force a muscle or muscle group can generate at a specified velocity" (Knuttgen and Kraemer, 1987).

Health is a condition with physical, social and psychological dimensions. Health related fitness can therefore be seen as a set of capabilities conductive to good health in its broadest sense (Oja, P. & Tuxworth, B).

Aerobic Fitness is a key component of Health related Fitness. Maximum oxygen uptake (VO_2 max) is the objective to measure the aerobic chain consisting of respiratory, cardiovascular and metabolic functions. It reflects training

status and the level of habitual physical activity of an individual within genetically determined limits. Aerobic fitness is the single most important dimension of overall functional fitness needed for everyday physical demands (Oja P. & Tuxworth, B).

2. PURPOSE OF THE STUDY

The aim of the present study was to asses the Muscular Strength and Cardio Respiratory Endurance between Sportsmen and Non- Sportsmen to find out which of these two categories is fit in response to tests administered so as one can improve the standard and level of physical fitness in Sportsmen and Non- Sportsmen.

3. MATERIALS AND METHODS

The thirty (30) volunteer subjects were selected for the present study. They were 19–23 years old they were divided into two groups as Sportsmen (n=15) and Non- Sportsmen (n=15) groups. Subjects of the Sportsmen group participated continuously in ten sessions of sporting activity per week from LNIPE, Guwahati, while subjects of Non- Sportsmen group had no sporting exercises from Guwahati. After selection, purpose and methodology as well as the research applications were explained to the subjects.

4. SELECTION OF VARIABLE AND THEIR CRITERION MEASURES

The Muscular Strength and Cardio Respiratory Endurance selected as variable from the present study and were measured. Muscular Strength was measured by 1RM test Bench Press (in Kg) and Cardio Respiratory Endurance was measured by Cooper VO_2 max test (nearest 25 meters).

5. STATISTICAL ANALYSIS

To Compare Muscular Strength and Cardio Respiratory Endurance between Sportsmen and Non- Sportsmen level between Sportsmen and Non- Sportsmen t-test was used. The Level of Significance was set at .05 level.

6. FINDINGS AND CONCLUSIONS

The Assessment of Muscular Strength and Cardio Respiratory Endurance between Sportsmen and Non- Sportsmen were computed by t- test and its results have been showed in Table 1 and Table 2.

Table 1: Assessment of Muscular Strength of Sportsmen and Non- Sportsmen

	Sportsmen	Non- Sportsmen
Mean	46.33333333	43.66666667
Variance	40.95238095	30.23809524
Observations	15	15
Pooled Variance	35.5952381	
Hypothesized Mean Difference	0	
Df	28	
t Stat	1.224061992	
P(T<=t) one-tail	0.115564568	
t Critical one-tail	1.701130908	
P(T<=t) two-tail	0.231129136	
t Critical two-tail	2.048407115	

Table 1 showed that insignificant difference was found between the means of Sportsmen and Non- Sportsmen in Muscular Strength, Since the calculated value of t (= 1.2240) is less than tabulated t .05 (1.701), it may be concluded that the mean of Muscular Strength of Sportsmen was significantly lower than of the Non- Sportsmen at the significance level 0.05. Sportsmen and Non- Sportsmen performed equal in One Repetition method Bench Press.

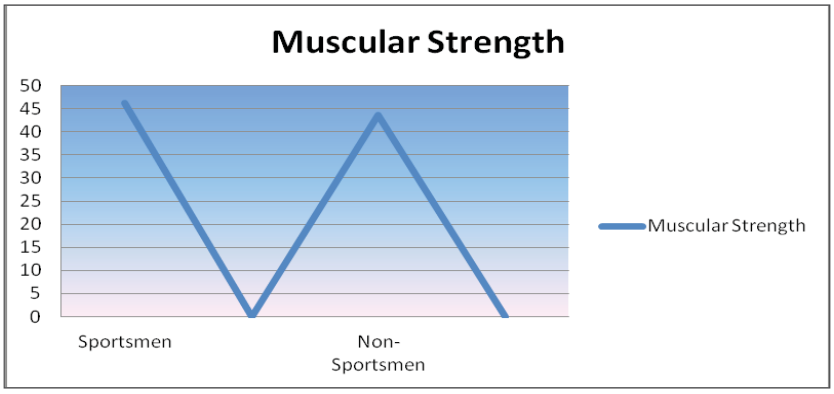

Figure 1: Raphical Demonstration of Muscular Strength of Sportsmen and Non- sportsmen

Table 2: Assessment of Cardio Respiratory Endurance of Sportsmen and Non- sportsmen

	Sportsmen	Non- Sportsmen
Mean	1913.333333	1326.666667
Variance	41238.09524	49238.09524
Observations	15	15
Pooled Variance	45238.09524	
Hypothesized Mean Difference	0	
Df	28	
t Stat	7.553876662	
P(T<=t) one-tail	1.575E-08	
t Critical one-tail	1.701130908	
P(T<=t) two-tail	3.14999E-08	
t Critical two-tail	2.048407115	

Table 2 showed that significant difference was found between the means of Sportsmen and Non- Sportsmen in Cardio Respiratory Endurance, Since the calculated value of t (=7.5538) which was higher than tabulated t .05 (1.701), it may be concluded that the mean of Cardio Respiratory Endurance of Sportsmen was significantly higher than the Non- Sportsmen at the significance level 0.05.

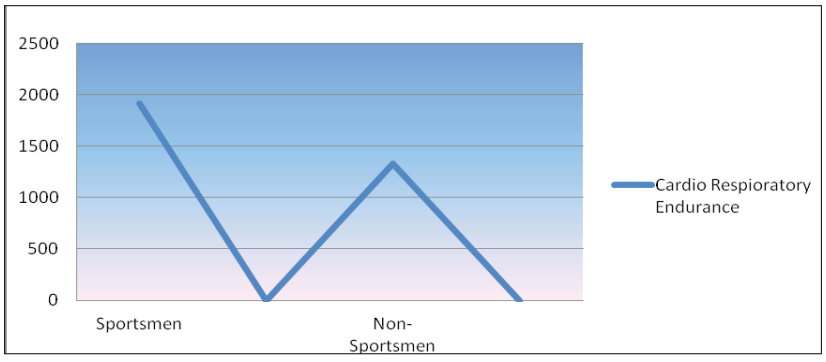

Figure 2: Graphical Demonstration of Cardio Respiratory Endurance of Sportsmen and Non- sportsmen

7. DISCUSSION

The results of the present study showed significant differences in Cardio Respiratory Endurance between Sportsmen and Non- Sportsmen where Sportsmen were found better than Non- Sportsmen. This might be due to the reason that Sportsmen group perform more sporting activities related to endurance. Difference of Cardio Respiratory Endurance might be due to over all fitness and regular sports activities. The study is also supported by study conducted by Shin K, *et al*. in 1997 where the result was found that the resting HR in athletes was significantly lower than that in nonathletes.

With reference to Muscular strength component of Sportsmen and Non- Sportsmen performed almost equal. This might be due to the reason that in both the selected groups, perform the similar type of activities related to shoulder.

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Comparative Study of Blood Pressure and Pulse Rate Between High Achieving and Low Achieving National Level Footballers

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Abstract:
The purpose of the study was "comparative study of blood pressure and pulse rate between high achieving and low achieving national level footballers". The subjects for this study were male national football players. One hundred forty four subjects were selected for the study. Seventy two were those high achieving national level footballers and seventy two were those low achieving national level footballers. The age group of footballers was ranged between 19 to 28 years. To determine the comparative differentials of blood pressure and pulse rate between high achieving and low achieving national level footballers, the test of significance ('t'-ratio) was employed. Further, the level of significance was set at 0.05 level of confidence. The findings of the study reveal that there was significant difference was found in case of systolic blood pressure and pulse rate between high achieving national level footballers exhibited better systolic blood pressure and pulse rate in comparison with the low achieving national level footballers. the study also shows that there was no significant difference in diastolic blood pressure between high achieving and low achieving national level footballers may be due to the reason that the players were almost of the same standard with a similar kind of experience which must have been a probable cause.

Keyword:
Blood Pressure and Pulse Rate

1. INTRODUCTION

From its very simple form, sports has emerged into highly organized activity of human society. Sports is highly organized form of play and play is a general innate tendency. Play is very important for preservation, growth and development of organism. Sports is as old as the human society and it holds a prominent place in the modern life. Millions of people participate in sports activities, watch and read about them and spend billions of dollars annually on sports activities and equipment. It now enjoys a popularity which outstrips any other form of social activity. It has become an integral part of the educational process as physical education and sports have been included in the regular curriculum. The students are taught various games and sports in a systematic manner. Besides teaching, the students are evaluated in their performance. Many people participate in games and sports for deriving physical, mental, social and emotional benefits. Competitive element is inherent in sports, as now sportsmen participate to win and achieve laurels for them as well as for their country contrary to earlier philosophy of participation in sports competition for sake of participation, In other words, competitive sports has come to be valued in society. Towards the attainment of top performance, the physical educationists and coaches are trying to bring the new innovations as they are deeply involved in the preparation of sportsmen for present and future. The modern trend

in preparation of sportsmen is to proceed in a scientific manner and take its help of allied sciences to achieve a top level performance.

2. OBJECTIVES

1. To compare the blood pressure of High Achieving and Low Achieving National Level Footballers.
2. To compare the pulse rate of High Achieving and Low Achieving National Level Footballers.

Hypothesis It was also hypothesized that there may be significant difference in Blood Pressure and Pulse Rate between High Achieving and Low Achieving National Level Footballers.

Methodology The study was confined to One hundred forty four Senior Level Footballers .Seventy two High Achieving and Seventy two Low Achieving National Level Footballers were selected (age group of 19 to 28 years). The data was collected in the 68th Shantosh Trophy National Football Tournament held Kanchanjangha Stadium Siliguri from 24th February to 9th March 2014. One hundred forty four subjects by administering the tests for the selected test items on the different National level football players.

Sampling The subjects for this study were male National Football players, One hundred forty four subjects were selected for the study. Seventy two were those High Achieving National Level Footballers and Seventy two were those Low Achieving National Level Footballers. The age group of footballers was ranged between 19 to 28 years.

3. PROCEDURES

Blood pressure was measured by Sphygmomanometer and stethoscopes. Pulse Rate was measured by stopwatch.

4. STATISTICAL PROCEDURE

To determine the comparative differentials of Blood pressure and pulse rate between High Achieving and Low Achieving National Level Footballers, the test of significance ('t'-Ratio) was employed. Further, the level of significance was set at 0.05 level of confidence.

5. RESULTS

Table 1: Significance of Difference Between High Achieving and Low Achieving National Level Footballers on Pulse Rate in Numbers of Beats

Variables	M-1	M-2	MD	SE	`t' Ratio	Required `t' Ratio
Pulse Rate	67.53	69.40	01.87	00.53	03.53*	01.98

* Significant at 0.05 level of Confidence

M_1 = Mean of High Achieving National Level Footballers

M_2 = Mean of Low Achieving National Level Footballers

From the above Table 1, it is revealed that there was significant difference in case of Pulse Rate Test as calculated 't' value (03.53) was more than tabulated 't' value (1.98) at 0.05 level of significance with 142 degree of freedom. Thus, it may be concluded that there was significant difference between High Achieving and Low Achieving National Level Footballers related to Pulse Rate Test, in which mean Pulse Rate Test is significantly lower for High Achieving National Level Footballers than Low Achieving National Level Footballers at 0.05 level of significance. The findings of the Table 1 are presented in Fig. 1.

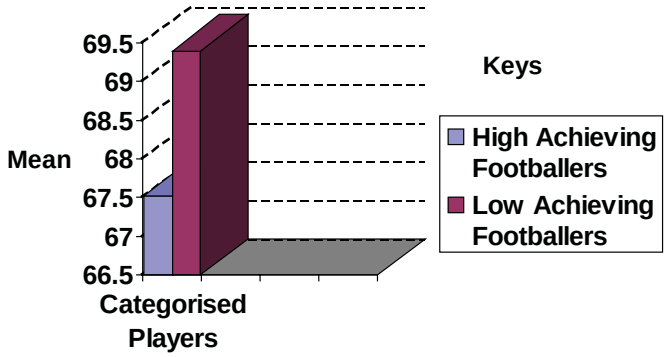

Figure 1: Graphical Depiction of Mean values of Pulse Rate Test between High Achieving and Low Achieving National Level Footballers

Table 2: Significance of Difference Between High Achieving and Low Achieving National Level Footballers on Systolic Blood Pressure in Numbers of Beats

Variables	M-1	M-2	MD	SE	`t' Ratio	Required `t' Ratio
Systolic Blood Pressure	124.62	140.24	15.62	3.97	3.93*	1.98

* Significant at 0.05 level of Confidence

M_1 = Mean of High Achieving National Level Footballers

M_2 = Mean of Low Achieving National Level Footballers

From the above Table 2, it is revealed that there was significant difference in case of Systolic Blood Pressure Test as calculated 't' value (03.93) was more than tabulated 't' value (1.98) at 0.05 level of significance with 142 degree of freedom. Thus, it may be concluded that there was significant difference between High Achieving and Low Achieving National Level Footballers related to Systolic Blood Pressure Test, in which mean Systolic Blood Pressure Test is significantly lower for High Achieving National Level Footballers than Low Achieving National Level Footballers at 0.05 level of significance. The findings of the Table 2 are presented in Fig. 2.

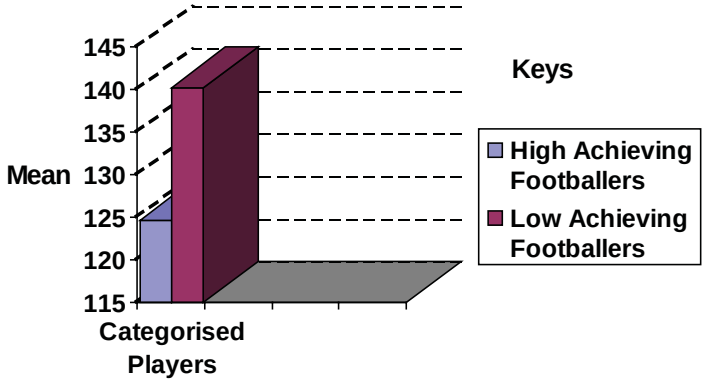

Figure 2 : Graphical Depiction of Mean values of Systolic Blood Pressure Test between High Achieving and Low Achieving National Level Footballers

Table 3: Significance of Difference Between High Achieving and Low Achieving National Level Footballers on Diastolic Blood Pressure in MM. GH.

Variables	M-1	M-2	MD	SE	`t' Ratio	Required `t' Ratio
Diastolic Blood Pressure	81.67	82.14	00.47	01.12	00.42	01.98

* Significant at 0.05 level of Confidence

M_1 = Mean of High Achieving National Level Footballers

M_2 = Mean of Low Achieving National Level Footballers

From the above Table 3, it is revealed that there was insignificant difference in case of Diastolic Blood Pressure Test as calculated 't' value (00.42) was less than tabulated 't' value (1.98) at 0.05 level of significance with 142 degree of freedom. Thus, it may be concluded that there was insignificant difference between High Achieving and Low Achieving National Level Footballers related to Diastolic Blood Pressure Test, in which mean Diastolic Blood Pressure Test is insignificantly lower for High Achieving National Level Footballers than Low Achieving National Level Footballers at 0.05 level of significance. The findings of the Table 3 are presented in Fig. 3.

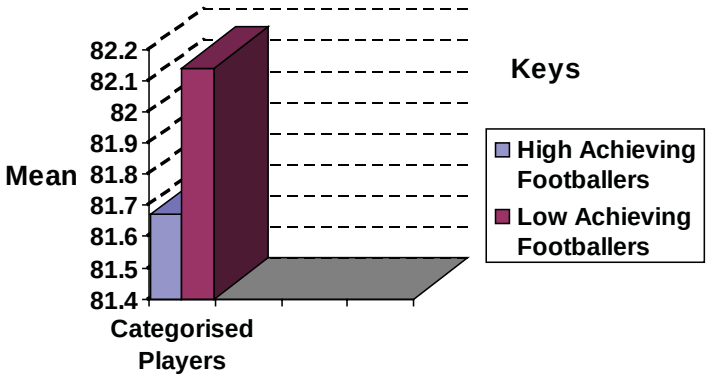

Figure 3: Graphical Depiction of Mean Values of Diastolic Blood Pressure Test between High Achieving and Low Achieving National Level Footballers

6. DISCUSSION

The findings of the study reveal that there was a significant difference in Pulse Rate between High Achieving and Low Achieving National Level Footballers. It may be due to the reason that in Pulse Rate where the subjects who were in the High Achieving National Level Footballers had pulmonary circulation blood leaves the right ventricle via pulmonary artery. The pulmonary artery is divided into two branches for left and right lungs. Within the lungs arteries are divided from arterioles to which further divide into capillaries. As the subjects had undergone systematic training programme the ability of the wall of capillaries might have increased the oxygen absorption ability during inhalation. As the capillaries the unite to form venues and veins where by the blood leaves the lungs via pulmonary veins emptying the left atrium of the heart. This would have influenced the heart to function even after circulating required amount of blood to the working muscles and as the subjects were hyper tensed due to the effect of pollution the systematic pranayama practices might have improved the working condition of heart reducing the pulse rate.

The findings of the study reveal that there was a significant difference in Systolic Blood Pressure between High Achieving and Low Achieving National Level Footballers. It may be due to the fact that in systolic blood pressure where the subjects who were in the High Achieving National Level Footballers had undergone practices of different training have improved and influenced higher function of central nervous system thereby improving the working ability of sympathetic and parasympathetic nervous system. Another reason of decrease in systolic blood pressure may be due to the improvement in the elasticity of blood vessels which otherwise might have contracted.

The study also shows that there was no significant difference in Diastolic Blood Pressure between the study shows that there was no significant difference in Diastolic Blood Pressure between High Achieving and Low Achieving National Level Footballers. It may be due to the fact that two categories Footballers like High Achieving and Low

Achieving National Level Footballers were undergoing almost similar type of training programme. It may also be the reason that both groups were almost equal in experience and competition.

Further, it is also a known fact that motor skills and large muscle psychometric ability are far more specific. In addition, it is a known fact that it may be a matter of chance that an individual who is highly coordinated in one type of performance will be excellent or clumsy in co-ordination in other sports. Successful patterns of specific traits are generally not the same for all sportsmen. Usually the sportsmen have some common characteristics and the pattern of these characteristics varies from sportsman to sportsman and a successful sportsman may be low on a particular trait but may compensate for strength in another. It has been observed that there are few extraordinary individuals in the field of physical education whose ability to acquire skills in different games and sports is comparatively faster than others and hence they score better in practical than others. Probably, the reason behind their quick pick-up of skills may lie in the abundance of different variables and their combination of Physiological Abilities.

7. CONCLUSION

- There was significant difference was found in case of Pulse Rate where High Achieving National Level Footballers exhibited better Pulse Rate in comparison with the Low Achieving National Level Footballers.
- There was significant difference was found in case of Systolic Blood Pressure where High Achieving National Level Footballers exhibited better Systolic Blood Pressure in comparison with the Low Achieving National Level Footballers.
- There was insignificant difference was found in case of Diastolic Blood Pressure where High Achieving National Level Footballers exhibited better Systolic Blood Pressure in comparison with the Low Achieving National Level Footballers.

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Comparison of Emotional Stability and Academic Anxiety between Athletes and Non Athletes

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1. INTRODUCTION

Abstract:
The purpose of the study was to compare the emotional stability and academic anxiety between athlete and non athlete. The present study was conducted on the 25 athlete and 25 non athlete students of priyadarshini madhyamik vidya mandir high school, Pune. On the basis of evidence available in the literature and with personal experience as well as discussion with experts the following hypothesis was formulated what there will be no significance difference in emotional stability and academic anxiety of athlete and non athlete.The psychological questionnaire developed by emotional stability (A.K. singh & A. sen gupta) and academic anxiety (A.K. Singh & A. Sen Gupta) in National Psychological Corporation were selected for the collection of data. In order to determine the emotional stability and academic anxiety of athlete and non athlete students independent 't'- test was employed and the level of significance was set (0.05). the result of the study showed that there was no significant difference was found between athletes and non athletes in relation to academic anxiety and emotional stability.

A sport team is comprised of various individual athletes; each having different orientation and perceptions, and at times, these differences may interfere with performance of the team. Better performance will result if each member of them merges his personal feelings and abilities into a total team effort. Success of a team depends on adjustment within i.e. how closely the team seems to be working and feeling together. Psychological togetherness among the member of the team does reflect on the outcome of the performance. Group dynamics and performance are thus mutually influential, and are further influenced by the stability of the personnel concerned with the team. It has been found that better group cohesion; generally tend to produce better performance.

Emotional stability contributes to a sense of well-being. Without this, we may be prone to feelings of internal chaos, despair and isolation. Emotional stability also allows one to be in command of their thoughts so as not to react impulsively. It is therefore integral to anger control. In addition, emotional stability influences other aspect of health, including physical, mental and social health. Stress leads to the release of certain chemicals that prepare us for action. However, when this is not required these excessive chemical levels can cause damage to our body over time. Emotional issues may also manifest themselves as physical illness. Such psychosomatic symptoms may include headache, abdominal pain, and palpitation among others. Finally, emotional issues that are not dealt with properly can present as psychological problems and may affect how we interact with others. Emotional stability is an important and useful state of being. With emotions managed and under control, yet still having the ability to feel intense emotion and understand the reason for the emotions, a power in situations is gained. Poor emotional health can lead to damage to your physical health. Have you ever seen a person and thought to yourself, "She must be going through something!" This person can be well-dressed, smelling good and even seem to have everything, yet we can always tell if deep inside a person isn't truly happy. Our body carries energy that speaks louder than

designer brands and luxurious threads. A person carrying negative energy can be felt once they walk into the room! You don't want to be that person. If you can visually see and feel stress on another person, you must be able to identify it within yourself.

Emotions are important in human life. If an individual's emotions do not develop in a balance manner, the individual's entire personality becomes disorganized, and many distortions manifest themselves. Emotions arouse in a person both constructive and destructive feelings. Emotional stability helps an individual in social adjustment. Education aims at bringing emotional balance in every student. Anxiety describes the individual's level of emotionality. Anxiety is the vague from of fear which involves bodily responses or stress reactions

2. METHODOLOGY

For the purpose of the present study the investigator randomly selected a total no. of 50 male students (25 athletes and 25 non athletes) with age of 14–16 year from Priyadarshini Madhyamik Vidya Mandir, High School Pune.

On the basis of literature pertaining psychological dimensions of athletes and non athletes the following variables were selected for the present study:

- Emotional stability
- Academic anxiety

In the study the tools used were standard questionnaire. Those were considered accurate enough for the purpose of this study.

Emotional stability test for children and Academic anxiety scale for children used to measure the emotional stability level and academic anxiety level of athlete and non athletes.

3. RESEARCH DESIGN

The present study is a comparative study under the descriptive research. In this research, the researcher made comparison of emotional stability & academic anxiety between athletes and non athletes of Priyadarshini Madhyamik Vidya Mandir, in Pune city by questioners. The researcher selected the subjects randomly purposive random sampling technique was used for the collection of data

To achieve the purpose of the present study the researcher randomly selected a total no. of 50 male students (25 athletes and 25 non athletes) with age of 14–16 year from Priyadarshini Madhyamik Vidya Mandir, High School Pune. Standard questionnaire were administered to collect the data in relation to emotional stability and academic anxiety.

4. ANALYSIS

The data of selected variables that is analysis of emotional stability and academic anxiety of athletes and non athletes was subjected to independent 't' test.

To compare the selected variables under present study the independent t–ratio was applied and the level of significance was set at 0.05 levels. The statistical analysis is being presented through following tables.

Table 1: Comparison of Academic Anxiety between of Athletes and Non Athletes

Group	Mean	Md	df	Cal. t
Athlete	8.24	0.44	48	0.8
Non athlete	7.8			

*Level of significance 0.05, df (48), 3.19

Table 1 reveals that the calculated t–ratio 0.8 is lesser than the Table t–ratio 3.19. Hence, there is no significant difference was found between athletes and non athletes in relation to academic anxiety.

Table 2: Comparison of Emotional Stability between of Athletes and Non Athletes

Group	Mean	Md	df	Cal. t
Athlete Non athlete	7.84 7.36	0.48	48	1.06

*Level of significance 0.05, df (48), 3.19

Table 2 reveals that the calculated t–ratio 1.06 is lesser than the Table t–ratio 3.19. Hence, there is no significant difference was found between athletes and non athletes in relation to emotional stability.

The analysis of data reveals that there is no significant difference in emotional stability as well as academic anxiety between athlete and non athlete. It may be due to the similar nature of school, training, diet, environment, climatic, conditions and sports field and also they reside at the same place. This may be due to the similar nature of the schedule followed by them or the similarity in the coaching styles of the coaches.

One of the reasons for this might be that the performance level of the subjects taken for the study is same, ie, schools level. Another reason for the same might be that factors of emotional stability and academic anxiety are overlapping. Literature suggests that the person having the high/ low level of emotional stability would also have high/ low level of academic anxiety and vice-versa.

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Comparison of Self Concept and Social Adjustment between Physical Education and Non Physical Education Students

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Abstract:
The purpose of the present study was to compare the Self Concept and social adjustment between physical education and non physical education students. For the purpose of the study fifty subjects were selected from A.K. College, Shikohabad. Twenty five subjects from physical education (B.P.Ed) and twenty five from education (B.Ed) faculty. The age level of the subjects ranged from 21–28 years. Keeping the feasibility criterion in mind, Self Concept and Social Adjustment variables were selected for the present study. The self-concept scores of the subject were obtained by using Self-Concept Questionnaire (SCQ) developed by Dr. Raj Kumar Saraswat and the social adjustment scores of the subjects were obtained by using the social adjustment questionnaire (SAI-D) developed by Dr. R.C. Deva. To compare the Self-Concept and social adjustment among Physical education and non physical students, Descriptive statistics and independent t-test was applied. The level of significance was set at 0.05 level. The findings of the study showed no significant difference between the Social Adjustment and Self Concept between both the groups.

Keywords: Social Adjustment, Self Concept

1. INTRODUCTION

Sports psychology, today, is an emerging discipline like industrial psychology, medical psychology, the child psychology, the educational psychology etc. Physical education and sports is incomplete without mental training of athletes who have to cope with extremely stressful situations on and off the play field. So long as the aim of physical education continues to be the "well-being" of the' individual, psychology will help the physical education teachers to devise ways and means to plan curriculum accordingly. Every child gets an opportunity to develop himself/ herself to the optimal level on the platform of physical. Psychological approach to athletic training plays an important part today[1].

Self Concept is learned by an individual inference from his unique experiences. The individual perceptions of feeling of others towards him strongly influence his self image. In turn, self concept may prove the most powerful motivation for specific behaviour. The self concept is a highly complex component of behaviour, composed of both cognitive and effective dimension and has at least four orientations: The real self, the perceived self, and the ideas self and the self as perceived by others.

Same way adjustment is a popular expression used by people in day to day life. It is important to maintain personal

[1]S.R. Gangopadhyay, Sports Psychology, (published by S.R. Gangopadhyay, 2002), p. 3.

as well as social peace and harmony. Social adjustment is, getting along with the members of the society as best as one can. In other words we can say that social adjustment is the direction we, the teachers, try to instil adjustment skill in our students. Being a physical education teacher we should emphasise on the adjustment of the student in the society. Thus we see that adjustment means reaction to the demands and pressures the social environment imposed upon the individual. Perception is needed for social adjustment. The way we interact with people depends to a great extent upon how we perceive them and how we interpret their behavior. The perceptions about people what we think, what they are like-influence the way we respond to them. If you perceive that a student is hostile, you are unlikely to interact or adjust with him/ her. Your behavior in a group is certainly different from the behavior when in alone. Group affects an individual's behavior. The mere presence of others affects our performance. In the present circumstances, youth as well as children are facing difficulties in life. These difficulties are giving rise to many psychosomatic problems such as anxiety, tensions, frustrations and emotional upsets in day to day life. We, as a physical education teacher, are more concerned with the adjustment of students in school/ college because the primary purpose of education is to train students to be successful in their social life. They are trained to face social and economic problems. Teachers have important role in modifying and shaping the personality of students in accordance with natural objectives of life. The greatest contribution of teachers will be to channels the energy of students to reconstruction in their social life. We should emphasis on the harmonious development of students' personality so that they can contribute to the welfare of the country. We can facilitate their adjustment in their life and help them in maintaining their mental health because proper mental health leads to social adjustment.

Each of us has a unique system that determines and reflects own characteristics behaviour and thought. All the psychological variables differ from in individual to individual. In the present study the investigator made an effort to compare self concept and social adjustment among physical education and non physical education students.

2. OBJECTIVE

The objective of the study is to compare the Self Concept and social adjustment between physical education and non physical education students.

3. METHODOLOGY

Fifty subjects were selected from A.K. College, Shikohabad. Twenty five subjects from physical education (B.P.Ed) and twenty five from education (B.Ed) faculty. The age level of the subjects ranged from 21–28 years.

4. CRITERION MEASURES

The following criterion measures were chosen:

1. The self-concept scores of the subject were obtained by using Self-Concept Questionnaire (SCQ) by Dr. Raj Kumar Saraswat.
2. The social adjustment scores of the subjects were obtained by using the social adjustment questionnaire (SAI-D) by Dr. R.C. Deva.

3. STATISTICAL PROCEDURE

To compare the Self-Concept and social adjustment among Physical education and non physical students , Descriptive statistics and independent t-test was applied. The level of significance was set at 0.05 level.

4. RESULT

The statistical analysis of data collected on self concept and social adjustment is presented below:

Table 1: Comparison of Self Concept between the Physical Education and Non Physical Education Students

	Mean	S.D.	D.M.	σ DM	't' ratio
Physical Education	167.7	12.07	4.12	4.32	0.953
Non Physical Education	163.6	17.95			

* significant $\mathbf{t}_{0.05\,(48)} = 2.021$

Table 1 reveals that there is no significant difference between Physical Education and non Physical Education students on self Concept. Since the calculated t (0.953) is less than tabulated t (2.021) at 0.05 level of significance, thus it may be concluded that the self concept of both the groups are same.

Table 2: Comparison of Social Adjustment between the Physical Education and non Physical Education Students

	Mean	S.D.	D.M.	σ DM	't' ratio
Physical Education	44.54	26.5			
Non Physical Education	46.2	27.78	3.66	5.37	0.680

* significant $\mathbf{t}_{0.05\,(48)} = 2.021$

Table 2 reveals that there is no significant difference between Physical Education and non Physical Education students on Social Adjustment. Since the calculated t (0.680) is less than tabulated t (2.021) at 0.05 level of significance, thus it may be concluded that the Social Adjustment level of both the groups are same.

5. CONCLUSION

Within the limitation of the study the following conclusions may be drawn:

1. There is no significant difference between the Social Adjustment among both the group of students.
2. There is no significant difference between Self Concept among both the group of students.

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Flow State and Racquet Sports: A Comparative Study

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Abstract:
The purpose of the study was to compare, "Flow State and Performance among Selected Racquet Sports Players. For the purpose of the study a total of fifteen (N=15) Inter-university players who represented Lakshmibai National University of Physical Education, Gwalior, belonging to respective racquet sport Badminton (5), Tennis (5) and Table Tennis (5) with age ranging from 19–25 years of age. For the purpose of the study the researcher intense to compare the level of flow state and performance of player belonging to the racquet sports namely Badminton, Tennis and Table Tennis. The flow state scale (FSS; Jackson & Marsh, 1996) containing 9 items was chosen as criterion measure for assessing flow state of the players. The performances of the players were recorded by making competition on a league basis with respect of their racquet game. The flow state and optimal performance of different racquet sports players were computed through descriptive statistics. To find out the significance difference of flow state of performances of selected racquet sports players were made by applying ANOVA. The hypothesis was tested at 0.05 level of the significance.

Keywords:
Flow State, Racquet

1. INTRODUCTION

The flow state is the peak performance mental state-which produces super-human performances and winning streaks. It is a well-known term in many sports, and any athlete who is in this mental state is virtually unbeatable at their respective level of competition-and when at the elite level, you often witness world records which are well and truly smashed. An athlete who is 'in the zone' experiences an unusual feeling of effortless control and power, almost as if their body was programmed for the perfect performance, and moving with and automatic fluid movement. It can be almost a strange sensation PS the performance often does not feel as if it's being controlled by the actual In fact, they often feel as if they weren't responsible for the performance al- all - as if their body was being guided and directed by a more powerful force (Craig Townsend; 2000).

The concept of flow entails a state in which there is a perfect match between the perceived demands of an activity and the abilities of the performer. During flow, a performer loses self-consciousness and becomes completely immersed in the task at hand. This engenders a state in which performance is pleasurable and intrinsically gratifying (Costas Karageorghis; 1999).

2. MATERIAL AND METHODS

2.1. Selection of Subjects

The study was conducted on fifteen (N=15) Inter-university players who represented Lakshmibai National University of Physical Education, Gwalior, belonging to respective racquet sport Badminton (5), Tennis (5) and Table Tennis (5).

2.2. Selection of Variables

For the purpose of the study the research scholar intense to assess the flow state belonging to the racquet sports namely Badminton, Tennis and Table Tennis. The following variables were selected to assess the flow state namely Total flow (TF), Challenge-skill balance (CSB), Action-Awareness Merging (AAM), Clear Goal (CG), Unambiguous Feedback (UNMF), Concentration on Task at Hand(COTAH), Sense of Control(SEC), Loss of Self Consciousness (LOSC), Loss of Self Consciousness ((TT) and Autoletic Experience (ALE) respectively.

3.3. Criterion Measures

1. The flow state scale (FSS; Jackson & Marsh, 1996) was chosen as criterion measure for assessing flow state of the players.
2. The performances of the players were recorded by making competition on a league basis with respect of their racquet game.

3.4. Statistical Techniques

To compare the flow state among selected racquet sports player's descriptive statistics and to find out the significant difference of mean among selected racket sports ANOVA was employed. The hypothesis was tested at 0.05 level of the significance.

3. RESULTS

To compare the flow state among selected racquet sports players the data were presented here. The mean and standard deviation of Badminton, Table Tennis and Tennis have been presented in the Table 1.

Table 1: Statistical Descriptions of Flow State

	Group	N	Mean	Std. Deviation	Std. Error
	Badminton	05	3.23	0.38	
T F	Table-Tennis	05	3.72	0.34	
	Tennis	05	3.96	0.51	
	Badminton	05	2.6	0.52	
CSB	Table-Tennis	05	3.2	0.84	
	Tennis	05	3.85	0.58	
	Badminton	05	3.75	0.64	
AAM	Table-Tennis	05	4.1	0.58	
	Tennis	05	4.1	0.74	
	Badminton	05	3.55	0.37	
CG	Table-Tennis	05	3.7	0.33	
	Tennis	05	3.95	0.57	

	Badminton	05	3.3	0.48	
UNMF	Table-Tennis	05	4.25	0.35	
	Tennis	05	4.05	0.71	
	Badminton	05	2.95	1.09	
COTAH	Table-Tennis	05	3.45	0.65	
	Tennis	05	3.45	0.84	
	Badminton	05	3.35	0.45	
SEC	Table-Tennis	05	3.75	0.68	
	Tennis	05	3.95	0.82	
	Badminton	05	2.5	0.35	
LOSC	Table-Tennis	05	3	0.64	
	Tennis	05	3.25	0.61	
	Badminton	05	3.85	0.57	
TTB	Table-Tennis	05	4.1	0.22	
	Tennis	05	4.6	0.41	
	Badminton	05	3.25	0.47	
ALE	Table-Tennis	05	3.95	0.41	
	Tennis	05	3.8	0.78	

Table 1 reveals that mean and standard deviation of the total flow for rackets game is (3.23, 3.72 and 3.96) challenge-skill balance (CSB) is (2.6, 3.2 and 3.85), Action-Awareness Merging (AAM) is (3.75, 4.1 and 4.1), Clear Goal (CG) is (3.55, 3.7 and 3.95), Unambiguous Feedback (UNMF) is (3.3, 4.25 and 4.05), Concentration on Task at Hand(COTAH) is (2.95, 3.45 and 3.45), Sense of Control(SEC) is (3.35, 3.75 and 3.95), Loss of Self Consciousness(LOSC) is (2.5, 3 and 3.25), Loss of Self Consciousness((TT) is (3.85, 4.1 and 4.6), Autoletic Experience(ALE) is (3.25, 3.95 and 3.8) respectively.

Figure Mean Graph of Flow State of Table 1 among Badminton, Table Tennis and Tennis.

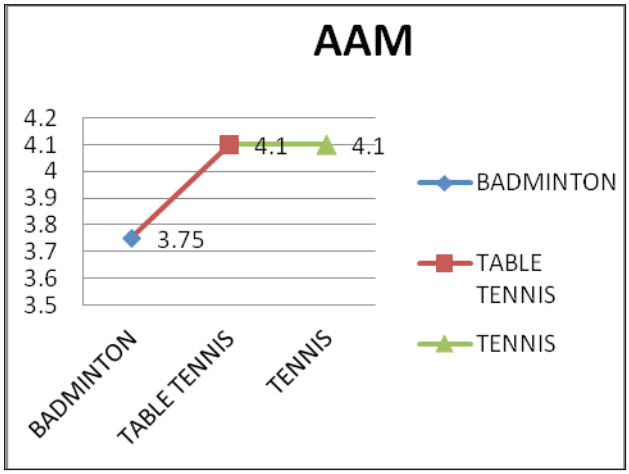

Figure 1: Mean Graph of CSB

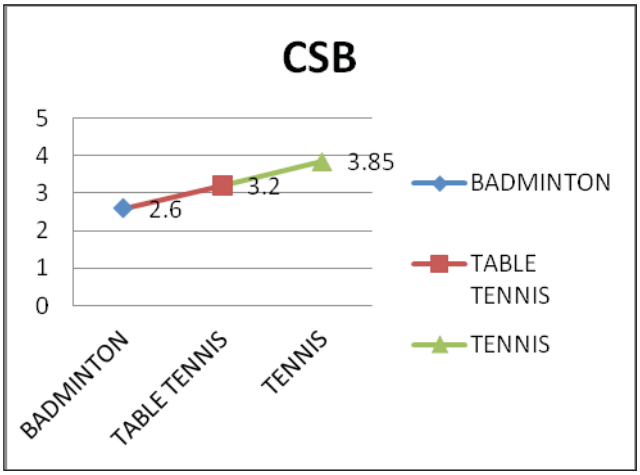

Figure 2: Mean Graph of AAM

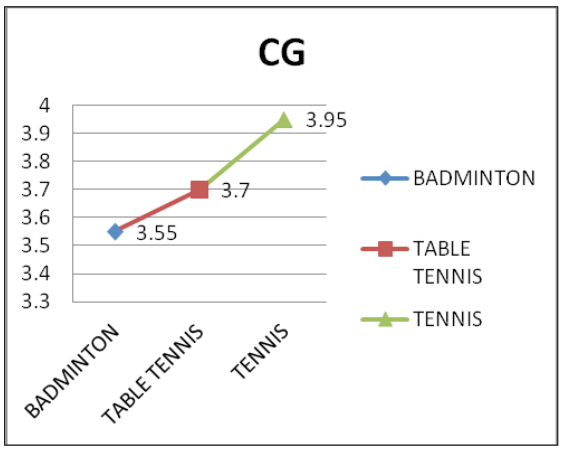

Figure 3: Mean Graph of CG

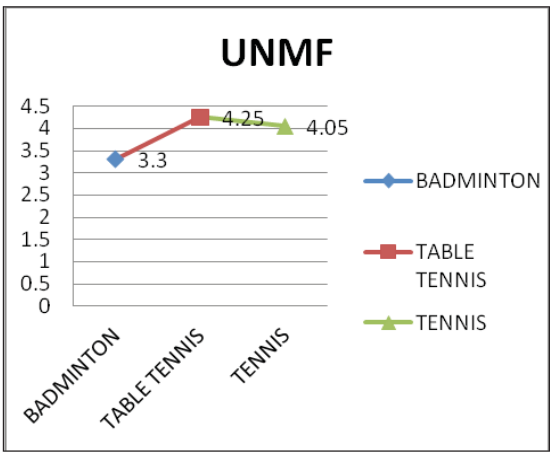

Figure 4: Mean Graph of UNMF

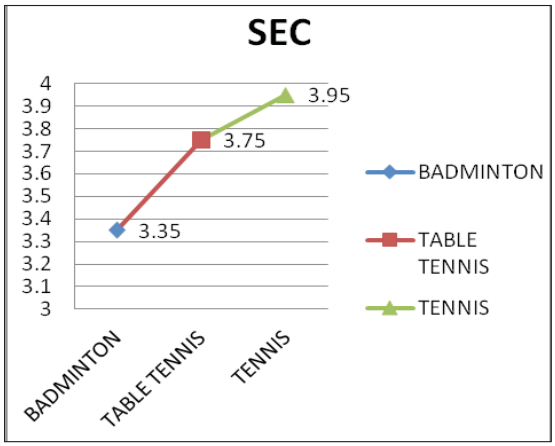

Figure 5: Mean Graph of COTAH

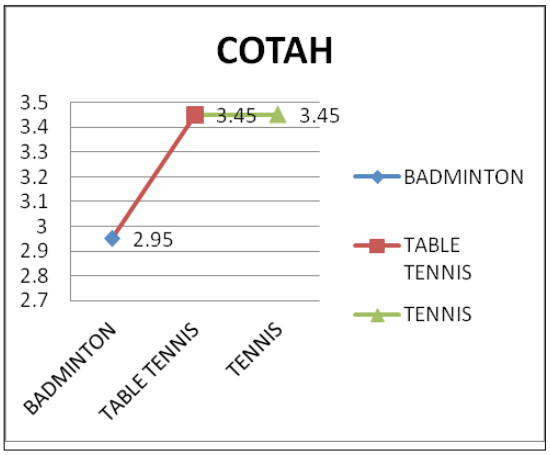

Figure 6: Mean Graph of SEC

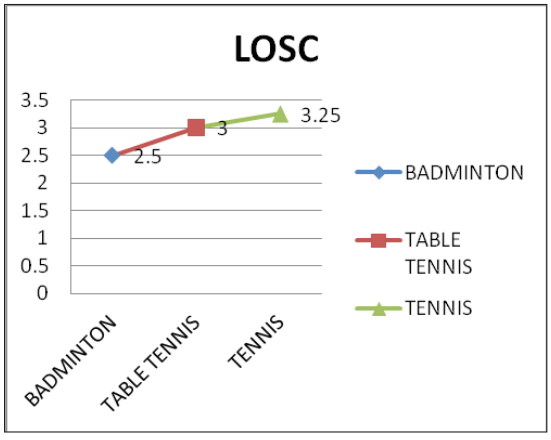

Figure 7: Mean Graph of LOSC

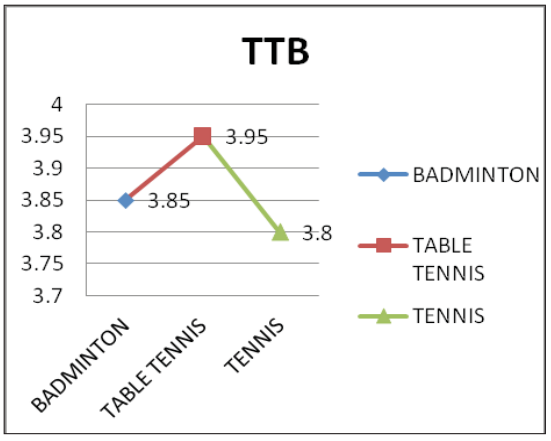

Figure 8: Mean Graph of TTB

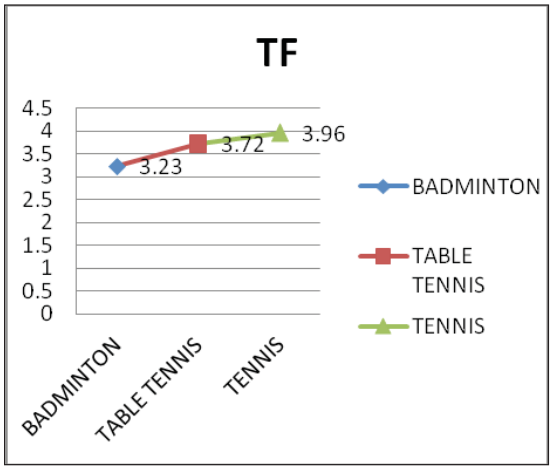

Figure 9: Mean Graph of ALE

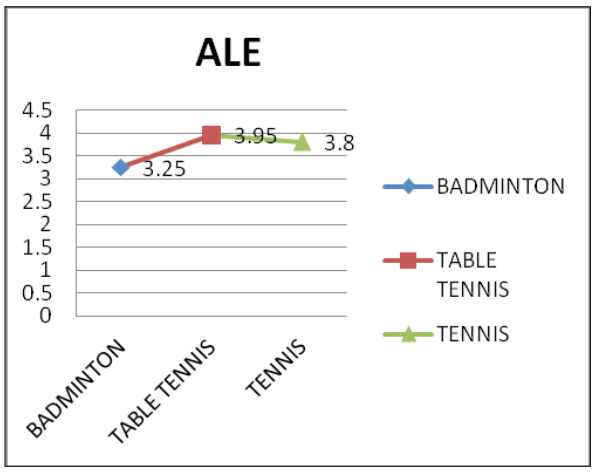

Figure 10: Mean Graph of Total Flow

Table 2: ANNOVA of Flow State and Optimal Performances of Racquet Sports Players

Psychological Skill		Sum of Square	df	Mean Square	F	p-value
Total Flow	Between Groups	1.458	2	0.729	3.93*	0.04
	Within Groups	2.225	12	0.185		
CSB	Between Groups	3.908	2	1.954	4.510*	0.03
	Within Groups	5.2	12	0.433		
AAM	Between Groups	0.408	2	0.204	0.476	0.63
	Within Groups	5.15	12	0.429		
CG	Between Groups	0.408	2	0.204	1.077	0.37
	Within Groups	2.275	12	0.189		
UNMF	Between Groups	2.508	2	1.254	4.331*	0.038
	Within Groups	3.475	12	0.290		
COTAH	Between Groups	0.833	2	0.416	0.54	0.60
	Within Groups	9.275	12	0.772		
SEC	Between Groups	0.933	2	0.466	1.041	0.38
	Within Groups	5.375	12	0.448		
LOSC	Between Groups	1.458	2	0.729	2.413	0.13
	Within Groups	3.625	12	0.302		
TTB	Between Groups	1.458	2	0.73	3.932*	0.049
	Within Groups	2.225	12	0.19		
ALE	Between Groups	1.358	2	0.68	2.05	0.171
	Within Groups	3.975	12	0.33		

*Significant at 0.05 level, [F value (1, 12) = 3.89].

Table 2. Reveals that there were significant difference was found in some of the parameters namely Total Flow, challenge-skill balance (CSB), Unambiguous Feedback (UNMF) and Loss of Self Consciousness ((TT) in performance of the racquet sports players where calculated value was greater than the tabulated value at .05 level of significance with 1, 12 degree of freedom, with a F value 3.89, while insignificant difference was found in rest of the variables namely Action-Awareness Merging (AAM) , Clear Goal (CG), Concentration on Task at Hand(COTAH), Sense of Control(SEC), Loss of Self Consciousness(LOSC) and Autoletic Experience(ALE) as calculated value was lesser than the tabulated value at .05 level of significance with 1, 12 degree of freedom, with a F value 3.89 respectively.

4. DISCUSSION OF FINDING

The purpose of the study was to compare the flow state of performance among selected racquet sports players. It is well accepted facts that the performance of the player is much related with the level of his flow. So, it is evident according to the analysis that there is a significant difference in some of parameters in flow state between the performances of a player with flow they possess.

It is evident from the Table 2 that the performance of the racquet sports players was found to be significant with total flow and also with its factors namely challenge—were significant difference was found in some of the parameters namely Total Flow, challenge-skill balance (CSB), Unambiguous Feedback (UNMF) and Loss of Self Consciousness ((TT) in performance of the racquet sports players. This result may be due to the interest and motivation as well as curiosity to challenge with other members of the teams. It may also be due to the art of practice and implication of the training and similar specific goal oriented.

Insignificant difference was found in rest of the variables namely Action-Awareness Merging (AAM) , Clear Goal (CG), Concentration on Task at Hand(COTAH), Sense of Control(SEC), Loss of Self Consciousness(LOSC) and Autoletic Experience(ALE). The result may be attributed to the fact that the players were familiars to each other and committed for the fair play and integrity of the sports. It's may also be due to the flow and performance perceived is independent and it is differ from situation to situation, hence it can be inferred that there is no significant relationship amongst the performance and flow of the racquet sports players.

The reason for the insignificant relationship may also be due the fact that immaterial of their sports group all the player perceived its ethical behaviour to be within the expectation and presentation of races to more or less same level.(John M. Silva; 1984)

5. CONCLUSION

From the findings of the study the following conclusions may be drawn that the hypothesis stated earlier in the study was that significant difference was found in some of the parameters namely Total Flow, challenge-skill balance (CSB), Unambiguous Feedback (UNMF) and Loss of Self Consciousness ((TT) in performance of the racquet sports players were calculated value was greater than the tabulated value at .05 level of significance with 1, 12 degree of freedom, with a F value 3.89, while insignificant difference was found in rest of the variables namely Action-Awareness Merging (AAM) , Clear Goal (CG), Concentration on Task at Hand(COTAH), Sense of Control(SEC), Loss of Self Consciousness(LOSC) and Autoletic Experience(ALE) respectively.

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A Comparative Study of Explosive Leg Strength and Co-Ordination between Volleyball Spikier and High Jumper

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Abstract:
The present study was conducted to determine the difference of Explosive Leg Strength and Co-ordination between Volleyball Spikier and High Jumpers. The data pertaining to the present study were collected by using the Vertical Jump and Eye Leg Co-ordination test on 15 Inter District level Volleyball Spikier and 15 Inter District level High Jumper of Assam which age was ranging from 17 to 25 years. To analyze the collected data standardized t-test was employed and the hypothesis was observed at 0.05 level of confidence. The study was concluded that there is significant difference in Explosive Leg Strength and Co-ordination of Volleyball Spikier and High Jumper. It was also further concluded that the Volleyball spikier had significantly better Explosive Leg Strength and Co-ordination than the High Jumpers.

1. INTRODUCTION

Movement and physical activity are basic function for which the human organism created. Advances in modern technology to of physical activity are almost eliminated in every one's daily life. The available scientific show the physical inactivity and sedentary life have become a passive there of to our health and significantly increase the deterioration rate of the human body. With the non development of technology the nutrition stress and environment have changed significantly and effect negatively in the human health.

Volleyball is a team sport in which two teams of six players are separated by a net. A number of consistent techniques have evolved in volleyball including spiking and blocking (because these plays are made above the top of the net, the vertical jump is an athletic skill emphasized in the sport) as well as passing, setting, and specialized player positions and offensive and defensive structures. Volleyball spikier is the title given to the players who finishes the attack by hitting the ball across the net fast and hard. It is more useful attack in volleyball to getting point. The thrill of the sports lies in spike. In volleyball the golden movement when the spikier leaping up in the air, meets the set ball and smash's in to the opponent court.

Volleyball places a large number of demands on the technical and physical skills of a player. During the course of play, players are required to serve, pass, set, attack, block, and dig the ball. Volleyball players required flexibility, balance, upper and lower body strength and speed in order to play effectively.

The high jump is a track and field event in which competitors must jump over a horizontal bar placed at measured heights without the aid of certain devices. High jumper must leap over the bar without knocking the bar off of its support.

2. METHODOLGY

For the study 15 Volleyball Spikier and 15 High Jumpers of Assam which age was ranging from 17 to 25 years were selected as subject randomly. The data pertaining to this study was collected by conducting the Standing Vertical Jump and Eye Leg Co-ordination test and score were converted to t-scores. To analyze the data T- test statistical technique was employed and the level of significance was observed at 0.05 level of confidence.

3. RESULT AND DISCUSSION

Table 1: Comparison of Means of Eye-Foot Co-Ordination between Volleyball Spikier and High Jumper

Group	Mean	Standard Deviation	Mean Difference	Standard Error	t-ratio
Volleyball Spikier	55.86	4.44	12.10	2.79	4.43*
High Jumper	43.76	8.86			

* Significant at 0.05 level of Confidence Tabulated $t_{0.05\,(28)}$ = 2.048

Table 1. Reveals that t-value is 4.43 and critical value is 2.04. It shows that t-value (4.43) is more than table value (2.04), which is statistically significant at 0.05 levels. Hence from the above analysis it is known that there is significant difference on Eye-Foot Co-Ordination between Volleyball Spikier and High Jumper.

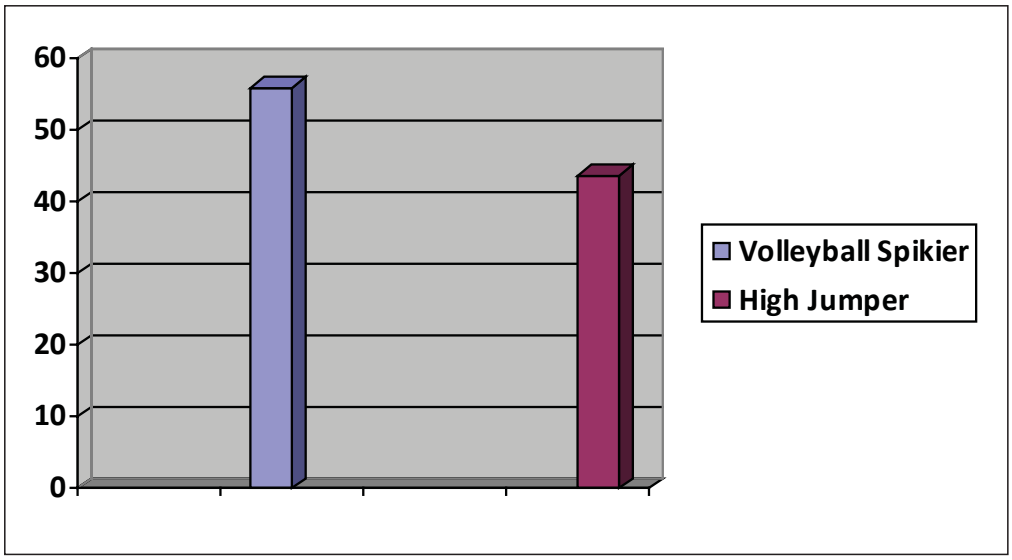

Figure I : Graphical Presentation of Mean Difference of Eye-Foot Coordination between Volleyball Spikier and High Jumper

Table 2: Comparison of Means of Explosive Leg Strength between Volleyball Spikier and High Jumper

Group	Mean	Standard Deviation	Mean Difference	Standard Error	t-ratio
Volleyball Spikier	51.79	7.40	3.59	3.53	1.02*
High Jumper	48.20	11.49			

* Insignificant at 0.05 level of Confidence Tabulated $t_{0.05\,(28)}$ = 2.048

Table 2. Reveals that t-value is 1.02 and critical value is 2.04. It shows that t-value (1.02) is less than table value (2.04), which is statistically insignificant at 0.05 levels. Hence from the above analysis it is known that there is insignificant difference on Explosive leg strength between Volleyball Spikier and High Jumper.

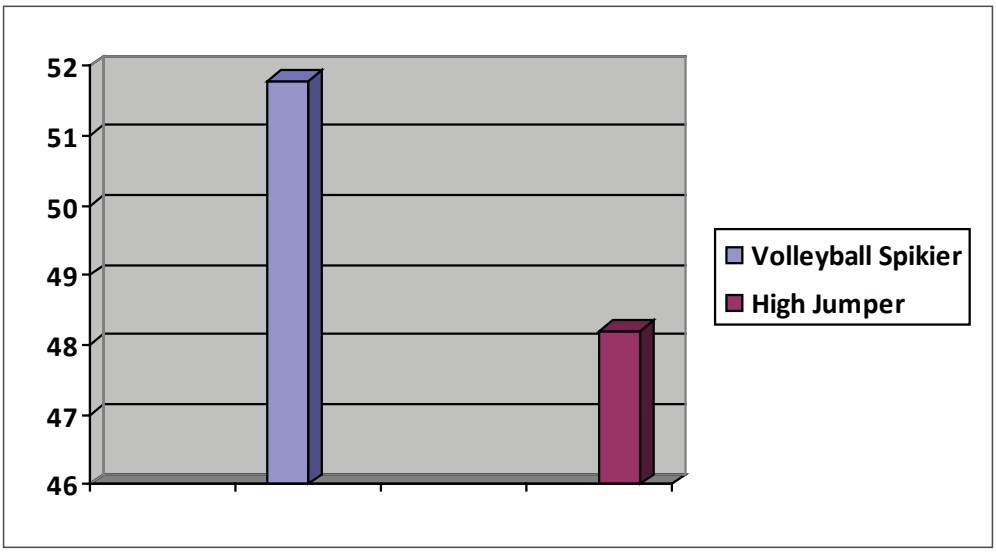

Figure II: Graphical Presentation of Means of Explosive Leg Strength between Volleyball Spikier and High Jumper

4. DISCUSSION OF FINDINGS

The findings of the Table 1 revealed that there was significant difference in Eye Foot Co-ordination between Volleyball Spikier and the High Jumper. As according to the movement structure of the Volleyball Spikier has to execute the performance with full co-ordination. During the co-ordination at the time of jumping and spiking the ball on the other hand high jumper at the time of take off. It frequently occurs at the time of practice as well as while participating in the competitions. While jumping for spiking the ball volleyball spikier has to adjust with the position of the ball which is always unpredictable. But in case of high jump the position of cross bar is remained unchanged and the frequency of stride and stride length remained fixed as the high jumper practiced. This may be the cause of significant difference between the two selected groups.

From Table 2 shows that no significant difference is observed in case of Explosive Leg Strength of both the selected group. It might because of nature of the activity of both the group. Most of the time Volleyball spikier, have to jump for spike the ball or block the attack of the opponent. High Jumpers also used to jump always to clear the cross bar where the effort of jump is always increased along with the jumping performance in a competition.

5. CONCLUSION

On the basis of findings it was conclude that there is significant difference in Eye-Leg Co-ordination of Volleyball Spikier and High Jumper and there was no significant difference in Explosive Leg Strength of both the groups. It was further concluded that the Volleyball Spikier are superior in both the variable than the High Jumper.

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Estimation of Raiders Performance in Kabaddi on the basis of Coordinative Abilities

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Abstract:
The objective of the study was to establish regression equation for predicting Dependent Variable (Raiders Performance in kabaddi) on the basis of Independent Variables (selected Coordinative Abilities). The subjects for this study were selected from Madhya Pradesh State. A total of 30 male Kabaddi players were selected who played as Raiders in Kabaddi. Age of the subjects was ranging from 17 to 26 years. Raiders Performance in Kabaddi was considered as dependent variable and Coordinative Abilities were selected as independent variables i.e. Orientation Ability, Differentiation Ability, Reaction Ability, Balance Ability and Rhythmic Ability. For predicting Dependent Variable (Raiders Performance in Kabaddi) on the basis of Independent Variables (Selected Coordinative Abilities), multiple regression analysis was used and three regression equations (models) were established. The established regression models are: (1) Raiders Performance = 27.93 -7.32 * Rhythmic Ability, (2) Raiders Performance = 37.21 -4.57*Rhythmic Ability-1.40*Balance Ability, (3) Raiders Performance = 31.31-4.08*Rhythmic Ability-1.10*Balance Ability+.22*Differentiation Ability.

Keywords:
Raiders, Coordinative Abilities

1. INTRODUCTION

In India many games are played. But only few games are of Indian origin. Kabaddi is one out of them. Now a days, this game has taken a scientific base. Various researches have been conducted time to time on this game. Various sports scientists and physical educators are associated with this game. As a result of that this game has achieved expected level. This game has seven playing team members and all players has a specific playing positions. So, there is a need to conduct research studies on a specific playing positions in Kabaddi.

2. OBJECTIVE OF THE STUDY

To establish regression equation for predicting Dependent Variable (Raiders Performance in kabaddi) on the basis of Independent Variables (selected Coordinative Abilities).

3. METHODOLOGY

3.1 Subjects

The subjects for this study were selected from Madhya Pradesh State. A total of 30 male Kabaddi Players were selected who played as Raiders in kabaddi. Age of the subjects was ranging from 17 to 26 years.

3.2 Variables

Raiders Performance in Kabaddi was considered as dependent variable and Coordinative Abilities were selected as independent variable i.e. Orientation Ability, Differentiation Ability, Reaction Ability, Balance Ability and Rhythmic Ability.

4. STATISTICAL TECHNIQUE USED

For predicting Dependent Variable (Raiders Performance in Kabaddi) on the basis of Independent Variables (Selected Coordinative Abilities), multiple regression analysis was used and three regression equations (models) were established.

5. FINDINGS AND CONCLUSION

Table 1: Descriptive Statistics of Raiders Performance and Coordinative Abilities

Measures	Mean		Standard Deviation	Skewness		Kurtosis	
	Statistic	Standard Error	Statistic	Statistic	Standard Error	Statistic	Standard Error
Raiders Performance	17.10	.29	1.60	.57	.42	-.29	.83
Reaction Ability	107.53	.93	5.13	-.22	.42	-.64	.83
Orientation Ability	8.92	.13	.73	-.87	.42	-.01	.83
Differentiation Ability	10.43	.20	1.10	.67	.42	-.44	.83
Balance Ability	9.51	.08	.45	-1.00	.42	.24	.83
Rhythmic Ability	1.47	.03	.21	-.09	.42	-.71	.83

Table 1 shows the descriptive statistics of Raiders Performance and coordinative abilities.

In Raiders Performance obtained mean, standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 17.10, .29, 1.60, .57, .42, -.29 and .83 respectively.

In Reaction Ability obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 107.53, .93, 5.13, -.22, .42, -.64 and .83 respectively.

In Orientation Ability obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 8.92, .13, .73, -.87, .42, -.01 and .83 respectively.

In Differentiation Ability obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 10.43, .20, 1.10, .67, .42, -.44 and .83 respectively.

In Balance Ability obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 9.51, .08, .45, -1.00, .42, .24 and .83 respectively.

In Rhythmic Ability obtained mean, Standard error of mean, standard deviation, skewness, standard error of skewness, kurtosis and standard error of kurtosis were 1.47, .03, .21, -.09, .42, -.71 and .83 respectively.

Table 2: Model Summary Related to Estimating Raiders Performance in Kabaddi on the basis of Coordinative Abilities

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate	Durbin-Watson
1	.98[a]	.97	.97	.27	2.42
2	.99[b]	.99	.99	.13	
3	.99[c]	.99	.99	.11	
a. Predictors: (Constant), Rhythmic Ability					
b. Predictors: (Constant), Rhythmic Ability, Balance Ability					
c. Predictors: (Constant), Rhythmic Ability, Balance Ability, Differentiation Ability					
d. Dependent Variable: Raiders Performance					

Table 2 shows the model summary for estimating Raiders Performance on the basis of Coordinative Abilities. Three models were established by multiple regression analysis.

In model one, R of .98 is the relationship between independent variables (Rhythmic Ability) and dependent variable (Raiders Performance). Adjusted R square of .97 justify that 97% of Raiders Performance in explained by Rhythmic Ability.

In model two, R of .99 is the relationship between independent variables (Rhythmic Ability and Balance Ability) and dependent variable (Raiders Performance). Adjusted R square of .99 justify that 99% of Raiders Performance in explained by Rhythmic Ability and Balance Ability.

In model three, R of .99 is the relationship between independent variables (Rhythmic Ability, Balance Ability and Differentiation Ability) and dependent variable (Raiders Performance). Adjusted R square of .99 justify that 99% of Raiders Performance in explained by Rhythmic Ability, Balance Ability and Differentiation Ability.

Table 3: ANOVA Table for Estimating Raiders Performance in Kabaddi on the basis of Coordinative Abilities

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	72.56	1	72.56	951.65	.00[a]
	Residual	2.13	28	.07		
	Total	74.70	29			
2	Regression	74.19	2	37.09	1989.09	.00[b]
	Residual	.50	27	.01		
	Total	74.70	29			
3	Regression	74.33	3	24.77	1766.50	.00[c]
	Residual	.36	26	.01		
	Total	74.70	29			
a. Predictors: (Constant), Rhythmic Ability						
b. Predictors: (Constant), Rhythmic Ability, Balance Ability						
c. Predictors: (Constant), Rhythmic Ability, Balance Ability, Differentiation Ability						
d. Dependent Variable: Raiders Performance						

Table 3 of ANOVA in related to the utility of three established models.

In model one, F. Value of 951.65 is significant at .05 level, this model is found effective is estimating Raiders Performance on the basis of Rhythmic Ability.

In model two, F. Value of 1989.09 is significant at .05 level, this model is also found effective is estimating Raiders Performance on the basis of Rhythmic Ability and Balance Ability.

In model three, F. Value of 1766.50 is significant at .05 level, this model is found effective is estimating Raiders Performance on the basis of Rhythmic Ability, Balance Ability and Differentiation Ability.

Table 4: Coefficients of Regression Model for Estimating Raiders Performance in Kabaddi on the basis of Coordinative Abilities

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Standard Error	Beta		
1	(Constant)	27.93	.35		78.74	.00
	Rhythmic Ability	-7.32	.23	-.98	-30.84	.00
2	(Constant)	37.21	1.00		36.92	.00
	Rhythmic Ability	-4.57	.31	-.61	-14.43	.00
	Balance Ability	-1.40	.15	-.39	-9.35	.00
3	(Constant)	31.31	2.06		15.13	.00
	Rhythmic Ability	-4.08	.31	-.54	-12.91	.00
	Balance Ability	-1.10	.16	-.31	-6.86	.00
	Differentiation Ability	.22	.07	.15	3.14	.00
a. Dependent Variable: Raiders Performance						

Table 4 shows the coefficients of regression model for estimating Raiders Performance on the basis of Coordinative Abilities. On The basis of Table 4 established models are:

Model I: Raiders Performance = 27.93 -7.32 * Rhythmic Ability

Model II: Raiders Performance = 37.21 -4.57*Rhythmic Ability-1.40*Balance Ability

Model III: Raiders Performance = 31.31-4.08*Rhythmic Ability-1.10*Balance Ability+.22*Differentiation Ability

Table 5: Details of Excluded Variables for Estimating Raiders Performance in Kabaddi on the basis of Coordinative Abilities

Model		Beta In	T	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Reaction Ability	-.32[a]	-1.73	.09	-.31	.02
	Orientation Ability	.00[a]	.02	.98	.00	.48
	Differentiation Ability	.35[a]	5.40	.00	.72	.12
	Balance Ability	-.39[a]	-9.35	.00	-.87	.13
2	Reaction Ability	-.13[b]	-1.41	.16	-.26	.02
	Orientation Ability	.00[b]	.35	.72	.07	.48
	Differentiation Ability	.15[b]	3.14	.00	.52	.07
3	Reaction Ability	-.08[c]	-1.00	.32	-.19	.02
	Orientation Ability	.01[c]	.57	.57	.11	.48
a. Predictors in the Model: (Constant), Rhythmic Ability						
b. Predictors in the Model: (Constant), Rhythmic Ability, Balance Ability						
c. Predictors in the Model: (Constant), Rhythmic Ability, Balance Ability, Differentiation Ability						
d. Dependent Variable: Raiders Performance						

Table 5 shows the details of excluded variables for estimating Raiders Performance on the basis of Coordinative Abilities.

In the model one, four Coordinative Abilities were excluded (Reaction Ability, Orientation Ability, Differentiation Ability & Balance Ability).

In the model two, three Coordinative Abilities were excluded (Reaction Ability, Orientation Ability & Differentiation Ability).

In the model three, two Coordinative Abilities were excluded (Reaction Ability & Orientation Ability).

Table 6: Residual Statistics for Raiders Performance in Kabaddi related to Coordinative Abilities

	Minimum	Maximum	Mean	Standard Deviation	N
Predicted Value	14.81	20.84	17.10	1.60	30
Residual	-.21	.20	.00	.11	30
Standardized Predicted Value	-1.42	2.34	.00	1.00	30
Standardized Residual	-1.78	1.76	.00	.94	30
a. Dependent Variable: Raiders Performance					

Table 6 shows the residual statistics for estimating Raiders Performance in kabaddi on the basis of Coordinative Abilities.

In this standardised residual ranges from -1.78 to 1.76. This fall in the expected range, so there is no outliers in this study. In Table 2, Durbin Watson value of 2.42 justify that there is independence in data point.

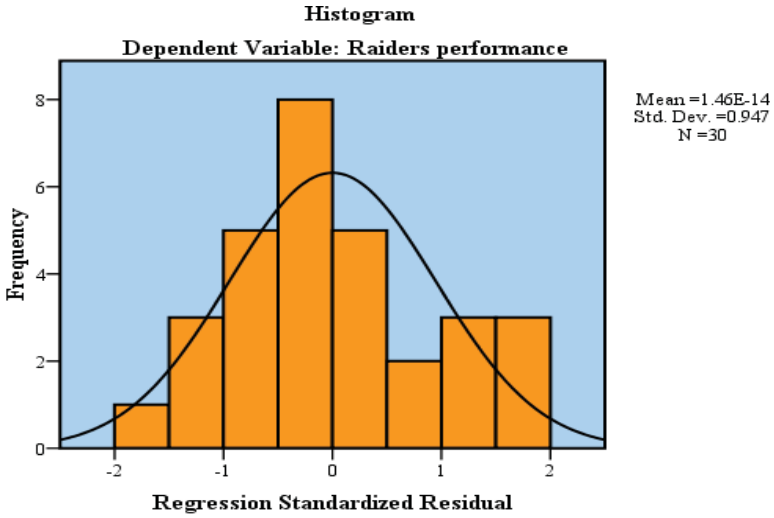
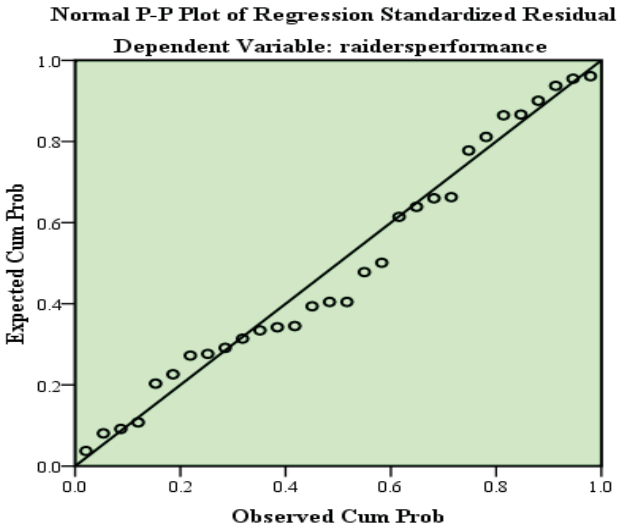


Figure 1: Histogram and Normal Probability Plot of Residuals for Estimating Raiders Performance in Kabaddi on the basis of Coordinative Abilities

Figure 1 shows the histogram and normal probability plot of residuals for estimating Raiders Performance on the basis of Coordinative Abilities. Figure shows that normality is present regarding the residuals with mean near to zero and standard deviation near to one.



e 2: P-P Plot of Residuals for Estimating Raiders Performance in Kabaddi on the basis of Coordinative Abilities

Figure 2 Shows the P-P plots of residuals for estimating Raiders Performance in Kabaddi on the basis of Coordinative Abilities.

Figure shows that observed plots are near to expected standard line. This shows that distribution of residuals is normal.

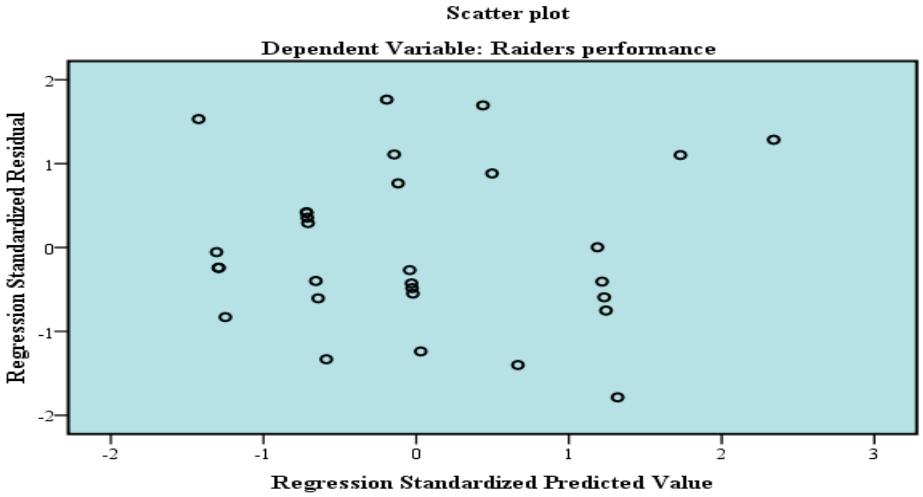


Figure 3: Scatter Plot for Estimating Raiders Performance in Kabaddi on the basis of Coordinative Abilities for Constant Variance

Figure 3 shows scatter plot for estimating Raiders Performance on the basis of Coordinative Ability. Figure shows the constant variance.

Since all the assumptions are fulfilled to apply multiple regression model, established models may be generalized to estimate Raiders Performance on the basis of Coordinative Abilities.

6. OUTCOME OF THE STUDY

In this study three multiple regression models has been established to estimate the Performance of Raiders in Kabaddi on the basis of Anthropometric Characteristics.

This model may be very useful for physical education teachers and coaches and these three models may be generalized since fulfil all the assumptions to apply multiple regression analysis.

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Comparison of Selected Physiological Variables between Caesarean and Normal Birth Students

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Abstract:

The purpose of the study was to compare selected physiological variables (Heart rate, Blood pressure, Vital capacity, Respiratory rate and Hemoglobin content) between caesarean and normal birth students. For this study 100 caesarean and 100 normal students of 9th and 10th standard, age ranging from 15 to 17 years were selected randomly as the subjects from various schools of Bankura districts. In statistical analysis of data for the study 'T' ratio was employed in order to compare the selected physiological variables between caesarean and normal birth students. The significant was set at.05 level of confidence. The analysis of data revealed that there was no significant difference between caesarean and normal birth students.

1. INTRODUCTION

Top performance irrespective to any field depends on human potentialities. Human potentialities scattered in innumerable forms which are considered to be the responsible factors of individual differences. Individual potentialities are unlimited in nature. However, the researchers, investigators, scholars, government and non government organizations are restlessly devoting their brilliant services in research of the key factors of human potentialities which are admired as prerequisites factors of the top performance. Not only the gross arenas of physical, physiological, and psychological aspects of the human life is investigated, the minute areas of racial traits, environmental peculiarities, scientific training technology, birth order and even now a days the process of birth and delivery technique also taken into consideration and given important priority to search the hidden keys of individual potentialities to reach at the top level of performance.

2. METHODOLOGY

2.1. Selection of Subjects

200 subjects were selected from various schools of Bankura district. In order to know the mode of birth, survey sheet was given to each student of 9th and 10th standard of various schools. The survey sheets were filled up by the parents of the students informing the mode of birth of their child. From the return survey sheets, 100 caesarean birth students and 100 normal birth students were selected randomly as subjects for this study.

2.2. Criterion Measure

Criterion measures adopted to this study were Heart rate, Blood pressure, Respiratory rate, Vital capacity and Hemoglobin content.

2.3. Statistical Technique

To compare the selected physiological variables between caesarean normal birth students 'T' test was used. Significance was set at .05 level of confidence.

2.4. Findings

In order to compare the physiological variables (heart rate, blood pressure, vital capacity, respiratory rate and hemoglobin content) between caesarean and normal birth students 'T' ratio was employed. The significance was set at .05 level of confidence. The findings have been presented:

Table 1: Significance of Mean Difference on Heart Rate between Caesarean and Normal Birth Students

Group	Mean	SD	Mean Diff.	T-ratio
Caesarean birth	80.11	7.18		
			09	24
Normal birth	80.2	60652		

GTable t.05 (98) = 1.98

Table 2: Significance of Mean Difference on Systolic Blood Pressure between Caesarean and Normal Birth Students

Group	Mean	SD	Mean Diff.	T-ratio
Caesarean birth	119.27	7.59		
			.18	.48
Normal birth	119.09	6.198		

Table t.05 (98) = 1.98

Table 3: Significance of Mean Difference on Diastolic Pressure between Caesarean and Normal Birth students

Group	Mean	SD	Mean Diff.	T-ratio
Caesarean birth	79.36	2.844		
			.15	.67
Normal birth	69.51	2.104		

Table t.05 (98) = 1.98

Table 4: Significance of Mean Difference on Vital Capacity between Caesarean and Normal Birth Students

Group	Mean	SD	Mean Diff.	T-ratio
Caesarean birth	2.58	.39		
			.12	1.39
Normal birth	2.46	.32		

Table t.05 (98) = 1.98

Table 5: Significance of Mean Difference on Respiratory Rate between Caesarean and Normal Birth Students

Group	Mean	SD	Mean Diff.	T-ratio
Caesarean birth	28.3	3.371		
			.37	1.41
Normal birth	27.93	3.482		

Table t .05 (98) = 1.98

Table 6: Significance of Mean Difference on Hemoglobin Content between Caesarean and Normal Birth Students

Group	Mean	SD	Mean Diff.	T-ratio
Caesarean birth	10.29	.752		
			.18	1.47
Normal birth	10.47	.73		

Table t.05 (98) = 1.98

Table 1 to 6 reveal that there was no significant difference between caesarean and normal birth students on selected physiological variables (Heart rate, Blood pressure, Vital capacity, Respiratory rate and Hemoglobin content) as the calculated value is less than that of tabulated value of 1.98 at .05 level of confidence.

3. DISCUSSION

From the finding it was seen that there was no significant difference between caesarean and normal birth students on selected physiological variables (heart rate, blood pressure, vital capacity, respiratory rate and hemoglobin content). The normal delivered babies were adjusted with the external environment easily because they were fully matured of their parental stage. But the caesarean babies might take time to adjust with the external environment because they were not delivered in exact time. Up to few hours after birth the physiological characteristics might differ in both groups of neonates. But the students ran through a long years of their life cycle. The environmental effects are impacted on physiological characteristics of the students. Therefore there was no significance difference between caesarean and normal birth students on selected physiological characteristics. According to Singh and Tiwari, "Environment can change in genetic composition and structure partly as a result of environmental pressure and partly as a result of social factors.

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Assessment of Aggression Among Open and Closed Skill Athletes: A Psychological Probe

Pawan Gusain

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Abstract:
The present study was conducted to examine the aggression among players of various sports. To obtain data for this study, the investigators had selected thirty six (N=36) male college level athletes of D.A.V.V. Indore between 18 to 24 years of age group to act as subjects. 12 subjects were selected from Football Group, 12 subjects were selected from Hockey group and 12 subjects were selected from Volleyball Group. The *purposive sampling technique was used to* obtain the required data. To measure the level of aggression of the subjects, the Sports Aggression Inventory constructed by Anand Kumar and Premshankar Shukla was administered. One way Analysis of Variance (ANOVA) was employed to find out the intra-group differences. To test the hypothesis, the level of significance was set at 0.05. The results revealed insignificant differences found with regard to aggression of athletes among various sport groups (Football, Hockey and Volleyball).

Keywords:
Aggression

1. INTRODUCTION

Aggression may be defined as the tendency to hurt others under certain circumstances. The term aggression is used in several ways, we speak of good aggression, (for example, going after a loose ball in volley ball or lowering your shoulder in a driver toward the basket) and bad aggression (for example, taking a cheap shot in soccer or committing a flagrant foul in basket ball). The term seems to draw automatic associations and produce positive or negative value judgments and emotional responses. Aggressiveness needs to be acknowledged and should be controlled through sporting physical activities. Sport teaches character building, sport is the only setting where violence and aggression are not only tolerated but also encouraged and rewarded by members of society.

Aggression can be an understood act directed to injure someone consciously or unconsciously, which can be cause by frustration and anger. What many people call example of good aggression in sport is playing within the rules with high intensity and emotion but without intention to do harm.

Certainly, the relation between aggression and performance is complex, and there have been many cases where aggressive act have paid off regarding outcome. For example, the strategy of having a lower- skilled player commits aggressive acts against higher- skilled opponents to distract the superior player by drawing him into a fight. Some sport psychologists agree that aggression facilitates performance outcome (Widmeyer, 1984) whereas others feels it does not (Gill, 1986).

Aggression has been examined in reference to different sports types e.g., contact vs. non contact and individual vs. team (Allawy, 1981; Bredemeire & Shields, 1986; Colley, Roberts & Chipps, 1985; Mace & Bains, 1989; Silva 1983). It has also been shown that sports with contact have positive associations with the amount of aggressiveness of

their participants (Allawy, 1981; Bredemeire, 1994; Gardener & Janelle, 2002; Silva, 1983). The present study was conducted to investigate any differences in sports aggression between team sports (Football, Hockey & Volleyball).

2. MATERIAL AND METHODS

2.2. Subjects

To obtain data, the investigators had selected thirty six subjects (N=36) male college level athletes of 18 to 24 years of age to act as subjects. 12 subjects were selected from Football Group, 12 subjects were selected from Hockey group and 12 subjects were selected from Volleyball Group. The *purposive sampling technique was used to select the subjects.* All the subjects, after having been informed about the objective and protocol of the study, gave their consent and volunteered to participate in this study.

Table 1: A Break-Up of Selected Sample

Sr. No.	A-Open Skill	Sample
1	Football	12
2	Hockey	12
3	Volleyball	12

3. TOOLS

To measure the level of aggression of the subjects, the Sports Aggression Inventory constructed by Anand Kumar and Premshankar Shukla was administered.

4. STATISTICAL ANALYSIS

One way Analysis of Variance (ANOVA) was employed to find out the intra-group differences. To test the hypothesis, the level of significance was set at 0.05.

5. RESULTS

Table 2: Analysis of Variance (ANOVA) Results with Regard to Aggression among Athletes of Football, Hockey and Volleyball

Source of Variance	Sum of Squares	df	Mean Square	F-ratio	Sig.
Between Groups	.167	2	.083	.016	.984
Within Groups	168.583	33	5.109		
Total	168.750	35			

F 0.05 (2, 57)

It is evident from Table 2 that results of Analysis of Variance (ANOVA) among various sports groups (Football, Hockey and Volleyball) were found statistically insignificant (P>.05). Since 'F' ratio was not found statistically significant in all the sub-variables, therefore, there is no need to apply the post hoc

6. DISCUSSION

The relationship between 'aggression and athletes' physical performance has been of concern for coaches and even for athletes for a long time especially with the knowledge that the aggression levels do have enormous impact on athlete's performance. It can be summarize that Football, Hockey and Volleyball players equally developed on mentally bouncing back from setbacks and mistakes, ability to stay calm in the clutch, ability to focus and unshaken

by setbacks and failures, motivational drive, successful completion, ability to accomplish the goals and aggression. It has also been observed from the above Analysis of Variance (ANOVA) Table 2 that the insignificant differences were noticed with regard to aggression among players of various sports. These reasons for these results may be attributed to the same type of sports i.e. team sports and also the nature of football and hockey are also near about same i.e. body contact sports.

7. CONCLUSION

There have been insignificant differences found (Table 2) with regard to aggression of athletes among various sport groups (Football, Hockey and Volleyball).

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Effect of Interval Training on the Cardiac Efficiency of Female Boxing Players

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Abstract:
The purpose of the study was to investigate the effect of interval training on the cardiac efficiency of female boxing players with age group of 20 to 25 years from HMV College Jalandhar. Total 40 female boxing players were the sample of the study. 20 subjects were in experimental group and 20 were control group. The all femaleboxing players were Inter-college level players. T-test was the statistical technique and results shows the significance difference in Pre and post teston cardiac efficiency of female boxing players.

Keyword:
Cardiac Efficiency, Boxing Players

1. INTRODUCTION

Sport is commonly defined as an organized, competitive and skillful physical activity requiring commitment and fair play. To achieve any goal in sports physical fitness is an essential variable. Fitness is an essential aspect for the higher performance in sports competition which includes speed, strength, endurance, flexibility, & coordinative ability. As other component endurance is one of them, which is also known as cardiovascular endurance. Cardiac Efficiency is defined as the ratio of the energy delivered by a system to the energy supplied to it. Cardiac-efficiency mainly depends on the cardiac output, the pulse rate and the blood pressure. Heart is the vital organ of our body. The muscle of the heart and the blood vessels must be strong enough to send the required amount of oxygen and nutrition through the blood. Physical fitness is the capability of the heart blood vessels, lungs and muscles to function at operative efficiency.

2. OBJECTIVE

To find out effect of interval training on cardiac efficiency of the female boxing players.

3. HYPOTHESIS

There exists significant difference on cardiac efficiency of the female boxing players.

4. METHOD & MATERIAL

The total sample of forty female boxing players wasselected through purposive sampling technique. The data was collected from the female boxing players of H.M.V. Jalandhar aged 20 to 25 years. They were divided into two groups: group A (20 Boxing Players) worked as experimental group and group B (20 Boxing Players) as control group. Group A perform eight weeks interval training program. Pre test and post test was taken by the researcher.

5. TOOL

Harvard Step Test: To measure the cardiac efficiency of female football players.

6. STATISTICAL TECHNIQUE

The raw data was arranged in tabulated form for the further statistical treatment. Collection data was analyzed with the help of t-test because the sample size was less than thirty (30) and two groups were there. The results were tested at 0.05 level of confidence.

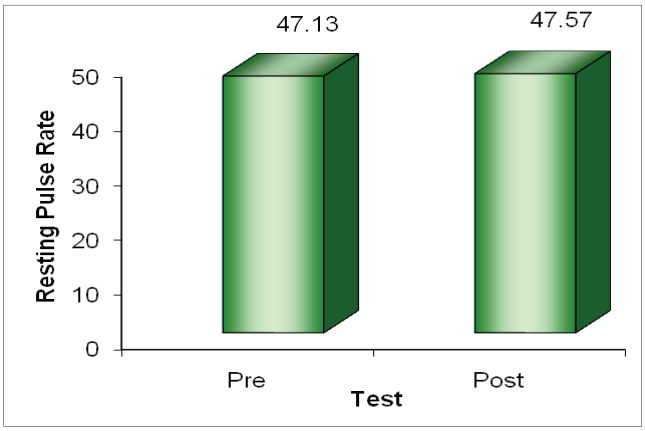
7. RESULTS

Table 1.1 shows the pre–test and post-test mean scores of Cardiac Efficiency of control group female boxing players. The pre-test mean scores 47.13 (SD=1.03) and post-test mean scores of 47.57 (SD=1.01) show that there exists little difference in the pre-test and post-test cardiac efficiency scores of female boxing players who have not attended the 8-week Interval training programme.The calculated 't' value is 1.687 which is not significant at 0.05 level of confidence.

Table No. 1.1: Comparison between Pre and Post-test Data of Control Group

Test	N	Mean	SD	SEM	df	t
Pre-test	20	47.13	1.03	0.23	19	1.687
Post-test	20	47.57	1.01	0.22		

* Significant at 0.05 level=2.09



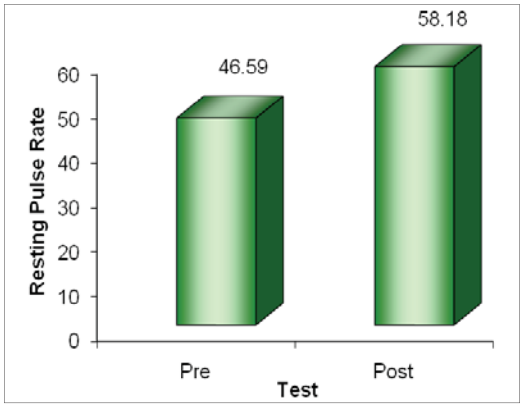
Graff 1.1: Comparison between Pre and Post-test Data of Control Group

Table 1.2: Comparison between Pre and Post-test Data of Experimental Group

Test	N	Mean	SD	SEM	df	t
Pre-test	20	46.59	1.11	0.24	19	34.218**
Post-test	20	58.18	1.73	0.38		

** Significant at 0.01 level=2.86

Table 1.2 shows the mean scores of Cardiac Efficiency of pre test and post test of the female boxing players of the practitioner group The pre-test mean scores 46.59 (SD=1.11) and post-test mean scores of 58.18 (SD=1.73) show that there exists a significant difference in the cardiac efficiency of female boxing players after undergoing the 8-week Interval training programme. The calculated 't' value is 34.218 is highly significant at 0.01 level of confidence.



Graff 1.2: Comparison between Pre and Post-test Data of Experimental Group

8. CONCLUSION

According to the results obtained it is established that there exists a statistically significant difference in the cardiac efficiency of female boxing players pre-test and after undergoing Interval training exercises. Cardiac Efficiency can be improved by imparting the systematic interval training.

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Role of Competitive State Anxiety in Volleyball Players Performance

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Abstract:

The present study was focused to assess the level of competitive state anxiety in volleyball players. A group of 30 subjects (15 district and 15 state) aged 17–25 years participated in the study. The *purposive sampling technique was used to* attain the objectives of the study. All the subjects, after having been informed about the objective and protocol of the study, gave their consent and volunteered to participate in this study. To measure the level of State Anxiety was measured by applying Competitive State Anxiety Inventory-2 (CSAI-2) scale constructed by Rainer Marten was administered. To determine the significant differences between district and state level handball players, unpaired t-test was employed for data analyses. To test the hypothesis, the level of significance was set at 0.05. The results of Competitive Anxiety (i.e., Cognitive anxiety, Somatic anxiety and Self-confidence) *between volleyball players of district and state* are presented in table-1. In case of Competitive Anxiety, significant between-group differences were found for Cognitive anxiety (t=6.48*), Somatic Anxiety (t=5.95*) and Self-Confidence (t=9.58*).

Keywords:

Competitive State Anxiety, Cognitive Anxiety, Somatic Anxiety, Self-Confidence, Volleyball, Player.

1. INTRODUCTION

Each psychological variable has its unique contribution towards sports performance but some of the variables are preferably and specifically suitable for few games. The psychological parameters such as personality traits, anxiety, self-esteem and mental toughness are among the factors that can be considered to determine psychological predictors (Anizu *et al*., 2003). The ability to cope with pressure and anxiety is an integral part of sports, particularly among elite athletes (Hardy, Jones, & Gould, 1996; Orlick & Partington, 1988). Researchers have reported that over 50 of consultations among athletes at an Olympic festival were related to stress or anxiety related problems (Murphy, 1988). Research has demonstrated that the ability to cope with intense anxiety is integral to success in competitive sport, particularly at the highest levels. Accordingly, a great deal of research has been directed towards the study of anxiety in sport, much of it utilizing the Competitive State Anxiety Inventory-2 (CSAI- 2) (Martens, Burton, Vealey, Bump, & Smith, 1990). Terry and Youngs (1996) indicated that the ability to predict performance from the multidimensional approach was stronger for "open" sports, which deal with greater interaction between opponents and less environmental control (e.g., softball, basketball), than it is for "closed" sports which are more individualized (e.g., golf, archery).

2. MATERIAL AND METHODS PARTICIPANTS

A group of 30 subjects (15 district and 15 state) aged 17–25 years participated in the study. The ***purposive sampling technique was used to*** attain the objectives of the study. All the subjects, after having been informed about the objective and protocol of the study, gave their consent and volunteered to participate in this study.

3. INSTRUMENTATION

To measure the level of State Anxiety was measured by applying Competitive State Anxiety Inventory-2 (CSAI-2) scale constructed by Rainer Marten was administered.

4. STATISTICS

To determine the significant differences between district and state level handball players, unpaired t-test was employed for data analyses. To test the hypothesis, the level of significance was set at 0.05.

5. RESULTS

Table 1: Significant Differences in the Mean Scores of Competitive Anxiety of the District Players and State Players Volleyball Players

	District Players=15		State Players=15			
Variables	**Mean**	**SD**	**Mean**	**SD**	**t-value**	**Sig.**
Cognitive Anxiety	27.32	6.86	30.88	7.53	6.48*	0.000
Somatic Anxiety	25.88	5.52	21.28	8.96	5.95*	0.000
Self-Confidence	18.72	7.60	17.88	7.71	9.58*	0.001

*Significant at 0.05 level Degree of freedom= 28

The results of Competitive Anxiety (i.e., Cognitive anxiety, Somatic anxiety and Self-confidence) ***between volleyball players of district and state*** are presented in Table 1. In case of Competitive Anxiety, significant between-group differences were found for Cognitive anxiety (t=6.48*), Somatic Anxiety (t=5.95*) and Self-Confidence (t=9.58*).

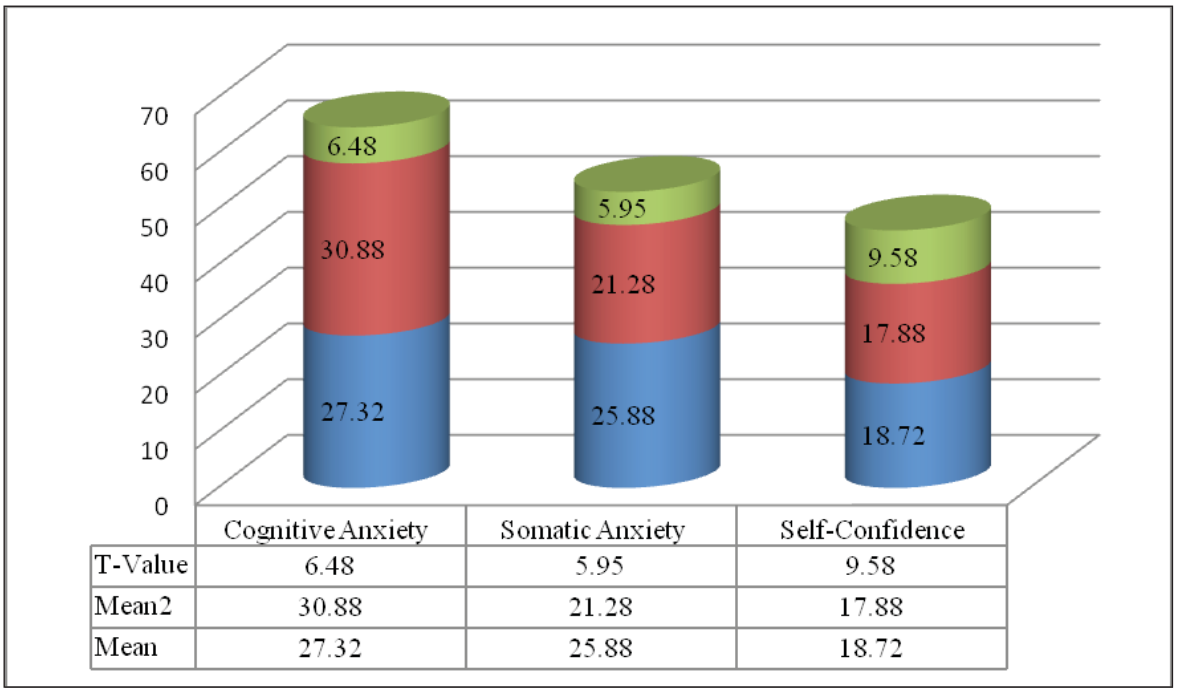

Figure 1: Mean Scores of Competitive Anxiety of the District Players and State Players Volleyball Players

6. CONCLUSIONS OF THE STUDY

Based on the findings of this study, the following conclusions were drawn:

It is concluded from the above findings that Competitive Anxiety (i.e., Cognitive anxiety, Somatic anxiety and Self-confidence) ***between volleyball players of district and state*** are presented in Table 1. In case of Competitive Anxiety, significant between-group differences were found for Cognitive anxiety (t=6.48*), Somatic Anxiety (t=5.95*) and Self-Confidence (t=9.58*).

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A Comparative Study of Physical Fitness Components of Volleyball Players

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Abstract:

The present study was focused to assess the level of Physical Fitness Components of Volleyball Players. A group of 30 subjects (15 district and 15 state) aged 17–25 years participated in the study. The *purposive sampling technique was used to* attain the objectives of the study. All the subjects, after having been informed about the objective and protocol of the study, gave their consent and volunteered to participate in this study. The SPSS 14.0 software was used. The between-group differences were assessed by using the Student's t-test for dependent data. The level of significance was set at .05. It is concluded from the results of physical fitness components (i.e., speed, strength, power and endurance) *between volleyball players at different level of competition* are presented in table-1. In case of physical fitness components, significant between-group differences were found for speed (t=2.85*), strength (t=3.25*), power (t=4.21*) and endurance (t=2.66*).

Keywords:

Physical Fitness, Volleyball Players

1. INTRODUCTION

Volleyball today is one of the most popular and highly paid sports in the world. Volleyball as it is seen today has undergone a tremendous amount of improvement Barness *et al.,* (2007). The performance in most of the sports is determined by such factors as physical fitness, techniques and tactics, tough their relative contribution varies from sport to sport. In addition of these, other factors like physique, body composition and psychological traits also have an overall effect on the performance. Brar (1986). These factors also influence the physical fitness status and technical and tactical capabilities of the sportsman. Of all these factors the most important one that of the physical fitness, as a high level of efficiency in techniques and tactics are also dependent upon physical fitness. Therefore, it is necessary that during the selection of sportsmen for competition a relatively high weight age should be given to physical fitness Gabbet & Georgieff (2007).

Volleyball is the most popular sport in the world. People of all ages and skill levels play volleyball in over 200 countries around the world. William G. Morgan at the YMCA in Springfield, Massachusetts, invented volleyball in 1895. The goal was to create a game that would be less stressful on the bodies of young athletes, yet enjoyable and competitive enough to keep young people fit (Lakherwal 1990). While most of us envision volleyball as a fun game played occasionally at beach parties or the park, it is a sport with varsity school teams and traveling professional teams.

2. SELECTION OF SUBJECTS

A group of 30 subjects (15 district and 15 state) aged 17–25 years participated in the study. The ***purposive sampling technique was used to*** attain the objectives of the study. All the subjects, after having been informed about the objective and protocol of the study, gave their consent and volunteered to participate in this study.

3. STATISTICAL PROCEDURE USED

The SPSS 14.0 software was used. The between-group differences were assessed by using the Student's t-test for dependent data. The level of significance was set at .05.

4. RESULTS

Table 1: Significant Differences in the Mean Scores of Physical Fitness Parameter of the District Players and State Players Volleyball Players

Physical Fitness Components	Mean		SD		SEM		t-value
	District	State	District	State	District	State	
Speed	8.83	8.36	1.57	0.97	0.40	0.25	2.85*
Strength	42.10	42.00	13.25	10.32	3.42	2.66	3.25*
Power	186.13	196.66	7.01	11.66	1.81	3.01	4.21*
Endurance	1745.00	18630.66	215.24	448.09	55.57	115.69	2.66*

The results of physical fitness components (i.e., speed, strength, power and endurance) between volleyball players of district and state are presented in table-1. In case of physical fitness components, significant between-group differences were found for speed (t=2.85*), strength (t=3.25*), power (t=4.21*) and endurance (t=2.66*).

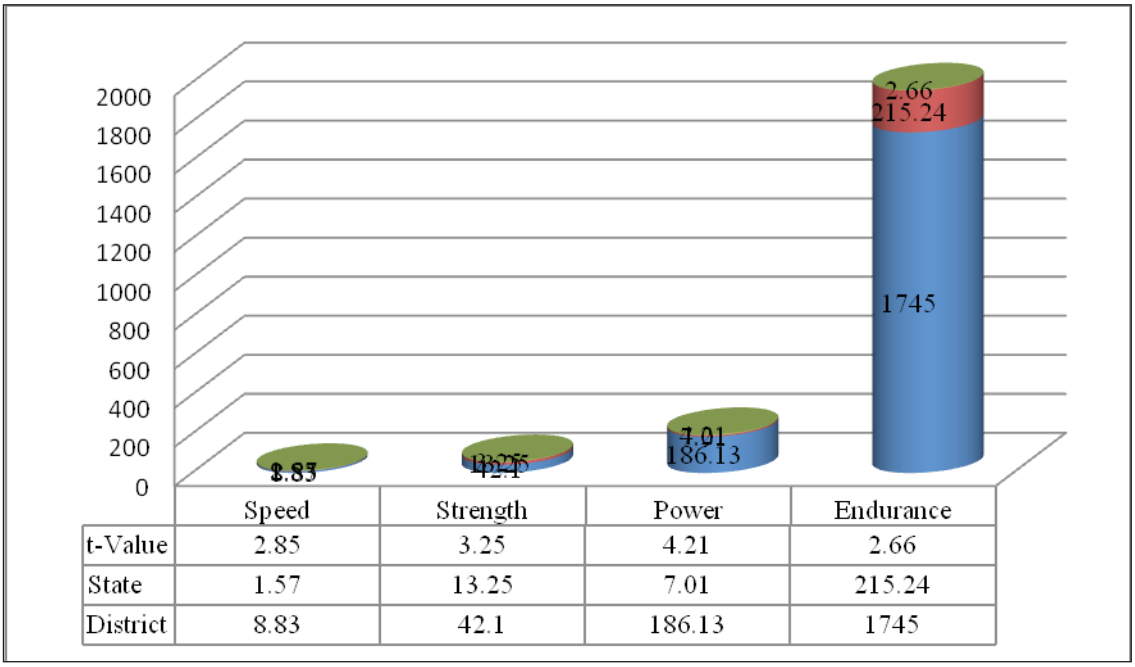

Figure 1: Significant Differences in the Mean Scores of Physical Fitness Parameter of the District Players and State Players Volleyball Players

5. CONCLUSION

It is concluded from the results of physical fitness components (i.e., speed, strength, power and endurance) *between volleyball players district and state* are presented in table-1. In case of physical fitness components, significant between-group differences were found for speed (t=2.85*), strength (t=3.25*), power (t=4.21*) and endurance (t=2.66*).

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Dietetic Appraisal and Eating Disorders in Relation to Waist to Hip Ratio and Waist to Height Ratio

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Abstract:

For the purpose of the study of Dietetic appraisal and eating disorders in relation to waist to hip ratio and waist to height ratio, a total of one hundred male students (n=100) from summer camp organized by Lakshmibai National Institute of Physical Education, Guwahati were randomly selected as the subjects for the study. The age of the subjects ranged from 14 to18 years. Eating disorders were measured with the help of EAT-26 developed by M.Garner et.al. (1982)[1]. For Dietetic appraisal Life Style Assessment Inventory by Anspangh Davids, Michael, H. Hamrich and Frank D. Rosato[2] was used. Waist circumference measured and recorded correct to the nearest centimeter divided by height measured and recorded correct to the nearest 0.1 centimeter, were criterion measure of waist to height ratio. Waist circumference measured and recorded correct to the nearest centimeter divided by Hip circumference also measured and recorded correct to the nearest 0.1 centimeter, were criterion measure of waist hip ratio. Descriptive Statistics – Mean, Standard Deviation and Percentage .Product Moment Correlation. Independent t- test was used for comparison .0.05% was set for level of significant Conclusion- Large numbers of subjects were unlikely to suffer from eating disorders. Large numbers of subjects had good Dietetic appraisal Significant relationship existed between eating disorders and waist to hip ratio. Significant relationship existed between eating disorders and waist to height ratio also. Relationship also found significant between Dietetic appraisal and waist to hip ratio.

Keywords:

Dietetic Appraisal, Eating Disorders Etc.

1. INTRODUCTION

The original term of (Dietic) nutritional assessment was used by a sub-committee of the League of Nations (1932) referring to a set of medical tasks to determine the nutritional status of a population (Gibson, 2005). After 1976 (Bistrian & Blackburn et al), it became a standardized, hospital-based set of tools to predict nutrition and health outcomes in individual patients with post-op complications, trauma or malnutrition. In 1996, Theresa Schneider RD decided to take assessment tools out of the hospital to assess the health of athletes, those with chronic diseases and corporate executives. Today a nutrition assessment includes computerized food intake analysis, clinical nutrition

[1]M.Garner et. al., (1982). Eating Attitude Test. Retrieved on August 23,2010, from http://is.muni.cz/th/322639/ pedf _b/ priloha_EAT_26.pdf

[2]Anspangh Davids, Michael, H. Hamrich and Frank D. Rosato. **Wellness-concepts and applications.** Mosby: Von Halfmon Press. Inc, 1994.pp. 25-33.

body composition assessment (bioelectrical impedance), laboratory blood test results if applicable, nutrigenomix, anthropometrics, review of medications, lifestyle and fitness indicators[3].

Eating disorder is a condition characterized by extreme reduction of food intake or extreme overeating. One of the common symptoms is constant worrying about our body shape and weight. If we are obsessed with our weight and go to any lengths to keep it off, we may be suffering from an eating disorder. Eating disorders can be very harmful to our health and can cause severe complications[4].Eating disorders should never be misunderstood to be purely nutritional problems, that is, problems that can be corrected by normalizing weight or food intake. They are psychological disorders. Malnutrition is secondary to the disease; the root of eating disorders is complex and multifactorial, with the etiology of problem linked to self esteem, familydynamics, stress, sense of loss of control, sexual abuse, and other sources[5]

Today about 1 in 3 kids is overweight or obese. And studies show that overweight kids are likely to become overweight and obese adults. If obesity among kids continues to increase at this rate, our current generation would live shorter and sicker lives than their parents. Obesity is a problem which occurred due to lack of physical participation, eating habits etc. Overweight and obesity are major risk factors for a number of chronic diseases, including diabetes, cardiovascular diseases and cancer. It was observed that there is not a single study that establishes relationship of eating disorders to waist-to hip ratio and waist-to height ratio of students falling within 14 to 18 year of age group. It has been also observed that multinational companies like McDonald, Pizza Hut, Dominoz, Café Coffee Day etc. have increased their number of shops, where the vulnerable youth has been targeted. These students do not think twice in the consumption of fast food as they enjoy it a lot. This trend is ringing an alarm bell as the students of the nation are adding inches to the waist line as well as becoming obese. Hence, a need was felt to undertake such a project that attempts to find out the relationship of dietetic assessment and eating disorders to waist-to hip ratio and waist to height ratio.

1.1 Criterion Measured

For the purpose of the study Dietetic appraisal and eating disorders in relation to waist to hip ratio and waist to height ratio, a total of one hundred male students (n=100) from summer camp organized by Lakshmibai National Institute of Physical Education, Guwahati were randomly selected as the subjects for the study. The age of the subjects ranged from 14 to18 years. To measure eating disorders eating habits were measured with the help of EAT-26 developed by M.Garner et.al. (1982)[6]. For dietetic appraisal (nutritional assessment), Life Style Assessment Inventory by Anspangh Davids, Michael, H. Hamrich and Frank D. Rosato[7] was used. WHR and WHR were selected as these are widely used because of administrative feasibility. Waist circumference measured and recorded correct to the nearest centimeter divided by height measured and recorded correct to the nearest 0.1 centimeter, were criterion measure of waist to height ratio. Waist circumference measured and recorded correct to the nearest centimeter divided by Hip circumference also measured and recorded correct to the nearest 0.1 centimeter, were criterion measure of waist hip ratio.

[3]What is nutritional assessment? Retrieved on April 27th, 2013 from http://nutritionassessment.com /index.php

[4]Eating disorders, Retrieved on April 27th, 2013 from http://www.indianwomenshealth.com/Eating-Disorders-166.aspx

[5]Gorden Edlin and Eric Golanty, Health and Wellness, 9th Ed (USA, Jones and Bartlett publishers, 2007), p-260.

[6]M.Garner et. al., (1982). Eating Attitude Test. Retrieved on August 23,2010, from http://is.muni.cz/th/322639/ pedf _b/ priloha_EAT_26.pdf

[7]Anspangh Davids, Michael, H. Hamrich and Frank D. Rosato. Wellness-concepts and applications. Mosby: Von Halfmon Press. Inc, 1994.pp. 25-33.

2. STATISTICAL TECHNIQUES

Following statistical techniques were used for analyzing the data:

- Descriptive Statistics–Mean, Standard Deviation and Percentage.
- Product Moment Correlation.
- Independent t-test.
- 0.05% was set for level of significant

3. FINDINGS OF THE STUDY

The findings pertaining to descriptive statistics (mean, standard deviation and percentage) and correlation for the selected variables of school going students have been presented in table.

Table 1: Subject's Characteristics as Mean and Standard Deviation of all the Selected Variables

	Mean	Std. Deviation
Age	14.87	0.98
Height	167.28	7.75
Weight	54.24	11.42
Waist to Hip Ratio	0.83	0.05
Waist to Height Ratio	0.41	0.04
Eating Disorder	13.57	6.78
Nutritional Status	71.71	11.99

Table 01 reveals the mean and standard deviation pertaining to all four variables

Table 2: Total Percentage and Categories of Subjects in Dietetic Appraisal

Categories	Number of Subjects	Percentage
Excellent	5	5%
Good	38	38%
Average	30	30%
Below Average	25	25%
Needs Improvement	2	2%
Total	**100**	**100%**

Table 02 displays percentage and number of subjects, falling under five different categories of dietetic Status.

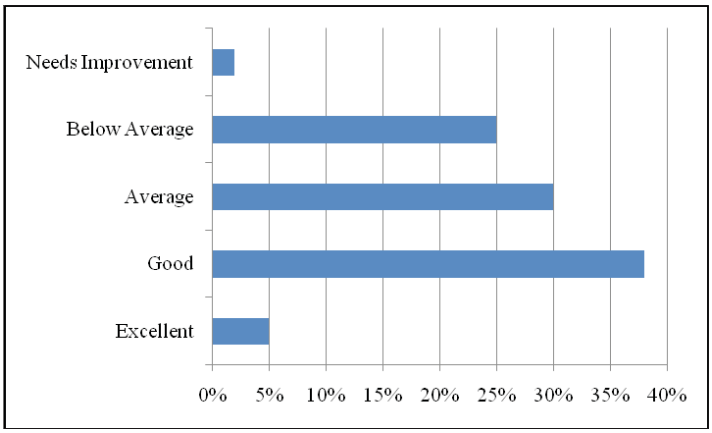

Figure 1: Total Percentage and Categories of Subjects in Dietetic Appraisal

Table 3: Total Percentage and Categories of Subjects in Eating Attitude Test

Category	Number of Subjects	Percentage
Unlikely	84	84%
Probable	6	6%
Likely	10	10%
Total	**100**	**100%**

Table 03 reveals the percentage of subjects, falling under different categories of EAT (Eating Attitude Test).

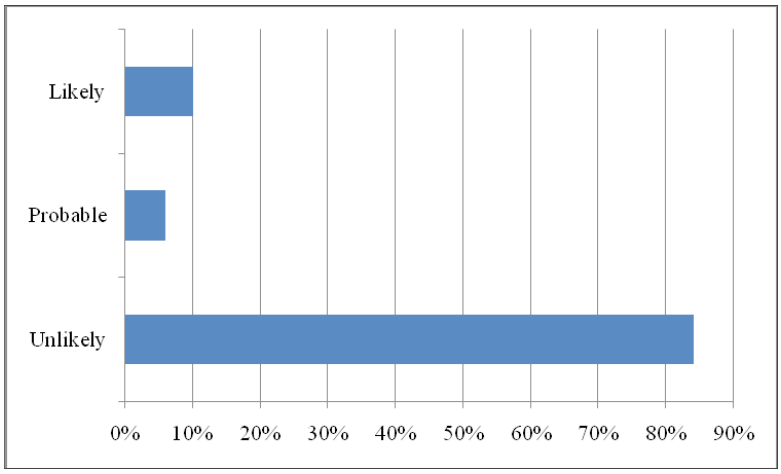

Figure 2: Total Percentage and Categories of Subjects in Eating Attitude Test

Table 4: Total Percentage and Categories of Subjects in Waist Hip Ratio

Category	Number of Subjects	Percentage
Ideal- Very Low Risk	90	90%
Low Risk	07	07%
Moderate Risk	03	03%
High Risk	00	00%
Total	**100**	**100%**

It is evident from table 11 that there were 90% (N=90) subjects who fell in ideal category of Waist to Hip Ratio, 7% (N=7) subjects fell under low risk category, Moderate and high risk categories were observed in 3% (N=3) and 00% (N=0) respectively among subjects.

Table 5: Total Percentage and Categories of Subjects in Waist to Height Ratio

Category	Number of Subjects	Percentage
Abnormally Slim to Underweight	00	00%
Extremely Slim	66	66%
Slender and Healthy	16	16%
Healthy, Normal, Attractive Weight	16	16%
Overweight	01	01%
Extremely Overweight/Obese	00	00%
Highly Obese	01	01%
Total	**100**	**100%**

Table 05 reveals the percentage of subjects, falling under different categories of Waist to Height Ratio.

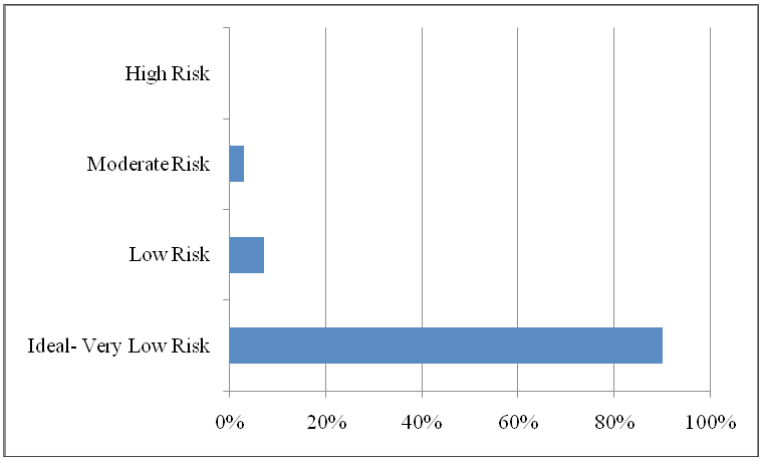

Figure 3: Total Percentage and Categories of Subjects in Waist Hip Rati

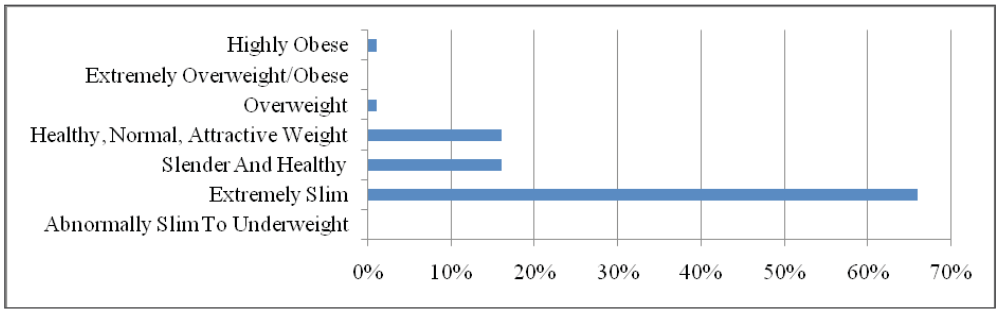

Figure 4: Total Percentage and Categories of Subjects in Waist Height Rati

Table 6: Correlation between Eating Attitude, Dietetic appraisal Waist to Hip Ratio and Waist to Height Ratio

	Waist to Hip Ratio	p-value	Waist to Height Ratio	p-value
Eating Disorders	.261*	.009	.242*	.015
Nutritional Status	-.340*	.001	-.073	.473

r.05 (98) = .195

* Correlation is significant at the 0.05 level.

4. DISCUSSION OVER FINDINGS

- Results of the study revealed a significant relationship between both variables.
- Findings of the study showed an insignificant relationship between Dietetic appraisal and Waist to Height Ratio.
- Findings of the study uncovered a significant relationship between these two variables.
- Results of the study revealed that hypothesis was accepted in this case also because a significant relationship was obtained in eating disorders and waist to height ratio.
- Results of the study showed that there was large number of subjects who unlikely had chances of suffering from eating disorders.
- Results of the study showed that there was large number of subjects had good Dietetic appraisal. Hence, hypothesis was accepted in this case also.

5. CONCLUSION

The purpose of the study was to survey of Dietetic appraisal and eating disorders in relation to waist to hip ratio and waist to height ratio among youth, hence, considering the purpose along with objectives of the study in mind and on the basis of findings researcher had derived following conclusions;

- Large numbers of subjects were unlikely to suffer from eating disorders.
- Large numbers of subjects had good Dietetic appraisal
- Significant relationship existed between eating disorders and waist to hip ratio.
- Significant relationship existed between eating disorders and waist to height ratio also.
- Relationship also found significant between Dietetic appraisal and waist to hip ratio.
- There was no relationship obtained between Dietetic appraisal and waist to height ratio.

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Relationship of Selected Biomechanical Variables with the Performance of Cricket Players in Cover Drive Shot

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Abstract:
The purpose of this study was to measure the relationship of selected biomechanical variables to the performance of cricket player in cover drive shot. The subjects for this study were 48 male cricket players who had represented their respective states in Under-19 in Cricket tournaments (12 subjects from each team). Their age ranged from fifteen to nineteen years. All the subjects were right handed batsman. The data was analyzed by use of Pearson's Product Moment Correlation. The level of significance chosen to test the hypothesis was .05. None of the selected angular biomechanical (kinematic) variables that is Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Right and Left), and Hip Joint (Left and Right) has significant relationship with the performance of Cricket players in cover drive shot. In case of Linear A biomechanical (kinematic) variable that is height of center of gravity at moment contact does not have significant relationship with the performance of Cricket players in cover drive shot.

Keywords:
Biomechanical, Kinematics, Cover Drive

1. INTRODUCTION

Cricket is one of the most popular and richest in history of all ball games. There is no record available which shows when and by whom cricket was started in England. It is essentially an English game. Old work shows that it is as old as 13th Century. The game eventually developed in the 17th century with underarm bowling, curved bat and a wicket of two feet wide and one foot high with a whole in the ground between the stumps. Cricket is a game of intricate movements combined with great speed and accuracy. Great teams are developed by the meshing of fundamentally sound players weaving clever patterns of attack and defense tactics.

There is a wide variety of shots played in cricket. The batsman's repertoire includes strokes named according to the style of swing and the direction aimed: e.g., "Cut", "Drive", and "Hook", "Pull". It is universally accepted that success of a team in cricket depends upon a greater extent on the hitting ability of the players.

Thus in cricket driving (or to use the pace of the ball) is a primary skill of the game and requires a great deal of practice assisted by good models, scientifically based. Since players were expected to drive often in order to score, they developed a variety of drives, which include the straight drive, the cover drive, the square drive, and the on drive. Now the sportsman has been able to give outstanding performance because of involvement of new scientifically substantiated training methods and means of execution of sport exercises such as sports techniques and tactics, improvement of sportswear and equipments as well as other components and conditions of the system of training.

The role that sports biomechanics can play is becoming more widely understood in sports community and the demand for service increasing, researchers in sports biomechanics will have to consider carefully how much time they can devote to the provision of scientific services without impairing their performance as scholar researchers. To develop programmers of study for the training of techniques in sports biomechanics, technicians who can provide the kind of services sought by sporting bodies.

In order to analyze the techniques o sports and games, photographic methods is probably the most popular methods. Although this is not a recent development, photography was formally limited to the filming of few sports only. It is now being applied to many sports at an increasing rate.

Recently videotapes have begun to replace conventional motion pictures for teaching and coaching purpose. Since videotape is erasable reusable and does not require any developing. It is more economical than film. The relatively inexpensive recorders are simple to operate and permit immediate play back.

Biomechanics and Cricket players in cover drive shot practices described by some of the authors are as follows:

1.1. Biomechanics

A branch of physics concerns with the description of the motion of objects without considering the forces that causes or result from the motions. It is a study of motion that aims to provide a description of the spatial position of points in moving bodies. For the purpose of this study Biomechanical variables were represented by the selected angles of the various joints of human body and height of center of gravity at moment contact.

1.2. Kinematics

Kinematics will be represented by the selected angles of the various joints of human body and height of center of gravity at selected moment.

1.3. Cover Drive

Cover Drive also called off drive; this is a batting stroke in which slightly over pitch ball is struck with full downward swing off perpendicular bat. Cover drive is usually played to a length ball pitching just outside off stump by which the ball is sent pass cover point the bats taken back with a good back lift and the front foot moved across to place it just near to the spot where the ball is likely to pitch. The bat is brought forward with a straight swing close to the front leg, and the weight of the body transferred to the front foot. The ball played powerfully to the mid-off or extra-cover region.

2. METHODOLOGY

The subjects for this study were 48 male cricket players who had represented their respective states Uttar Pradesh, Delhi, Uttaranchal and Haryana (12 subjects from each team) Under-19 in Cricket tournaments. Four teams were selected for this study namely: Uttar Pradesh, Delhi, Uttaranchal and Haryana (12 subjects from each team). Their age ranged from fifteen to nineteen years. All the subjects were right handed batsman. The research scholar familiarized subjects with the testing equipments and procedures. Following were the Kinematic variables which were constituted in the study: The selected kinematical variables were divided in two parts i.e.

1. Linear Kinematic Variable were
   - Height of Center of Gravity at moment release.
2. Angular Kinematic Variables were represented by the angles at selected joints i.e.
   - Ankle joints
   - Knee joints

- Hip joints
- Shoulder joints
- Elbow joints
- Wrist joints

The scholar developed stick figures on the photographs, from which selected kinematical variables were calculated. The stick figures were developed by using Joint-point method. The center of gravity of each subject, at one selected moment.

2.1 Procedure for Location of Center of Gravity

The center of gravity of the body at moment release was determined by use of segmentation method.

3. ANALYSIS OF DATA AND RESULTS OF THE STUDY

The data was analyzed by use of Pearson's Product Moment Correlation. The level of significance chosen to test the hypothesis was .05 and are presented in Table I, Table II, Table III, Table I, Table IV.

Table I: Relationship of Selected Angular Kinematical Variables at Moment Contact with the Performance of Uttar Pradesh Under-19 Cricket Team in Cover Drive (N = 12)

S. No.	Variables	Coefficient of Correlation "r"
1.	Ankle Joint (Left)	0.189
2.	Ankle Joint (Right)	0.144
3.	Knee Joint (Left)	0.175
4.	Knee Joint (Right)	-0.123
5.	Hip Joint (Left)	0.118
6.	Hip Joint (Right)	0.305
7.	Shoulder Joint (Left)	0.420
8.	Shoulder Joint (Right)	-0.162
9.	Elbow Joint (Left)	0.137
10.	Elbow Joint (Right)	-0.036
11.	Wrist Joint (Left)	0.00
12.	Wrist Joint (Right)	-0.007

*Significant at 0.05 Level

r .05 (10) = 0.576

Table II: Relationship of Selected Angular Kinematical Variables at Moment Contact with the Performance of Delhi Under-19 Team in Cover Drive (N = 12)

S. No.	Variables	Coefficient of Correlation "r"
1.	Ankle Joint (Left)	-0.151
2.	Ankle Joint (Right)	-0.127
3.	Knee Joint (Left)	0.070
4.	Knee Joint (Right)	-0.069
5.	Hip Joint (Left)	0.195
6.	Hip Joint (Right)	0.287
7.	Shoulder Joint (Left)	-0.206
8.	Shoulder Joint (Right)	-0.126
9.	Elbow Joint (Left)	-0.100
10.	Elbow Joint (Right)	-0.053
11.	Wrist Joint (Left)	------
12.	Wrist Joint (Right)	-0.407

*Significant at 0.05 Level

r .05 (10) = 0.576

Table III: Relationship of Selected Angular Kinematical Variables at Moment Contact with the Performance of Uttaranchal Under-19 Team in Cover Drive (N = 12)

S. No.	Variables	Coefficient of Correlation "r"
1.	Ankle Joint (Left)	-0.208
2.	Ankle Joint (Right)	-0.274
3.	Knee Joint (Left)	-0.384
4.	Knee Joint (Right)	-0.267
5.	Hip Joint (Left)	-0.323
6.	Hip Joint (Right)	-0.402
7.	Shoulder Joint (Left)	0.553
8.	Shoulder Joint (Right)	-0.318
9.	Elbow Joint (Left)	-0.437
10.	Elbow Joint (Right)	-0.551
11.	Wrist Joint (Left)	-----
12.	Wrist Joint (Right)	0.033

*Significant at 0.05 Level

r .05 (10) = 0.576

Table IV: Relationship of Selected Angular Kinematical Variables at Moment Release with the Performance of Haryana Under-19 Team in Cover Drive (N = 12)

S. No.	Variables	Coefficient of Correlation "r"
1.	Ankle Joint (Left)	-0.542
2.	Ankle Joint (Right)	0.384
3.	Knee Joint (Left)	0.046
4.	Knee Joint (Right)	-0.284
5.	Hip Joint (Left)	0.113
6.	Hip Joint (Right)	-0.034
7.	Shoulder Joint (Left)	-0.847*
8.	Shoulder Joint (Right)	0.605*
9.	Elbow Joint (Left)	0.065
10.	Elbow Joint (Right)	0.555
11.	Wrist Joint (Left)	-----
12.	Wrist Joint (Right)	0.056

*Significant at 0.05 Level

r .05 (10) = 0.576

As shown in **Table I, II, III,** that the values of coefficient of correlation in case of all the selected Kinematic variables with the (Uttar Pradesh Under, Delhi , Uttaranchal) Under-19 teams were found insignificant at the selected level of significance of 0.05. Since the required value of coefficient of correlation for 10 degree of freedom is 0.576 and the obtained values of coefficient of correlation of selected variables less than the required value. The correlation could not be calculated with the left wrist joint because the variable was constant in case of every subject. The correlations might have been insignificant because of the independent calculation but they must have a cumulative effect on the performance.

As shown in **Table IV** that the values of Coefficient of Correlation in case of all the selected Kinematic variables with the Haryana Under-19 team were found insignificant at the selected level of significance of 0.05. Since the required value of Coefficient of Correlation for 10 degree of freedom is 0.576 and the obtained values of coefficient of correlation of selected variables less than the required value, except in case of the both the shoulder joints of the subjects which showed significant relationship. As the Cricket player uses both his hands while executing the Cover Drive and full extension of hands is required and the right hand is the bottom hand so as the angle would increase the shot would be better and vice versa the left shoulder joint angle is bound to decrease, so combination of both would produce a good Cover Drive. The correlation could not be calculated with the Left Wrist Joint because the variable was constant in case of every subject. The correlations might have been insignificant because of the independent calculation but they must have a cumulative effect on the performance.

The relationship of selected Linear Kinematic variables at the moment contact with the performance in Cover Drive as presented in Table 1.5, 1.6, 1.7, and 1.8.

Table 1.5: Relationship of Selected Linear Kinematic Variables at Moment Contact with the Performance of Uttar Pradesh Under-19 Team in Cover Drive

S. No.	Variables	Coefficient of Correlation "r"
1.	Height of Centre of Gravity (Moment contact)	-0.172

*Significant at 0.05 Level

r .05 (10) = 0.576

Table 1.6: Relationship of Selected Linear Kinematic Variables at Moment Contact with the Performance of Delhi Under-19 Team in Cover Drive

S. No.	Variables	Coefficient of Correlation "r"
1.	Height of Centre of Gravity (Moment contact)	0.304

*Significant at 0.05 Level

r .05 (10) = 0.576

Table 1.7: Relationship of Selected Linear Kinematic Variables at Moment Contact with the Performance of Uttaranchal Under-19 Team in Cover Drive

S. No.	Variables	Coefficient of Correlation "r"
1.	Height of Centre of Gravity (Moment contact)	-0.161

*Significant at 0.05 Level

r .05 (10) = 0.576

Table 1.8: Relationship of Selected Linear Kinematical Variables at Moment Contact with the Performance of Haryana Under-19 Team in Cover Drive

S.No.	Variables	Coefficient of Correlation "r"
1.	Height of Centre of Gravity (Moment contact)	0.019

*Significant at 0.05 Level

r .05 (10) = 0.576

As shown in Table-1.5, 1.7, 1.6, 1.8, that the values of coefficient of correlation in case of the selected Linear Kinematic variable (Height of Center of Gravity) with the (Uttar Pradesh, Delhi, Uttaranchal, Haryana) Under-19 Cricket teams was found insignificant at the selected level of significance of 0.05. Since the required value of coefficient of correlation for 10 degree of freedom is 0.576 and the obtained values of coefficient of correlation of selected variables less than the required value. This trend does not mean that Height of Center of Gravity does not play any important role in executing the Cover Drive but the low value of correlation must have been because of the small sample size and the low value of the Height of Center of Gravity at moment contact.

Table 1.9: Analysis of Variance of the Mean Difference of the Four Groups for Height of Centre of Gravity at Moment Contact

Source of Variance	df	Sum of Square	Mean Sum of Square	'F' Ratio
Between Groups	3	3731	1243.06	9.48*
Within Groups	44	6295.92	131.66	

*Significant at .05 level.

F.05 (3, 44) = 2.82

It is evident from Table 1.9 that variability exists among the four groups with respect to criterion variable namely Height of Centre of Gravity at moment contact. As each player has his own reach as per the flexibility of the groin muscle and leg length so the difference in the Centre of Gravity at moment contact must have been there.

Since there is significant difference in the result of 'One Way Analysis of Variance' therefore Post Hoc (LSD) test was applied to find out which of the mean difference amongst the group were statistically significant. The data relating to this is presented in Table 1.10.

Table 1.10: Least Significant Difference Post Hoc Test for Mean of the Four Groups for Height of Centre of Gravity at Moment Contact

Uttar Pradesh	Delhi	Uttaranchal	Haryana	M. D.	C. D.
	188.72		185.20	-3.52*	0.2282
		183.15	185.20	-2.05*	
166			185.20	-19.2*	
	188.72	183.15		-5.57*	
166		183.15		-17.15*	

*Significant at .05 level.

The above Table 1.10 shows that there was significant difference between the means of Delhi and Haryana Under-19 teams in which as per the terms of means Delhi Under-19 team was found to be superior.

Significant difference was also found between the means of Uttaranchal and Haryana Under-19 teams in which as per the terms of means Haryana Under-19 team was found to be superior. Significant difference was also found between the means of Uttar Pradesh and Haryana Under-19 teams in which as per the terms of means Haryana Under-19 team was found to be superior. Table 4.26 also reveals that difference was found between the means of Delhi and Uttaranchal Under-19 team as per the means the Delhi Under-19 team was found to be superior. Significant difference was also found between the means of Uttar Pradesh and Uttaranchal Under-19 teams in which as per the terms of means Uttaranchal Under-19 team was found to be superior. Difference between the means of four groups is shown in Fig. 1.

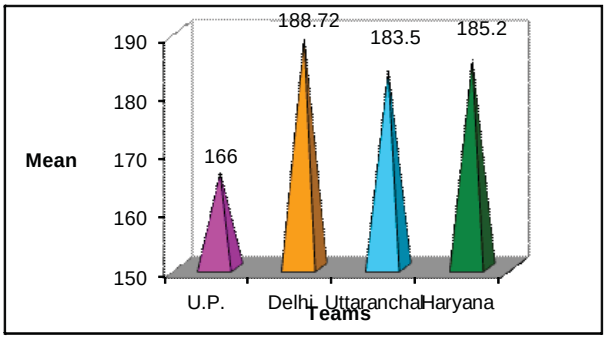

Figure 1: Bar Diagram Representing Means for Four Under-19 Teams for Height of Centre of Gravity at Moment Contact

4. DISCUSSION OF FINDINGS

1. None of the selected Angular Kinematic variables that are Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Right and Left), and Hip Joint (Left and Right) showed relationship with the performance of Uttar Pradesh, Delhi, Uttaranchal, Haryana Under-19 team in Cover drive. This trend does not mean that these variables do not have any effect on the performance of the players but these variables' relationship was calculated independently but the variables must have a cumulative effect on the performance.
2. In case of Linear Kinematic variable Height of Center of Gravity at moment contact none of the teams showed relationship with the performance of the subjects in Cover Drive. As the study was about the moment contact of the Cover Drive and the higher the subject is elevated from the ground which is Height of Centre of Gravity the better would be his performance. So it can be concluded that better performance is achieved by higher elevation.

3. No variation was found between the groups in case of all the Under-19 teams in terms of their performance in Cover Drive but the mean of the performance of Haryana was a little high than the other teams. As the performance of the Under-19 teams is more or less the same but in this age of cut throat competition even a little difference can win or lose matches but the skill tested was under controlled conditions and was also one in number so if a detailed study on each and every skill (Hook Shot, Pool Shot, Drive Shot etc.) may be done difference can found.
4. No variation was found between the Under-19 teams in terms of their Angular Kinematic Variables Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Left), and Hip Joint (Left and Right) apart from right wrist joint and Height of Centre of Gravity at moment contact which was the highest in case of Uttar Pradesh Under-19 state team. No significant difference was found between the means of Uttar Pradesh and Haryana, Delhi and Haryana, Uttaranchal and Haryana but the means of the Uttar Pradesh and Delhi, Delhi and Uttaranchal were found to be statistically significant as per the LSD test implemented which showed the mean difference 13.91 in case of Uttar Pradesh and Haryana, 8.08 in case of Delhi and Haryana and 8.41 in case of the means of Uttar Pradesh and Haryana , Delhi and Haryana, Uttaranchal which was higher than the tabulated value of 3.59. The analysis of data clearly reveals that the Uttar Pradesh and the Uttaranchal Under-19 State team are better in terms of right Wrist Angle. In case of Height of The Center of Gravity the following state teams differed Uttar Pradesh and the Delhi State team as the mean difference was 22.49, Uttar Pradesh and Uttaranchal Under-19 State team which was 15.34, Uttar Pradesh and Haryana was 16.62 which was higher than the tabulated value of 3.59 hence it could be said that Delhi and Uttaranchal Under-19 State team was better in terms of Height of Center of Gravity at moment contact.

5. CONCLUSION

1. None of the selected Angular Kinematic variables that are Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Right and Left), and Hip Joint (Left and Right) showed relationship with the performance of Uttar Pradesh, Delhi, Uttaranchal, Haryana Under-19 team in Cover Drive.
2. In case of Linear Kinematic Variable Height of Center of Gravity at moment contact none of the teams showed relationship with the performance of the subjects in Cover Drive.
3. No variation was found between the groups in case of all the National Teams in terms of their performance in Cover Drive but the mean of the performance of Haryana was a little high than the other Under-19 teams.
4. No variation was found between the Under-19 teams in terms of their Angular Kinematic variables Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Left), and Hip Joint (Left and Right) apart from right wrist joint and Height of Centre of Gravity at moment contact which was the highest in case of Uttar Pradesh Under-19 state team. No significant difference was found between the means of Uttar Pradesh and Haryana, Delhi and Haryana, Uttaranchal and Haryana but the means of the Uttar Pradesh and Delhi, Delhi and Uttaranchal were found to be statistically significant as per the LSD test implemented which showed the mean difference 13.91 in case of Uttar Pradesh and Haryana, 8.08 in case of Delhi and Haryana and 8.41 in case of the means of Uttar Pradesh and Haryana, Delhi and Haryana, Uttaranchal which was higher than the tabulated value of 3.59. The analysis of data clearly reveals that the Uttar Pradesh and the Uttaranchal Under-19 State team are better in terms of Right Wrist angle. In case of Height of the Center of Gravity the following state teams differed Uttar Pradesh and the Delhi Under-19 State team as the mean difference was 22.49, Uttar Pradesh and Uttaranchal State team which was 15.34, Uttar Pradesh and Haryana was 16.62 which was higher than the tabulated value of 3.59 hence it could be said that Delhi and Uttaranchal Under-19 State team was better in terms of Height of Center of Gravity at moment contact.

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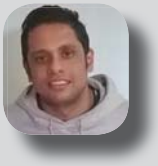

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Relationship of Selected Kinematic Variables with the Performance of National Level Kabbadi Players in Running Hand Touch

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Abstract:

The purpose of this study was to establish the relationship between kinematic variables and the performance of national level kabbadi players in Running hand touch. The subjects for this study were 48 male kabbadi players who had represented there respective states in National Games, in Kabbadi tournaments. Four teams were selected for this study namely: Delhi, Uttar Pradesh, Punjab and Maharashtra (12 subjects from each team). There age ranged from eighteen to twenty seven years. Subjects were familiarized with the testing equipments and procedures by the research scholar. The scores of the subjects in Running hand touch was used as criterion variable in this study. None of the selected angular kinematic variables that are Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Right and Left), and Hip Joint (Left and Right) showed relationship with the performance of Delhi Team in Running hand touch. None of the selected angular kinematic variables that are Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Right and Left), and Hip Joint (Left and Right) showed relationship with the performance of Uttar Pradesh Team in Running hand touch. None of the selected angular kinematic variables that is Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Right and Left), and Hip Joint (Left and Right) showed relationship with the performance of Punjab Team in Running hand touch. None of the selected angular kinematic variables that are Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Right and Left), and Hip Joint (Left and Right) showed relationship with the performance of Maharashtra Team in Running hand touch. It was hypothesized that there may not be significant relationship between kinematic variables and performance of Kabbadi players in Running hand touch. This hypothesis may be accepted none of the variables did not show any relationship with the performance of kabbadi players in Running hand touch.

1. INTRODUCTION

Physical education and training organized instruction in motor activities that contribute to the physical growth, health, and body image of the individual. The historical roots of physical education go back as far as the ancient Chinese (c.2500 BC), who had a well-developed system of exercise and physical training. In ancient Greece the Athenians were concerned with both physical and mental development and consequently they accorded gymnastics, sports, and rhythms an important educational role. During the period of the Roman Empire, and later during the Middle Ages, physical education was primarily used as a form of military training.

Kabaddi is basically a combative sport, with seven players on each side; played for a period of 40 minutes with a 5 minutes break (15-5-15). The core idea of the game is to score points by raiding into the opponent's court and touching as many defence players as possible without getting caught on a single breath.

One player, chanting Kabaddi!!! Kabaddi!!!! Kabaddi!!!! Charges into the opponent court and tries to touch the opponent closest to him, while the seven opponents make manoeuvres to catch the attacker. This is Kabaddi, the match of one against seven, known as the game of struggle. The players on the defensive side are called "Antis" while the player of the offence is called the "Raider". The attack in Kabaddi is known as a 'Raid'. The antis touched by the raider during the attack are declared 'out' if they do not succeed in catching the raider before he returns to home court. These players can resume play only when their side scores points against the opposite side during their raiding turn or if the remaining players succeed in catching the opponent's raider Running hand touch is another fundamental raiding skill akin to running hand touch

with similar application method and principles. However, the salient difference between both the skills is that in running hand touch the raider tries to touch the antis with his toe while in Running hand touch, the raider uses his complete Toe.

During the execution of this skill, the raider drags his thrusting leg towards the antis, which is known as a 'slip' in Kabaddi. This 'slip' helps the raider cover more area in the opponents' court which has an advantage over running hand touch.**Kinematics** (from Greek κινεν, kinein, to move) is the branch of classical mechanics that describes the motion of objects without consideration of the causes leading to the motion. "It is natural to begin this discussion by considering the various possible types of motion in themselves, leaving out of account for a time the causes to which the initiation of motion may be ascribed; this preliminary enquiry constitutes the science of Kinematics . —ET Whittaker"

Kinematics is not to be confused with another branch of classical mechanics: analytical dynamics (the study of the relationship between the motion of objects and its causes), sometimes subdivided into kinetics (the study of the relation between external forces and motion) and statics (the study of the relations in a system at equilibrium). Kinematics also differs from dynamics as used in modern-day physics to describe time-evolution of a system. The term kinematics is less common today than in the past, but still has a role in physics. (See analytical dynamics for more detail on usage). The term "kinematics" also finds use in biomechanics and animal locomotion. The simplest application of kinematics is for particle motion, translational or rotational. The next level of complexity is introduced by the introduction of rigid bodies, which are collections of particles having time invariant distances amongst themselves. Rigid bodies might undergo translation and rotation or a combination of both. A more complicated case is the kinematics of a system of rigid bodies, possibly linked together by mechanical joints. The kinematic description of fluid flow is even more complicated, and not generally thought of in the context of kinematics.

2. STATEMENT OF THE PROBLEM

The purpose of this study was to establish the relationship between kinematic variables and the performance of national level kabbadi players in Running hand touch.

3. DELIMITATIONS

1. Only Running hand touch was used in the study.
2. The study was delimited to the four teams of male kabbadi players those who participated in National Level Kabaddi Tournaments.

3. The Running hand touch was recorded in one plane only.
4. Selected kinematic variables were:
    - Ankle joint
    - Knee joint
    - Hip joint
    - Shoulder joint
    - Elbow joint
    - Body inclination
    - Standing height
    - Height of centre of gravity

5. OBJECTIVES OF THE STUDY

To find out the relationship between kinematic variables and performance of kabbadi players in Running hand touch.

6. SELECTION OF SUBJECTS

The subjects for this study were 48 female kabbadi players who had represented there respective states in National Games in Kabbadi tournaments. Four teams were selected for this study namely: Delhi, Uttar Pradesh, Punjab and Maharasthra (12 subjects from each team).There age ranged from eighteen to twenty seven years. Subjects were familiarized with the testing equipments and procedures by the research scholar.

7. CRITERION MEASURE

The scores of the subjects in Running hand touch was used as criterion variable in this study.

8. ANALYSIS OF DATA

The data was analyzed by use of Pearson's Product Moment Correlation, Analysis of Variance and Least Significant Difference Test as Post-Hoc Test.

The level of significance chosen to test the hypothesis was .05.

Pearson's product moment correlation was used to find out the relationship of selected kinematic variables and anthropometric variables with the performance of national level kabbadi players in Running hand touch and to compare the four teams on the basis of selected linear and angular kinematic variables[namely: ankle joint, knee joint, and hip joint, shoulder joint (touching arm), elbow joint (touching arm), body inclination, standing height and height of centre of gravity.

The score of each independent angular kinemtaic variable was correlated with the performance of subjects in Running hand touch. The relationship of selected angular kinematic variables at the moment contact with the performance in Running hand touch as presented in Table 4.1.

Table 4.1: Relationship of Selected Angular Inematical Variables at Moment Release with the Performance of Delhi Team in Running Hand Touch (N = 12)

S. No.	Variables	Coefficient of Correlation "r"
1.	Ankle Joint (Left)	0.189
2.	Ankle Joint (Right)	0.144
3.	Knee Joint (Left)	0.175
4.	Knee Joint (Right)	-0.123
5.	Hip Joint (Left)	0.118
6.	Hip Joint (Right)	0.305
7.	Shoulder Joint (Left)	0.420
8.	Shoulder Joint (Right)	-0.162
9.	Elbow Joint (Left)	0.137
10.	Elbow Joint (Right)	-0.036
11.	Wrist Joint (Left)	------
12.	Wrist Joint (Right)	-0.007

As shown in Table 4.1 that the values of coefficient of correlation incase of all the selected kinematic variables with the Delhi national Team were found insignificant at the selected level of significance of 0.05. Since the required value of coefficient of correlation for 10 degree of freedom is 0.658 and the obtained values of coefficient of correlation of selected variables less than the required value. The correlation could not be calculated with the left wrist joint because the variable was constant incase of every subject. The correlations might have been insignificant because of the independent calculation but they must have a cumulative effect on the performance.

The score of each independent angular kinemtaic variable was correlated with the performance of subjects in Running hand touch of the Delhi national Team. The relationship of selected angular kinematic variables at the moment contact with the performance in Running hand touch as presented in Table 4.2.

Table 4. 2: Relationship of Selected Angular Inematical Variables at Moment Contact with the Performance of Uttar Pradesh Team in Running Hand Touch (N = 12)

S. No.	Variables	Coefficient of Correlation "r"
1.	Ankle Joint (Left)	-0.151
2.	Ankle Joint (Right)	-0.127
3.	Knee Joint (Left)	0.070
4.	Knee Joint (Right)	-0.069
5.	Hip Joint (Left)	0.195
6.	Hip Joint (Right)	0.287
7.	Shoulder Joint (Left)	-0.206
8.	Shoulder Joint (Right)	-0.126
9.	Elbow Joint (Left)	-0.100
10.	Elbow Joint (Right)	-0.053
11.	Wrist Joint (Left)	------
12.	Wrist Joint (Right)	-0.407

As shown in Table 4.2 that the values of coefficient of correlation incase of all the selected kinematic variables with the Uttar Pradesh national Team were found insignificant at the selected level of significance of 0.05. Since the required value of coefficient of correlation for 10 degree of freedom is 0.658 and the obtained values of coefficient of correlation of selected variables less than the required value. The correlation could not be calculated with the left wrist joint because the variable was constant incase of every subject. The correlations might have been insignificant because of the independent calculation but they must have a cumulative effect on the performance.

The score of each independent angular kinemtaic variable was correlated with the performance of subjects in Running hand touch of the Punjab national Team. The relationship of selected angular kinematic variables at the moment contact with the performance in Running hand touch as presented in Table 4.3.

Table 4.3: Relationship of Selected Angular Kinematical Variables at Moment Release with the Performance of Punjab Team in Running Hand Touch (N = 12)

S. No.	Variables	Coefficient of Correlation "r"
1.	Ankle Joint (Left)	-0.208
2.	Ankle Joint (Right)	-0.274
3.	Knee Joint (Left)	-0.384
4.	Knee Joint (Right)	-0.267
5.	Hip Joint (Left)	-0.323
6.	Hip Joint (Right)	-0.402
7.	Shoulder Joint (Left)	0.553
8.	Shoulder Joint (Right)	-0.318
9.	Elbow Joint (Left)	-0.437
10.	Elbow Joint (Right)	-0.551
11.	Wrist Joint (Left)	-----
12.	Wrist Joint (Right)	0.033

As shown in Table 4.3 that the values of coefficient of correlation incase of all the selected kinematic variables with the Punjab national Team were found insignificant at the selected level of significance of 0.05. Since the required value of coefficient of correlation for 10 degree of freedom is 0.658 and the obtained values of coefficient of correlation of selected variables less than the required value. The correlation could not be calculated with the left wrist joint because the variable was constant incase of every subject. The correlations might have been insignificant because of the independent calculation but they must have a cumulative effect on the performance.

The score of each independent angular kinemtaic variable was correlated with the performance of subjects in Running hand touch of the Maharashtra national Team. The relationship of selected angular kinematic variables at the moment contact with the performance in Running hand touch as presented in Table 4.4.

Table 4.4: Relationship of Selected Angular Kinematical Variables at Moment Release with the Performance of Maharashtra Team in Running Hand Touch (N = 12)

S. No.	Variables	Coefficient of Correlation "r"
1.	Ankle Joint (Left)	-0.542
2.	Ankle Joint (Right)	0.384
3.	Knee Joint (Left)	0.046
4.	Knee Joint (Right)	-0.284
5.	Hip Joint (Left)	0.113
6.	Hip Joint (Right)	-0.034
7.	Shoulder Joint (Left)	-0.847
8.	Shoulder Joint (Right)	0.605
9.	Elbow Joint (Left)	0.065
10.	Elbow Joint (Right)	0.555
11.	Wrist Joint (Left)	-----
12.	Wrist Joint (Right)	0.056

As shown in Table 4.4 that the values of coefficient of correlation incase of all the selected kinematic variables with the Maharashtra national Team were found insignificant at the selected level of significance of 0.05. Since the required value of coefficient of correlation for 10 degree of freedom is 0.658 and the obtained values of coefficient of correlation of selected variables less than the required value. The correlation could not be calculated with the left wrist joint because the variable was constant incase of every subject. The correlations might have been insignificant because of the independent calculation but they must have a cumulative effect on the performance.

The score of the single linear kinemtaic variable was correlated with the performance of subjects in Running hand touch of the Punjab national Team. The relationship of selected angular kinematic variables at the moment contact with the performance in Running hand touch as presented in Table 4.5.

Table 4.5: Relationship of Selected Linear Kinematic Variables at Moment Contact with the Performance of Delhi Nationalteam in Running Hand Touch

S. No.	Variables	Coefficient of Correlation "r"
1.	Height of Centre of Gravity (Moment contact)	-0.172

As shown in Table 4.5 that the values of coefficient of correlation incase of the selected linear kinematic variable (Height of Center of Gravity) with the Delhi national Team were found insignificant at the selected level of significance of 0.05. Since the required value of coefficient of correlation for 10 degree of freedom is 0.658 and the obtained values of coefficient of correlation of selected variables less than the required value. This trend does not mean that height of center of gravity does not play any important role in executing the Running hand touch but the low value of correlation must have been because of the small sample size and the low value of the height of center of gravity at moment contact.

The score of the single linear kinemtaic variable was correlated with the performance of subjects in Running hand touch of the Haryana national Team. The relationship of selected angular kinematic variables at the moment contact with the performance in Running hand touch as presented in Table 4.6.

Table 4.6: Relationship of Selected Linear Kinematic Variables at Moment Contact with the Performance of Uttar Pradesh National Team in Running Hand Touch

S. No.	Variables	Coefficient of Correlation "r"
1.	Height of Centre of Gravity (Moment contact)	0.304

As shown in Table 4.6 that the values of coefficient of correlation incase of the selected linear kinematic variable (Height of Center of Gravity) with the Uttar Pradesh national Team was found insignificant at the selected level of significance of 0.05. Since the required value of coefficient of correlation for 10 degree of freedom is 0.658 and the obtained values of coefficient of correlation of selected variables less than the required value. This trend does not mean that height of center of gravity does not play any important role in executing the Running hand touch but the low value of correlation must have been because of the small sample size and the low value of the height of center of gravity at moment contact.

The score of the single linear kinemtaic variable was correlated with the performance of subjects in Running hand touch of the Punjab national Team. The relationship of selected angular kinematic variables at the moment contact with the performance in Running hand touch as presented in Table 4.7.

Table 4.7: Relationship of Selected Linear Kinematic Variables at Moment Contact with the Performance of Punjab National Team in Running Hand Touch

S. No.	Variables	Coefficient of Correlation "r"
1.	Height of Centre of Gravity (Moment contact)	-0.161

As shown in Table 4.7 that the values of coefficient of correlation incase of the selected linear kinematic variable (Height of Center of Gravity) with the Punjab national Team was found insignificant at the selected level of significance of 0.05. Since the required value of coefficient of correlation for 10 degree of freedom is 0.658 and the obtained values of coefficient of correlation of selected variables less than the required value. This trend does not mean that height of center of gravity does not play any important role in executing the Running hand touch but the low value of correlation must have been because of the small sample size and the low value of the height of center of gravity at moment contact.

The score of the single linear kinemtaic variable was correlated with the performance of subjects in Running hand touch of the Karnataka national Team. The relationship of selected angular kinematic variables at the moment contact with the performance in Running hand touch as presented in Table 4.8.

Table 4.8: Relationship of Selected Linear Kinematic Variables at Moment Contact with the Performance of Maharashtra National Team in Running Hand Touch

S. No.	Variables	Coefficient of Correlation "r"
1.	Height of Centre of Gravity (Moment contact)	0.019

As shown in Table 4.8 that the values of coefficient of correlation incase of the selected linear kinematic variable (Height of Center of Gravity) with the Maharashtra national Team was found insignificant at the selected level of significance of 0.05. Since the required value of coefficient of correlation for 10 degree of freedom is 0.658 and the obtained values of coefficient of correlation of selected variables less than the required value. This trend does not mean that height of center of gravity does not play any important role in executing the Running hand touch but the low value of correlation must have been because of the small sample size and the low value of the height of center of gravity at moment contact.

The score of each independent anthropometric variable was correlated with the performance of subjects in Running hand touch of the Delhi national Team as the anthropometric and body characteristics play a vital role in executing any skill in kabbadi Running hand touch being no difference.

9. CONCLUSION

1. None of the selected angular kinematic variables that are Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Right and Left), and Hip Joint (Left and Right) showed relationship with the performance of Delhi Team in Running hand touch.
2. None of the selected angular kinematic variables that are Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Right and Left), and Hip Joint (Left and Right) showed relationship with the performance of Uttar Pradesh Team in Running hand touch.
3. None of the selected angular kinematic variables that is Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Right and Left), and Hip Joint (Left and Right) showed relationship with the performance of Punjab Team in Running hand touch.
4. None of the selected angular kinematic variables that are Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Right and Left), and Hip Joint (Left and Right) showed relationship with the performance of MaharashtraTeam in Running hand touch.

5. DISCUSSION OF HYPOTHESIS

It was hypothesized that there may not be significant relationship between kinematic variables and performance of Kabbadi players in Running hand touch. This hypothesis may be accepted none of the variables did not show any relationship with the performance of kabbadi players in Running hand touch.

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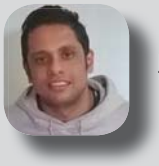

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Comparative Trend of the Effects of Four Verities of Bhastrika Pranayama on BMI of Middle Age People

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Abstract:
The objective of the study was to find out the comparative trend of the effects of four different variations of Bhastrika Pranayama on BMI of middle age people. Hundred middle age people, with age ranging between 45 to 55 years were randomly selected as subjects from Gwalior. All subjects were, randomly divided into four experimental group (A, B, C & D) and one control group (E), each consisting of 20 subjects. The experimental treatments were also randomly assigned to the groups. The groups A, B, C and D were treated as experimental groups and were given training programmes of Bhastrika Pranayama with different variation. The Group E served as a control group and continued participating in the normal programme. For the study, variation of split plot design, which consisted four experimental groups (20 students in each group) and one control group (n=20) was used. Equal numbers of subjects were assigned randomly to the groups. Four groups (BP-V1, BP- V2, BP-V3 and BP-V4) served as experimental groups on which treatments were assigned and fifth group served as the control group. In split plot design level of A (Groups) are randomized over blocks and within each block levels of B (Observations) are randomized. In the present study other than the fact that level of B was not randomized. Bhastrika pranayama was treated as independent variable and BMI was treated as dependent variable. For the purpose of the study four varieties of Bhastrika pranayama was included. The experimental treatments were given for approx thirty to thirty five minutes daily of the four varieties of Bhastrika Pranayama respectively 4 days per week for 12 weeks under the proper supervision and guidance of the scholar while placebo was given to the control group. To find out the trend of the effect of four varieties of bhastrika pranayama on BMI, to find out the linear trend of the effect of four varieties of bhastrika pranayama on BMI, to find out the quadratic trend of the effect of four varieties of bhastrika pranayama on BMI, to find out the cubic trend of the effect of four varieties of bhastrika pranayama on BMI trend analysis with multiple treatments was used at .05 level of Significance. Significant difference between measures of performance for five treatments (significant trend for treatments) was found. Significant difference between trials (significant trend for trials) was found. Interactions between trials and treatments were found. Linear component for overall trend was found significant. Quadratic component for overall trend was found insignificant. Cubic component for overall trend was found significant. Linear components of the trends for the five treatments groups were found significant. Quadratic components of the trends for the five treatments groups were found significant.Cubic components of the trends for the five treatments groups were found significant.

1. INTRODUCTION

Pranayama practices establish a healthy body by removing blockages in the paranamaya kosha, enabling an increased absorption of prana. Pranayama establish control over the flow of prana calming the mind and controlling

the thought process. Once the mind has been stilled and prana flows freely in the nadis and chakras, the door way to the evolution of consciousness opens, leading the aspirant into higher dimensions of spiritual experience **(Saraswati, 2008).** In the science of pranayama Swami Sivananda writes, "there is an intimate connection between the breath, nerve currents and control of the inner prana or vital forces. Prana becomes visible on the physical plane as motion and action and on the mental plane as thought. Pranayama is the means by which a yogi tries to realize within his individual body the whole cosmic nature and attempts to attain perfection by attaining all the powers of the universe **(Saraswati, 2008).** Pranayama removes the poisonous substances from the body and makes it healthy and strong. Through control of breath, one can have control over life currents (**Atmanand, 2009).** Bhastrika Pranayam in Yoga is said to be a type of breathing exercise. An individual practicing this pranayam will be filled with energy and power. This is also known as the Bellows Breath since it is known to be mimicking as a working bellow used to flame a fire. While performing Bhastrika Pranayam a person pumps air or prana (life force or breath) vigorously throughout the entire system (**Saraswati, 2008).**

2. OBJECTIVE OF THE STUDY

The objective of the study was to find out the comparative trend of the effects of four different variations of Bhastrika Pranayama on BMI of middle age people.

3. METHODOLOGY

3.1. Subjects

Hundred middle age people, with age ranging between 45 to 55 years were randomly selected as subjects from Gwalior. All subjects were, randomly divided into four experimental group (A, B, C & D) and one control group (E), each consisting of 20 subjects. The experimental treatments were also randomly assigned to the groups. The groups A, B, C and D were treated as experimental groups and were given training programmes of Bhastrika Pranayama with different variation. The Group E served as a control group and continued participating in the normal programme.

3.2. Description of Four Verities of Bhastrika Pranayama

1. First Variety of Bhastrika Pranayama (Kpalbhati Plus Ujjai). In this glottis not partially closed during purak and rechek). Sequence is as per given in tabular form below:

Start	Purak	Kumbhak	Rechek
Kapalbhati	Both Nostrals	Jalandhar Bandh	Left Nostril

2. Second Variety of Bhastrika Pranayama (Kpalbhati plus Surya Bheden). In this glottis partially closed during purak and rechek). Sequence is as per given in tabular form below:

Start	Purak	Kumbhak	Rechek
Kapalbhati	Right Nostril	Jalandhar Bandh	Left Nostril

3. Third Variety of Bhastrika Pranayama. Sequence is as per given in tabular form below:

Start	Purak	Kumbhak	Rechek
Kapalbathi with right Nostril	Right Nostril	Jalandhar Bandh	Left Nostril
Again Kapalbhati With left Nostril	Left Nostril	Jalandhar Bandh	Right Nostril

4. Fourth Variety of Bhastrika Pranayama. Sequence is as per given in tabular form below:

Start	Purak	Kumbhak	Rechek
Kapalbathi (inhalation with Right Nostril and exhalation with left nostril	Right Nostril	Jalandhar Bandh	Left Nostril
Kapalbathi (inhalation with Left Nostril and exhalation with Right nostril	Left Nostril	Jalandhar Bandh	Right Nostril

5. STUDY DESIGN

For the study, variation of split plot design, which consisted four experimental groups (20 students in each group) and one control group (n=20) was used. Equal numbers of subjects were assigned randomly to the groups. Four groups (BP-V1, BP- V2, BP-V3 and BP-V4) served as experimental groups on which treatments were assigned and fifth group served as the control group. In split plot design level of A (Groups) are randomized over blocks and within each block levels of B (Observations) are randomized. In the present study other than the fact that level of B was not randomized. Bhastrika pranayama was treated as independent variable and BMI was treated as dependent variable. For the purpose of the study four varieties of Bhastrika pranayama was included. The experimental treatments were given for approx thirty to thirty five minutes daily of the four varieties of Bhastrika Pranayama respectively 4 days per week for 12 weeks under the proper supervision and guidance of the scholar while placebo was given to the control group.

4.1 Treatment Schedule

Weeks	Schedule			
	Bhastrika Pranayama Variety I	**Bhastrika Pranayama Variety II**	**Bhastrika Pranayama Variety III**	**Bhastrika Pranayama Variety IV**
First 4 weeks	Yogic Warm-up Asanas	Yogic Warm-up Asanas	Yogic Warm-up Asanas	Yogic Warm-up Asanas
	(5 rep. X 4 sets)	(5 rep. X 4 sets)	(5 rep. X 4 sets)	(5 rep. X 4 sets)
	Relaxation Asanas	Relaxation Asanas	Relaxation Asanas	Relaxation Asanas
Same schedule was followed for this week				
5th to 8th week	Yogic Warm-up Asanas	Yogic Warm-up Asanas	Yogic Warm-up Asanas	Yogic Warm-up Asanas
	(8 rep. X 4 sets)	(8 rep. X 4 sets)	(8 rep. X 4 sets)	(8 rep. X 4 sets)
	Relaxation Asanas	Relaxation Asanas	Relaxation Asanas	Relaxation Asanas
Same schedule was followed for this week				
9th to 12th week	Yogic Warm-up Asanas	Yogic Warm-up Asanas	Yogic Warm-up Asanas	Yogic Warm-up Asanas
	(10 rep. X 4 sets)	(10 rep. X 4 sets)	(10 rep. X 4 sets)	(10 rep. X 4 sets)
	Relaxation Asanas	Relaxation Asanas	Relaxation Asanas	Relaxation Asanas

6. STATISTICAL TECHNIQUE

To find out the trend of the effect of four varieties of bhastrika pranayama on BMI, to find out the linear trend of the effect of four varieties of bhastrika pranayama on BMI, to find out the quadratic trend of the effect of four varieties of bhastrika pranayama on BMI, to find out the cubic trend of the effect of four varieties of bhastrika pranayama on BMI trend analysis with multiple treatments was used at .05 level of Significance.

7. FINDINGS

6.1. Trend Analysis (Trial Means with different treatments)

Table 1: Significant Difference between Measures of Performance for Five Treatments (Significant Trend for Treatments)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Treatment (Factor)	180.334	4	45.084	19.42*	.000
Error	220.474	95	2.321		

*Significant at .05 level

F-Value required to be significant at 4, 95 df = 2.46

It is evident from table 1 that the five treatment means (Bhastrika 1, Bhastrika 2, Bhastrika 3, Bhastrika 4 & control group) differ significantly since F value of 19.426 was found higher than the required value with 4,95 df at .05 level of significance.

Table 2: Significant Difference between Four Trials (Significant Trend for Trials)

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Factor 1	279.380	3	93.127	107.042*	.000
Error (factor1)	24.842	285	.087		

*Significant at .05 level

F-Value required to be significant at 3,285 df = 2.62

Table 2 revealed that the four trials means (T1,T2,T3,T4) was found significantly since F value of 1.068 was found higher than the required value with 3,285 df at .05 level of significance.

Table 3: Interaction between Trials and Treatments

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Factor1 * Treatments	101.123	12	8.427	96.678*	.000
Error (Factor1)	24.842	285	.087		

*Significant at .05 level

F-Value required to be significant at 12,285 df = 1.78

It is revealed that interaction between trials and treatments was found significant since F value of 96.678 was found higher than the required value with 12,285 df at .05 level of significance.

Table 4: Linear, Quadratic and Cubic Component for Overall Trend

Source	Factor1	Type III Sum of Squares	Df	Mean Square	F	Sig.
Factor1	Linear	279.087	1	279.087	1567.90*	.000
	Quadratic	.046	1	.046	.873	.352
	Cubic	.248	1	.248	7.863*	.006
Error (factor1)	Linear	16.887	95	.178		
	Quadratic	4.958	95	.052		
	Cubic	2.996	95	.032		

*Significant at .05 level

F-Value required to be significant at 1, 95 df = 3.94

8. LINEAR COMPONENT

Table 4 revealed that linear component for overall trend was found significant since F value 1.570 was found higher than the required value with 1,95 df at .05 level of significance.

9. QUADRATIC COMPONENT

Table 4 also revealed that quadratic component for overall trend was found insignificant since F value .873 was found lower than the required value with 1,95 df at .05 level of significance.

10. CUBIC COMPONENT

Table 4 also revealed that cubic component for overall trend was found significant since F value 7.863 was found higher than the required value with 1,95 df at .05 level of significance.

Table 5: Linear, Quadratic and Cubic Components of the Group X Trial Interaction (Differences among the Linear, Quadratic and Cubic Components of the Trends for the Treatments Groups)

Source	factor1	Type III Sum of Squares	Df	Mean Square	F	Sig.
Factor1 * Treatments	Linear	97.176	4	24.294	136.66*	.000
	Quadratic	3.351	4	.838	16.05*	.000
	Cubic	.596	4	.149	4.72*	.002
Error (Factor 1)	Linear	16.887	95	.178		
	Quadratic	4.958	95	.052		
	Cubic	2.996	95	.032		

*Significant at .05 level

F-Value required to be significant at 4,95 df = 2.46

9.1. Linear Components of the Trends for the Treatment Groups

Table 5 revealed that linear components of the trends for the five treatments groups was found significant since the F value of 136.667 was found higher than the required value with 4,95 df at .05 level of significance.

9.2. Quadratic Components of the Trends for the Treatment Groups

Table 5 also revealed that quadratic components of the trends for the five treatments groups was found significant since the F value of 16.052 was found higher than the required value with 4,95 df at .05 level of significance.

9.3. Cubic Components of the Trends for the Treatment Groups

Table 5 also revealed that cubic components of the trends for the five treatments groups was found significant since the F value of 4.724 was found higher than the required value with 4,95 df at .05 level of significance.

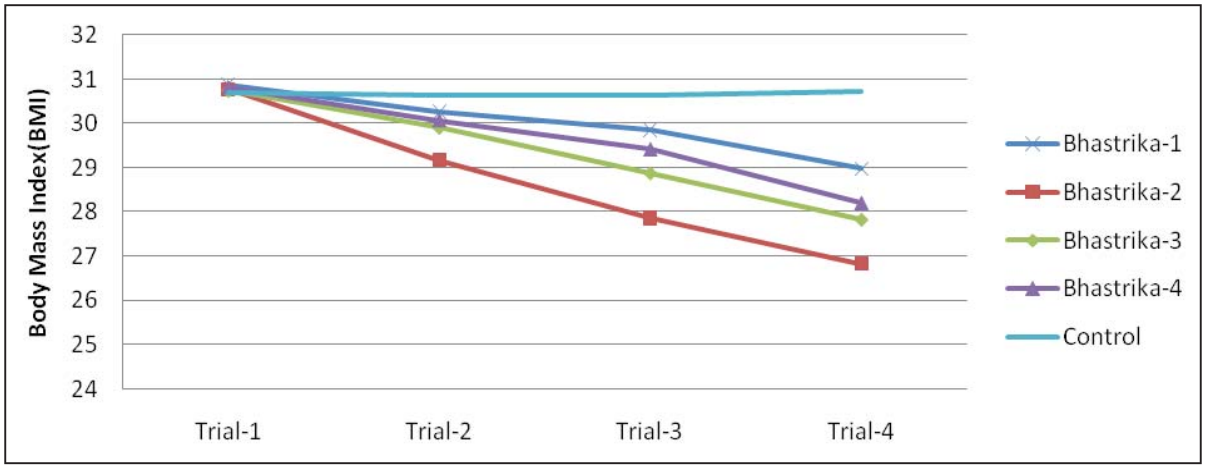

Figure 1: Trend for the Effect of Four Experimental and Control Group in Four Successive Trials in Relation to Body Mass Index (BMI)

11.DISCUSSION OF FINDINGS

Various studies have been conducted on different types of effects on yoga especially of pranayama. There is a need to specify the effects pertaining to a particular variety of pranayama. Another important need is to find out the durational effect along with the trend of effect. **Morris (2008)** conducted a study on the topic "An evaluation of yoga for the reduction of fall risk factors in older adults". He found that there were yoga and balance training

may have potential as an intervention for improving physiological and psychological fall risk factors among older adults. Results of the present study reveal that changes in BMI due to different varieties of pranayama are not of same nature. Results also reveal that change in BMI is not only in a early phase of practice but lasts long.

12. CONCLUSION

1. Significant difference between measures of performance for five treatments (significant trend for treatments) was found.
2. Significant difference between trials (significant trend for trials) was found.
3. Interactions between trials and treatments were found.
4. Linear component for overall trend was found significant.
5. Quadratic component for overall trend was found insignificant.
6. Cubic component for overall trend was found significant.
7. Linear components of the trends for the five treatments groups were found significant.
8. Quadratic components of the trends for the five treatments groups were found significant.
9. Cubic components of the trends for the five treatments groups were found significant.

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Effect of Kapalbhati on Reaction Ability of Cricketers

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Abstract:

The purpose of the study was to find out the effect of Kapalbhati of Yoga on Reaction ability in Cricket. Kapalbhati was considered as independent variable and reaction ability was considered as dependent variable. Reaction ability was measured by the ball reaction exercise test and was recorded in centimetres. The random group design was used for the study. Two groups were made, each comprising of Twenty subjects. These subjects participated voluntarily in the study. The subjects who leared and practiced Kapalbhati were kept in the experimental group (N=20) and the other subjects were kept in control group (N=20). The data collected on Reaction Ability viz. Pre-test and post-test were subjected to following statistical analysis to find out effect of treatment for the experimental group. The pre and post test after two months (eight weeks) of treatment were subjected to ANCOVA to analyse the effect of Kapalbhati on Reaction Ability in cricket at 0.05 level of significance. Further graphical presentation was also made for ready reference comparison and mean values were highlighted in each parameter with respect to pre and post test. It was concluded that, since Kapalbhati is beneficial in improving Reaction ability of Cricketers, it is recommended for the training programme of cricketers.

1. INTRODUCTION

The word Kapalbhati in derived from two words meaning "To clean the Skull on shining skull". It in intended to clean the nostrils the ears and the other air ducts in the head. "Cleaning of all the Nerves of the head in called Kapal Bhati." The word Kapalbhati is a Compound consisting of two members Kapal and Bhati. In Sanskrit Kapal means the skull and Bhati is derived from Sanskrit root meaning is to shine. Hence Kapalbhati is an exercise tha makes the skull shining. It is one of the six cleansing processes know in Hath Yoga Shat Kriyas and is intended to clean the nasal passage of the respiratory system. It is the process of continuous active forceful exhalation and passive inhalation. It effects the functions of heart and lungs.

2. OBJECTIVE OF THE STUDY

The purpose of the study was to find out the effect of Kapalbhati of Yoga on Reaction ability in Cricket.

3. METHODOLOGY

Variables

Kapalbhati was considered as independent variable and reaction ability was considered as dependent variable.

Measures

Reaction ability was measured by the ball reaction exercise test and was recorded in centimetres.

Subjects and Design of the Study

The random group design was used for the study. Two groups were made, each comprising of twenty subjects. These subjects participated voluntarily in the study. The subjects who learned and practice Kapalbhati were kept in the experimental group (N=20) and the other subject were kept in control group (N=20).

		N=40	0 week	8 weeks
Groups (G)	A (control)	20	*s1* *s2* . . *s20*	*s1* *s2* . . *s20*
	B (Experimental)	20	*s1* *s2* . . *s20*	*s1* *s2* . . *s20*

4. STATISTICAL TECHNIQUE FOR THE ANALYSIS OF DATA

The data collected on all the parameters viz. Pre-test and post-test were subjected to following statistical analysis to find out effect of treatment for the experimental group. The pre and post test after two months (eight weeks) of treatment were subjected to ANCOVA to analyze the effect of Kapalbhati on Reaction Ability in cricket at 0.05 level of significance. Further graphical presentation was also made for ready reference comparison and mean values were highlighted in each parameter with respect to pre and post test.

5. FINDINGS

Table 1: Descriptive Statistics of Pre-Test and Post-Test of Experimental Group and Control Group in Reaction Ability

Groups	Observation	M	S. D	N
Experimental group	Pre – test	92.7000	8.16346	20
	Post – test	87.5500	4.35860	20
Control group	Pre – test	92.0500	7.85041	20
	Post – test	91.3500	6.64336	20

Above table includes mean (M) and standard deviation (SD) of reaction ability in the both observations i.e. on pre-test and post-test of experimental group and control group. Above table also indicates that the experimental group post – test mean value (87.55) was lower than pre–teat mean value (92.70). In control group post – test mean value (91.35) was lower than pre–test mean value (92.05).

Table 2: Analysis of Co-Variance of Comparison of Adjusted Post Test Means of Experimental Group and Control Group of Reaction Ability

Source	Type III Sum of Squares	df	Mean Square	F	P-value
Pre	729.030	1	729.030	57.334	.000
Groups	172.383	1	172.383	13.557	.001
Error	470.470	37	12.715		
Total	321396.000	40			
Corrected Total	1343.900	39			

*p value < 0.05 is significant

Above table shows that there was a significant effect of training on reaction ability as the p-value was 0.00 which was less than 0.05. It also shows that there was significant difference between experimental and control group during pre – teat as the p-value was 0.001 which was less than 0.05.

Since, the analysis of covariance for Reaction ability was found significant difference between experimental group and control group. Therefore post hoc comparison LSD test was applied

Table 3: Post Hoc Comparisons of Adjusted Post Test Means of Experimental and Control Group of Reaction Ability

(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	P-value	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
Experimental	Control	-4.156*	1.129	.001	-6.442	-1.869
Control	Experimental	4.156*	1.129	.001	1.869	6.442

*p value < 0.05 is significant

Above table indicates that there was significant difference between experimental group and control group as the p-value was 0.001 which was less than 0.05.

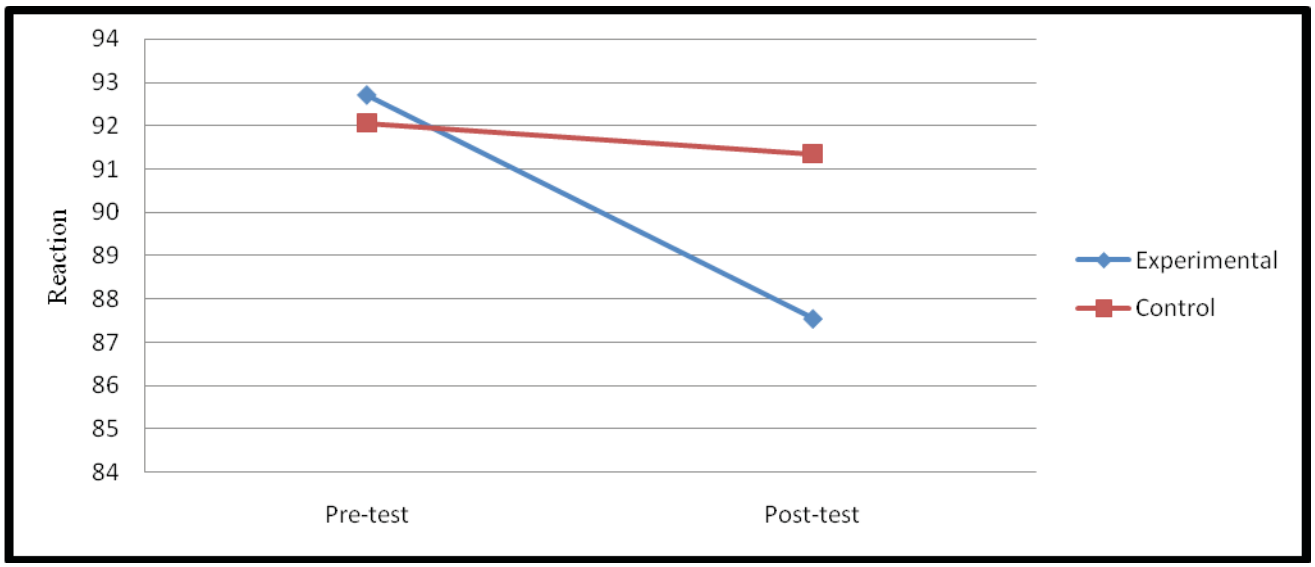

Fig. 1: Graphical representation of Pre-Test and Post-Test of Experimental Group and Control Group of Reaction Ability

6. CONCLUSION AND RECOMMENDATION

It was concluded that, since Kapalbhati is beneficial in improving Reaction ability of Cricketers, it is recommended for the training programme of cricketers.

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