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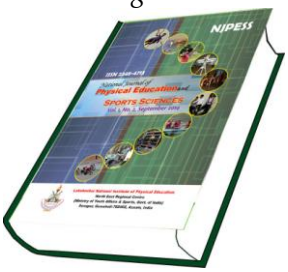

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Editorial

Epicenter Voyage of a Myth Institute-Lakshmibai National Institute of Physical Education
North East Regional Center

Lakshmibai National Institute of Physical Education, NERCis amongst the most admired centers of world-class education to foster academic excellence, physical fitness and research in sports committed to helping scholars, researchers and sports scientist leap into the 21st century. The present endeavor is a tribute to the holy symbol of Lakshmibai National Institute of Physical Education, NERC as the same was long precious aspiration. The journal shall symbolically signify the essence of quality research thereby appropriate in the ambition of the institute. The journal shall offer a much desired platform to publish quality research being undertaken in the whole world on the area in question. The journal shall bring the academicians and researchers from all over the globe to share their accumulated experiences and perceptions in order to realize new scientific and original innovation focused on aspects of the sports sciences and sports performance.

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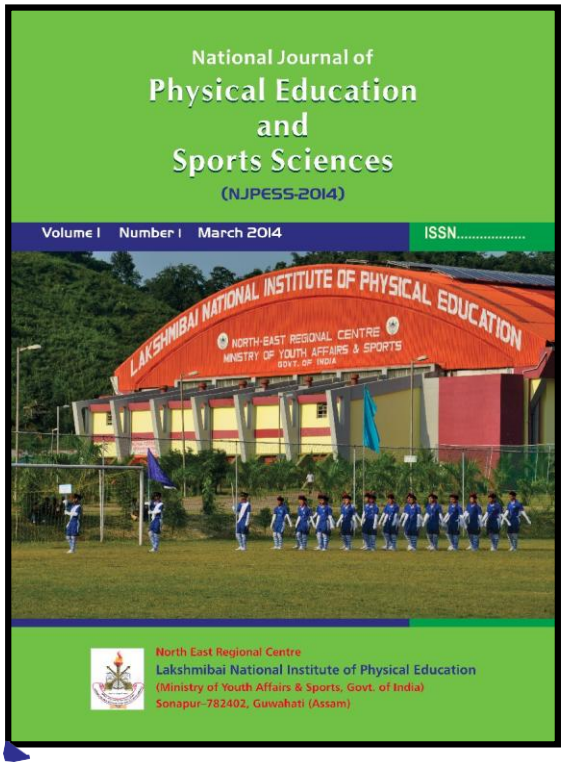

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Peer Reviewed Research Article

Analysis of Achievement Motivation among Men Handball Players

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ABSTRACT

Achievement motivation is an effective arousal state directing behavior in an achievement oriented activity cognitively appraised as potentially satisfying. The purpose of the study was to analyze the level of Achievement motivation among men handball players. 48 men handball players were selected as the subjects for the study (four universities i.e., Nagarjuna University, L.N.U.P.E., Kerela University and Osmania University and 12 subjects for each University). The sports achievement motivations test by Dr. M.L. Kamlesh was selected for this study. For the statistical analysis of data, analysis of one way ANOVA was used to compare the best four teams. The level of significance was set at 0.05. There was no significant different was found in sports achievement motivation among the all best four teams.

Keywords: *Achievement Motivation, Handball Players*

INTRODUCTION

The study of motivation is very important in understanding various factors which initiate and direct an individual's actions. Only in rare case motivation may not be a determining factor of a course of action. As a psychological concept motivation is used in explaining why some individual are more desirous to compete and win than others. It is more obvious in situation where two individuals equally skilful are challenged by a difficult task. One is showing himself more capable of achieving success than the others are explained by motive and motivational the ories. A central issue in modern sport psychology is motivation an insight into how the construct of motivation function in sports and physical activity setting is an important area of interest to sport psychologist and also has a practical relevance for coaches, teachers and parents why do some athletes train very hard while other train less hard despite the coaches extolling them to work hard? Why some athlete more persistent? Why do some drop out? Why do individual select to play certain sport to the exclusion of others? These entire questions pertain to the motivation of the individual. This warning motivation experiences examines some of the psychological mechanism underlying motivation. As we can see, motives influence decision and in turn, practice is more effective and efficient in activities, when athletes are highly motivated for this purpose. In turn it can be expected that skill will be improved and that athlete will develop more favourably in the sport of interest. But not all athletes reveal the same motive nor are they developed to the same extent. Furthermore a person can show a high achievement motive for all activity characteristic has been notified that are associated with those people who have termed high achievers. Through an analysis of their behaviour it becomes possible to formulate notion about the tanning of others who do not demonstrate these same behaviour. If we can assume that achievement demonstrated in any given situation is reflected by capabilities and motivation then we can readily reduce the importance of understanding motivation and how to improve the needs to achieve in those who are apparently poorly motivated for special activities and responsibilities.

OBJECTIVES OF THE STUDY

- To find out the analysis of achievement motivation among men handball players.

HYPOTHESIS

- It was hypothesized that there was significant analysis difference of achievement motivation of among interuniversity south west zone Handball players.

SELECTION OF SUBJECTS

48 men handball players of intervarsity level were selected as subjects for this study. Subjects were members of the best four teams of west zone intervarsity handball tournament (four universities i.e., Nagarjuna University, L.N.U.P.E., Kerela University and Osmania University and 12 subjects for each University.) from the academic year in 2009–10 held at Acharya Nagarzuna University, Guntur (Andhra Pradesh). They were from undergraduate and post-graduate courses. Their age ranged between 18–25 years.

SELECTION OF VARIABLE

The following variable was used for this study:

- Achievement motivation.

SELECTION OF QUESTIONNAIRE

The sports achievement motivations test by Dr. M.L. Kamlesh was also selected for this study. It was selected because it is a sports specific test. Further it was standardized under Indian conditions and is widely used for research in India.

RESULTS

Table 1: Descriptive Statistic of Selected Handball University on Achievement Motivation

	N	Mean	S.D	S.E	Minimum	Maximum
Nagarjuna Univ.	12	26.16	4.46	1.29	20	32
L.N.U.P.E	12	28	3.41	0.98	22	32
Kerela Univ.	12	26.66	4.45	1.28	20	32
Osmania Univ.	12	27	4.55	1.31	20	32
Total	48	26.95	4.16	0.60	20	32

Table 1 shows that mean and standard deviation of sports achievement motivation of Nagarjuna University handball team was 26.16–4.46, L.N.U.P.E handball team was 28–3.41, Kerela University handball team was 26.66–4.45, Osmania University handball team was 27–4.55.

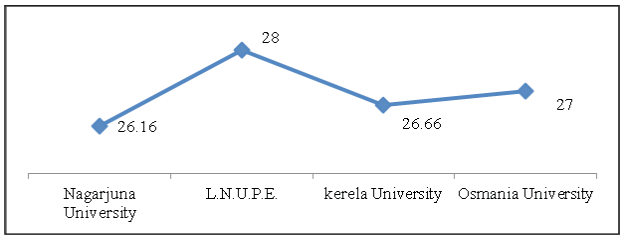

Fig. 1: Mean Value of Selected Handball University of Sports Achievement Motivation

Table 2: Analysis of Varience of Mean Difference of Sports Achievement Motivation of Four Teams of West Zone Intervarsity Level Men Handball Players

	Sum of Squares	DF	Mean Square	F	Sig
Between Group	21.58	3	7.19	0.39	0.75
Within Group	794.33	44	18.05		
Total	815.91	47			

*significant at 0.05 level (3, 44) 2.82

Table 2 reveals that calculated f value of sports achievement motivation (0.39) was lower than tabulated value (2.82) required to be significant at 0.05 level. This indicated that there was no significant difference was found in case of sports achievement motivation among selected handball university teams.

DISCUSSION

From the finding it was also evident that achievement motivation levels of male handball players of South west zone inter university was not found significant difference among all the selected four teams.tis might be attributed the fact that all the selected handball team were highly motivated to achieve the place in SOUTH west zone inter university handball tournament.

CONCLUSION

It was also evident that there was no significant different was found in sports achievement motivation among the all best four teams.

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Peer Reviewed Research Article

Personal & Social Development through Adventure & Outdoor Sports

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ABSTRACT

Adventure is nature's own workshop to repair our body & mind. Adventure sports also help develop leadership qualities & character traits. It is one of the most important training grounds for developing self–confidence, spirit of camaraderie, emotional stability & sense of responsibility. In the past, learning was focused on the three "Rs" whereas the present emphasis is on the three "Hs" i.e., HEAD, HEART AND HAND. It has been realized that, the head, the heart and the hand get the best training in self-sustaining activities like the adventure sports. Adventure sports play a valuable role in moulding the character of the youths, making them self-confident, courageous and disciplined citizens.

INTRODUCTION

Games & Sports play a very important role in the life of people through the ages. Physical excellence of the individuals is considered a valuable gift. Through the ages people all over the world cherish to attain good health and fitness apart from other attainments. A very significant input of sports is it gives joy to the sportsman and the sports lovers. This is the two fold effects of sports. Peoples in different walk of life, invariably enjoy with indoor and outdoor games. The history of Games & Sports traces back from very early stage of human civilization and its has played a vital role in the development of personal and social life of people.

The present paper is an attempt to highlight the role of sports in the personal and social development through adventure & outdoor sports. We know that there are many ways through which personal and social development through adventure & outdoor games can be achieved. Sports can be employed to help achieve the stipulated target at different levels. We can examine certain points in support of the theme. Positive personal and social development can be won through adventure and outdoor games.

The history of Olympic Games proved that the spirit of Games and Sports was rooted early in human mind. People in the past adored physical excellence in the form of games & sports. One of the proofs of this is indicated by the organization of Olympic Games. The ancient Olympic Games were held at Olympia on the border between Greece & Macedonia. It is believed that the games began in 776 B.C. and were held every four years. After the subjugation of Greece by Rome, the Games declined and in A.D. 342 the Olympics were banned by Emperor Theodosius I. The Olympic Games were revived in 1896 when the first modern Olympic Games were held in Athens. The modern Olympic Games have been revived through the efforts of a French scholar, Pierre de Coubertin. The modern Olympic Games have been held every four years since 1896 except during 1st & 2nd World War.

Baron Pierre de Coubertin's advice to all Olympic athletes was the important thing in these Olympics is not so much winning as taking part. The important thing in life is not victory but the battle. The essential thing is not to have conquered but to face a good looser.

The Olympic motto–Citius, Altius & Fortius (Latin word meaning–swifter, higher & stronger) suggest the real spirits of games & sports. The motto was introduced in 1924 at the Olympic Games at Paris.

Development of Sports is clearly integrated with our education system. Our education takes care of the health of the citizens as much as it takes care of the intellectual development. It is evolved as a twin process. Sport is to be streamlining with health and physical education. Without good health and physical fitness sportsman cannot expose the best talent in them.

Adventure & outdoor games have strong impacts on the personal and social development of individuals.

Man is a social animal. He lives in the society and does his part as a member of the society. The history of man develops gradually. It is obvious that there has been continuous inflow of interaction between man and his society. As a result of this different human activities grew up with competitive the spirits. The society admits and encourages the competitive activities in the form of games and sports right from the primitive stage and it has been handed down to the generations. Individual skills and outstanding achievements and appreciated and awarded with social recognition. This is about the origin of games and sports. Game spirits has been injected to the participants at large. Traditional Games of different communities grew out of this cultural and social habit. This perhaps, is the foundation of modern games developed on primitive heritage.

What is Adventure Sports

"Unusual or exciting experience"

These adventure activities often involve speed, height, a high level of physical exertion, and high specialized gear or spectacular stunts. These adventure sports can be competitive or non competitive and often involve individual participants rather than teams. The high danger associated with the activities places the participants at high risk for injury and or death in the case of an accident or mistake.

Types of Adventure Sports

Adventure sports can be broadly divided into three groups

Terrestrial (Land) Adventure Sports

Terrestrial adventure sports comprises several adrenaline pumping activities such as Alpine sports above the snow line, mountaineering, rock climbing, high altitude trekking, snow skiing among others. It is ideally suitable in the high altitude areas. The lower altitude region can play host to several terrestrial sports, including bungee jumping, natural rock climbing, artificial climbing (sport climbing), mountain biking, cycle safari, jungle safari, slithering etc.

Aero (Air) Adventure Sports

These sports involve throwing your body into the air at an extremely high elevation. There are several aero sports that can be organized in anytime. Several areas are fit for parasailing, paragliding, hang gliding, skydiving, gliding, hot air ballooning, micro light flying, power gliding, base jumping & Para jumping etc. There are number of disused and partially used airfields as well. These airfields—are the ideal places for the promotion of aero adventure sports. Paragliding can also be developed easily in many places. With some efforts, these areas can be transformed into the most happening site, some of the sites are suitable for more than one activities.

Aquatic (Water) Adventure Sports

These categories are based on the relation of the sports to the water. Water sports could be equally and perhaps even be more challenging. White water rafting, sailing, canoeing, Kayaking, surfing soft water adventure sports like water skiing, Bare foot water skiing, wind surfing, speed boat, parasailing, sailing, scuba diving, snorkeling, jet skiing and others.

Activities relating to Adventure Sports and outdoor sports are essential components of human resource development, helping to promote good health, comradeship and a spirit of friendly competition. Adventure sports provide a fertile ground for leadership training. All group oriented adventure sports require effective leadership in order to succeed. The quality of leadership for a group working under physical & mental stress, challenging the forces of nature has to be top class. Interestingly, adventure sports require and at the same time produce such top quality leadership. This, in turn, has positive impact on the overall development of personality of the youth.

Excellence in Adventure sports enhances the sense of achievement, national pride and patriotism. Adventure Sports also provide beneficial recreation, improve productivity and foster social harmony and discipline.

The object of the adventure is to stimulate a spirit of Adventure, to reveal and develop sturdier qualities of character, both physical and mental, to instill a sense of comradeship, discipline, selflessness, service to the community, self reliance, physical fitness and the ability to think and live adventurously.

Now, a day's meaning of adventure is still wandering. Gradually adventure activities were entered to India during the late 60s.

Let us introspect about the present situation of country. Just imagine the anxiety of our teenager those are living in the rural & urban areas. What they want to achieve and what they have achieved. Most of them are ambitious but due to absence of proper guidance and lack of endurance many of them shun away from their true goal of life.

Frustration from the parents, friends, society and intimates they are taking quick decision to ruin himself or herself. To solve such problems we need empowered them the following quality: such as Endurance, Excellent, Courage and Fraternity.

After achieving such type of quality they never defeat in their life and we can create a new generation for a better nation tomorrow. Only thing is such type of quality could achieve through Adventure Course and other outdoor activities. Biking and touring from one corner to another corner is not an adventure. Seeing adventure movies, reading adventure journal through one's internet is not an adventure. Act like an adventurer behave like an adventurer. Aim high and achieved your goal. Come out from your little world and learn from the vast lesson of this nature. One will feel fresh and feel how tiny one is when comparing to this Mother Nature.

CONCLUSION

From the above points of view: Adventure Sports & Education will be the only sources of healthy human resources of this nation.

We are the part of this nature just enjoy to live with this nature be friendly and learn a lot as we can for our future generation.

It will be a nice educational programme which can save the lives of many youths who are otherwise would be victims of drugs and other anti social elements. The future of our country is largely dependent on the quality and physical, moral and intellectual strength of its youth. If our youths with strong moral strength and sense of dedication to any noble cause for the Nation, we need not worry for our future, we need physically and mentally healthy, positive, confident, patriotic and responsible citizen for the growth of our country. This is where we find the importance of adventure sports. The promotion of adventure sports shall play a major role in molding the characters of our youths.

We can quote the immortal lines from the writings of Pandit Jawaharlal Nehru on adventure.

"And yet, adventure is always there for the adventurous and the wide world still beckons to those who have courage and spirit, and the stars hurl their challenge across the skies. Need one go to the poles or the deserts or the mountains for adventure when the adventure of life is there for all who care? What a mess we have made of this life of ours and of human society! With plenty of joy and a free development of the human spirit open to us, we yet starve in misery and have our spirits crushed in slavery worse than that of old. Let us do our bit to change this, so that human beings many become worthy of their great inheritance and make their lives full of beauty and joy and the things of the spirit. The adventure of life beckons, and it is the greatest adventure of all".

SUMMARY

From the above presentation of facts and figures, observation, it can summed up that Personal and Social development through Adventure and outdoor games has a wide scope for the lovers of games and sports all over the world. Investments in the promotion of these activities will have very good returns in human development. Adventure is an elixir of life to be tested and fostered alive for all its lovers.

If you plan for a year,
Sow paddy
If you plan for a decade,
Plant trees
If you plan for the future
Nurture youths

—A Chinese quote

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Peer Reviewed Research Article

An Emotional Intelligence among Players of Selected Team Games–Comparision

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ABSTRACT

The purpose of the study was to compare K.V.S. Dehradun region players of, volleyball, basketball, handball & soccer players in relation to their emotional intelligence. 60 male students between 15 to 18 years of age studying in Kendriya Vidyalaya. Sangathan were randomly selected as subjects for this study. The Psychological characteristics as emotional intelligence was selected as a variable for the purpose of this study. The emotional intelligence scale (E.I.S.) was develop and standardized by Anukool Hyde, Sonjyot Dethe and Upinder Dhar was selected for this study. In order to compare the emotional intelligence of the subjects the data were subjected to the analyses of variance ('F'-Test). The level of significance was set at 0.05 level. The emotional intelligence did not differ from each other among the groups. No significance difference was found among the selected team games namely basketball, soccer, handball, volleyball. Such results may be attributed to the nature of demands on the sportsman. All these selected games were team games and requires more or less similar type of emotional stability and intelligence. The task requirement were co-operation, co-ordination and group dynamics or group cohesion among the members and all the team games have similar emotional status, it comprises of same mental, emotional status and conscious effort for the games.

Keywords: *Emotional Intelligence*

INTRODUCTION

The term "Intelligence" cause from a Latin word claimed by cicero to cover all cognitive processes. It was assumed that this capacity of cognition was something inherent in human nature and possibly in animals. It was recognized that every man was born with a general cognitive capacity which was conveniently termed as intelligence. Just like the concept of energy in physics, the term intelligence is only a convenient level to designate a cognitive ability which is innate and general.

Mayer and solovery (1993) define emotional intelligence as the ability to monitor one's own and other's feeling and emotions to discriminate among them, and to use this information to guide one's thinking and action. Emotional Intelligence involves the ability to perceive accurately, appraise and express emotions; the ability to access and or generate feeling when they facilitate thought; the ability to understand emotions and emotional knowledge and intellectual growth.

The emotional intelligence comprises of the following five characteristics and abilities discussed by Goleman (1995) namely: Self awareness, Mood management, Self motivation, Empathy and Managing relationship. Hence by understanding the present investigation the author wants to find out the existence of variations among the selected subject groups.

Keeping in mind the purpose of the study it was hypothesized that there would have significant difference in emotional intelligence among players of selected team games.

METHODOLOGY

For the present study sixty male players were selected as the subject and categorized into four groups volleyball, basketball, handball, soccer, (15 in each group). The subjects were participated in Regional sports meet in their respective games for K.V.S.

CRITERION MEASURES

The criterion measure chosen for testing the hypothesis was emotional intelligence with factors self awareness,

empathy, self motivation, emotional stability, managing relation, integrity, self development, value orientation, commitment and altruistic behavior to emotional intelligence scale (E.I.S.).

RESULTS AND DISCUSSION OF FINDINGS

Findings

Table 1: Analysis of Variance of the Means of Players of Selected Team Games in Relation to Emotional Intelligence

Source of Variable	Degree of Freedom	Sum of Squares	Mean Sum of Square	F-Ratio
Between Group	3	390.45	130.15	1.1843
Within Group	56	6154.28	109.89	

* Significant at.05 level, tabulated F.05 (3, 56)=2.78

It is clearly revealed from Table 1 that there was no significant difference in the means of player of selected team games i.e. volleyball, soccer, basketball & handball in relation to emotional intelligence as obtained F-ratio was 1.1843 which was lesser than the tabulated value 2.78 required to be significant at 0.05 level with (3,56) degree of freedom.

DISCUSSION OF FINDINGS

Present study shows that all these selected games were team games and requires more or less similar type of emotional stability and intelligence. The task requirements were co-operation, co-ordination and group dynamics among the members and all the team games have similar emotional status, it comprises of same mental, emotional status and conscious effort for the games. All in games are based on group cohesion and not an individual play. It requires careful planning in terms of strategy and tactical aspects and requires equal amount of technical and tactical elements for successful participation in sports competition. So it is quite obvious that their intelligence level would be same and also the level of competition and standard of players are same that why their emotional intelligence level was same.

DISCUSSION OF HYPOTHESIS

The hypothesis stated earlier that their would be significant difference among volleyball, soccer, basketball, handball in relation to emotional intelligence is rejected because no significant difference were found among the players of these games.

CONCLUSION

On the basis of analysis and result of the study it was concluded that the selected games namely volleyball, soccer, basketball, handball were found similar type of emotional intelligence.

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Peer Reviewed Research Article

Comparative Effect of Selected Plyometric Training Programmes on Improvement of Flexibility between Untrained Male Tribal and Non-tribal School Going Students

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ABSTRACT

The purpose of the study was to investigate the comparative effect of selected plyometric training programmes on improvement of flexibility between untrained male tribal and non-trinal school going students. Participants were forty untrained male tribal and forty untrained male non-tribal students within the range of 14 to 16 years of age were randomly assigned to experimental group and control group for the study, the experimental group was based on the plyometric training programmes namely single leg hop, double leg hop, box drill, barrier hops, and stadium hops. The sit and reach test was conducted to measure flexibility and training programme consisted of ten weeks for three days a week. Analysis of covariance statistics was used to test the significant differences in the post test measures among the experimental group and control group. Post hoc analysis was used to determine which of the means were significantly different. All the hypotheses for the study were tested at 0.05 critical level. Based on the findings it was concluded that Plyometric training programmes are best to be used in developing flexibility of the upper and lower extremities.

Keywords: *School Going Students, Plyometric Training, Flexibility, Tribal and Non-tribal*

INTRODUCTION

Training represents a long term endeavor. Athletes are not developed over night and a coach cannot create miracles by cutting corners through overlooking scientific and methodical theories. Miroslav Vanek has stated "physical effort prevails in training and psychic effort prevails at competition.

Sports training is a programme of exercise designed to improve the skills and increase the energy capacities of an athlete for a particular event. These basic training procedures will serve better when utilized with modifications suited to individual or a group dealt with. The training programme should look into improving the performance of the athletes and at the same time should prevent injury from taking place.

Sports performance is not a single component. It includes strength, speed, endurance, flexibility, coordinative abilities, technique and tactics. Various forms of strength can be achieved by the scientific and systematic use of various trainings, such as plyometric training, resistance training, aerobic training, interval training, circuit training, weight training etc. Plyometric exercise is a relatively new concept of trainees that applies the scientific principles regarding the present stretch condition of the muscle prior to explosive contraction. The effect of plyometric exercise in increasing vertical jump ability has been studied experimental but no attempt has made if they are more effective than is okinetic exercise.

Therefore, the research scholar is interested to investigate the degree of importance of the plyometric training, out of many available training techniques for the development of flexibility which are essential to attain the top sport performance and that too on tribal as well as non-tribal subjects and thereby such study was being undertaken.

METHOD

Forty tribal as well as forty non-tribal untrained male school students of 8th to 10th standard of Hooghly District were assembled height wise in separate two line. Further, each forty subjects from each line of untrained male tribal and non-tribal school students were again sub-divided randomly into the two equal groups (N = 20

in each group). One group was studied as experimental training group, named as Group 'A', whereas remaining group was studied as control group, and named as Group 'B' in both categories. The training programme namely Plyometric training was assigned to experimental training group. Flexibility was measured by using sit and reach test, which was recorded correct to the nearest inches at the gymnasium of Rabindra Mahavidyalaya, Champadanga, Hooghly, West Bengal. In this study, applied training programme was conducted for a period of ten weeks for three alternative days in a week i.e. Tuesday, Thursday and Saturday in the evening session. The training schedule prepared by the investigator was applied to the experimental group as treatment and the training programme was personally supervised by the investigator with the help of two qualified experts who were previously trained and instructed for the same. A pre test was taken and immediate after the completion of the training programme (10 weeks), the post test was conducted.

Details of the Training Programme

Experimental training programme for experimental training group plyometrics training i, e. single leg hop, double leg hop, box drill, barrier hops (hurdle hop) and stadium hops were included for tribal as well as non-tribal school boys categories was as follows.

STATISTICAL TECHNIQUES

In order to investigate the existence of significant differences if any between the experimental training group (group-A) and one control group (group-B) subjects belonging to the untrained male tribal as well as non-tribal school going students in pre-, post-and adjusted post-test phases, the Analysis of co-variance statistics was applied. In case of existence of significant difference, the Post hoc-test was applied in order to investigate the significances between the paired group means in untrained tribal male school going students. The level of significance was set at $P<0.05$ level of significance.

FINDINGS

The statistical analysis of data of flexibility between experimental training group and control group of untrained male tribal school students was computed by applying analysis of co-variance statistics which is presented in Table 1.

Table 1 in respect to the analysis of co-variance statistical result of experimental training group and control group in flexibility of untrained male tribal school going students revealed insignificant difference in pre-test phase. The computed 'F' value of 0.04 was found to be lesser than that of the table value (4.10) required to be significant at 0.05 level of significance.

Plyometric Training Schedule

Weeks	Preparatory Phase (Warming up)	Intensity (Rate of Doing Work)	Frequency (Repetition)	Density (Active Rest in between Sets = 3 min.)	Duration	Total Duration
1st & 2nd	5 minutes	medium	One	3 minutes	16 minutes	24 min
3rd & 4th	5 minutes	medium	Two	6 minutes	32 minutes	43 min
5th & 6th	5 minutes	medium	Three	9 minutes	48 minutes	62 min
7th & 8th	5 minutes	optimum possible	Four	12 minutes	64 minutes	81 min
9th & 10th	5 minutes	optimum possible	Five	15 minutes	80 minutes	100 min

Table 1: Analysis of Co-variance of the Means in Flexibility of Experimental Training and Control Group of Untraied Tribal Male School Going Students

Mean	Experimental Group	Control Group	SS	Df	MSS	F-ratio
Pre test	4.5	4.5	A 0.121 W 120.758	1 38	0.121 3.178	0.04
Post test	5.8	4.7	A 12.656 W 60.838	1 38	12.656 1.601	7.91*
Adjusted Post test	5.8	4.7	A 11.160 W 14.616	1 37	11.160 0.395	28.25*

*significant at 0.05 level of significance
$F_{.05}(1, 38) = 4.10$ A = Among Means Variance
$F_{.05}(1, 37) = 4.09$ W = Within Group Variance

However, in post-and adjusted post-test phases, the significant differences were observed. The computed 'F' value 7.91 and 28.25 were found to be greater than that of the table value (4.10 and 4.09) required to be significant at 0.05 level of significance.

As the significant differences in flexibility of untrained male tribal school going students in post- and adjusted post-test phases of experimental training group and control group were observed, further, in order to find out the existence of paired group means differences, if any, the post hoc-test was applied which is presented in Table 2.

Table 2: Paired Group Mean Differences in Flexibility between Experimental Training and Control Groups of Untrained Male Tribal School Going Students

Experimental Group	Control Group	Mean Difference	Critical Difference
5.8	4.7	1.1*	0.4

Table 2 clearly indicates significant difference between experimental training group and control group of tribal untrained male school going students.

The statistical analysis of data of flexibility between experimental training group and control group of untrained male non-tribal school students was computed by applying analysis of co-variance statistics which is presented in Table 3.

Table 3 in respect to the analysis of co-variance statistical result of experimental training group and control group in flexibility of untrained male non-tribal school going students revealed insignificant difference in pre-test phase. The computed 'F' value of 0.01 was found to be lesser than that of the table value (4.10) required to be significant at 0.05 level of significance.

However, in post-and adjusted post-test phases, the significant differences were observed. The computed 'F' value 4.86 and 11.39 were found to be greater than that of the table value (4.10 and 4.09) required to be significant at 0.05 level of significance.

As the significant differences in flexibility of untrained male non-tribal school going students in post- and adjusted post-test phases of experimental training group and control group were observed, further, in order to

Table 3: Analysis of Co-variance of the Means in Flexibility of Experimental Training and Control Group of Untraied Male Non-tribal School Going Students

Mean	Experimental Group	Control Group	SS	DF	MSS	F-ratio
Pre test	4.2	4.2	A 0.006 W 45.188	1 38	0.006 1.189	0.01
Post test	5.5	4.6	A 6.4 W 50.00	1 38	6.4 1.316	4.86*
Adjusted Post test	5.4	4.7	A 6.076 W 19.745	1 37	6.076 0.534	11.39*

*significant at 0.05 level of significance
F.05 (1, 38) = 4.10 A = Among Means Variance
F.05 (1, 37) = 4.09 W = Within Group Variance

Table 4: Paired Group Mean Differences in Flexibility between Experimental Training and Control Groups of Untrained Male Non-tribal School Going Students

Experimental Group	Control Group	Mean Difference	Critical Difference
5.4	4.7	0.8*	0.5

Table 5: Analysis of Co-variance of the Means in Flexibility in Plyometric Training between Untrained Male Tribal and Non-tribal School Going Students

Mean	Experimental Group	Control Group	SS	DF	MSS	F-ratio
Pre test	4.5	4.2	A 0.812 W 118.85	1 38	0.812 3.128	0.26
Post test	5.8	5.5	A 1.406 W 66.588	1 38	1.406 1.752	0.80
Adjusted Post test	5.7	5.5	A 0.376 W 18.897	1 37	0.376 0.511	0.74

*significant at 0.05 level of significance
$F_{.05}$ (1, 38) = 4.10 A = Among Means Variance
$F_{.05}$ (1, 37) = 4.09 W = Within Group Variance

find out the existence of paired group means differences, if any, the post hoc-test was applied which is presented in Table 4.

Table 4 clearly indicates significant difference between experimental training group and control group of tribal untrained male school going students.

Comparison of flexibility between untrained male tribal and non-tribal school going students under plyometric training was computed with the help of analysis of co-variance statistics which is presented in Table 5.

Table 5, clearly indicate insignificant differences in flexibility between untrained male tribal and non-tribal school going students in pre, post and adjusted post phases($F = 0.26, 0.80$ and $0.74 < 4.10$ and 4.09 at 0.05 level of confidence).

However, it was observed that in plyometric training the mean values in flexibility in pre, post and adjusted post test phases of untrained male tribal school going students (4.5, 5.8 and 5.7 respectively) were found to be slightly better than that of untrained non-tribal male school going students (4.2, 5.5, and 5.5 respectively).

DISCUSSION OF FINDING

As the logical support of the aforesaid result, the concerned literature highlights that, plyometric training programmes enhance reasonable amount of flexibility.

Muscle tissue is the key factor in developing flexibility because it can be lengthened if is regularly stretched. Muscles contain proteins that create movement by causing muscles to contract. These contractile proteins can also stretch and they are involved in the development of flexibility.

Strength training causes higher muscle tone and leads to shortening of the muscle. But if strength training is properly supplement with flexibility exercise then the flexibility can be effectively maintained.

The main means of instilling flexibility the general preparatory and special preparatory exercise "on extension". They are all characterized by an ultimate increase of amplitude of movements in the cause of the serial execution of an exercise.

Static flexibility depends on many factors, including the ability to tolerate stretched muscles, the structure of a joint and the tightness of muscle, tendons and ligaments that are attached to the joint. Dynamic flexibility depends on static flexibility but it also involved such factors as strength, coordination and resistance to movement.

In plyometric training, it is noticed that the range of the extension of muscles, joints and ligaments are greater along with it is springing movements and Probably because of such reasons the plyometric training revealed greater result undertaken in this study

Further, the Tables 5, in respect to the comparison of mean values of flexibility between untrained male tribal and non-tribal school going students in pre-, post- and adjusted post-test phases.

However, in aforesaid table, it was noticed that in all the cases of mean values of flexibility the untrained male tribal school students was found to be little bit greater in pre-, post-and adjusted post-test phases, than that of untrained male non-tribal school students. From such result of this study, it may be assumed that the untrained male tribal students were superior in flexibility than that of the untrained male non-tribal school students.

It is usually seen that tribal people keep themselves busy with the various types of acrobatic activities like hunting, digging, carrying etc. along with other daily life activity, which are concerned with higher range of motion and thereby flexibility is increased.

On the other hand, it is also seen that non-tribal peoples are not so much associated with such types of activities and probably, because of such reasons the flexibility of the untrained male tribal school boys were better than that of untrained male non-tribal school going students.

CONCLUSION

It is concluded that the untrained male tribal students were superior in flexibility than that of the untrained male Non-tribal school students.

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Peer Reviewed Research Article

A Comparative Study of Cardiovascular Endurance between Government and Private High School Going Boys of Dbrugarh District of Assam

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ABSTRACT

The purpose of the study was to determine the difference of Cardiovascular Endurance between Government High School boys and Private High Schools boys of Dibrugarh district of Assam. 80 (Eighty) boys from Government High School (40) and Private High School (40), age ranging from 14 to 16 years were selected as the subject. The data pertaining to the study were collected by employing the Modified Harvard Step Test and the t-ratio statistical technique was employed to compare the mean value at 0.05 level of confidence. On the basis of result it was conclude that no significant difference was observed between Cardiovascular Endurance of Government High School going boys and Private High School going boys. It was also observed that the Government High School going boys have better Cardiovascular Endurance than Private High School going boys.

Keywords: *Cardiovascular Endurance, Govt. High School, Private High School*

INTRODUCTION

To achieve high performance in all sports there required five motor qualities- Strength, Speed, Co-ordination, flexibility and Endurance. The Endurance is the most essential motor ability in the purpose of doing a motor task for a prolong period of time. Endurance is highly trainable motor quality.

Endurance is characterized by the maintenance of working capacity and by the degree of resistance of the organism against fatigue and against the influence of unfavorable environment condition. Endurance is depending upon the aerobic capacity of the sportsperson. Aerobic capacity is related to heart. Capacity of heart mean cardio input and output of blood from heart, which increase the VO_2 max in the working muscles. The muscle of the heart and blood vessels must be strong enough to send the required amount of oxygen and nutrition, through the blood. So, it can be said that cardiovascular fitness represents one's whole health. Physical fitness is the capability of heart, blood vessels, lungs and muscles, to function at operative efficiency.

The Endurance is subdivided in to Cardiovascular Endurance and Muscular Endurance. Cardiovascular Endurance is the ability of the heart to provide oxygen to muscles during physical activity for a prolong period of time. Cardiovascular system is input and output of the blood from the heart to flow to the working muscles. During exercise, heart rate combines with stroke volume to provide an appropriate, at maximal or near maximal results of work. Body might adjust to provide the optimal combination of heart rate and stroke volume to maximize the blood flow to active muscle and increase VO_2 max.

The growth and development of a child passes through various stages Endurance can develop from pre-school age to adolescence stage (15–16 years). Endurance can be improved to a high level in adolescence. The benefits of regular physical activities, in children and youth, are well documented.

Cardiovascular tests have shown possible relationship, sometimes, with functional manifestations cardio respiratory endurance. In this study the research scholars compared the cardiovascular endurance between government and private high schools male students of Dibrugarh district of Assam.

METHODOLOGY

For the present study 40 (forty) male Private High Schools going boys and 40 (forty) male Government High School going boys of Dibrugarh District of Assam were selected as the subjects randomly. The age of the subjects was ranged from 14 to 16 years. To collect the data Modified Harvard Step Test was used and the pulse of all the three half minute counts are recorded are added together and a fitness index is calculated by employing the FI formula. For the statistical analysis t-ratio statistical technique was employed. The level of significance was kept at 0.05 to test the hypothesis.

RESULT AND DISCUSSION

The result of the present study is presented in the following Table.

Table 1: Comparison between the Means of Government and Private High Schools Going Boys in Cardiovascular Endurance

School	Mean	Standard Deviation	Mean Difference	Standard Error	T-ratio
Govt. high schools boys	62.66	10.90	1.34	2.78	0.69@
Private high schools boys	61.32	13.80			

@ Insignificant at 0.05 level of confidence Tabulated $t_{0.05(78)}$ =1.9908

The table reveals that the obtain t-ratio value of 0.69 lesser than the tabulated t-value of 1.9908; hence statistically there is no significant difference in the means of cardiovascular endurance of Government High Schools boys and Private High Schools boys.

The comparison of means has been graphically shown in figure below.

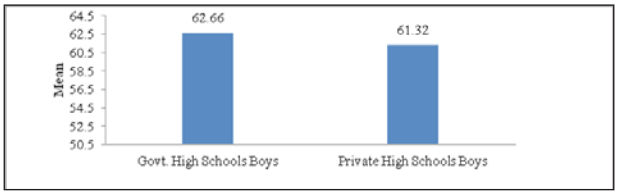

Fig. 1: Comparison of Means of Cardio Vascular Endurance between Government High Schools Boys and Private High Schools Boys

DISCUSSION OF FINDINGS

The above mentioned Table and figure shown that there is no significant mean difference in cardiovascular endurance of government high schools boys and private high schools boys of Dibrugarh district of Assam. It may be attributed to the fact that both the government high schools boys and private high school boys might be involved equally in the various games and sports activities in the school or off the school. But as most of the government schools boys are from low socio-economic background family, they might have to involve in vigorous physical activities for the fulfillment of their daily needs. On the other hand most of private schools boys are from good family background so that they might have to do less physical activity. But in comparison to Govt. High School, Private High Schools have abundant facilities for games and physical education which help boys to be fit.

CONCLUSION

The result of the study showed that there is no significant difference in the means of cardiovascular endurance of Government High Schools boys and Private High Schools boys. It was also conclude that the cardiovascular endurance of Govt. High School boys is better than Private High Schools boys (62.66>61.32).

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Peer Reviewed Research Article

Study of Selected Physical Fitness Components of Inter-College Level Football and Volleyball Players

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ABSTRACT

The purpose of the study was to compare the physical fitness components between male football and volleyball players. The present study was conducted on a sample of seventy two (N = 72), which includes thirty six each, male Football (N1 = 36, mean ± SD: age 21.28 ± 1.45 years, height 1.77 ± 5.43 m, weight 68.83 ± 6.53 kg, BMI 21.93 ± 1.96) and male volleyball (N2 = 36, mean ± SD: age 20.50 ± 1.03 years, height 1.81 ± 4.09 m, weight 73.58 ± 3.74 kg, BMI 22.33 ± 1.23) players who participated in inter- college competitions of Guru Nanak Dev University, Amritsar, India. All the participants were informed about the aim and methodology of the study and they volunteered to participate in this study. All the participants were assessed for height, weight and selected physical fitness components. The height of the subjects was measured with anthropometric rod to the nearest 0.5 cm. The weight of subjects was measured by using portable weighing machine to the nearest 0.5 kg. The vertical jump test was used to measure explosive power of the legs whereas speed was determined by 50 yard dash and Illinois agility test was used to measure agility. The independent samples t-test was applied to assess the differences between football and volleyball players. The results of present study indicated that football players had significantly greater speed ($p < 0.05$) and agility ($p < 0.05$) than their counterparts volleyball players but on the other hand volleyball players had greater power ($p < 0.05$) than football players.

Keywords: *Physical Fitness, Football, Volleyball, Power, Speed, Agility*

INTRODUCTION

There are numerous components which are responsible for the performance of the players. These are physical fitness, physiological, technical and tactical. Among them, physical fitness components are most important. Fitness enables a player to cope with the physical demands of the game as well as allowing the efficient use of his various Technical and tactical competencies throughout the match (Brandon & Leigh, 2009). Physical fitness is, in a very broad sense, determined by the individual's capacity for optional work and motor and sport performance (Astr and & Rodahl, 1986). Physical fitness components of the players are more important as these have marked effects on the skill of players and the tactics of the teams because ball games require repeated maximum exertion such as dashing and jumping (Tsunawake, 2003). Football and volleyball players require well-developed power, speed and agility. Such physical fitness components are important for both football and volleyball players to achieve higher levels of performance. Functionally, each game of football is made up of distinct phases incorporating sprinting (accelerating and decelerating), dribbling, and walking, jogging, change in direction, tackling, pushing, heading and kicking (Inklaar, 1994; Lees & Nolan, 1998). Football players are required to such a high level of speed, power, muscular strength and agility (Arnason *et al*., 2004; Bangsbo *et al*., 1991). Speed is very important physical fitness component because the running with high intensity and speed activities is determining factors of the performance of the football players (Bradley *et al*., 2009; Di salvo *et al*., 2009). High level of agility would be the distinctive feature of the football players, since playing football requires quick directional changes (Reilly & Thomas, 1980). Volleyball is a dynamic game. Successful participation in the

volleyball requires expertise in many performance skills that is dependent on player's ability to propel themselves into the air during offensive and defensive movements i.e. the jump serve, spike, and block. Lower body power, speed and agility are important indicators of volleyball performance (Vescovi & Mcguigan, 2008). Vertical jump is most frequent element during the volleyball game (Harman *et al*., 1990).The physical fitness of a player however can be a decisive determinant of success during competition (Smekal *et al*., 2001). Thus, the purpose of this study was to compare the physical fitness components between football and volleyball players.

MATERIALS AND METHODS

Subjects

A total of seventy two i.e. football (N1 = 36) and volleyball (N2 = 36) male inter-college level players were selected for the present study. The age of subjects was between 19 to 24 years. The subjects of the study were selected from different colleges affiliated to Guru Nanak Dev University, Amritsar. The purposive sampling method was used to select the subjects for the present study.

Selection of Variables and Tests

The study was conducted on selected physical fitness variables i.e. power, speed and agility of inter-college level football and volleyball players. The necessary data was collected by administering various tests. The height of the subjects was measured with anthropometric rod to the nearest 0.5 cm. The weight of subjects was measured by using portable weighing machine to the nearest 0.5 kg. BMI was calculated by the formula of; Body Mass Index = Weight/Height^2 in metric units.

Table 1: Physical Fitness Variables

Variables	Test Used	Measurement Units
Explosive power	Vertical Jump Test (Fleishman, 1964)	Centimeters
Speed	50 yard Dash Test (Johnson and Nelson, 1982)	Seconds
Agility	Illinois Agility Test (Getchell,1985)	Seconds

Statistical Analyses

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

RESULTS

Table 2: Demographic Characteristics of Male Football and Volleyball Players

Sports Group	Age (yrs)		Height (m)		Weight (Kg)		BMI	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Football Players	21.28	1.45	177.22	5.43	68.83	6.53	21.93	1.96
Volleyball Players	20.50	1.03	181.58	4.09	73.58	3.74	22.33	1.23

Table 2 depicts the demographic characteristics of male football and volleyball players. The mean age of football players was 21.28 years and volleyball players were 20.50 years. The mean height of football players was 177.22cm and volleyball players were 181.58cm. The mean weight of football players was 68.83 kg and volleyball players were 73.58 kg. The mean BMI value of football players was 21.93 and volleyball players were 22.33.

Table 3 presents the physical fitness characteristics of male football and volleyball players. The results depicts that football players had significantly greater speed ($p < 0.05$) and agility ($p < 0.05$) than their counterparts volleyball players but on the other hand volleyball players had greater power ($p < 0.05$) than football players.

DISCUSSION

In the present study physical fitness components of the inter-college level football and volleyball players have been evaluated and compared with each other. This study indicates the existence of physical fitness variables differences among the football players and volleyball players. The demographic characteristics

Table 3: Physical Fitness Components of Inter-College Level Male Football and Volleyball Players

Variables	Football Players (N_1 = 36)		Volleyball Players (N_2 = 36)		Mean Difference	SEDM	T-Value	Sig.
	Mean	SD	Mean	SD				
Power	42.67	4.28	48.33	5.23	5.66	1.13	5.03*	0.00
Speed	6.69	0.40	8.12	0.63	1.43	0.12	11.46*	0.00
Agility	16.94	0.90	19.79	0.85	2.85	0.21	13.86*	0.00

*Significant at 0.05 level t.05 (70) = 2.00

of football and volleyball Players show that volleyball players were taller and heavier as compared to the football players. The volleyball players in the present study have shorter height and lighter weight than their international counterparts (Gualdi & Zaccagni, 2001; Gabbett, 2008; Morques & Marinho, 2009). Because the volleyball require handling the ball above the head, having a greater height is an advantage in volleyball game (Kansal *et al*., 1986). Lower height of Indian volleyball players might be the one of the reason for their dismal performances at the international level (Gaurav *et al*., 2010). The explosive power of the legs measured by vertical jump test was significantly higher in volleyball players than football players. The game volleyball requires greater vertical jump performance (Gladden & Colacino 1978; Fleck *et al*., 1985; Marques *et al*. 2006; Marques *et al*., 2008) for spiking, blocking and jump serve. The agility measured by Illinois agility test and speed measured by 50 yard dash of football players was better than volleyball players. This indicates that playing football requires fast directional short turns during the games. Speed and agility are very important for football because, each game is made up of distinct phases incorporating sprinting (accelerating and decelerating), dribbling, and walking, change in direction, tackling, pushing, heading and kicking (Inklaar, 1994; Lees & Nolan, 1998).

CONCLUSION

Significant differences were found between male football and volleyball players with regard to selected physical fitness characteristics i.e. power, speed and agility. On average, the volleyball players were taller and heavier than the football players. The football players had higher speed and agility when compared to volleyball players but on the other hand, volleyball players had significantly higher power than their football counterparts.

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Peer Reviewed Research Article

Effect of Saq Training on Agility and Endurance between Kho-Kho Players

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ABSTRACT

The purpose of the study was to examine the effect of SAQ (Speed, Agility and Quickness) training on Agility and Endurance between junior level Kho-Kho players. Out of Hundred, forty (40) subjects were selected for the present study from Kho-kho academy Ashoknagar, North 24 parganas, West Bengal and their age ranged from 14–18 years. The subjects were equally divided into two groups namely experimental and control groups with twenty (20) subjects in each group. Control group did not undergo any training programme rather than their daily routine work. The experimental group was treated with SAQ training. Training was given for a period of 12 weeks. Training was given on four days (i.e. Tuesday, Thursday, Friday and Sunday) in a week. The training session was carried out for 60 minutes which includes warming up and cooling down. Agility was measured through 4x10 yard shuttle run test nearest in seconds and endurance was measured through 12 minute run and walk test in meters. Mean and standard Deviation of the variables were calculated. The data of the selected variables were analysed through Statistical procedure by using ANCOVA. Statistical significance was tested at 0.05 level of confidence. The results highlighted that there were significant difference in agility and endurance between experimental and control groups of junior level Kho-Kho players.

Keywords: *Agility, Endurance, Kho-Kho Players*

INTRODUCTION

Speed, agility and quickness (SAQ) are a system of training aimed at the development of motor abilities and the control of body movement through the development of the neuromuscular system. It aims to improve the athlete's ability to perform explosive multi directional movements by reprogramming the neuromuscular system, so that it can work more efficiently. According to Jovanovich, *et al.* (2011) SAQ training will remove mental blocks and thresholds and will allow the athlete to exert maximal force during controlled and balanced movement patterns, which are specific to their sport. By considering the energy systems involved in the athlete's sport, the specificity of the movement patterns, muscle action, the speed and range of motions performed and the specific needs of the athlete, SAQ training can provide a highly specific and detailed training method that will help the performer reach their goals (Polman, *et al.* 2009). Speed, Agility, and Quickness (SAQ) training has become a popular way to train athletes. With increasing need to promote athletic ability, this type of training has proven to enhance the practical field abilities of participants in a wide variety of sports. It is practiced in addition to conventional resistance training in the gymnasium and serves to assist the strength gained there to performance in the arena of play.

Agility is closely related to balance because it requires athletes to regulate shifts in the body's centre of gravity while subjecting them to postural deviation. Many athletes and coaches believe that agility is primarily determined by genetics and is therefore difficult to improve to any significant degree. Coaches often become enamoured with an athlete who possesses natural physical attributes physical size, strength, vertical and horizontal power, ideal body composition that are associated with successful performance. However, these attributes alone will not guarantee success in sports that require agility.

Kho-kho players require performing numerous actions that require strength, power, speed, agility, balance, stability, flexibility and endurance suggesting that the physical conditioning of players is a complex process.

During a Kho-Kho match, a player cover about 8 km in total, which includes a sprint every 05–10 seconds (75% of overall activity) with each action lasting on average of 2 to 4 seconds and covering a distance of 5–10 m. Although speed represents a very important component of fitness for a Kho-Kho player, quickness (acceleration speed during the first steps) is probably more important. This is because sprints in Kho-Kho are mainly performed over short distances undertaken at maximal intensity although the longest distances tend to be about 20 m and usually involves several changes in direction. So the researcher was of opinion to investigate the effect of SAQ training on Agility and Endurance between junior level Kho-Kho players.

METHODOLOGY

Out of Hundred, forty (40) subjects were selected for the present study from Kho-kho academy Ashoknagar, North 24 parganas, West Bengal and their age ranged from 14–18 years. The subjects were equally divided into two groups namely experimental and control groups with twenty (20) subjects in each group. Control group did not undergo any training programme rather than their daily routine work. The experimental group was treated with SAQ training. Training was given for a period of 12 weeks. Training was given on four days (i.e. Tuesday, Thursday, Friday and Sunday) in a week. The training session was carried out for 60 minutes which includes warming up and cooling down. Agility was measured through 4x10 yard shuttle run test nearest in seconds and endurance was measured through 12 minute run and walk test in meters. Mean and standard Deviation of the variables were calculated. The data of the selected variables were analysed through Statistical procedure by using ANCOVA. Statistical significance was tested at 0.05 level of confidence.

Findings

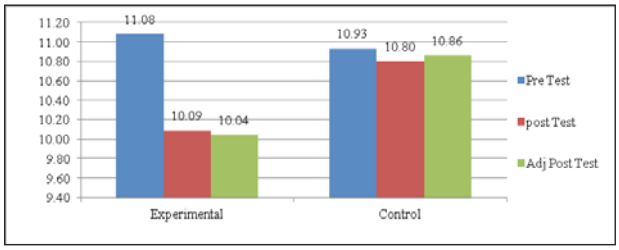

Fig. 1: Comparison of Means of Agility between Experimental and Control Groups of Junior Level Kho-Kho Players

Table 1: Analysis of Co-variance of the Means of Agility between Experimental and Control Group of Junior Level Kho-Kho Players

Mean	Experimental Group	Control Group	SS		DF	MSS	F-ratio
Pre Test	11.08	10.93	A	0.20736	1	0.20736	0.33
			W	23.7954	38	0.626195	
Post Test	10.09	10.80	A	4.98436	1	4.98436	3.72
			W	22.67944	38	0.596827	
Adjusted Post Test	10.04	10.86	A	6.678572	1	6.6785716	32.68*
			W	7.561668	37	0.2043694	

*significant at 0.05 level of confidence
F.05 (1, 38) = 4.10 A = among means variance.
F.05 (1, 37) = 4.10 W = with in group variance.

Table 2: Paired Adjusted Final Means Difference in Agility (Post hoc-test) between Experimental and Control Group of Junior Level Kho-Kho Players

Experimental Group	Control Group	Mean Difference	Critical Difference
10.04	10.86	0.82	0.80

*significant at 0.05 level of confidence

Table 3: Analysis of Co-variance of the Means of Endurance between Experimental and Control Groups of Junior Level Kho-Kho Players

Mean	Experimental Group	Control Group	SS		DF	MSS	F ratio
Pre Test	2392.05	2357.20	A	12145.22	1	12145.22	0.18
			W	2536108	38	66739.69	
Post Test	2482.80	2322.45	A	257121.20	1	257121.20	3.80
			W	25690120	38	67605.58	
Adjusted Post Test	2468.21	2337.04	A	171247.10	1	171247.13	8.01*
			W	791543.60	37	21393.07	

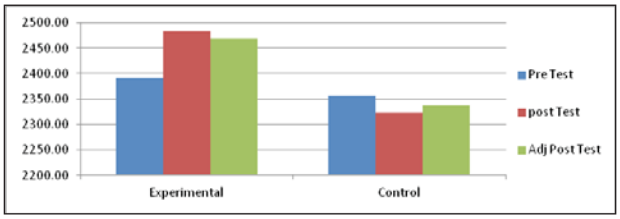

Fig. 2: Comparison of Means of Endurance between Experimental and Control Groups of Junior Level Kho-Kho Players

DISCUSSION OF FINDINGS

This study has shown that twelve weeks of SAQ training had positive effects on Agility and Endurance in Kho-Kho players. Players in the experimental group improved their agility and endurance as well as performance significantly. These results demonstrate that specific speed and agility and quickness training (SAQ), as a part of the overall training process, can be considered a useful tool for the improvement of agility and endurance among Kho-Kho players. They also confirm Bloomfield *et al.*'s (2007) viewpoint that the SAQ regimen is an important training method for the improvement of speed and quickness. Importantly, the tests used in this study assessed sprinting performance in a very important manner i.e. changes of direction from 2 to 4 meters, as this type of movement represents 75% of all sprint activities during kho-kho matches.

Furthermore, we suggested that agility along with quickness and speed during the first three steps represent the most significant motor ability of a Kho-Kho player. Although it is considered that the best period for the development of agility is at the age of 16 (Markovic *et al.*, 2007). This study has shown that agility can also be improved in later years using an appropriate training programme. This confirm-mason finding where a SAQ training programme produced improved agility and endurance as well as performance in junior level kho-kho players.

Consequently the finding that SAQ training had a positive impact on agility and endurance in more realistic soccer specific tests than previously used (i.e. sprinting with 90°,turns, 180° turns and more complex movements with turns in different directions,) provides strong support for the efficacy of this training. The SAQ training protocol used in this study included a large number of complex coordination exercises. This training protocol was shown to improve performance, which was thought to be primarily as a consequence of improved agility and endurance. SAQ training is one of the key components of contemporary game, which requires high levels of endurance, power performance and agility (Jeffreys, 2004; Meckel *et al.*, 2009).

CONCLUSION

Significant training enhancements and adaptations were experienced on agility and endurance of junior level Kho-Kho players by the SAQ group in effective with a control group. This outcome suggests that this form of training might be a beneficial inclusion in the physical conditioning programs of trained players performing invasion games. However, additional studies are required with elite populations and with different training regimes and selecting players.

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Peer Reviewed Research Article

A Comparative Study of Aggression between Block Level and District Level Football Players of Jagalmahal

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ABSTRACT

The purpose of the study was to compare the degree of aggression between block level and district level football players of jangalmahal. Forty male football players of Jamboni block and forty football players of Medinipur district were chosen as the subject of this study. The age of the subjects were ranged between 18–25 years. The criterion measure chosen to test the hypothesis was the scores obtain in sports aggression inventory by Anand Kumar & Prem Shankar Shukla. T test was applied to compare the degree of aggression between block level and district level football players. On the basis of the result obtained it is concluded that there is significant difference between the means of two groups i.e. block level football players and district level football players. The aggression level of District level players is found high than that of block level players.

Keywords: *Aggression, Football*

INTRODUCTION

In competitive sports Psychologist preparation of an athlete or a team is as much important as technique of the different skills of the game on a specific line. In modern competitive sports the athletes and teams are prepared not only to play the game and for winning the game it is not only the proficiency in the skills, which bring victory but more important is the mental preparation. The spirit and the attitudes of the athletes with which they play and perform the best in the competition (Singh, 1992).

Sport competition without "aggression" is a body without soul, competition and aggression are twins. There is clear evidence that, in general aggression is more boisterous games, may help performance because it arouses players overly to put in harder effort, and "do or die" for the success of the team.

Gary (1979) states such attitudes suggest a high degree of aggressive in sports. Empirical research has identified tough mindedness and aggressiveness as a personality trait which coincide positively with athletic ability and success. Psychologist have performed thousands of studies concerning problems related to aggression, in sports have rarely been studied on an empirical basis.

Modern competitive sports of today demands more emphasis on the training of psychological aspects of sport. The high level performance seen in competitive sports is nothing but a perfect optimum harmonious relationship between one's psychological preparedness and technical preparation. It is believed that superior athletic performance has benefited from knowledge about the physiology and bio-mechanics of human motor activity.

However, many coaches and psychologists throughout the world believe that future records will be broken primarily because of increased attention to the psychological parameters of human personality.

Aggression has long been a part of the sports domain. Outside of wartime, sport is perhaps the only setting in which acts of interpersonal aggression are not only tolerated but enthusiastically applauded by large segment of society.

OBJECTIVE OF THE STUDY

The objective of the study was to compare the degree of aggression between block level and district level football players of jangalmahal.

METHODOLOGY

Selection of Subjects

For this study forty male football players of Jamboni block and forty football players of Medinipur district were chosen as the subject of this study. The age of the subjects were ranged between 18–25 years.

Procedure

The criterion measure chosen to test the hypothesis was the scores obtain in sports aggression inventory by Anand Kumar & Prem Shankar Shukla. This questionnaire is consisted of 25 items, in which 13 items are positive and the remaining 12 items are negative were evaluated. For each items score was "1". The maximum score would be 25 and minimum score would be 0. Scored obtained by each statement was added up which would represent one's total score on aggression. The questionnaire was administered on the subject during the competition of Jamboni block and during the competition at Midnapur district level. The aggression questionnaires were distributed to football players of block level and district level in the month on August and October respectively. To ensure maximum co-operation from the subject the research scholar had a meeting with the selected subjects in presence of their respective coaches, where the subject were oriented and explained regarding the purpose and the procedure of the questionnaire.

Analysis of the Data

The obtained data were statistically analyzed by using 't' test, to compare the degree of aggression between block level and district level football players.

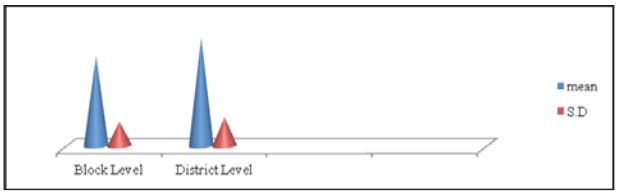
Results of the Study

The data was analyzed by 'T' test. The significance of mean difference found between score obtains on aggression by the subjects of block level and district level is presented in Table 1.

Table 1: Significance Difference of Mean on Aggression between Block Level and District Level Football Players

Variable	Group Mean & S.D		Mean Diff.	Dm	T-value
	Block Level	District Level			
Aggression	12.38, 3.30	14.89, 3.91	2.51	.61	3.09*

*Significant at.05 level of confidence.
t-value needed for significance at 0.05 with 78 degree of freedom is 1.98



Graphical 1: Representation of Mean and Standard Deviation of Block and District Level Football Players

The Table 1 shows obtained t value is 3.09 which indicate significant difference between the aggression level of block level and district level players. The t-value required to be significant for 78 degree of freedom was 1.98 at 0.05 level of confidence, hence it is concluded that players participating in district level players posses higher level of aggression than that of Block level players.

CONCLUSION

On the basis of the result obtained it is concluded that there is significant difference between the means of two groups i.e. block level player and district level players. The aggression level of District level players is found high than that of Block level players. The higher degree of aggression in district level players may be due to the fact at as the level of competition increases the anxiety level of the player tends to increase. Research studies had shown earlier that anxiety is directly related with aggression. The players participated at district level may have taken the competition very seriously and are originally football players and the player of block level showed significantly lower level of aggression the result may be the few good players in all the teams may have been assigned other position in football other than their own specific position. Such as offensive player may have acted as defensive player might be one of the reason for not finding higher level of aggression. Present study concludes that as the competition level increases level of aggression also increases.

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Peer Reviewed Research Article

Effect of Surya Namaskar Yogic Practice on Heart Rate and Flexibility of Tribal College Youths

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ABSTRACT

The purpose of the study is to determine the effect of Surya Namaskar yoga practice on resting heart rate (HR) and flexibility of tribal college youths. Twenty healthy college athletes were randomly selected from Seva Bharati Mahavidyalaya, Kapgari as subjects of the study. Their age ranged from 17 to 23 yrs. Surya namaskar techniques were properly introduced with demonstration to the subjects before the practice begins. The duration of the practice was 15–20 minutes with two sessions in a day i.e. morning and evening session for a period of twelve weeks. The variables resting heart rate and flexibility were selected for the present study. Pre and post test were conducted in order to identify the significance difference. The collected data was analyze by applying 't' test. The result shows that there is a significant difference was found in resting heart rate. Surya namaskar is effective in increasing flexibility of the subjects.

Keywords: *Surya Namaskar, Heart Rate, Flexibility etc*

INTRODUCTION

Surya Namaskar is a branch of yoga that concentrates physical health and mental well-being. Through practicing various body postures (asana), breathing techniques (Pranayama), and meditation, it is believed that one can obtain a sound physical body as well as a calm and peaceful mind.

Regular practice of a variety of yoga techniques have been shown to lower heart rate and blood pressure in various populations. In recent years, it has become more apparent that people need techniques to help them cope with the everyday stressors of modern life. With stress related hypertension and cardiovascular disease on the rise.

In most cases facilitating mind and body flexibility is easily put aside when it is probably needed the most. However, keeping the body flexible may help decrease tightness and tensions that can lead to chronic and often debilitating physical problems. Once sidelined from regular activities due to orthopedic or other problems, it becomes increasingly difficult to be motivated to start exercising again. Regardless of the potential physical risks of inflexibility, even the most dedicated runner or recreational athlete often does not make time for adequate flexibility training. Since time is often seen as a limiting factor when exercising, a daily practice of Surya namaskar (salute to the sun) can be the perfect solution for time-challenged individuals.

Surya namaskar is a series of 12 physical postures made up of a variety of forward and backward bends. The series of movements stretch the spinal column and upper and lower body through their full range of motion, massaging, toning and stimulating vital organs by alternately flexing the body forwards and backwards. It builds upper body strength through the inherent weight bearing positions, especially in the arms and shoulders, throughout the series. The simulated push-up movement and upper body weight bearing positions in the series may help to develop muscular strength and endurance in the pectoral, triceps, as well as the muscles of the trunk. The series gives such a profound stretch to the body that it is considered to be a complete yoga practice by itself. The purpose of the study is to determine the effects of six weeks, twice daily Surya namaskar yoga practice on heart rate and flexibility of college youths.

OBJECTIVE OF THE STUDY

To study the effect of twelve weeks Surya Namaskar practice on resting heart rate and flexibility of tribal college youths.

HYPOTHESIS OF THE STUDY

It was hypothesized that there shall be a significant difference in the selected variables following twelve weeks Surya Namaskar practice.

METHODOLOGY

Selection of Subjects

In present study simple random sampling was adopted for selection of subjects. Twenty male tribal students from Seva Bharati Mahavidyalaya, Kapgari were selected for the present study. The ages ranged of the subjects were 17 to 21 yrs.

Selection of Variable

To order to assess the effects of twelve weeks, twice daily Surya Namaskar yoga practice on heart rate and flexibility of tribal college youths. Sit and reach test was used to measure the flexibility and resting heart rate was measured manually with the help of stop watch.

Procedure

The Surya Namaskar practice was given to the subjects for twelve weeks, twice daily for the duration of 15–20 mints. in the gymnasium hall of Seva Bharati Mahavidyalaya, Kapgari. Variables selected for the study was resting heart rate and flexibility. The data was collected twice i.e. prior to the start of the training program (Pre data) and after the completion of the twelve weeks practice (post data). The data collected the study was statistically analyzed by employing 't' test at level of significance.

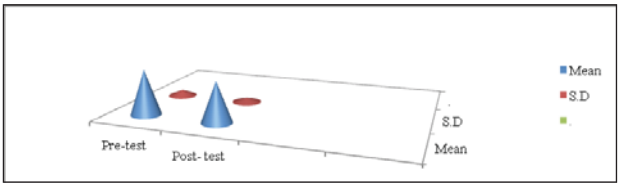
RESULT

The 't' test was applied to find out the significance difference between the pre test and post test means of the selected variables. The level of significance was chosen to test the hypothesis was 0.05.

Table 1: Values of Paired Statistics of Resting Heart Rate

Groups	Mean	S.D	S.E.M	'T" Ratio
Pre- test	64.66	8.70	2.51	5.19*
Post- test	58.16	5.93	1.71	

*Significant at 0.05 level of significance; t.05=2.18



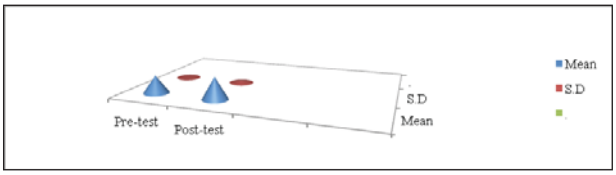
Graphical 1: Representation of Pre and Post Test Mean and Standard Deviation of Resting Heart Rate

Table 1 indicate the mean`, standard deviation and standard error mean values of pre-test of resting heart rate which were found to be 64.66, 8.70and 2.51 respectively. And the values of mean, standard deviation and standard error mean of post-test of resting heart rate were found to be 58.16, 5.93 and 1.71 respectively. Table 1 also indicate the paired sample t-test of resting heart rate which shows that there was a significant different in the pre and post test values of the variables resting heart rate. The calculated value of 't' was found to be 5.19* at 0.05 level of significance, which is higher than the tabulated value of 't' at 0.05 level of significance.

Table 2: Values of Paired Statistics of Flexibility

Groups	Mean	S.D	S.E.M	'T" Ratio
Pre- test	1.96	0.05	0.12	2.68*
Post- test	2.46	0.25	0.05	

*Significant at 0.05 level of significance; t.05=2.18



Graphical 2: Representation of Pre and Post Test Mean and Standard Deviation of Resting Flexibility

Table 2 indicate the mean`, standard deviation and standard error mean values of pre-test of flexibility which were found to be 1.96, 0.05 and 0.12 respectively. And the values of mean, standard deviation and standard error mean of post-test of flexibility were found to be 2.46, 0.25 and 0.05 respectively. Table 2 also indicate the paired sample t-test of flexibility which shows that there was a significant different in the pre and post test values of the variables flexibility. The calculated value

of 't' was found to be 2.68* at 0.05 level of significance, which is higher than the tabulated value of 't' at 0.05 level of significance.

CONCLUSION

The result of the present study shows that there is significant difference in resting heart rate and flexibility of tribal college of Seva Bharati Mahavidyalaya of Vidyasagar University of West Bengal. Result of present study support finding of Kristine (2008) and Sivansankara (2006) in case of BMI and is compatible with results of talles (2204), Mc Caffrey(2005), Wang(2004) and Smith(2001) in case of HR, SBP, DBP and Health related quality of life.

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Peer Reviewed Research Article

Effect of Submaximal and Supramaximal Training on Performance of Sprinters

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ABSTRACT

The present study was to determine the effect of submaximal and supramaximal training on the performance of sprinters. The subjects were sixty male sprinters of 18 to 25 years of age, from L.N.U.P.E., Gwalior. The subjects were randomly selected and were assigned to two experimental groups i.e. submaximal and supramaximal groups and control group, with 20 subjects in each group. The training was given for a period of 12 weeks. The two experimental groups were trained upto six days in a week, while the control group continued with their daily routine work. The selected variables were the performance of subjects in to cover distance of 100 meters. The pre- and post-test were conducted. After the collection of data, analysis of covariance was used to identify significant difference between the groups. The LSD post hoc test was used to identify significant differences between the training programmes. The level of significance was set at 0.05.

Keywords: *Submaximal, Supramaximal, Performance of Sprinters*

INTRODUCTION

Track and field gained popularity because of its similarity with daily life. Sprinting speed is the capacity of the individual to perform successive movements of the same pattern at a fast rate. Sprinting speed demand effort plus style involving the study and practice of the technique. Training is not a recent discovery. In ancient times, people systematically trained for military and Olympic endeavours. Today athletes prepare themselves for a goal through training. Training in games and sports is no longer a myth and does not have a casual approach; it provides opportunities for scientific process and verification. Training has been accepted as a highly specialized science. In the recent years, greater stress has been laid on the quality rather than the quantity of training. Sports scientists and experts want their sportsman to extract maximum achievement from their training procedure without causing too much strain on them. This is possible only if coaches and teachers of physical education apply the most economical manner for enhancing the performance of athletes. Sprinting is the fullest form of running performed over short distances in which maximum or near maximum effort can be sustained. Track and field events need tremendous strength for good performance. It would be better to find out the same through isometric and isotonic exercises. The vital need of all sprinters is tremendous leg power, necessary for the fastest possible leg speed.

STATEMENT OF THE PROBLEM

The purpose of the study is to find out the effect of submaximal and supramaximal training on performance of sprinters.

METHODOLOGY

Selection of Subjects

The subjects for this study were selected from the Lakshmibai National University of Physical Education, Gwalior. Sixty-seven male athletes who had participated in inter-university and state level competitions ranged from 18–25 years of age, were selected for the experimental programme utilizing the purposive sampling technique. A medical examination of the subjects was carried out in order to check the fitness of the subjects. Four subjects from the supramaximal group, two from the submaximal and one from the control group discontinued due to injury during the course of training. So out of sixty subjects, twenty each were selected on random basis for submaximal training, supramaximal training and control group.

Selection of Variables

Keeping in mind the feasibility criteria and specific purpose of the study. The performance of sprints was measured by the time taken to cover the distance of 100 meters.

Experimental Design

Pre-test and post-test randomized group design was employed in this study; both subjects as well as the experimental treatments were randomly assigned to the two experimental groups and one control group. The initial tests were conducted, followed by 12-weeks of selected training programmes. After completion of the experimental period, the final tests were conducted.

ANALYSIS OF DATA

In order to find out the effect of submaximal and supramaximal training on performance of sprinters, analysis of co-variance was used. The level of significance was 0.05.

Findings

In order to determine the significance difference between experimental groups and control group, the pre test and post test scores were collected. The initial and final test scores were analysed using ANCOVA. The results of the study are presented in tables and figure for each selected parameter of performance of sprinters are shown.

Table 1: Descriptive Statistics Showing Mean and Standard Deviation of 100 Meters Performance of Different Groups

Sr. No.	Group	No	Mean (sec.)	S.D.
1	Control	20	11.324	0.125
2	Submaximal	20	11.379	0.086
3	Supramaximal	20	11.048	0.144

Table 1 reveals that the Mean and Standard Deviation of control, submaximal and supramaximal were 11.324+0.125, 11.379+0.086 and 11.048+0.144 sec. respectively.

Table 2 indicate the adjusted post mean and standard deviation of control, submaximal and supramaximal groups are 11.336±0.023, 11.315±0.026, 11.100±0.025 sec. respectively.

Table 2: Descriptive Statistics Showing the Adjusted Mean and Standard Deviation of 100 Meters Performance of Different Groups

Sr. No.	Group	Mean (sec.)	S.D.	95% Confidence Interval	
				Lower Bound	Upper Bound
1	Control	11.336	0.023	11.291	11.382
2	Submaximal	11.315	0.026	11.263	11.367
3	Supramaximal	11.100	0.025	11.050	11.150

Table 3: Analysis of Co-Variance of Comparison of Adjusted Post Test Means of Experimental Group and Control Group in 100 Meters

	Sum of Squares	df	Mean Square	f	Sig.
Between the groups	0.560	2	0.280	27.224*	0.000
Error	0.576	56	0.010		

* Significant at 0.05 level.
F 0.05 (2,56) = 2.39
p<0.05

Table 3 reveals that there was a significant difference among supramaximal, submaximal and control group of 100 meters performance as calculated value (27.22) was more than the tabulated value (2.39) at 0.05 level of significance. Table further shows that probability error is 0.000 which is $p < 0.05$.

Table 4: Comparison of Adjusted Post Test Means of Three Experimental Group and Control Group in 100 Meters Run

Group	Group	Mean Difference	Sig.
Control	Supramaximal	0.236*	0.000
	Submaximal	0.021	0.553
Submaximal	Control	-0.021	0.553
	Supramaximal	0.215*	0.000
Supramaximal	Control	-0.236*	0.000
	Submaximal	-0.215*	0.000

*Significant at 0.05 level.

Table 4 shows adjusted post test means of two experimental groups i.e. submaximal, supramaximal and control groups. The adjusted means of submaximal, supramaximal and control group were 11.315, 11.100 and 11.336 respectively. The mean difference between submaximal and supramaximal group is 0.215 significant p<0.05. However, the insignificant difference is obtained between control group and submaximal group. As the obtained mean difference is 0.021 where is probability of error $p > 0.05$.

Table further exhibited the significant difference between supramaximal group and control group as the obtained mean difference is -0.236 against the critical value of 0.049 at 0.05 level. Table has clearly shown that the supramaximal group is significantly superior than the submaximal group and control group. However, the submaximal and control group has not shown any significant difference.

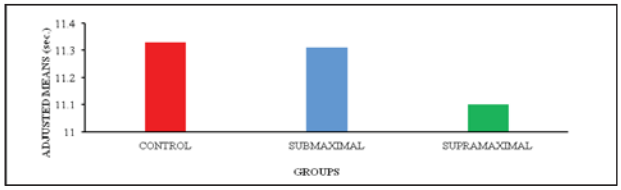

Fig. 1: Bar Diagram Showing Descriptive Statistics of Adjusted Means of Different Groups in 100 Meters Run

DISCUSSION OF FINDING

The results, in general, show that submaximal and supramaximal training improve performance of sprinters. It was found that the experimental groups improved significantly. No significant differences were found in the control group. The results show, that the subjects who followed the treatment of submaximal and supramaximal training improved their performance of sprinters.

On the basis of findings of the study, the following conclusions were drawn:

1. Twelve-week submaximal and supramaximal training programmes are useful to improve the performance of sprinters.
2. The supramaximal training programme has a greater effect in comparison to submaximal training programme on the performance of sprinters.

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Peer Reviewed Research Article

A Comparative Study on Selected Physiological Varriables between Hand Ball Players and Kho-Kho Players

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ABSTRACT

Modern life is now stiffly comparative. To lead a prosperous and fruitful life everyone has to fight against heavy odds in every sphere and stages of life. The field of games and sports is no exception. In this field a sportsman has to against the opponent, environment condition and against himself and thus he can reach at the top and still he has to continue his work to remain at the helm for a long period. Evaluation goes on, those who prove themselves fitter in the struggle for existence and adaptation, remain and those who could not were subjected to extinction. Now the sportsman has been able to give outstanding performance because of involvement of new scientifically substantiated training methods and means of execution of sports exercise such as sports techniques, tactics and physiological assessment. The purpose of the study was to compare the differences on vital capacity, Resting pulse rate, Systolic blood pressure, Diastolic blood pressure between state level hand ball players and state level kho-kho players. 20 male state level hand ball players and 20 male state level kho-kho players from Burdwan, Hooghly, East Medinapur, North 24 pgs, and Nadia district west Bengal was selected as the subject for the study. The age of the subject was 15–18 years. Vital capacity, Resting pulse rate, Systolic blood pressure, Diastolic blood pressure were consider as physiological variables for the study. To compare the study student 't' test was applied to calculate the collected data at 0.05 level of significance.. The result showed that there was no significant difference on Resting pulse rate between state level hand ball players and state level kho-kho players but significant difference on vital capacity, Systolic blood pressure and Diastolic blood pressure between state level hand ball players and state level kho-kho players.

Keywords: *Vital Capacity, Resting Pulse Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Hand Ball Players, Kho-Kho Player*

INTRODUCTION

The world of games and sports has crossed many milestones, as a result of different achievements in general and their application in the field of sports in particular. Scientific investigation for performance of sportsmen has been playing an increasingly important role to attain excellence of performance in different sports. Now the sportsman has been able to show outstanding performance because of involvement of new scientifically substantiated training methods and means of execution of sports exercise such as physiological investigation, sports techniques and tactics.

The main aim of modern sports competitions is to detect and diagnose the human ability at an early stage of life and channelize it in the right direction to realize the achievements aimed at in a particular sports/game. Competition in sports is always connected with the aspiration of individual for achieving higher goals. In high-class competition, one always plans to create a new record of to become the champion in a particular sport. Participation in competition, always has a social significance, as the team or individual represent the city, state or the country. His performance is, therefore, bound to be evaluated by other people.

Kho-Kho is a very versatile game that makes enormous physical, psychological, physiological, technical and tactical demands, but it is that physical fitness component that will directly determine the level of demand that can be put on the technical, tactical and psychological abilities of a player. Kho means 'Go' in this sport where this word is used by a raider to give the authority to a team mate to commence chasing. When a raider who is on the 'prowl' says kho and taps a fellow member, who is seated, the person receiving authority to chase can get up and begin his chase. But what is important is that he cannot change the direction from where he began. The person who needs to protect himself however can move to any side of the diagonal line and can also change direction at any time.

As handball is popular in European countries and USA, the scientific research data is available mainly from European and USA handball players. Though good work has been done in western countries in this regard, still very few studies are available on Indian handball players. Hence this study was undertaken. Handball is a very versatile game that makes enormous physical, psychological, technical and tactical demands, but it is the physical fitness component that will directly determine the level of demand that can be put on the technical, tactical and psychological abilities of a player.

The players in good physical condition are generally thought to have the ability to do sustained work over a long period time. Handball players should have sufficient motor abilities. Involvement in a systematic program of training brings about the desirable changes in the physical and physiological factors contributing to the development of functional ability that enhance the player's performance on the spot. The better team or players required physiological system of the body to be fit. It must function well enough to support the specific activity that the individual is performing. Handball players need physiological fact that the human organism needs stimulating exercise.

Hand ball and kho-kho is an extremely popular game which is played all over the India. Specificity of testing is revered when performance is to be evaluated. Sports specific assessments are useful in providing information concerning an athlete's ability to participate in sports and additional information can be gained on possible ways to improve performance and prevent injuries. Assessments are also often used to optimize training and in the selection of teams for competition and also prepaid proper factor. It is a sport involving short and intensive physical efforts during training and competitions.

So researcher thinks that there is any difference or not on vital capacity, Resting pulse rate, Systolic blood pressure, Diastolic blood pressure between state level hand ball players and state level kho-kho players.

STATEMENT OF THE PROBLEM

The purpose of the study was to compare the differences of vital capacity, Resting pulse rate, Systolic blood pressure, Diastolic blood pressure between state level hand ball players and kho-kho players.

METHODOLOGHY

The objective of the study was to investigate the difference on vital capacity, Resting pulse rate, Systolic blood pressure, Diastolic blood pressure between state level hand ball players and state level kho-kho players. 20male state level hand ball players were selected from Burdwan district and Hooghly district, East Medinapur and 20 male state level kho-kho players were selected from North 24 pgs, East Medinapur and Nadia district as the subjects for this study. The age of the subject was 15 to18 years.

To compare the selected Physiological variables i.e

- Vital capacity was measured by wet Spirometer and recorded in nearest liter.
- Resting Pulse Rate was measured with the help of Radial Pulse.
- Blood Pressure (Systolic and Diastolic) was measured with the help of Sphygmomanometer and Stethoscope and recorded in nearest 1.0mm/Hg.

To compute all the results Students 't' test was employed at 0.05 level of Significance.

Findings

Table 1: Mean Standard Deviation and 't' Test in Vital Capacity between State Levels Hand Ball Players and Kho-Kho Players

Variables	Mean		Std-Deviation		't' Ratio
	Hand Ball Players	Kho-Kho Players	Hand Ball Players	Kho-Kho Players	
Vital Capacity	2.36	2.14	269	272	7.91*

$t_{0.05}(38)$ =2.021,

*=Significance

From Table 1 It was evident that the calculated value is more than tabulated value (7.91 › 2.021). So in case of Vital capacity there is significant difference in physiological variable between the state level Hand ball and Kho-Kho players.

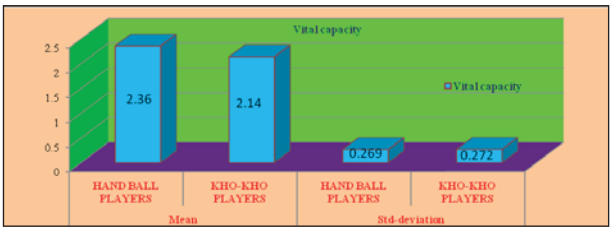

Fig. 1: Comparison of Vital Capacity between the State Level Hand Ball and Kho-Kho Players

Table 2: Mean Standard Deviation and 't' Test in Resting Pulse Rate between State Levels Hand Ball Players and Kho-Kho Players

Variables	Mean		Std-Deviation		't' Ratio
	Hand Ball Players	Kho-Kho Players	Hand Ball Players	Kho-Kho Players	
Resting Pulse Rate	67.5	70.2	6.20	6.37	1.33

$t_{0.05}(38)$ =2.021,
*=Significance

From Table 2 it was evident that the calculated value is more than tabulated value (1.33 ‹ 2.021). So in case of Resting pulse rate there is no significant difference in physiological variable between the state level Hand ball and Kho-Kho players.

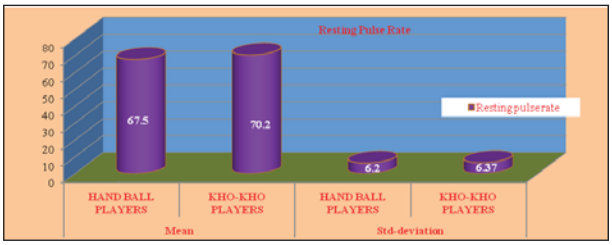

Fig. 2: Comparison of Resting Pulse Rate between the State Level Hand Ball and Kho-Kho Players

Table 3: Mean Standard Deviation and 't' Test in Systolic Blood Pressure between State Levels Hand Ball Players and Kho-Kho Players

Variables	Mean		Std-Deviation		't' Ratio
	Hand Ball Players	Kho-Kho Players	Hand Ball Players	Kho-Kho Players	
Systolic Blood Pressure	111	119	8.39	9.30	2.80*

$t_{0.05}(38)$ =2.021,
*=Significance

From Table 3 it was evident that the calculated value is more than tabulated value (2.80 › 2.021). So in case of Systolic Blood pressure there is significant difference in physiological variable between the state level Hand ball and Kho-Kho players.

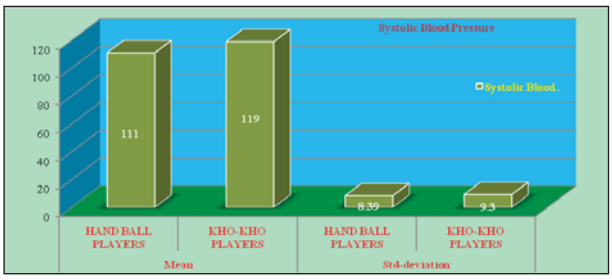

Fig. 3: Comparison of Systolic Blood Pressure between the State Level Hand Ball and Kho-Kho Players

Table 4: Mean Standard Deviation and 't' Test in Diastolic Blood Pressure between State Levels Hand Ball Players and Kho-Kho Players

Variables	Mean		Std-Deviation		't' Ratio
	Hand Ball Players	Kho-Kho Players	Hand Ball Players	Kho-Kho Players	
Diastolic Blood Pressure	56.5	60.75	4.76	5.76	2.48*

$t_{0.05}(38)$ =2.021,
*=Significance

From Table 4 it was evident that the calculated value is more than tabulated value (2.48 › 2.021). So in case of Diastolic Blood pressure there is significant difference in physiological variable between the state level Hand ball and Kho-Kho players.

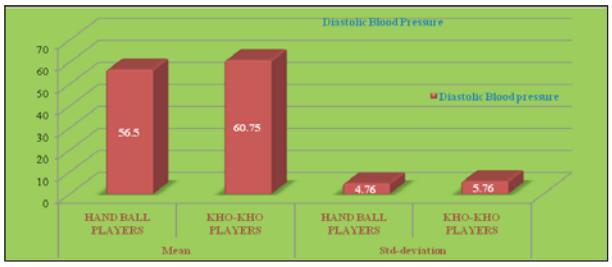

Fig. 4: Comparison of Diastolic Blood Pressure between the State Level Hand Ball and Kho-Kho Players

DISCUSSION

From the above Table it is clearly shown that no significance difference were found in case of Resting pulse rate between the state level Hand ball and Kho-Kho players.

In case of Resting pulse rate Hand ball player had shows superior than the Kho-Kho player due to their demand of skill develop in their training schedule and also during the play which effect in the result or may be the lower Resting pulse rate person may engage themselves in Hand ball.

In case of vital capacity shown that significance difference were found between state level hand ball player and state level kho-kho player. Hand ball player had shows higher VO2 max than Kho-Kho players. Because during match play, players run about 4 to 6 km at a mean intensity close to 80 to 90% of maximal heart rate (HR) (Loftin M., *et al*. 1996) Significant associations between maximal oxygen uptake (VO2max) and playing level have also been shown (Rannou F., 2001). In fact, elite players have to repeat more than 120 high-intensity actions during a game (Karcher C., 2014)

To ensure that athletes reach the required high intensity, using field running test performance is an objective, accurate, practical (HR monitoring is not required) and likely effective approach. For a long time, the speed associated with VO2max (vVO2max or maximal aerobic speed [MAS]) has been the preferred reference running speed to schedule run-based HIT (Buchheit M, *et al*, 2013). Game duration (individual playing time per match: 32 to 53 minutes) and the repetition of high-intensity runs and actions in combination trigger aerobic metabolism at high levels. Wings spent the largest part of their time in the 70 to 80% and 80 to 90% zones (~30% in the two intensities), while backs and pivots spent more time in the 80 to 90% zone. The greater cardiac demands observed for these two latter positions (at or close to HR max) suggest that there should be greater emphasis on cardiopulmonary function during training and/or that different rotational strategies should be implemented during games(Martin Buchheit 2014) but that much of intensity was not require in kho-kho and effect in to result.

In case of Blood pressure (Systolic and Diastolic) Hand ball player had shows lower value than the Kho-Kho player due to their demand of skill develop in their training schedule and long time high intensity, speed required high VO2max. High aerobic demands on the players as evidenced by a high relative workload also during the play practice. The player who have lower blood pressure have the capability to perform the work in high intensity for long time which is the basic demeaned of Hand ball player so it effect in the result.

CONCLUSION

- It was found that there is a significant difference in vital capacity between state level hand ball players and state level kho-kho players. The vital capacity of state level hand ball players is much higher in comparison to vital capacity of state level kho-kho players.
- It was found that there is no significant difference in Resting pulse rate of state level hand ball players and state level kho-kho players The Resting pulse rate of state level hand ball players is higher in comparison to Resting pulse rate of state level kho-kho players.
- It was found that there is a significant difference in Systolic Blood pressure of state level hand ball players and state level kho-kho players. The Systolic Blood pressure of state level hand ball players is higher in comparison to Systolic Blood pressure of state level kho-kho players.
- It was found that there is a significant difference in Diastolic Blood pressure of state level hand ball players and state level kho-kho players. The Diastolic Blood pressure of state level hand ball players is higher in comparison to Diastolic Blood pressure of state level kho-kho players

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Peer Reviewed Research Article

Relationship among Somatic Anxiety, Cognitive Anxiety and Self Confidence with the Performance of Throwers

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ABSTRACT

The purpose of this study was to examine the Relationship between among Somatic Anxiety, Cognitive Anxiety and Self-Confidence with the performance of throwers. The Competitive State Anxiety Inventory-2 (CSAI-2) By & Rainer Marten were utilized based on their ability to assess a number of different psychological states thought to be a crucial for proper mental preparation prior to athletic competition as well as for their psychometric properties. These inventories were employed to determine pre-competition levels of Somatic Anxiety, Cognitive Anxiety and Self-Confidence of throwers. Thirty females throwers were randomize selected from All India Inter-University Athletes Meet 2013–2014 which was held at Panjab University Patiala. The age of subjects were ranged of between 18–27 years. Pearson's product moment correlation was employed to examine the relationship. The level of confidence was set at 0.05 level. The finding was revealed that somatic anxiety is having significant impact on performance of throwers because somatic anxiety is a conditional response to performance arena. So it showed disperse once performance begins and having significant effect on the performance cognitive anxiety and self-confidence also shows significant relationship with performance.

Keywords: *Somatic Anxiety, Cognitive Anxiety and Self-Confidence*

INTRODUCTION

Stress is the process that involves the perception of a substantial imbalance between environmental demand and response capabilities under condition in which a failure to meet demand is perceived as having important consequences and is responded to with increase levels of cognitive and somatic state anxiety (Marlens, Veabey and Buston, 1990). When in stressful and anxiety-provoking circumstances, some athletes have been observed to experience deficits in performance, even to the point of "Choking". The multidimensional theory suggested that anxiety consisted of both cognitive and somatic subcomponent based on the theory, cognitive anxiety is "The mental component of anxiety and is caused by negative expectation about success or by negative self-evaluation, the other hand somatic anxiety refers to the physiological and affective element of the anxiety experience that develop directly from autonomic arousal". Marlens *et al.* (1990) have suggested that somatic anxiety should affect performance with lower and higher levels of somatic anxiety being increased to performance. The third subcomponent is the individual differences factor of self confidence.

SIGNIFCANT OF THE STUDY

1. To examine the relationship between somatic anxiety in Throwers.
2. To examine the relationship between cognitive anxiety in Throwers.
3. To examine the relationship between self confidence in university Throwers.

METHODOLOGY

Selection of Subjects

Thirty subjects were randomly selected from the total shotput throwers and discuss throwers participants of All India Inter University athletic championship, which

was held at Panjab University Patiala 2013–14. The age of subjects were ranged between 19 to 27 years. The data were collected by the permission of the team manager. The Competitive State Anxiety Inventory-2 (CSAI-2) by Rainer Marten was selected for the study because it is a sports specific anxiety test.

Administration of Questionnaire

In the present study the aim was to evaluate the psychometric properties of the All india university throwers participated. The test was administrated to the subjects before the thirty minutes of the competition. The subjects were assembled in a group, clear instruction were specifically given that all the items in the questionnaire must be attempted. The shot put and discus thrower performance were considered as the score of Throwers performance.

Statistical Procedure

Pearson's Product Moment Correlation was employed to determine the relationship between competitive anxiety and throwing performance and also with sub variables somatic anxiety, cognitive anxiety and self confidence with the throwing performance. The level of confidence was set at 0.05.

RESULTS

In order to find out the relationship competitive anxiety and throwing performance and also with sub variables somatic anxiety, cognitive anxiety and self confidence with the throwing performance, the collected data was analysed by using coefficient of correlation. The results of the statistical technique used on data were presented in given Table 1.

Table 1: Relationship of Competitive Anxiety along with Variables with the Performance of Throwers

Sr. No.	Name of Variables	Coefficient of Correlation (r)
1	Somatic Anxiety	0.567*
2	Cognitive Anxiety	0.448*
3	Self-confidence	0.405*

* Significant at 0.05 level $r_{0.05}$ (28) = 0.361

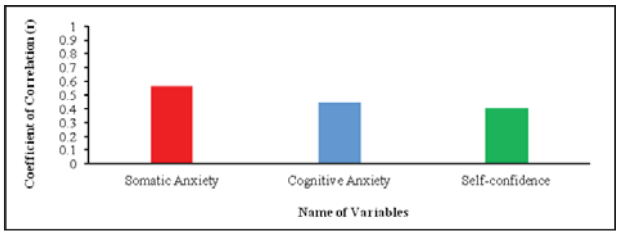

Fig. 1: Graphical Representation of Relationship among Somatic Anxiety, Cognitive Anxiety and Self Confidence with Performance of Throwers

DISCUSSION OF FINDINGS

Result suggested that the CSAI-2 is able to discriminate between the groups (shotput and discuss throwers). On the intensity of symptoms reported. A judement made by the participant as to whether a particular symptoms will facilitate or debilitate performance may be based on a number of factors, but reflects an entirely separated process that does not alter the way in which the individual experience alter those symptoms. The finding was revealed that somatic anxiety is having significant impact on performance of throwers because somatic anxiety is a conditional response to performance arena. So it showed disperse once performance begins and having significant effect on the performance cognitive anxiety and self-confidence also shows significant relationship with performance. Furthermore, given the difficulties associated with interpreting the CSAI-2(d) in its current form it is suggested that future research should be directed towards the development of sport-specific inventories that aim to assess the range of emotions experienced by athletes.

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Peer Reviewed Research Article

A Comparative Analysis of Motor Fitness Components among Inter-University Sprinters, Throwers and Jumpers

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ABSTRACT

Thus the aim of this study was to determine the comparative analysis of motor fitness components among Sprinters, Throwers and Jumpers. To obtain data, the investigators had selected Ninety (N=90), Male Inter-University Level (Sprinters, Throwers and Jumpers) between the age group of 18-25 years (Mean ± SD: age 20.683±2.02 years, height 5.7449±26.3 m, body mass 76.400±14.3 kg) were selected. The subjects were purposively assigned into three groups: Group-A: Inter-University Sprinters (n1=30); Group-B: Inter-University Throwers (n2=30); Group-C: Inter-University Jumpers (n3=30). One way Analysis of Variance (ANOVA) to find out the intra-group differences and where the 'F' ratio found significant then Post-hoc test Least Significant Difference (LSD) was applied to find out the direction and degree of differences. To test the hypothesis, the level of significance was set at 0.05. To conclude, it is significant to mention in relation to Motor Fitness Components that significant differences occur among Inter-University Sprinters, Thrower and Jumpers on the sub variable Speed and Flexibility. However, the insignificant differences occur among Inter-University Sprinters, Throwers and Jumpers on the sub variable Explosive Strength.

Keywords: *otor Fitness Components, Sprinters, Throwers and Jumpers*

INTRODUCTION

Prediction in human performance and sports has long been a popular topic of debate. Is there such a thing as natural athletes? What physical attributes are most important for high level of athletic performance? Is it possible to measure athletic potential and predict future athletics success? (James, *et al.*, 2011). Early researcher operated on the theory that as there were tests for assessing the innate ability of intelligence in the cognitive domain, there must also be a way to measure innate motor ability in the psychomotor domain. These early researchers concentrated from the early 1920's to the early 1940 on determining the physical components that are basic to and necessary for a successful human performance. The relationship of sports performance with the physical, psychological and physiological abilities has been the thrust area for researchers from decades. There have been thousands of attempts by the researchers to develop a consistent Physical and psychological and physiological profile of athletes, to be reliably used to differentiate athletes and to predict the sports performance (Ketelaar, *et al.* 2009, Lena *et al.*2010). Scientists and physiologists have been of the view that body composition and physical components of an athlete have a lot to do with his performance. More than the technique and tactics of a player or a team physical and physiological characteristic helps him for better performance.

The research findings show that a high level of technical perfection alone has nothing to do with the competitive sports. Most of the games demand a higher level of speed, strength, endurance, agility and optimum fitness of the organism. The variations in these abilities have been associated with the level of achievement in all sports. Due to the importance of these abilities, it has become an eye catching area for sports scientist. Keeping in view the importance of these physical, psychological and physiological abilities to achieve top performance, the researcher decided to study the motor fitness components of Inter-university level sprinters, jumpers and throwers.

SELECTION OF SUBJECTS

For the purpose of the present study, Ninety (N=90), Male Inter-University Level (Sprinters, Throwers and Jumpers) between the age group of 18-25 years (Mean ± SD: age 20.683±2.02 years, height 5.7449±26.3 m, body mass 76.400±14.3 kg) were selected. The subjects were purposively assigned into three groups:

- Group-A: Inter-University Sprinters (n_1=30)
- Group-B: Inter-University Throwers (n_2=30)
- Group-C: Inter-University Jumpers (n_3=30)

SELECTION OF VARIABLES

With the above criteria in mind, the following Motor Fitness Components were selected for the present study:

MOTOR FITNESS COMPONENTS

1. Speed
2. Explosive Strength
3. Flexibility

STATISTICAL TECHNIQUE EMPLOYED

One way Analysis of Variance (ANOVA) to find out the intra-group differences and where the 'F' ratio found significant then Post-hoc test Least Significant Difference (LSD) was applied to find out the direction and degree of differences. To test the hypothesis, the level of significance was set at 0.05.

RESULTS

The results of Motor Fitness Components among Inter-University (Sprinters, Throwers and Jumpers) are presented in the following tables and their interpretations are given accordingly.

Table 1: Analysis of Variance (ANOVA) Results with Regard to Motor Fitness Components among Inter-University (Sprinters, Throwers and Jumpers) on the Sub-Variable Speed

Source of Variation	Sum of Squares	df	Mean Square	F-Ratio	P-Value (Sig.)
Between Groups	2.931	2	1.465	48.481*	.000
Within Groups	2.630	87	0.030		
Total	5.560	89			

F- 0.05 (2, 87)

It can be judged from Table 1 that results of Analysis of Variance (ANOVA) among various groups (sprinters, throwers and jumpers) with regard to motor fitness components on the sub-variable speed were found highly statistically significant (P<.05). Since the obtained F-ratio 48.481 was found statistically highly significant, therefore, Post-hoc test (LSD) was applied to find out the degree and direction of differences between paired means among various groups (sprinters, throwers and jumpers) with regard to motor fitness components on the sub-variable speed. The results of Post-hoc test have been presented in Table 2.

Table 2: Analysis of Least Significant Difference (LSD) Post Hoc Test with Regard to Motor Fitness Components Among Inter - University (Sprinters, Throwers and Jumpers) on the Sub-Variable Speed

Mean Values and Groups		Mean Difference	P-Value (Sig.)
Sprinters (5.8837)	Throwers (6.2833)	0.39967	0.000
	Jumpers (5.9200)	0.03633	0.420
Throwers (6.2833)	Sprinters (5.8837)	0.39967	0.000
	Jumpers (5.9200)	0.36333	0.000
Jumpers (5.9200)	Sprinters (5.8837)	0.03633	0.420
	Throwers (6.2833)	0.36333	0.000

*Significant at 0.05

From Table 2, the following conclusions can be drawn:

It has been observed from the Table 2 that mean difference between sprinters and throwers group was found.39967. The sprinters (5.8837) group had exhibited significantly better on speed than their counterpart throwers (6.2833) group. The mean difference between sprinters and jumpers group was found.03633. The sprinters (5.8837) had demonstrated better on speed than their counterpart jumpers (5.9200) group. The mean difference between throwers and jumpers group was found.36333. The jumpers (5.9200) had exhibited significantly better on speed than their counterpart throwers (6.2833) group.

Table 3: Analysis of Variance (ANOVA) Results with Regard to Motor Fitness Components among Inter-University Sprinters, Throwers and Jumpers on the Sub-Variable Explosive Strength

Source of Variation	Sum of Squares	df	Mean Square	F-Ratio	Sig.
Between Groups	20.867	2	10.433	0.747	0.477
Within Groups	1215.633	87	13.973		
Total	1236.500	89			

F- 0.05 (2, 87)

It can be judged from Table 3 that results of Analysis of Variance (ANOVA) among various groups (sprinters, throwers and jumpers) with regard to motor fitness components on the sub-variable explosive strength were found statistically insignificant (P>.05).

Table 4: Analysis of Variance (ANOVA) Results with Regard to Motor Fitness Components among Inter-University Sprinters, Throwers and Jumpers on the Sub-Variable Flexibility

Source of Variation	Sum of Squares	df	Mean Square	F-Ratio	Sig.
Between Groups	232.500	2	116.250	9.600*	0.000
Within Groups	1053.565	87	12.110		
Total	1286.065	89			

F- 0.05 (2, 87)

It can be judged from Table 4 that results of Analysis of Variance (ANOVA) among various groups (sprinters, throwers and jumpers) with regard to motor fitness components on the sub-variable flexibility were found statistically significant (P<.05). Since the obtained F-ratio 9.600 was found statistically significant, therefore, Post-hoc test (LSD) was applied to find out the degree and direction of differences between paired means among various groups (sprinters, throwers and jumpers) with regard to motor fitness components on the sub-variable flexibility. The results of Post-hoc test have been presented in Table 5.

Table 5: Analysis of Least Significant Difference (LSD) Post Hoc Test with Regard to Motor Fitness Components among Inter–University Sprinters, Throwers and Jumpers on The Sub–Variable Flexibility

Mean Values and Groups		Mean Difference	P-Value (Sig.)
Sprinters (14.9000)	Throwers (13.3167)	1.58333	0.082
	Jumpers (17.2300)	2.33000	0.011
Throwers (13.3167)	Sprinters (14.9000)	1.58333	0.082
	Jumpers (17.2300)	3.91333	0.000
Jumpers (17.2300)	Sprinters (14.9000)	2.33000	0.011
	Throwers (13.3167)	3.91333	0.000

*Significant at 0.05

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From table 5, the following conclusions can be drawn:

It has been observed from the Table 5 that mean difference between sprinters and throwers group was found 1.58333. The sprinters (14.9000) group had demonstrated better on flexibility than their counterpart throwers (13.3167) group. The mean difference between sprinters and jumpers group was found 2.33000. The jumpers (17.2300) had exhibited significantly better on flexibility than their counterpart sprinters (14.9000) group. The mean difference between throwers and jumpers group was found 3.91333. The jumpers (17.2300) had exhibited significantly better on flexibility than their counterpart throwers (13.3167) group.

CONCLUSIONS OF THE STUDY

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

To conclude, it is significant to mention in relation to Motor Fitness Components that significant differences occur among Inter-University Sprinters, Thrower and Jumpers on the sub variable Speed and Flexibility. However, the insignificant differences occur among Inter-University Sprinters, Throwers and Jumpers on the sub variable Explosive Strength.

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A Comparative Analysis of Agility and Balance among Inter-University Sprinters, Throwers and Jumpers

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ABSTRACT

Thus the aim of this study was to determine the comparative analysis of agility and balance among Sprinters, Throwers and Jumpers. To obtain data, the investigators had selected Ninety (N=90), Male Inter-University Level (Sprinters, Throwers and Jumpers) between the age group of 18-25 years (Mean ± SD: age 20.683±2.02 years, height 5.7449±26.3 m, body mass 76.400±14.3 kg) were selected. The subjects were purposively assigned into three groups: Group-A: Inter-University Sprinters (n1=30); Group-B: Inter-University Throwers (n2=30); Group-C: Inter-University Jumpers (n3=30). One way Analysis of Variance (ANOVA) to find out the intra-group differences and where the 'F' ratio found significant then Post-hoc test Least Significant Difference (LSD) was applied to find out the direction and degree of differences. To test the hypothesis, the level of significance was set at 0.05. To conclude, it is significant to mention in relation to Motor Fitness Components that significant differences occur among Inter-University Sprinters, Thrower and Jumpers on the sub variable Balance. However, the insignificant differences occur among Inter-University Sprinters, Throwers and Jumpers on the sub variable Agility.

Keywords: *Motor Fitness Components, Sprinters, Throwers and Jumpers*

INTRODUCTION

One of the additional attempts was the development of classification indexes for categorized students according to their abilities. This was to allow physical education classes to be formed homogeneously so that they could be taught with increased efficiency. The earliest classification index focused on predicting ability by age, height and weight information (McCloy, 1932). At the same time, researcher began classifying the student by motor ability testing. The term motor ability was introduced, which referred to the overall proficiency in performing a wide range of sports related tasks. To increase the accuracy of the prediction, test batteries were designed on the premises that certain motor abilities such as agility, balance, co-ordination, endurance, power, speed and strength were the basic of physical performance (Clark and Bonested, 1935). Early researcher operated on the theory that as there were tests for assessing the innate ability of intelligence in the cognitive domain, there must also be a way to measure innate motor ability in the psychomotor domain. These early researchers concentrated from the early 1920's to the early 1940 on determining the physical components that are basic to and necessary for a successful human performance. The relationship of sports performance with the physical, psychological and physiological abilities has been the thrust area for researchers from decades. There have been thousands of attempts by the researchers to develop a consistent Physical and psychological and physiological profile of athletes, to be reliably used to differentiate athletes and to predict the sports performance (Ketelaar, *et al*. 2009, Lena *et al*.2010). Keeping in view the importance of these physical, psychological and physiological abilities to achieve top performance, the researcher decided to study the motor fitness components of Inter-university level sprinters, jumpers and throwers.

SELECTION OF SUBJECTS

For the purpose of the present study, Ninety (N=90), Male Inter-University Level (Sprinters, Throwers and

Jumpers) between the age group of 18-25 years (Mean ± SD: age 20.683±2.02 years, height 5.7449±26.3 m, body mass 76.400±14.3 kg) were selected. The subjects were purposively assigned into three groups:

- *Group-A*: Inter-University Sprinters (n_1=30)
- *Group-B*: Inter-University Throwers (n_2=30)
- *Group-C*: Inter-University Jumpers (n_3=30)

SELECTION OF VARIABLES

With the above criteria in mind, the following Motor Fitness Components were selected for the present study:

MOTOR FITNESS COMPONENTS

1. Agility
2. Balance

STATISTICAL TECHNIQUE EMPLOYED

One way Analysis of Variance (ANOVA) to find out the intra-group differences and where the 'F' ratio found significant then Post-hoc test Least Significant Difference (LSD) was applied to find out the direction and degree of differences. To test the hypothesis, the level of significance was set at 0.05.

RESULTS

The results of Motor Fitness Components among Inter-University (Sprinters, Throwers and Jumpers) are presented in the following tables and their interpretations are given accordingly.

Table 1: Analysis of Variance (ANOVA) Results with Regard to Motor Fitness Components among Inter–University Sprinters, Throwers and Jumpers on the Sub-Variable Agility

Source of Variation	Sum of Squares	DF	Mean Square	F-Ratio	Sig.
Between Groups	9.786	2	4.893	1.414	0.249
Within Groups	301.142	87	3.461		
Total	310.928	89			

F- 0.05 (2, 87)

It can be judged from Table 1 that results of Analysis of Variance (ANOVA) among various groups (sprinters, throwers and jumpers) with regard to motor fitness components on the sub-variable agility were found statistically insignificant (P>.05).

Table 2: Analysis of Variance (ANOVA) Results with Regard to Motor Fitness Components among Inter–University Sprinters, Throwers and Jumpers on the Sub-Variable Balance

Source of Variation	Sum of Squares	DF	Mean Square	F-Ratio	Sig.
Between Groups	618.156	2	309.078	6.107*	0.003
Within Groups	4402.967	87	50.609		
Total	5021.122	89			

F- 0.05 (2, 87)

It can be judged from Table 2 that results of Analysis of Variance (ANOVA) among various groups (sprinters, throwers and jumpers) with regard to motor fitness components on the sub-variable balance were found statistically significant (P<.05). Since the obtained F-ratio 6.107 was found statistically significant, therefore, Post-hoc test (LSD) was applied to find out the degree and direction of differences between paired means among various groups (sprinters, throwers and jumpers) with regard to motor fitness components on the sub-variable balance. The results of Post-hoc test have been presented in Table 3.

Table 3: Analysis of Least Significant Difference (LSD) Post Hoc Test with Regard to Motor Fitness Components among Inter–University Sprinters, Throwers and Jumpers on the Sub-Variable Balance

Mean Values and Groups		Mean Difference	P-Value (Sig.)
Sprinters (20.4000)	Thrower (26.8000)	6.40000	.001
	Jumpers (24.0333)	3.63333	.051
Thrower (26.8000)	Sprinters (20.4000)	6.40000	.001
	Jumpers (24.0333)	2.76667	.136
Jumpers (24.0333)	Sprinters (20.4000)	3.63333	.051
	Thrower (26.8000)	2.76667	.136

*Significant at 0.05

From Table 3, the following conclusions can be drawn:

1. It has been observed from the table-3 that mean difference between sprinters and throwers group was found 6.40000. The throwers (26.8000) group had exhibited significantly better on balance than their counterpart sprinters (20.4000) group.
2. The mean difference between sprinters and jumpers group was found 3.63333. The jumpers (24.0333) had exhibited significantly better on balance than their counterpart sprinters (20.4000) group.

3. The mean difference between throwers and jumpers group was found 2.76667. The throwers (26.8000) had demonstrated better on balance than their counterpart jumpers (24.0333) group. The graphical representation of responses has been exhibited in (Figure- 1).

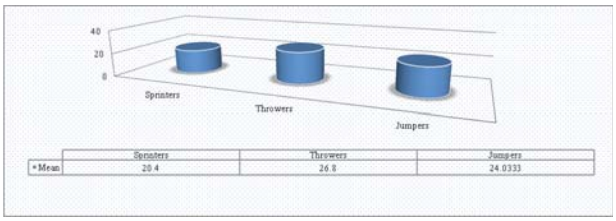

Fig. 1: Graphical Representations in the Mean Scores of Motor Fitness Components among Inter-College Sprinters, Throwers and Jumpers on the Sub-Variable Balance

CONCLUSIONS OF THE STUDY

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

To conclude, it is significant to mention in relation to Motor Fitness Components that significant differences occur among Inter-University Sprinters, Thrower and Jumpers on the sub variable Balance. However, the insignificant differences occur among Inter-University Sprinters, Throwers and Jumpers on the sub variable Agility.

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Peer Reviewed Research Article

Effect of 12-Week Yogic Practices on Hematological Variables of Young Girls

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ABSTRACT

Thus the aim of this study was to assess the effect of 12-week yogic practices on hematological variables of young girls. To obtain data, the investigators had selected for this purpose, One Hundred and Twenty (N=120), University Level Girls of Department of Physical Education (T), Guru Nanak Dev University, Amritsar between the age group of 21-26 years (Mean ± SD: age 23.983 ± 1.130 years, height 159.867 ± 3.0096 m, body mass 49.608 ± 4.39 kg) were selected. The subjects were purposively assigned into two groups: Group-A: Experimental (n1=60); Group-B: Control (n2=60). All the subjects were informed about the objective and protocol of the study. SPSS statistical software (version 16.0) was used to analyze. Student's t-test for independent data was used to assess the between-group differences and for dependent data to assess the Post-Pre differences. To test the hypothesis, the level of significance was set at 0.05. The 12-week yogic practices brought about insignificant improvement in all the hematological variables of young girls.

Keywords: *Hematological Variables, Yogic Asanas*

INTRODUCTION

India has a rich tradition of yogic practices. Now-a-days yoga, the ancient practice of postures, breathing and meditation is gaining a lot of attention from healthcare Professionals. With increasing scientific research in yoga, its therapeutic aspects are also being explored. The word "yoga" has come to describe a means of uniting or a method of discipline: to join the body to the mind and together join to the self (soul), or the union between the individual self and the transcendental self. Ayurvedic texts describe 8 components or arms of Yoga that encompass a philosophy of life: (a) yama (self-restraint); (b) niyama (routines); (c) asana (postures and physical exercises); (d) pranayama (use of breathing to achieve focus); (e) pratyhara (withdrawal of mind from sense organs); (f) dharana (concentration); (g) dhyana (meditation); and (h) samadhi (emancipation). Yoga through its techniques of meditation, asanas, and pranayama yields a positive effect in the management of stress in adolescents (Krejci, 1994). The processing of sensory information at the thalamic level is facilitated during the practice of pranayama (Telles *et al.*1992) and meditation. (Telles & Desiraju 1993). These two practices along with physical postures (asanas), cleansing practices, devotional sessions, and lectures on the theory and philosophy of yoga were focused to bring about an improvement in the steadiness of school students following 10 days of practice. This improvement was believed to be due to improved eye-hand coordination, attention, concentration, and relaxation (Telles *et al.* 1997).

SELECTION OF SUBJECTS

For the purpose of the present study, One Hundred and Twenty (N=120), University Level Girls of Department of Physical Education (T), Guru Nanak Dev University, Amritsar between the age group of 21-26 years (Mean ± SD: age 23.983 ± 1.130 years, height 159.867 ± 3.0096 m, body mass 49.608 ± 4.39 kg) were selected. The subjects were purposively assigned into two groups:

- Group-A: Experimental (n_1=60)
- Group-B: Control (n_2=60)

All the subjects were informed about the objective and protocol of the study. Subject's characteristics are displayed in table-1.

Table 1: Subject's Demographics of Experimental and Control Group

Sample Size (N=120)			
Variables	Total (N=120)	Experimental Group (n_1=60)	Control Group (n_2=60)
Age	23.983±1.130	24.1±1.069	23.867±1.185
Body Height	159.867±3.0096	159.7±3.2012	160.033±2.8222
Body Mass	49.608±4.39	49.383±4.14	49.833±4.65

SELECTION OF VARIABLES

With the above criteria's in mind, following the following variables was selected for the present study:

HEMATOLOGICAL VARIABLES

1. Hemoglobin
2. Total Cholesterol
3. HDL Cholesterol

Details of Yogic Practices And Training Protocol

The subjects from Group A: Experimental Group was subjected to a 12-week yogic asanas training programme. The training was consisting of a variety of yogic asanas:

Standing Postures

1. Alanasana
2. Utthita Parsvakonasana
3. Adho Mukha Svanasana

Balancing Postures

1. Parivrtta Ardha Chandrasana
2. Utthita Hasta Padangusthasana
3. Ardha Chandrasana

Arm-Balancing Postures

1. Vasisthasana
2. Purvottanasana
3. Mayurasana

Inverted Postures

1. Sarvangasana
2. Halasana
3. Sirsasana

Backward-Bending Postures

1. Setu Banda Sarvangasana
2. Dhanurasana
3. Eka pada raja kapotasana

The yogic practices training programme was given to experimental group for 12 weeks of one session in the morning between 6.00 A.M. to 7.30 A.M for three days on Monday, Wednesday, and Friday as shown in Table.

STATISTICAL TECHNIQUE EMPLOYED

SPSS statistical software (version 16.0) was used to analyze. Student's t-test for independent data was used to assess the between-group differences and for dependent data to assess the Post-Pre differences. To test the hypothesis, the level of significance was set at 0.05.

Hemoglobin

Table-2 presents the results of experimental group and the control group with regard to the variable Hemoglobin. The descriptive statistics shows the Mean and SD values of Hemoglobin of pre test and post test of experimental group was 11.978±0.736 and 11.933±0.690 respectively, whereas the Mean and SD values of Hemoglobin of pre-test and post-test of control group was 12.108±0.787 and 12.077±0.772. The "t" value in case of experimental group was 0.3811 and for control group it was 0.2363. The 't'-value in case of experimental group was 0.3811 and for control group it was 0.2363 as shown in the table above was found statistically insignificant (P>.05). As per the study the above remark can be given at 95% confidence.

Total Cholesterol

The Mean and SD values of Total Cholesterol of pre test and post test of experimental group was 154.875±2.348 and 155.217±2.246 respectively, whereas the Mean and SD values of Total Cholesterol of pre-test and post-test of control group was 142.780±3.560 and 141.482±2.865. The "t" value in case of experimental group was 0.8162 and for control group it was 0.4924. The 't'-value in case of experimental group was 0.8162and for control group it was 0.4924 as shown in the table above was found statistically insignificant (P>.05).

Yogic Practices Training Programme

Week	Yogasana positions	Intensity	Repetition	Set	Frequency Per Week	Each Asana	Rest in between Asanas
1–3	Standing Postures	50%	12 times	4	3 days	2 minute	45 Seconds
4–6	Balancing Postures	60%	10 times	4	3 days	2 minute	45 Seconds
7–9	Arm-Balancing Postures	70%	8 times	4	3 days	2 minute	45 45 Seconds
10–11	Inverted Postures	80%	6 times	4	3 days	2 minute	45 Seconds
12	Backward-Bending Postures	85%	6 times	4	3 days	2 minute	45 Seconds

(RM –Repetition Maximum)

RESULTS

Table 2: Significance of Differences between Pre-Test and Post-Test Means of Experimental Group and the Control Group with Regard to Hematological Variables

Hemoglobin						
Group	Number	Mean	S.D.	SEM	't' Value	P-value
Experiment (Pre-test)	60	11.978	0.736	0.095	0.3811	0.7045
Experimental (Post-test)	60	11.933	0.690	0.089	0.2363	
Control (Pre-test)	60	12.108	0.787	0.102		0.8140
Control (Post-test)	60	12.077	0.772	0.100		
Total Cholesterol						
Experiment (Pre-test)	60	154.875	2.348	0.303	0.8162	0.4177
Experimental (Post-test)	60	155.217	2.246	0.290	0.4924	
Control (Pre-test)	60	142.780	3.560	1.751		0.6243
Control (Post-test)	60	141.482	2.865	1.661		
HDL Cholesterol						
Experiment (Pre-test)	60	91.2588	4.5683	0.5898	1.4825	0.1435
Experimental (Post-test)	60	92.0153	4.5046	0.5815	0.2562	
Control (Pre-test)	60	90.0170	4.9685	0.6414		0.7987
Control (Post-test)	60	90.2490	4.2919	0.5541		

*Significant at 0.05 level Degree of freedom= 59

HDL Cholesterol

The Mean and SD values of HDL Cholesterol of pre test and post test of experimental group was 91.2588±4.5683 and 92.0153±4.5046 respectively, whereas the Mean and SD values of HDL Cholesterol of pre-test and post-test of control group was 90.0170±4.9685 and 90.2490±4.2919. The "t" value in case of experimental group was 1.4825 and for control group it was 0.2562. The 't'-value in case of experimental group was 1.4825 and for control group it was 0.2562 as shown in the table above was found statistically insignificant (P>.05).

DISCUSSION & CONCLUSION

It is evident from the findings of table-1to5 with regard to hematological variables that insignificant differences have been observed on the sub-variables; Haemoglobin, Total Cholesterol, HDL Cholesterol of university level girls. When compared the mean values of both the groups, it has been found that experimental group have demonstrated better on Haemoglobin, Total Cholesterol, HDL Cholesterol of university level girls after the yoga practices.

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Peer Reviewed Research Article

A Comparative Analysis of Passion and Shyness in Sports: A Key towards Success

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ABSTRACT

The researchers of this study aims to know about the role of passion and shyness in sports. For this purpose, the investigator had selected Forty (N=40) male inter-college level basketball and football players of 20 to 25 years of age to act as subjects. 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. To measure the level of Passion was measured by applying Passion questionnaire developed by Valler and et al., 2003 and Shyness was measured by applying Shyness questionnaire developed by Md. Rafi (2002). To determine the significant differences between basketball and football players, unpaired t-test was employed for data analyses. To test the hypothesis, the level of significance was set at 0.05. The results revealed insignificant difference with regard to variable passion and shyness between basketball and football players.

Keywords: *Passion, Shyness and Sports*

INTRODUCTION

Passion is a term applied to a very strong feeling about a person or thing. Passion is an intense emotion compelling, feeling, enthusiasm, or desire for something. The term is also often applied to a lively or eager interest in, or admiration for, a proposal, cause, or activity or love to a feeling of unusual excitement, enthusiasm or compelling emotion, a positive affinity or love, towards a subject, idea, person, or object. (Valler and *et al*., 2003) (Valler and *et al*. 2006), Valler and and Houlfort (2003), and Valler and and Miquelon (2007), "have offered a conceptual analysis of passion toward activities. Passion is a strong inclination toward an activity that individual like, that they find important and in which they invest time and energy.

It is also important to note that because they both entail a passion for the activity; harmonious and obsessive passions are hypothesized to be moderately and positively correlated. However, as posited above, each type of passion entails a specific type of activity engagement, which is expected to lead to different experiences and effects, with harmonious passion leading to adaptive outcomes, and obsessive passion predominantly leading to less adaptive and at times maladaptive effects.

Shyness is what causes that "funny" feeling one may get when one is with other people. Shyness can happen when we are nervous about meeting a new teacher (or becoming one you), scared about joining a new school or worried about being part of a drama troupe. Chronic shyness can clearly be distinguished from introversion. Introverts are people who prefer solitary to social activities but do not fear social inventors as do the Shy. Shy individuals have a wish for more contact with others and are not content with the degree of isolation that pervades their lives. Whether it is situational or chronic shyness that is experienced, the shy individual will report feeling some degree of disconnection with others and a longing for closer bonds with people in their lives.

Shyness is the fear to meet people and the discomfort in others' presence. At its core is anxiety about being evaluated by others and consequently rejected. It is associated with excessive monitoring of behavior and takes the form of hesitation in making spontaneous utterances, reluctance to express opinions, and making responses to the overtures of others that reduce the likelihood of further interaction. Shy people suffer

numerous disadvantages. Compared with others, they are more likely to regard their social networks as less supportive and less satisfying and are happy to be by themselves or to participate minimally in social encounters.

SELECTION OF SUBJECTS

For this purpose, the investigator had selected Forty (N=40) male inter-college level basketball and football players of 20 to 25 years of age to act as subjects. 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.

SELECTION OF TOOLS

Sr. No.	Tools	Authors	Year
1	PASSION	Vallerand *et al.*	2003
2	SHYNESS	Md. Rafi	2002

DESCRIPTION OF THE TESTS

In order to measure the level of passion and shyness of the subjects, three tools (i.e., questionnaires) have been used in this study. These tests have been described below:

PASSION

Passion was measured by applying Passion questionnaire developed by Vallerand *et al.* (2003).

SHYNESS

Shyness was measured by applying Shyness questionnaire developed by Md. Rafi (2002)

STATISTICAL TECHNIQUES EMPLOYED

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

RESULTS

Table 1 presents the results of basketball and football players with regard to the variable Passion. The descriptive statistics shows the Mean and SD values of basketball players on the variable passion as 89.54 and 7.32 respectively. However, football players had Mean and SD values as 94.49 and 9.04 respectively. The't'-value 3.09 as shown in the table above was found statistically insignificant (P>.05). But while comparing the mean values of both the groups, it has been observed that football players have demonstrated better passion than the basketball.

Table 2 presents the results of basketball and football players with regard to the variable Shyness. The descriptive statistics shows the Mean and SD values of basketball players on the variable shyness as 63.57 and 8.66 respectively. However, football players had Mean and SD values as 57.37 and 9.58 respectively. The 't'-value 2.48 as shown in the table above was found statistically insignificant (P>.05). But while comparing the mean values of both the groups, it has been observed that basketball players have demonstrated higher shyness than the football players.

Conclusions of the Study

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

1. It is concluded from the above findings that insignificant differences between basketball and football players on the variable of Passion.
2. Insignificant difference found between basketball and football players on the variable of Shyness.

Table 1: Significant Differences in the Mean Scores of Basketball and Football Players on the Variable Passion

Basketball Players (N=20)			Football Players (N=20)			T-Value	P-Value Sig.
Mean	SD	SEM	Mean	SD	SEM		
89.54	7.32	1.22	94.49	9.04	1.23	3.09	0.21

*Significant at 0.05 level Degree of freedom= 38

Table 2: Significant Differences in the Mean Scores of Basketball and Football Players on the Variable Shyness

Basketball Players (N=20)			Football Players (N=20)			T-Value	P-Value Sig.
Mean	SD	SEM	Mean	SD	SEM		
63.57	8.66	1.67	57.37	9.58	1.83	2.48	0.11

*Significant at 0.05 level Degree of freedom= 38

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Peer Reviewed Research Article

An Empirical Comparison of Competitive State Anxiety (CSA) between Individual, Team and Dual Sports

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ABSTRACT

The purpose of this study was to determine the significant difference of Competitive State Anxiety (CSA) Between Individual, Team and Dual Sports. The researcher collected the data on Forty five (N=45), Male subjects between the age group of 18-28 years (Mean ± SD: age 21.13±2.38 years, height 173.86±3.91 m, body mass 69.46±3.75 kg) were selected. The subjects were purposively assigned into Three groups: Group-A: Individual Sports (n1=15), Group-B: Team Sports (n2=15) and Group-C: Dual Sports (n3=15). The Competitive State Anxiety Inventory-2 (CSAI-2) by Rainer Marten was selected for the study. The differences in the mean of each group for selected variable were tested for the significance of difference by One-way Analysis of Variance (ANOVA). For further analysis Post-Hoc Test (Scheffe's Test) was applied. In all the analyses, the 5% critical level (p<0.05) was considered to indicate statistical significance. It is evident from the results that Somatic Anxiety and Self-Confidence were found to be statistically significant (P<0.05) whereas the results further reveals that Cognitive Anxiety were found to be statistically insignificant (P>0.05).

Keywords: *Competitive State Anxiety (CSA), Individual Sports, Team Sports, Dual*

INTRODUCTION

Anxiety is among the most frequently investigated variables in sport psychology (Hardy, Jones, and Gould, 1996; Jones, 1995). An individual's anxiety level experienced immediately before a competition (i.e., state anxiety) has a moderating effect on subsequent athletic performance (Martens, 1971). Early research suggested the relation between anxiety and sport performance is best described by an inverted-U function (Landers & Boutcher, 2001; Sonstroem & Bernardo, 1982). While there is a scarcity of research on the relationships of open and closed skills with performance (Terry & Slade, 1995), these two types of skills may be influenced differently by anxiety. Performance based on open skills may be more influenced by anxiety and self-confidence than performance based on closed skills. An open skill can involve either an individual or team sport with the athlete per- forming in an interactive and ever-changing environment (i.e., basketball, tennis). A closed skill is performed in a more stable environment that is relatively predictable and often self-paced (i.e., golf, gymnastics, crew teams).

SELECTION OF SUBJECTS

The researcher collected the data on Forty five (N=45), Male subjects between the age group of 18-28 years (Mean ± SD: age 21.13±2.38 years, height 173.86±3.91 m, body mass 69.46±3.75 kg) were selected. The subjects were purposively assigned into Three groups:

- Group-A: Individual Sports (n_1=15)
- Group-B: Team Sports (n_2=15)
- Group-C: Dual Sports (n_3=15)

Subject's characteristics are displayed in Table 1 and are exhibited in Fig. 1.

Table 1: Subject's Demographics

Variables	Sample Size (N=45)			
	Total N=45	Individual Sports (n_1=15)	Team Sports (n_2=15)	Dual Sports (n_3=15)
Age	21.13±2.38	21.06±2.31	20.66±1.98	21.66±2.84
Body Height	173.86±3.91	174.00±3.60	173.80±3.50	173.80±4.78
Body Mass	69.46±3.75	68.73±3.65	70.06±3.80	69.60±3.92

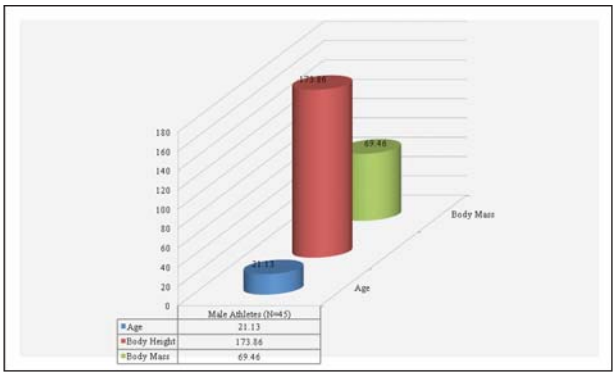


Fig. 1: Subject's Demographics

SELECTION OF VARIABLES

A feasibility analysis as to which of the variables could be taken up for the investigation, keeping in view the availability of tools, adequacy to the subjects and the legitimate time that could be devoted for tests and to keep the entire study unitary and integrated was made in consultation with experts. With the above criteria's in mind, the following variables were selected for the present study:

Competitive State Anxiety (CSA)

1. Somatic Anxiety
2. Cognitive Anxiety
3. Self-Confidence

ADMINISTRATION OF TEST

The Competitive State Anxiety Inventory-2 (CSAI-2) by Rainer Marten was selected for the study because it is a sports specific anxiety test. Further it assesses competitive anxiety on the basis of three dimension anxiety i.e., cognitive anxiety, somatic anxiety and self-confidence.

Procedure

The CSAI-2 was scored by computing a separate total for each of the three sub-scales with high score, ranging from a low of 9 to a high of 36. The higher the score the greater the cognitive or somatic anxiety as well as greater the state self-confidence. No. Of total score for the inventory was computed. The cognitive state sub-scale was scored for totaling the responses for the following 9 items 1, 4, 7, 10, 13, 16, 19, 22 and 25. The somatic state sub-scale was scored by adding the responses to the following items 2, 5, 8, 11, 14, 17, 20, 23, 26; and state self-confidence sub-scale was scored by adding the following items 3, 6, 9, 12, 15, 18, 21, 24 and 27. Scoring for items be reversed in calculating the score for the somatic and cognitive anxiety and self-confidence.

Directions

A number of directions preceded before the questionnaire was to be filled-in by the respondents and are as give below:

1. Read each statement and then circle the appropriate number to the right now at this moment.
2. There are no right wrong answers.
3. Do not spend too much time on any one statement, but choose the answer, which describes your feelings right now.

Inventories that are missing more than one response per sub-scale can still be scored but any inventory in which two or more items from any one sub-scale are committed should be invalidated. To obtain scale scores when an item has been omitted compute the mean item score for the right answered items, multiply this value by 9 than round the product to the nearest whole number.

Scoring

The responses of each statement of scored as follows:

Sr. No.	Response	Scoring
1	Not at all	4 points
2	Somewhat	3 points
3	Moderately	2 points
4	Very much so	1 point

Administration of Questionnaire

The test was administered on the subjects before one hour of the competition. The subject was assembling in a group; clear instructions were specifically given that all the items in the questionnaire must be attempted.

Reliability of Questionnaire

An alpha consistency assessed the consistency between each subscale and corresponding sample group of athletes. The internal consistency of the CSAI-2 Subscales (from D) resulted in coefficients ranges from

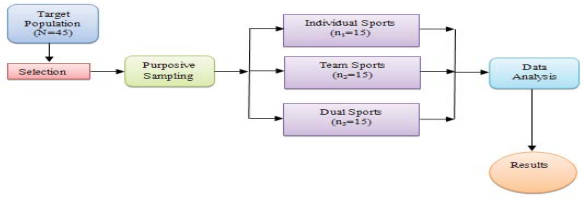
.79 to .90 indicating that the items and subscales were homogeneous.

COLLECTION OF DATA

The survey method through the technique of questionnaire had been adopted to collect the relevant data for this study. The researcher collected the data on sixty (N=45), Male subjects between the age group of 18-28 years. The purposive sampling technique was used to attain the objectives of the study.

Design of the Study

This is an exploratory study that has employed method of data collection and analysis quantitatively. The purpose of the study was to find out the significant difference of Competitive State Anxiety (CSA) between Individual, Team and Dual Sports. The purposive sampling technique was used to attain the objectives of the study.



STATISTICAL TECHNIQUE EMPLOYED

The Statistical Package for the Social Sciences (SPSS) version 14.0 was used for all analyses. The differences in the mean of each group for selected variable were tested for the significance of difference by One-way Analysis of Variance (ANOVA). For further analysis Post-Hoc Test (Scheffe's Test) was applied. In all the analyses, the 5% critical level ($p<0.05$) was considered to indicate statistical significance.

RESEARCH FINDINGS

For each of the chosen variable, the result pertaining to significant difference, if any, of competitive State Anxiety (CSA) Between Individual, Team and Dual Sports. are presented in the following Tables:

It is evident from Table 2 that the results of Analysis of Variance (ANOVA) among three groups with regard to the sub-parameter somatic anxiety were found to be statistically significant ($P<0.05$). Since the obtained "F" ratio 5.011 was found statistically significant, therefore, Post Hoc test (LSD) was applied to determine the degree and direction of difference between the paired means among the groups with regard to the sub-parameter somatic anxiety. The results of post-hoc test have been presented in Table 3 below.

Table 2: Analysis of Variance (ANOVA) Results with Regard to Somatic Anxiety among Individual, Team & Dual Sports

Source of Variance	Sum of Squares	DF	Mean Square	F-ratio	Sig.
Between Groups	67.511	2	33.756	5.011	.011
Within Groups	282.933	42	6.737		
Total	350.444	44			

*Significant at 0.05, F0.05 (2, 42)

Table 3: Analysis of Least Significant Difference (LSD) Post Hoc Test among Individual, Team & Dual Sports with Regard to Somatic Anxiety

Group (A)	Group (B)	Mean Difference (A-B)	Sig.
Individual Sports (Mean= 30.06)	Team	2.86667*	.004
	Dual	.66667	.486
Team Sports (Mean= 27.20)	Individual	-2.86667*	.004
	Dual	-2.20000*	.025
Dual Sports (Mean= 29.40)	Individual	-.66667	.486
	Team	2.20000*	.025

*Significant at 0.05 level

A glance at Table 3 showed that the mean value of Individual Sports was 30.06 whereas Team Sports had mean value as 27.20 and the mean difference between both the groups was found 2.86. The p-value sig .004 shows that the Individual Sports had demonstrated significantly better on somatic anxiety than their counterpart's Team Sports. The mean difference between Team Sports and Dual Sports was found 2.20. The p-value sig .025 showed that the Dual Sports had demonstrated significantly better on somatic anxiety than their counterpart's Team Sports. The mean difference between Dual Sports and Individual Sports was found 0.66. The p-value sig .486 shows that the Individual Sports had demonstrated better on somatic anxiety than their counterpart's Dual Sports though not significantly. The graphical representation of responses has been exhibited in Figure 2.

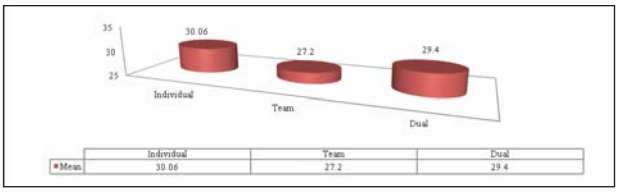


Fig. 2: Graphical Representation of Mean Scores among Individual, Team & Dual Sports with Regard to Somatic Anxiety

Table 4: Analysis of Variance (ANOVA) Results with Regard to Cognitive Anxiety among Individual, Team & Dual Sports

Source of Variance	Sum of Squares	DF	Mean Square	F-ratio	Sig.
Between Groups	26.133	2	13.067	3.135	.054
Within Groups	175.067	42	4.168		
Total	201.200	44			

*Significant at 0.05, $F_{0.05}$ (2, 42)

It is evident from Table 4 that the results of Analysis of Variance (ANOVA) among three groups with regard to the sub-parameter cognitive anxiety were found to be statistically insignificant (P>0.05). Since the obtained "F" ratio 3.135 was found statistically insignificant, therefore, there is no need to apply post hoc test.

Table 5: Analysis of Variance (ANOVA) Results with Regard to Self-Confidence among Individual, Team & Dual Sports

Source of Variance	Sum of Squares	DF	Mean Square	F-ratio	Sig.
Between Groups	397.378	2	198.689	17.821	.001
Within Groups	468.267	42	11.149		
Total	865.644	44			

*Significant at 0.05, $F_{0.05}$ (2, 42)

It is evident from Table 5 that the results of Analysis of Variance (ANOVA) among three groups with regard to the sub-parameter self-confidence were found to be statistically significant (P<0.05). Since the obtained "F" ratio 17.821 was found statistically significant, therefore, Post Hoc test (LSD) was applied to determine the degree and direction of difference between the paired means among the groups with regard to the sub-parameter self-confidence. The results of post-hoc test have been presented in Table 6 below.

Table 6: Analysis of Least Significant Difference (LSD) Post Hoc Test among Individual, Team & Dual Sports with Regard to Self-Confidence

Group (A)	Group (B)	Mean Difference (A-B)	Sig.
Individual Sports (Mean= 17.80)	Team	-3.26667*	.010
	Dual	-7.26667*	.000
Team Sports (Mean= 21.06)	Individual	3.26667*	.010
	Dual	-4.00000*	.002
Dual Sports (Mean= 25.06)	Individual	7.26667*	.000
	Team	4.00000*	.002

*Significant at 0.05 level

A glance at Table 6 showed that the mean value of Individual Sports was 17.80 whereas Team Sports had mean value as 21.06 and the mean difference between both the groups was found 3.26. The p-value sig .010 shows that the Team Sports had demonstrated significantly better on self-confidence than their counterpart's Individual Sports. The mean difference between Team Sports and Dual Sports was found 4.00. The p-value sig .002 showed that the Dual Sports had demonstrated significantly better on self-confidence than their counterpart's Team Sports. The mean difference between Dual Sports and Individual Sports was found 7.26. The p-value sig .000 shows that the Dual Sports had demonstrated significantly better on self-confidence than their counterpart's Individual Sports. The graphical representation of responses has been exhibited in Figure 3.

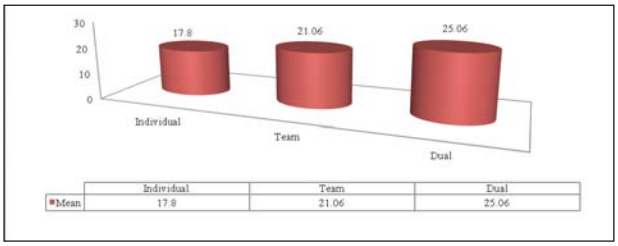


Fig. 3: Graphical Representation of Mean Scores among Individual, Team & Dual Sports with Regard to Self-Confidence

Table 7: Analysis of Variance (ANOVA) Results with Regard to Anxiety among Individual, Team & Dual Sports

Source of Variance	Sum of Squares	DF	Mean Square	F-ratio	Sig.
Between Groups	621.733	2	310.867	17.618	.000
Within Groups	741.067	42	17.644		
Total	1362.800	44			

*Significant at 0.05, $F_{0.05}$ (2, 42)

It is evident from Table 7 that the results of Analysis of Variance (ANOVA) among three groups with regard to the anxiety were found to be statistically significant (P<0.05). Since the obtained "F" ratio 17.618 was found statistically significant, therefore, Post Hoc test (LSD) was applied to determine the degree and direction of difference between the paired means among the groups with regard to the anxiety. The results of post-hoc test have been presented in Table 8 below.

Table 8: Analysis of Least Significant Difference (LSD) Post Hoc Test among Individual, Team & Dual Sports with Regard to Competitive Team Anxiety

Group (A)	Group (B)	Mean Difference (A-B)	Sig.
Individual Sports (Mean= 70.13)	Team	-1.33333	.390
	Dual	-8.46667*	.000
Team Sports (Mean= 71.46)	Individual	1.33333	.390
	Dual	-7.13333*	.000
Dual Sports (Mean= 78.60)	Individual	8.46667*	.000
	Team	7.13333*	.000

*Significant at 0.05 level

A glance at Table 8 showed that the mean value of Individual Sports was 70.13 whereas Team Sports had mean value as 71.46 and the mean difference between both the groups was found 1.33. The p-value sig .010 shows that the Team Sports had demonstrated better on competitive Team anxiety than their counterpart's Individual Sports though not significantly. The mean difference between Team Sports and Dual Sports was found 7.13. The p-value sig .000 showed that the Dual Sports had demonstrated significantly better on competitive Team anxiety than their counterpart's Team Sports. The mean difference between Dual Sports and Individual Sports was found 8.46. The p-value sig .000 shows that the Dual Sports had demonstrated significantly better on competitive Team anxiety than their counterpart's Individual Sports. The graphical representation of responses has been exhibited in Figure 4.

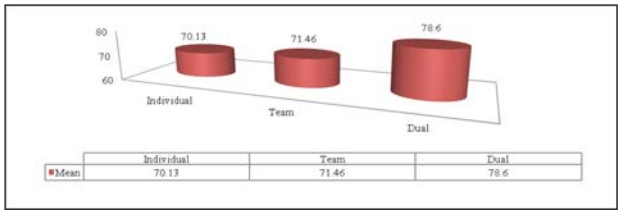


Fig. 4: Graphical Representation of Mean Scores among Individual, Team & Dual Sports with Regard to Competitive Team Anxiety

CONCLUSION

1. To conclude, It is evident that the results of Analysis of Variance (ANOVA) among three groups with regard to the sub-parameter Somatic Anxiety were found to be statistically significant (P<0.05).
2. To conclude, It is evident that the results of Analysis of Variance (ANOVA) among three groups with regard to the sub-parameter Cognitive Anxiety were found to be statistically insignificant (P>0.05).
3. To conclude, It is evident that the results of Analysis of Variance (ANOVA) among three groups with regard to the sub-parameter Self-Confidence were found to be statistically significant (P<0.05).
4. To conclude, It is evident that the results of Analysis of Variance (ANOVA) among three groups with regard to the Anxiety were found to be statistically significant (P<0.05).

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Peer Reviewed Research Article

Gene Doping: Ethics of Performance Enhancement in Sports

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ABSTRACT

This study elaborates the contemporary athlete, for whom winning is the sole purpose of participation. The pressure to excel has evolved into a desperation which invokes an athlete to resort to every measure to win- the last one being DOPING, which has now prevails as an issue at almost every sporting event of every magnitude. Doping is the element that has dented the image of true sportsmanship and has induced unfair means of earning laurels in the sporting world. Players have anonymous pressure to excel in competitions. They also know that winning can reap them more than a gold medal. Players know that training is the best path to victory but they also get the message that some drugs and other practices can boost their efforts and give them a shortcut, though they risk their health and their athletic careers by doing so. Doping may propel a sportsman to super human capabilities but always brings home an element of guilt in his heart rather than true pride and honor. Anabolic steroid use and other performance-enhancing drugs have altered the character of sports. Now sports authorities are facing another form of doping: the potential of gene therapy to create super-muscled mice (and men). Together with the rapidly increasing knowledge on genetic therapies as a promising new branch of regular medicine, the issue has arisen whether these techniques might be abused in the field of sports. Previous experiences have shown that drugs that are still in the experimental phases of research may find their way into the athletic world. Both the World Anti-Doping Agency (WADA) and the International Olympic Committee (IOC) have expressed concerns about this possibility. As a result, the method of gene doping has been included in the list of prohibited classes of substances and prohibited methods. This review addresses the possible ways in which knowledge gained in the field of genetic therapies may be misused in elite sports. The sporting world will eventually be faced with the phenomena of gene doping to improve athletic performance. A combination of developing detection methods based on gene arrays or proteomics and a clear education program on the associated risks seems to be the most promising preventive method to counteract the possible application of gene doping.

Keywords: *Doping; Gene Therapy; World Anti Doping Agency (WADA); International Olympic Committee (IOC); Erythropoietin (EPO)*

INTRODUCTION

In the broadest sense of the term, use of foreign substances to enhance ones sporting performance, doping seems to be as old as competitive sports. The word doping is believed to originate from the Dutch language, where, "doop" means sauce and the verb "doopen" means to dip, or immerse. In sports, doping is defined as the use of certain chemical substances or of methods that have been banned by International Olympic Committee. Doping has become such a great concern that the United States formed an Anti Doping Agency. The use of drugs to enhance physical performance has been a feature of human competition since the beginning of recorded history (Prokop, 1970; Strauss & Curry, 1987). Furthermore, the ancients as well as people of the medieval period indulged in to cure disease and to improve vitality and other aspects of performance (Newerla, 1943). By 1933 the word doping had become part of the English language (Prokop, 1970). While Rieser and others continued to speak out against doping, it was not until 1967 that the International Olympic Committee (IOC) voted to adopt a drug-testing policy banning the use of specific drugs (Todd & Todd, 2001). In the ancient Games, many of the athletes tried to improve their performance by studying the techniques of

their sport and by experimenting with their diet (Finley & Plecket, 1976). The use of stimulants also dates to ancient times. The Greeks drank various brandy and wine concoctions (Voy, 1991) and ate hallucinogenic mushrooms and sesame seeds to enhance performance. Likewise, the gladiators in the Roman Colosseum used unspecified stimulants to overcome fatigue and injury (Wadler & Hainline, 1989). Gene or cell doping is defined by the World Anti-Doping Agency (WADA) as "the non-therapeutic use of genes, genetic elements and/or cells that have the capacity to enhance athletic performance". New research in genetics and genomics will be used not only to diagnose and treat disease, but also to attempt to enhance human performance. In recent years, gene therapy has shown progress and positive results that have highlighted the potential misuse of this technology and the debate of 'gene doping'. Gene therapies developed for the treatment of diseases such as anaemia (the gene for erythropoietin), muscular dystrophy (the gene for insulin-like growth factor-1) and peripheral vascular diseases (the gene for vascular endothelial growth factor) are potential doping methods. With progress in gene technology, many other genes with this potential will be discovered. For this reason, it is important to develop timely legal regulations and to research the field of gene doping in order to develop methods of detection. To protect the health of athletes and to ensure equal competitive conditions, the International Olympic Committee, WADA and International Sports Federations have accepted performance-enhancing substances and methods as being doping, and have forbidden them. Nevertheless, the desire to win causes athletes to misuse these drugs and methods.

REASONS FOR INTAKE OF DRUGS

Athletes may have several reasons for using performance-enhancing drugs. An athlete may want to:

- Build mass and strength of muscles and/or bones
- Increase delivery of oxygen to exercising tissues
- Mask pain
- Stimulate the body
- Relax
- Reduce weight
- Hide use of other drugs

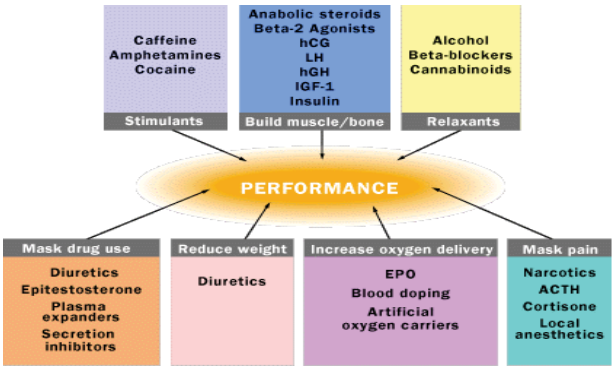

Fig. 1: The Classes of Drugs Used for these Purposes are Shown Above

Build Mass and Strength of Muscles and/or Bones

Mass- and strength-enhancing drugs used by athletes include:

- Anabolic steroids
- Beta-2 agonists
- Human chorionic gonadotropin (hCG)
- Luteinizing hormone (LH)
- Human growth hormone (high)
- Insulin-like growth factor (IGF-1)
- Insulin

Increase Delivery of Oxygen to Exercising Tissues

In addition to taking drugs that build mass and strength, some athletes take drugs and engage in practices that increase the amount of oxygen in tissues. Following aid the athletes in doing so.

- Protein hormones.
- Artificial oxygen carriers.
- Blood doping.

Mask Pain

Along with training and performing to be a world-class athlete, comes the pain of injuries. Sometimes, athletes try to mask their injury pain with drugs such as:

- Narcotics.
  a) Morphine.
  b) Methadone.
  c) Heroin.
- Protein hormones.
- Cortisone.
- Local anesthetics.

Stimulate the Body

Stimulants are generally used to help athletes stay alert reduce fatigue and maintain aggressiveness. Stimulants include:

- Caffeine.
- Amphetamines.
- Cocaine.

Relax

Relaxants come in the following forms.

- Alcohol.
- Beta blockers.
- Cannabinoids (marijuana).

Reduce Weight

Diuretics are commonly prescribed to treat high blood pressure and are often found in diet pills. Diuretics act on the kidney to increase the flow of urine. Athletes whose events have weight restrictions sports like weightlifting, horse racing and rowing, use them.

Hide Use of Other Drugs

Athletes generally attempt to deceive drug tests by using certain substances that reduce the quantity of banned substances in their bodies. The following are used for this purpose.

- Epitestosterone
- Plasma Expanders
- Secretion Inhibitors

Controlling Drug Abuse

In order to ensure unbiased and fair platform for sporting events, various drug detection techniques have evolved over the past years. Following table states the time duration up to which a particular category of drug can be detected.

Substance	Urine	Hair	Blood
Alcohol	24 hours	N/A	12 hours
Amphetamines (except meth)	2 to 3 days	Up to 90 days	12 hours
Methamphetamine	2 to 5 days	Up to 90 days	24 hours
Barbiturates (except phenobarbital)	2 to 3 days	Up to 90 days	1 to 2 days
Phenobarbital	7 to 14 days	Up to 90 days	4 to 7 days
Benzodiazepines	1 to 5 days	Up to 90 days	6 to 48 hours
Cannabis (single use)	2 to 3 days	Up to 90 days	24 hours
Cannabis (habitual use)	Up to 30 days	Up to 90 days	2 days
Cocaine	1 to 3 days	Up to 90 days	24 hours
Codeine	2 to 3 days	Up to 90 days	12 hours
Cotinine (a break-down product of nicotine)	2 to 4 days	Up to 90 days	2 to 4 days
Morphine	2 to 3 days	Up to 90 days	6 hours
Heroin	2 to 3 days	Up to 90 days	6 hours
LSD	2 to 24 hours	Unknown	0 to 3 hours
PCP	5 to 7 days	Up to 90 days	24 hours

DRUG TESTING METHODOLOGIES

The presence of drugs in the human system can be detected by testing a variety of different samples, most notably urine, blood, hair, sweat and saliva.

Urine

Also known as urinalysis, this procedure requires that one provide a sample of urine. Either a test card is used on site for immediate results, or the sample is sent away to a lab to undergo gas chromatography, high performance liquid chromatography or immunoassay analysis. Some people attempt to defeat a urine test by drinking copious amounts of water; however, a sufficiently diluted sample

may be rejected due to its clear color. Samples that are too clear may be flagged and tested for specific gravity. If the sample fails the specific gravity test, the sample is rejected and the dilution is reported to the entity that ordered the test. Some diuretics and herbal extracts, such as goldenseal, are marketed as a quick "detox" from controlled substances, but their efficacy is questionable. Some types of urinalysis can even detect the use of these "detox" products. One of the methods to test for adulterants is to add some amount of an actual drug to a small portion of the sample and then retest that portion. If a masking agent is present in the urine, the resulting drug test will have a negative result despite the fact that a drug was added. This situation is also usually reported to whosoever ordered the test.

Blood

In the case of detecting blood transfusions, a test for detecting homologous blood transfusions (from a donor to a doping athlete) has been in use since 2000. The test method is based on a technique known as flurescent activated cell sorting. By examining markers on the surface of blood cells, the method can determine whether blood from more than one person is present in an athlete's circulation A more recent and more sophisticated method of analysis, which has not yet reached the level of an official standard, is to compare the levels of mature and immature RBCs in an athlete's circulation. If a high number of mature RBCs is not accompanied by a high number of immature RBCs–called reticulocytes- it suggests that the mature RBCs were artificially introduced by transfusion.

Hair

Hair testing is quite accurate and can go back 6 months or longer, showing any controlled substances used in a sort of timeline. As hair grows out, any drugs used are encased in the hair shaft, so the longer the hair, the longer back in the individual's drug history the lab can detect. Most legitimate testing facilities, however, only use hair within about 3–5 cm of the scalp, and discard the rest. This limits the detection history to about 90 days, depending upon the rate of growth of the individual's hair. Some people attempt to circumvent this through shaving their heads. In the absence of the required amount of hair on the scalp, body hair can be used as an acceptable substitute.

Sweat

Sweat samples, which are obtained from patches that can be placed on a person for a number of days have the advantage of providing a longer time frame for detection and they are difficult to adulterate. They do not, however, provide a correlation regarding the degree of impairment and they are subject to individual differences in sweat production.

Saliva

Saliva samples permit a correlation with the degree of impairment and can be easily obtained. They are, however, subject to contamination from smoking or other substances.

GENE THERAPY

To understand what gene doping is, one must first understand the concept of gene therapy. Gene therapy is the insertion of genes into an individual's cells and tissues to treat a disease, and hereditary diseases in particular. Gene therapy typically aims to supplement a defective mutant allele with a functional one. Most of what we are, from the way we look, to how good we are in athletics, to what disease we might one day develop, comes to a certain degree from our genes. Some of our traits are predominantly determined by our genes with a minor contribution from our environment. Gene therapy using an Adenovirus vector. A new gene is inserted into an adenovirus vector, which is used to introduce the modified DNA into a human cell. If the treatment is successful, the new gene will make a functional protein.

THE REALITIES OF GENE DOPING

In gene doping, an athlete would not be suffering from any disease. Instead, normal gene would be injected into the body to increase the function of a normal cell. Scientists, including Dr. Lee Sweeney, have experimented with gene that produce insulin-growth factor 1 (IG-1), which helps muscle grow and repair themselves. The genes, carried into the body by a harmless virus, produce more IGM-1 than the body would normally produce, stimulating muscle growth. Friedmann envisions a scenario in which some athletes with injuries in a particular part of the body could use IGF–1 to speed healing and repair of the damaged muscles. Other might use gene doping to strengthen, for instance, a weakened knee or other damaged joint or injured tissue, which would give them

a significant advantage on the playing field. For athletes who use erythropoietin, or EPO, to enhance performance, gene doping would represent the next step. Instead of injecting themselves with the EPO, allowing the body to naturally produce more red blood cells.

THE DANGER OF GENE DOPING

Increased levels of EPO leads to a thickening of blood, which in turn, raises the risk of blood clotting and stroke. When using synthetic EPO the risk is only temporary, since the body will flush out the drug over time. If, however, the orders to produce more EPO are given at a genetic level, reversing the process may be much more complicated. Blood may become thicker and thicker, until the body is no longer capable of coping with it. Similarly, genetically boosting IGF1 levels, may lead to too much muscle growth, which could cause fractures, if muscle growth is out of proportion with the surrounding tendons and bone. The greatest threat to the athlete's health may well come from as yet unknown risks. Despite its huge potential, gene therapy has delivered very few concrete health benefits so far. And, since inserting genetic material into cells is a very tricky business, the potential for serious side effects is very high.

SUMMARY AND CONCLUSION

Doping is contrary to the spirit of sport. It undermines the virtues of honesty and fair play. It goes against the health-promoting aspects of sport. Ultimately, it is cheating. Doping threatens to damage sport as social institution, undermining the values of fair play, team spirit and the concept of a level playing-field. A variety of drugs and dietary supplements have proven performance-enhancing effects in athletes. However, many of these substances have adverse effects and are banned by various sports-governing organizations. Athletes come across various reasons which compel those to take this step and along come various ways do disguise it, because doping is banned and defies true sportsmanship. Scientific advances have facilitated various means to detect the use of banned substances in sporting events. This helps in checking and reducing the incidence of doping. A rational and morally sound sports enthusiast-participant or spectator - must not leave any stone unturned to curb this curse on sporting. A sportsman must be driven by passion rather than steroids. The genuine capability in the sporting arena brings glory to a nation but getting caught in scandals brings disgrace. One must be responsible to oneself and to his nation and as a representative, should endeavor to eradicate doping.

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Peer Reviewed Research Article

Comparison of Physical Fitness between Adolescent Athletes and Non-Athletes

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ABSTRACT

The purpose of this study was to compare the physical fitness components between adolescent athletes and non-athletes. The present study was conducted on a sample of sixty (N = 60) adolescent, which includes thirty each, athletes (N1 = 30, mean ± SD: age 15.37 ± 1.10years, height 156.57 ± 1.10cm, weight 47.98 ± 1.35kg, BMI 19.56± 0.48) and non-athletes (N2 = 30, mean ± SD: age 15.37 ± 1.10years, height 156.80 ± 1.03 cm, weight 48.42 ± 1.62kg, BMI 19.70 ± 0.65) selected from different schools affiliated to Punjab School Education Board, Punjab, India. Height measurements were taken by using the standard anthropometric rod to the nearest 0.5 cm. The subject's weight was measured with portable weighing machine to the nearest 0.5 kg. 50 yard dash test was used to estimate speed. Sit-ups test was used to assess the muscular strength. 600 yards run or walk test was used to measure cardiovascular endurance. The Vertical jump test was used to assess explosive power of the legs. Shuttle run test was used to monitor the agility of the subjects. The independent samples t-test was applied to assess the differences between football and volleyball players. The results of present study indicated that athletes had significantly greater speed ($p < 0.05$), strength ($p < 0.05$), endurance ($p < 0.05$), power ($p < 0.05$) and agility ($p < 0.05$) than non-athletes.

Keywords: *Athletes, Non-athletes, Speed, Strength, Endurance, Power, Agility*

INTRODUCTION

Physical fitness is, in a very broad sense, determined by the individual's capacity for optional work and motor and sport performance (Astrand & Rodahl, 1986). Physical fitness is maintained by a healthy life style, including habitual physical activity (Das & Dhundasi, 2001). Physical fitness acquired in growing children provides healthy impact on cardio-respiratory system. Several factors like heredity, environment, diet, socioeconomic status and training are known to contribute to physical fitness of an individual (Khodnapur, 2012). Physical fitness can be thought of as an integrated measure of most, if not all, the body functions involved in the performance of daily physical activity or physical exercise (Ortega *et al*., 2008). Physical fitness is recognized as an important component of health(Lamb *et al*., 1998; Twisk *et al*.,2002) and it may be important for the performance of functional activities and quality of life (Noreau & Shephard, 1995; Singh & Singh, 2012). Low physical fitness in children has been associated with impaired health indicators such as increased body fatness (Dencker *et al*., 2006), hypertension (Katzmarzyk *et al*., 2001; Ruiz *et al*., 2006) and low physical activity (Dencker et al., 2006). Physical fitness is measured by functional tests that are specific and usually normative-based, rather than criterion-based, thereby leaving unanswered as to how much of a specific fitness factor is required for a good quality of life (Chia et al., 2007). Athletes are commonly associated with a physically active lifestyle as compare to non-athletes, which is beneficial to physical fitness. Due to regular exercise, athletes tend to have an increase in physical fitness when compared to non-exercising individuals. Exercise is stressful condition which produces a marked change in body functions. Exercise and physical activity impact on wellness and fitness (Lee et al., 1995). Sedentary life styles could be associated with less efficient body functions. Therefore, the purpose of the study was to compare the physical fitness between adolescent athletes and non-athletes.

MATERIALS AND METHODS

Subjects

The present study was conducted on a sample of sixty (N=60) adolescent, which includes thirty each, athletes (N_1=30, mean ± SD: age 15.37± 1.10years, height 156.57± 1.10cm, weight 47.98± 1.35kg, BMI 19.56± 0.48) and non-athletes (N_2=30, mean ± SD: age 15.37± 1.10years, height 156.80± 1.03 cm, weight 48.42± 1.62kg, BMI 19.70± 0.65) selected from different schools affiliated to Punjab School Education Board, Punjab, India. All the participants were informed about aim and methodology of the study and they volunteered to participate in this study. The purposive sampling method was used to select the subjects for the present study. The age of each subject was calculated from the date of birth as recorded in his school.

Methodology

Height measurements were taken by using the standard anthropometric rod (HG-72, Nexgen ergonomics, Canada) 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'. BMI was calculated by the formula of; Body Mass Index = Weight/Height^2.

Physical Fitness Tests

A 50 yard dash test (Johnson & Nelson, 1982).was used to estimate Speed. The time taken by the subjects to complete the test in sec was the net score of the subjects. Sit-ups test (AAPHER, 1965) was used to assess the muscular strength. The score of the test is the number of correctly executed sit ups performed by the subjects in 60 seconds. 600 yards Run or Walk test (AAPHER, 1965) was used to measure cardiovascular endurance. The time taken to run 600 yards recorded in min. The Vertical jump test (Fleishman, 1964) was used to assess explosive power of the legs. Shuttle Run test (Johnson & Nelson, 1982) was used to monitor the agility of the subjects. The time taken by the subjects between the audible signal 'start' and the finishing of the run was recorded to be the score. The time was recorded correct in sec.

Statistical Analyses

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

RESULTS

Table 2: Demographic Characteristics of Adolescent Athletes and Non-athletes

Sports Group	Age (yrs)		Height (cm)		Weight (Kg)		BMI	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Athletes	15.37	1.10	156.57	1.10	47.98	1.35	19.56	0.48
Non Athletes	15.37	1.10	156.80	1.03	48.42	1.62	19.70	0.65

Table 2 depicts the demographic characteristics of adolescent athletes and non- athletes. The mean age of athletes was 15.37 years and non-athletes were 15.37 years. The mean height of athletes was 156.57 cm and non-athletes were 156.80 cm. The mean weight of athletes was 47.98 kg and non-athletes were 48.42 kg. The mean BMI value of athletes was 19.56 and non-athletes were 19.70.

Table 3 presents the physical fitness characteristics of adolescent athletes and non- athletes. The results depicts that athletes had significantly greater speed ($p<0.05$), strength ($p<0.05$), endurance ($p<0.05$), power ($p<0.05$) and agility ($p<0.05$) than non-athletes.

Table 3: Physical Fitness Components of Adolescent Athletes and Non-Athletes

Variables	Athletes (N1 = 30)		Non-Athletes (N2 = 30)		Mean Difference	SEDM	T-value	Sig.
	Mean	SD	Mean	SD				
Speed	7.88	0.45	8.56	0.21	0.68	0.09	7.54*	0.00
Strength	20.80	1.06	18.10	0.71	2.70	0.23	11.55*	0.00
Endurance	1.54	0.01	1.71	0.22	0.17	0.04	3.98*	0.00
Power	31.49	0.84	27.58	1.07	3.91	0.25	15.73*	0.00
Agility	13.57	0.20	13.89	0.48	0.32	0.09	3.31*	0.00

*Significant at 0.05 level t.05 (58) =1.671

DISCUSSION

In the present study physical fitness components of the adolescent athletes and non- athletes have been evaluated and compared with each other. This study indicates the existence of physical fitness variables differences among the athletes and non- athletes. The demographic characteristics of athletes and non- athletes show that non-athletes were taller and heavier as compared to the athletes. The results of present study indicated that athletes had significantly greater physical fitness components i.e. speed, strength, endurance, power and agility than non-athletes. This is because of regular exercise which brings changes on the body. In a study by Pakkala and coworkers significantly higher values of cardiopulmonary efficiency in athletes were observed as compared to non-athletes (Pakkala *et al*., 2005). Ara *et al.*(2007) observed that physically active children had significantly higher values of physical fitness parameters than that of non-physically active children.

CONCLUSION

Significant differences were found between athletes and non-athletes with regard to selected physical fitness characteristics i.e. speed, strength, endurance, power and agility than non-athletes. The athletes had higher speed, strength, endurance, power and agility than non-athletes. According to the obtained results in this study it is concluded that further, athletes dad better physical fitness than non-athletes.

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Peer Reviewed Research Article

Effect of Consumption of whey Protein Supplement on Aerobic Power, Anaerobic Power and Body Composition of Weight Trainers

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ABSTRACT

The aim of the present study was to determination the effect of ten weeks exercise combined with whey protein supplement on aerobic power, anaerobic power and body composition of Weight trainers. It is hypotheses that the whey protein supplement has effect on the aerobic capacity, anaerobic power and body composition (total body mass, lean body mass and body fat percentage) of Weight trainers. The study was semi-experimental that done in pre and post-test phases on control (n = 10) and treatment (n = 10) groups on 2013 in Tripura, India. One day before beginning of the study protocols, subjects accomplished aerobic capacity, anaerobic power and body composition tests. Afterwards, the subjects underwent exercise protocol for 10 weeks, 3 sessions per week, and 90 minutes per session of training. Half hour before each training session, the training group consumed whey protein supplement (1.25 g. whey protein powder with medium glass of water and 2 tea spoon of sugar for 1 kilogram of body weight) and the control group consumed placebo (2 tea spoon of sugar per medium glass of water). Data were analyzed through independent t test. The results showed that there were significant differences in post-test of aerobic and anaerobic capacity and body composition of Weight trainers. These results indicated that consumption of whey protein supplement combined with exercise leads to increase in aerobic power, anaerobic power, total body mass, lean body mass and decrease in body fat percentage.

Keywords: *Whey Protein, Aerobic Power, Anaerobic Power, Body Composition, Weight Trainer*

INTRODUCTION

Every bodybuilder understands, or should understand, the importance of protein supplementation. Weight trainers require more protein than sedentary folks. Without protein (which the body breaks down into amino acids), you cannot build muscle. As far as study concerned, no matter what kind of diet one follow – whether it is low or high in complex carbohydrates or fats – and despite the number of calories you taken in, your diet must be rich with protein.

There are many different types of protein sources available to all. Qualitative protein can be found in whole foods like eggs, milk, cottage cheese, beef, fish, poultry, etc. and, there are also a variety of protein supplements on the marked milk and egg protein, soy, beef, even vegetable protein. Out of all these different protein supplements, everyone absolutely convinced that whey protein is the best. Not only does it have a superior biological value (which means it may "yield" most usable grams of amino acids than other protein (supplements), it is also very low in lactose. Whey protein – ion-exchanged, micro filtered whey protein / is extremely high quality and very easy to use which is another thing that is terrific about it.

On the other hand in the case of weight trainers (specifically players of Olympic weightlifting and power lifting, success is determined by how much weight can be lifted in the appropriate movements, whereas a wrestler is judged by the degree of physical control over the opponent. These sports are quite different in terms of the patterns of muscle recruitment, the force and power

produced, and the equipment used. For most competitive sports, improving the performance of an athlete can be accomplished by reducing the resistance or drag that must be overcome or by increasing the athlete's ability to sustain a high power output to overcome that resistance or drag.

There are so many ergogenic aids for improving the performance; supplementary foods are one of them. During the training schedule or period a sportsman wants much more energy for completion of their schedule. The sources of energy in our body is limited i.e. the sportsman needs extra energy. The ultimate aim of sportsman is achieving highest performance in sports and games. If the sports are depend on strength, endurance, speed then the supplementary food is much more needed. However, in comparison with different types of exercise, there are not many studies available that were done on effects of whey protein supplement consumption on aerobic power, anaerobic power and body composition of Weight trainers. The present study aimed at assessing the effect of whey protein supplement consumption on aerobic power, anaerobic power and body composition of Weight trainers.

MATERIALS AND METHODS

Subjects

The present study was performed in order to assessing the effect of whey protein supplement consumption combined with 10 weeks exercise on the aerobic capacity, anaerobic power and body composition of weight trainers. All subjects were informed about the purpose, requirements and the experimental protocol of the investigation and completed confirm form. Twenty subjects were selected from the Dharmanagar (Tripura) for participants of the study. Afterward, they randomly assigned into two groups; control (n=10, consumed placebo) and treatment group (n=10, consumed whey protein supplement). The age, height and weight of the subjects were recorded before beginning the exercise protocols.

Dietary program: duration the exercise protocol, all subjects (control and treatment groups) were informed about nutrition information and dietary program. So, both groups get similar program and consumed same food diets. The subjects underwent exercise protocol for 10 weeks, 3 sessions per week, and 90 minutes per session of training. Each exercise session included warm up, ball training, training without ball, tactical training, competition and cool down.

Whey protein supplement: Each subjects of training group consumed 1.25 g. whey protein powder with medium glass of water and 2 tea spoon of sugar for 1 kilogram of body weight half hour before each exercise session. Each subjects of control group consumed placebo (2 tea spoon of sugar per medium glass of water without whey protein) half hour before each exercise session.

Measures: aerobic power measured by using Cupper test and calculated by using this formula:

Vo2 max (ml/kg/min) = covered distance (m)–504.9 44/73

Peak, mean and minimum anaerobic power measured by using the Rast test and calculated by using this formula: Anaerobic power = weight (kg) × [distance (m)]^2/ [time(s)]^3

Mean of anaerobic power = sum of 6 time peak anaerobic power divided 6

Body composition measurements were done by using the body composition apparatus such as skin fold caliper and BMI caculator measure total body mass, lean body mass and body fat percentage.

STATISTICAL ANALYSIS

Statistical analysis was performed using the independent t-test. Values of $p<0.05$ were considered significant.

RESULTS

The results of the study are shown in tables 1, 2,3,4,5 and 6 shows that consumption of the whey protein supplement has statistically significant increasing effect on aerobic power, peak, mean and minimum of anaerobic power, total and lean body mass and has significant decreasing effect on body fat percentage of treatment group in comparison with control group.

Table 1: Comparison of Aerobic Power between Two Groups

Groups	N	Mean	SD	DF	T	P
Control	10	0.98	3.34	18	2.83	0.011
Training	10	5.35	3.55			

The results of t test in table 1 show that there is significant differences between treatment and control group (p=0.011).

Table 2: Comparison of Peak Anaerobic Power between Two Groups

Groups	N	Mean	SD	DF	T	P
Control	10	-25.92	72.18	18	2.78	0.012
Training	10	52.82	52.96			

As shown in table2 the results of t test show that there is significant differences in peak anaerobic power between treatment and control group (p=0.012).

Table 3: Comparison of Minimum Anaerobic Power between Two Groups

Groups	N	Mean	SD	DF	T	P
Control	10	-15.09	127.56	18	2.19	0.042
Training	10	80.8	53.9			

The results of t test that shown in table3 show that there is significant differences in minimum anaerobic power between treatment and control group (p=0.042).

Table 4: Comparison of Mean Anaerobic Power between Two Groups

Groups	N	Mean	SD	DF	T	P
Control	10	-6.53	86.75	18	2.33	0.031
Training	10	64.22	40.67			

The results of t test that shown in table4 show that there is significant differences in mean anaerobic power between treatment and control group (p=0.031).

Table 5: Comparison of Total Body Mass between Two Groups

Groups	N	Mean	SD	DF	T	P
Control	10	0.71	1.32	18	2.37	0.029
Training	10	2.2	1.48			

The results of t test in tble5 show that there is significant differences in total body mass between treatment and control group (p=0.029).

Table 6: Comparison of Body fat Percentage between Two Groups

Groups	N	Mean	SD	DF	T	P
Control	10	-0.32	1.56	18	2.35	0.03
Training	10	-2.33	2.21			

The results of t test in tble6 show that there is significant differences in body fat percentage between treatment and control group (p=0.03).

DISCUSSION

The aerobic power the training group in this study increased significantly after 10 weeks whey protein intake combining with training program. Whey protein supplement has significant increasing effect on aerobic capacity of experimental group in comparison with control group.

The peak, mean and minimum anaerobic power of experimental group increased significantly in comparison with the control group after 10 weeks consumption of whey protein supplement combining with training programme.

Consumption of whey protein supplement has significant effect on total body mass and lean body mass of training group in comparison with control group and leads to increase in total and lean body mass.

The great things about-whey protein is that it has an especially high concentration of essential amino acids (up to 50%), half of which are muscle-preserving branched-chain aminos, and most quality whey-protein supplements are also fortified with glutamine – an amino acid which everyone believe is important to bodybuilders. So, it helps in the performance of weight trainers.

In the present study, whey protein supplement used in prolong time but in moderate sample and we achieved to beneficial results. However it is not cleared that using the whey protein supplement leads to good results in conditioning period or in large population. So, it is suggested that more studies must be taken place to response this question that if the whey protein supplement has other effects on the weight trainers in different condition of exercise.

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Peer Reviewed Research Article

Personality Traits and Teachers–A Comparative Study

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ABSTRACT

The purpose of this study was to identify the difference of personality traits between physical education teachers and general subject teachers. The present study was conducted on sixty teachers including thirty physical education teachers and thirty general subject teachers of Uttrakhand, who were selected randomly and treated as the sample of the study. To assess the personality Big Five Inventory (BFI) (John et al., 1991; John et al., 2008) was used. The collected data were analyzed by using't' test statistical technique at 0.05 level of significance. The study shows that there is a significant difference in the Extraversion (2.149), Agreeableness (2.177), and Openness (2.247), as the t-value is significant, as the tabulated tvalues (2.001) is lesser than calculated t at 0.05 level of significance. The study also revealed that there is aninsignificant difference was found in the Conscientiousness (0.882) Neuroticism (0.717), as the t-value is insignificant, as the tabulated t values (2.001) is greater than calculated t at 0.05 level of significance.

Keywords: *Personality Traits, Physical Education Teachers and General Subject Teachers*

INTRODUCTION

Personality is the totality of the faculties, bent qualities and temperament which characterize a person. Personality traits are the relatively constant patterns of thoughts, feelings and behaviours that reflect the tendency to respond in certain ways under certain circumstances (Roberts, B.W, 2009). Personality traits appear to have consequences for individuals across a range of life domains because they provide information about how different persons and groups of individuals characteristically self-regulate or how people control their thoughts, feelings and behaviours (Thoresen, 2002).

Sports in present day world have become extremely competitive, previous records are being broken whenever there is a competition Sports psychology is primarily interested in the analysis of behavior of sports man. No two individuals are exactly alike. All may have many characteristics in common. To some extent one individual differs from another in many characteristics but the degree to which we exhibit these traits and their inter relationship very markedly from person to person and it is the integration of our personality traits (Virupaksha, N.D., 2009)

METHOD

The present study was conducted on sixty teachers who had worked at least for one yearin Uttrakhand state were selected randomly and treated as the sample of the study. To assess the personality traits the Big Five Inventory (BFI) (John *et al*., 1991; John *et al*., 2008) were used respectively. Big Five Inventory (BFI) is a 44-item inventory thatwas developed to assess the Big Five personality domains of Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness. The collected data were analyzed by using 't' test statistical technique, at 0.05 level of significance

RESULTS

Table 1: Descriptive Statistics of Physical Education Teachers and General Subject Teacher's on Personality Traits

Variables	Teachers	Mean	Std. Deviation
Extraversion	Physical Education	28.62	2.67
	General Subject	26.32	2.03
Agreeableness	Physical Education	32.82	3.45
	General Subject	30.12	2.86
Conscientiousness	Physical Education	29.46	3.06
	General Subject	28.56	3.26
Neuroticism	Physical Education	19.88	2.68
	General Subject	20.72	2.17
Openness	Physical Education	34.76	3.86
	General Subject	32.82	3.26

The Table 1 shows the descriptive statistics of Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness of physical education teachers and general subject teachers.

Table 2: T-table for Physical Education Teachers and General Subject Teacher's on Personality Traits

	T-test for Equality of Means			
Variables	Mean	Mean Difference	Standard Error	T Value
Extraversion	28.62 26.32	2.30	1.07	2.149*
Agreeableness	32.82 30.12	2.70	1.24	2.177*
Conscientiousness	29.46 28.56	0.90	1.02	0.882
Neuroticism	19.88	0.84	1.17	0.717
	20.72			
Openness	34.76	2.54	1.13	2.247*
	32.22			

*tab.t (58)at 0.05 levelis 2.001

Table 2 shows that there is a significant difference was found in the Extraversion (2.149), Agreeableness (2.177), and Openness (2.247). There is an insignificant difference was found in the Conscientiousness (0.882), Neuroticism (0.717).

DISCUSSION

In this study result shows that there is significant difference found in Extraversion, Agreeableness, and Openness on personality traits between physical education teachers and general subject teachers. It may be attributed to the fact that physical education teachers are more outgoing, socially and frank as compare to the general subject teachers.

In this study result also revealed that there is an insignificant difference found in Conscientiousness and Neuroticismon personality traits between physical education teachers and general subject teachers. It may be attributed to the fact that physical education teachers and general subject teachers areequally Carefulness, organised and anxiousas both the group perform same type of activities during teaching

CONCLUSION

1. The result of the present study shows that there is significant differences are found in Extraversion, Agreeableness, and Openness on personality traits between physical education teachers and general subject teachers personality.
2. Theresultalsorevealedthatthereisaninsignificant difference found in Conscientiousness and Neuroticism on personality traits between physical education teachers and general subject teachers.

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Nutritional Status and Yogic Asanas–An Analytical Study

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ABSTRACT

The objective of the study was to find out the "nutritional status on yogic asanas".50 students who were doing graduation from L.C.C., Lucknow (session 2012–13),were selected as subject for the study.For the present study pretest and posttest randomized group design which consists of control group (n = 25) and experimental group (n = 25). One group served as experimental group on which treatment was assigned. The other group served as the control group. The treatment was administered on experimental group for the period of 8 weeks while the control group did not get any kind of treatment. Before the administration of yogic asanas, the height and weight was measured and BMI was calculated from both groups to collect pretest. After the completion of 8weeks again the same test was conducted to collect the posttest. The subjects in the experimental group participated in a yogic program for the period of 8 weeks, forty five minutes per session, three times per week (Monday, Wednesday and Friday) while the control group did not given any kind of treatment. To find out the significant difference of yogic asanas on nutritional status (BMI) of students, Analysis of Covariance (ANCOVA) was applied at 0.05 level of significance. The analysis of co-variance for Nutritional Status (BMI) was insignificant in case of pre-test means from which it is clear that the pretest means does not differ significantly (F-ratio of 0.35). The posttest means of all the two groups yielded an F-ratio of 0.39, which was insignificant at.05. The difference between the adjusted posttest means was found significant as the obtained F-ratio was 10.47. The F-ratio required for significance at 0.05 level of significance was 4.05 at df (1, 47). Based on the findings and within the limitation of the study it is noticed that practice of 8 weeks Yogic Asanas helped to strengthen Nutritional Status (BMI) of students. Strengthen Nutritional Status of the subjects of experiment group was found to be statistically significant.

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INTRODUCTION

The World Health Organization (WHO) regards a body mass index (BMI) of less than 18.5 as underweight and may indicate malnutrition, an eating disorder, or other health problems, while a BMI greater than 25 is considered overweight and above 30 is considered obese.

Yoga aims at bringing the different bodily functions into perfect coordination so that they work for the good of the whole body. Regular practice of asana maintains the physical body in an optimum condition and promotes health even in an unhealthy body. Yoga is the science of right living and as such, is intended to be incorporated in daily life. It works on all aspects of the person, physical, vital mental, emotional, psychic and spiritual. Through asana practice, the dormant energy potential is released and experienced as increased confidence in all areas of life. Yogaasanas have a deeper significant value in the development of the physical, mental and spiritual personality, whereas pure exercises only have a physical effect on the muscles and bones.

The Belgian polymath Adolphe Queteletinvented between 1830 and 1850.The body mass index (BMI) is a statistical measurement, which compares a person's weight and height. Though is does not actually measure the percentage of body fat, it is a useful tool to estimate a healthy body weight based on how tall a person is?

The purpose of the study was to measure the change in the nutritional status of students as a result of undergoing systematic yogic practices for a period of 8 weeks during which the researcher provided them a planned and systematic training as well as balanced nutritional diet chart.

OBJECTIVE OF THE STUDY

The objective of the study was to find out the "nutritional status onyogic asanas".

METHODOLOGY

Subjects

50 students who were doing graduation from L.C.C., Lucknow (session 2012-13), were selected as subject for the purpose of this study. Their average aged was 19 years.

Variables

Nutritional Status (BMI) was selected as a dependent variable and Yogic Asanas were considered as independent variable.

Criterion Measure

Nutritional Status was measured through body mass index (BMI), which was obtained by dividing the body height expressed in centimeters by the total body weight expressed in kilograms.

Experimental Design

For the present study pretest andposttest randomized group design which consists of control group (n=25) and experimental group (n=25). One group served as experimental group on which treatment was assigned. The other group served as the control group.

Yogic Group P_1 Treatment P_2

Control Group P_1 No Treatment P_2

Where P_1 = Pretest, P_2= Posttest.

Administration of Test

The treatment was administered on experimental group for the period of 8 weeks while the control group did not get any kind of treatment. Before the administration of yogic asanas, the height and weight was measured and BMI was calculated from both groups to collect pretest. After the completion of 8weeks again the same test was conducted to collect the posttest.

Administration of Training

The subjects in the experimental group participated in a yogic program for the period of 8 weeks,forty five minutes per session, three times per week (Monday, Wednesday and Friday) while the control group did not given any kind of treatment.

Statistical Analysis

To find out the significant difference of yogic asanas on nutritional status (BMI) of students, Analysis of Covariance (ANCOVA) was applied at 0.05 level of significance.

FINDINGS OF THE STUDY

The analysis of co-variance for Nutritional Status (BMI) was insignificant in case of pre-test means from which it is clear that the pretest means does not differ significantly (F-ratio of 0.35), and that the random assignment of subjects to the experimental group was quite successful. The posttest means of all the two groups yielded an F-ratio of 0.39, which was insignificant at.05. The difference between the adjusted posttest means was found significant as the obtained F-ratio was 10.47. The F-ratio required for significance at 0.05 level of significance was 4.05 at df (1, 47).

DISCUSSION

The mean scores of yoga group (pre-21.44 & post-21.25) as well as control group (pre-21.70& post-21.46) reveal that the yogic training intensifies nutritional status (BMI) of students. This improvement in the BMI score

Table 1: Analysis of Co-variance of the Means of Experimental Group and Control Group on Nutritional Status (BMI)

Test	Mean & S.D.		Group	Ancova Table				
	Yoga Group	Control Group		Sum of Squares	df	Mean Square	F	Sig.
Pre	21.44±3.11	21.70±2.94	Among	1.81	1	1.81	0.35	.880
			Within	246.64	48	5.13		
Post	21.25±3.51	21.46±3.36	Among	1.78	1	1.78	0.39	.493
			Within	216.62	48	4.51		
Adjusted	21.93	21.33	Among	3.56	1	3.56	10.47*	.000
			Within	16.22	47	0.34		

*Significant at 0.05 level of significance, df (1, 48) = 4.04, df (1, 47) = 4.05

has been made possible due to systematic training, which might have enhanced the muscle mass of the subjects resulting in increased body weight.

Sarkar *et al.* (2008), Pervin and Adhikari (2002), and Uppal (2003), conducted research to assess the nutritional status of young sportspersons as well as adults. They have observed that a large percentage of young sportspersons is undernourished. On the other hand research work with adults reveals that majority of the subjects have anaverage nutritional status.

Finally, result of present study similarly shows that the participants who followed the treatment of Yogic Asanas strengthen their Nutritional Status (BMI) than participants in control group.

CONCLUSION

Based on the findings and within the limitation of the study it is noticed that practice of 8 weeks Yogic Asanas helped to strengthen Nutritional Status (BMI) of students. Strengthen Nutritional Status of the subjects of experiment group was found to be statistically significant.

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Peer Reviewed Research Article

Comparison of Selected Motor Components among Selected team Games

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ABSTRACT

The aim of the study was to compare selected motor components among players from different team games. For the purpose of this research finding sixty male intercollegiate players of selected team sports viz. Football, volleyball and cricket, were taken as the subject (20 players from each sport). The mean age of the players was 21.47 years. Explosive strength, Flexibility, Agility were selected as the motor components among various team sports. Stratified sampling was adopted for the study and the test to measure explosive strength, vertical jump was implied. The test of sit and reach, and shuttle run for 10 yards was also made to measure flexibility and agility respectively. ANNOVA was deployed for statistical analysis and the hypothesis was tested at 0.05 level of significance. The results of the finding showed that there were significant differences on flexibility among players from different team sports (Football, Basketball and Cricket) as obtain f-ratio is 8.542 which are more than tabulated 4.0 values. Pairwise comparison among means with least significant different test showed that the players of cricketer were found to be significantly lower than players of volleyball and football. Explosive leg strength was insignificant among players of selected team game as f-ratio is 3.79 which is less than tabulated value 4.02. It was further revealed that agility among players of team game were insignificant as calculated value was 2.44 which is less than tabulated value 4.02.

Keywords: *Explosive Leg Strength, Agility, and Flexibility*

INTRODUCTION

Throughout the history of mankind, physical fitness has been considered as an essential element of everyday life. The ancient people were mainly dependent upon their individual's strength, vigor and vitality for physical survival. Physical preparation is an important pre-requisite for attaining high performance standard in games and sports. Motor components are said to be of five types which is an important pre-requisite for attaining high performance standard in games and sports. They are Speed, Endurance, Strength, Flexibility and co-coordinative ability. These are the most important components which helps a sportsman to achieve high performance in the sports arena.

METHODOLOGY

The study was conducted on 60 male intercollegiate students from various games (Football, Basketball and Cricket). Students were categorized into three groups comprises 20 from each team sport. Motor components of flexibility, agility and explosive strength were investigated with stratified sampling. Sit & Reach for flexibility was measure in centimeters; Vertical Jump for explosive leg strength was measure in fts. and 10 yards Shuttle Run for agility was measure in seconds.

RESULTS AND DISCUSSION

The result of the study (Table 1) revealed that while comparing the pair wise difference of means with critical difference it is evident that there is no difference between means of football and volleyball players but the mean of cricket player is significantly lower than football and volleyball players. These may be because the player in cricket doesn't have to execute greater range more frequently than that of the players of Football and Volleyball. Thus it can be concluded that players

of football and volleyball have more flexibility than cricket player.

In Table 2&3 revealed that there is no significant difference in the mean of the selected team game i.e. Cricket, Football and Volleyball in relation to explosive strength as obtains f - ratio is 3.79 and in Shuttle run as obtains f - ratio is 2.44 which is less than tabulated value of 4.02.

Table 1: Analysis of Variance for Flexibility among Football, Volleyball and Cricket Players of Intercollegiate (Sit & Reach test)

Sources of Variables	Degree of Freedom	Sum Square	Mean Square	F–Ratio
Between Group	2	385.25	192.625	8.542
Within Group	57	1285.50	22.55	

*significance at 0.05, Tab. value (2, 57) 0.5=4.02

Table 1 revealed that there is significant difference in the mean of the selected team game i.e. Cricket, Football, Volleyball in relation to Sit & Reach as obtain f - ratio is 8.542 which is more than tabulated value of 4.02. Hence it was evident and sufficient to indicate a difference on mean of flexibility among players from selected team games. To further analyze as to which program better pair wise mean comparison analysis will be done using Least Significant Difference test.

Mean on Selected Team Game in order of the Statement			
Mean	Cricket	Football	Volleyball
	5	10.05	10.65

Comparing the pair wise difference of means with critical difference it is evident that there is no difference between means of football and volleyball but the mean of cricket is significantly lower than that of football and volleyball. These may be because the player in cricket doesn't have to execute greater range more frequently than that of the players of Football and Volleyball. Thus it can be concluded that players of football and volleyball have more flexibility than cricket player.

Table 2: Analysis of variance for Explosive strength among Football, Volleyball and Cricket players of intercollegiate (Vertical jump)

Sources of Variables	Degree of Freedom	Sum Square	Mean Square	F–Ratio
Between Group	2	410.23	205.17	3.79
Within Group	57	3082.16	22.55	

*significance at 0.05, Tab. value (2, 57) 0.5 = 4.02

Table 2 revealed that there is no significant difference in the mean of the selected team game i.e. Cricket, Football and Volleyball in relation to vertical jump for explosive strength as obtains f-ratio is 3.79 which is less than tabulated value of 4.02. The difference may not be seen because in each game, explosive leg strength is very important for players. Thus it can be concluded that players of football, cricket and volleyball have similar explosive leg strength.

Table 3: Analysis of Variance for Agility among Football, Volleyball and Cricket Players of Intercollegiate (shuttle run)

Sources of Variables	Degree of Freedom	Sum Square	Mean Square	F – Ratio
Between Group	2	3.27	1.635	2.44
Within Group	57	38.46	0.67	

*significance at 0.05, Tab. value (2, 57) 0.5=4.02

Table 3 revealed that there is no significant difference in the mean of the selected team game i.e. Cricket, Football, Volleyball in relation to Shuttle run for agility as obtains f-ratio is 2.44 which is less than tabulated value = 4.02. The difference may not be seen because in each game it is very important for players to change direction having coordination among them. Thus it can be concluded that players of football, cricket and volleyball for agility were found to be insignificant.

CONCLUSION

From the statistical findings it was revealed that there were significant difference in one of the motor component among the football, volleyball and cricket players i.e. flexibility. In case of explosive leg strength and agility, players from all the selected team games were found to be insignificant. Therefore, following conclusion had been drawn through this research finding:

- Both the football and volleyball players have got more flexibility than the cricket players.
- Players of football, cricket and volleyball have got similar explosive leg strength or they were found insignificant.
- The agility among players from football, volleyball and cricket were also found to be insignificant.

The present study shows that all these selected games are team games and required more or less similar Physical efficiency and skills due to the nature of demands of the sportsman and to meet the demand of the game, one should be enriched with the motor components. All

team games needed more endurance, strength, speed, agility, flexibility. It required careful planning in terms of strategy and tactics. This game involved equal amount of technical and tactical element for successful participation in sports competition, so it quite obvious that in order to get better performance an individual should posses all those motor components..

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Resting Pulse Rate: Exploring the Effects of Aerobic Dance and Pranayama

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ABSTRACT

The purpose of the present investigation was to study the effects of aerobic dance and pranayama on resting pulse rate of college students. The study was experimental in nature with pre-test and post-test on experiment groups and control group design. The sample comprised ninety (N=90) boy students of age ranged between 19 to 21 years, belonging to three different colleges of Kapurthala and Jalandhar district. The colleges were randomly assigned treatment. Further ninety (N=90) students were divided equally thirty (N=30) in experiment group-1& group-2 and control group. The resting pulse rate was measured as the heart beat per minute. For this, stopwatch 1/10th of a second was used to record the pulse rate of subjects. The number of heart beats per minutes was recorded as the score. The data was analyzed with the help of Analysis of Covariance through SPSS. The Scheffe's test was also applied to see the difference between adjusted post means of resting pulse rate among experimental groups and control group. The post test resting pulse rate significantly improved with mean values i.e. 68.83 and 68.81 respectively after experiment of the aerobic dance and pranayama programme of experimental groups. The resut of Scheffe's test reveals that aerobic group and control group; pranayama and control group differ significantly, whereas aerobic group and pranayama group found insignificant
Keywords: *Aerobic Dance, Pranayama, Pulse Rate, Analysis of Covariance*

INTRODUCTION

Resting pulse rate is known as individual's heart beat during rest in one minute. It has very close relation with individual health and fitness. Globally aerobic dance and pranayama are practiced to attain good health and fitness. Davis et al. (2006) defined that, "fitness is a general term referring to the ability of a person to perform a series of varied physical exercise". The components of fitness are determined by several variables including the individual's pattern of living habits, diet, environment and heredity. Generally, fitness is operationalized in western societies with focus on two goals i.e. performance and health. Fitness is necessary for performance and optimal work in daily routine life. Health related fitness refers to those components of fitness which are affected favorably or unfavorably by habitual physical activity related to health status. One of the most important aspects of health related fitness is the cardiovascular endurance or aerobic capacity of an individual. Wiggins et al. (2005) stated that, "aerobic capacity is the ability of the cardiovascular system to take in and transport oxygen to the working muscles where it can be utilized and aerobic performance maintained". Aerobic fitness involves many important organs and tells much about the health in general. When aerobic fitness is high then physical and mental health enhances. Physical fitness prepares the body to perform strenuous activity without getting fatigue. Mental fitness prepares the mind to face tough tasks and challenges.

Aerobic dance is a form of rhythmic physical exercise which is generally practiced on music with planned pauses or continuously. Pranayama is an important part of yoga (Patil & Sawant, 2012). Yogic breathing techniques are termed as pranayama. Ankad et al. (2011) stated that the essence of the pranayama practice with slow and deep breathing is economical as it reduces dead space ventilation. Pranayama is a technique which helps to activate the quantity of prana (breath) in the body for a higher frequency. The science of pranayama is based on retention of prana or kumbhaka and the duration of breath retention has to be increased. When breath retention is held for a prolonged period, mental agitation

is curtailed. Inhalation and exhalation are methods of inducing retention. Retention is most important because it allows a longer period for the assimilation of prana and allows more time for the exchange of gases i.e., oxygen and carbon dioxide in the cells. Breath and consciousness are essentially linked and can be separated by scientific yogic technique of learning to retain the breath. Chaitow et al. (2014) mentioned that yoga techniques including pranayama have several beneficial effects on lung capacity. Thus, aerobic dance and pranayama are kind of exercises based on how oxygen is utilized by the body. It would be useful to study the effects of aerobic dance and pranayama programme on the normal functioning of the cardiovascular system. This may contribute to attain better fitness and health. Previously studies have been done in which effect of either aerobic dance or pranayama on resting pulse rate studied (Shiotani et al., 2009; Kumar, 2010 and Khetmalis, 2012). However, the present investigation was an attempt to study and compare the effects of aerobic dance and pranayama on pulse rate of college level boy students.

METHODOLOGY

Sample

The sample comprised ninety (N=90) boys selected from Ramgarhia College, Phagwara; Guru Nanak College, Phagwara and Lyallpur Khalsa College, Jalandhar. The subjects were divided into three groups and each group consisted of thirty (N=30) subjects from each college respectively. Further, selected subjects were divided into experimental group-1, experimental group -2 and control group. The participants had no previous history of participation in any sports and games. The age group of the subjects ranged between 19 to 21 years.

Tool

The resting pulse rate was dependent variable in the study. The stopwatch 1/10th of a second was used to record the heart beat of subjects. The number of heart beats per minutes was recorded as the score. The pulse rate of all groups was recorded in sitting position in morning time before aerobic dance and pranayama practise. Sufficient rest was given to subjects before recording the pulse rate. To record the pulse rate of subjects' finger tips were placed on the radical artery at wrist in such manner that palpation can be recorded for one minute.

Procedure

The two experimental groups were given different training programmes, namely aerobic dance and pranayama. The third group acted as control group which did not undergo any physical training. The data on the selected variables were collected before and after the training period of eight weeks. Group 1 & 2 were given aerobic dance and pranayama training respectively by researchers himself for eight weeks. Six days in week were experiment days and sunday was complete rest day. Every morning from 7 am to 8 am. (One hour) for aerobic dance and pranayama including warming up and cooling down given under special instructions to experiment group 1 & 2.

Statistical Analysis

Mean and S.D. were calculated and Analysis of Covariance was applied to find out the difference among experiment and control groups through SPSS. Further Scheffe's test was applied to see the difference between adjusted post test mean of resting pulse rate. The level of significance was set at 0.05.

Table 1: Analysis of Covariance on Resting Pulse Rate of Aerobic Dance, Pranayama and Control Groups

Test	Aerobic Dance Group	Pranayama Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' value
Pre-test								
Mean	81.3	80.03	80.7	Between	25.356	2	12.678	0.13
S.D.	11.37	10.12	7.78	Within	8471.93	87	97.379	
Post-test								
Mean	69.3	68.33	81	Between	2729.76	2	1364.88	23.04*
S.D.	8.5	8.35	7.23	Within	5153.53	87	59.24	
Adjusted Post-test								
Mean	68.83	68.81	80.99	Between	2697.63	2	1348.82	114.9*
				Within	1009.56	86	11.74	

*Significant at 0.05 level of confidence.
(The table values required for significance at 0.05 level of confidence for 2 and 87, 2 and 86 are 3.114 and 3.115 respectively).

RESULTS AND DISCUSSION

The influence of independent variables (aerobic dance and pranayama) on criterion variable (resting pulse rate) was determined by subjecting the collected data to the Analysis of Covariance and presented below in Table, 1.

Table 1 shows that the pre-test Mean and S.D. values on resting pulse rate for aerobic dance, pranayama and control groups were 81.3, 11.37, 80.03, 10.12 and 80.7, 7.78 respectively. The obtained 'F' ratio value of 0.13 for pre-test score of aerobic dance, pranayama and control groups on resting pulse rate was less than the required table value of 3.114 for significance with df 2 and 87 at .05 level of confidence.

The post-test mean values of resting pulse rate for aerobic dance, pranayama and control groups were 69.30, 68.33, and 81.00 respectively. The obtained 'F' value of 23.04 for post-test scores of aerobic dance, pranayama and control groups was more than the required table value of 3.114 for significance with df 2/87 at .05 level of confidence.

The adjusted post-test mean values of resting pulse rate for aerobic dance, pranayama and control groups were 68.83, 68.81 and 80.99 respectively. The obtained 'F' value of 114.90 for adjusted post-test scores of aerobic dance, pranayama and control groups were more than the required table value of 3.115 for significance with df 2/86 at .05 level of confidence.

The result of this study showed that there was a significant difference between aerobic dance, pranayama and control groups on resting pulse rate. Further to determine which of the paired means had a significant difference that Scheffé's test was applied and the result presented in Table, 2.

Table 2: Scheffë S Test for The Difference Between the Adjusted Post-Test Mean of Resting Pulse Rate

Adjusted Post Test Means			Mean Difference
Aerobic Dance Group	Pranayama Group	Control Group	
68.83	68.81		0.02
	68.81	80.99	12.18*
68.83		80.99	12.16*

*Significant at .05 level of confidence.

Table-2 shows that the adjusted post-test mean difference in resting pulse rate between aerobic dance, pranayama and control group are 0.02, 12.18 and 12.16 respectively. Since the adjusted post-test mean difference between aerobic dance and pranayama is not significant. The adjusted post-test means difference between aerobic dance and control group; pranayama and control group, were significant at 0.05 level of confidence.

DISCUSSION

The post-test result showed that significant difference found among aerobic dance, pranayama and control groups in relation to their resting pulse rate. The adjusted post-test mean difference in resting pulse rate among aerobic dance group and pranayama group showed that both experimental groups improved in resting pulse rate as compare to control group. Further Scheffe's post-hoc test reveals that significance difference found between aerobic dance group and control group, pranayama group and control group, whereas aerobic dance group and pranayama group did not find significant difference. Aerobic dance and pranayama training help to improve fitness and health benefits. Chakraborty (1983) stated that dance offer a wide range of rhythmic movements i.e. bending, jumping squatting and swinging and results of study determined which helps to improve physiological aspects of individuals. Shenbagavalli and Mary (2008) indicated that aerobic training helps the subject to decrease the weight and BMI. They concluded that mild aerobic training can be adopted by obese men to decrease the magnitude of obesity. Kaul (1984) concluded that pranayama is a special form of exercise which helps to improve fitness. It also corrects disorder of circulatory and respiratory system. Kumar and Elangovan (2011) concluded that experimental group has achieved significant improvement on selected motor ability components of speed, agility and leg explosive power. Kumar, et al. (2008) find out that yoga therapy has a positive effect on reducing body weight, total cholesterol, LDL and HDL in blood of women. The results of study revealed a great potential of yoga for healthier living. Mishra et al. (2011) carried out research on school level boys and concluded that programme of yoga is beneficial for students to develop better lung functioning. Auvai (2013) concluded that yoga training significantly decreased blood pressure and pulse rate of engineering college students. The results of above quoted studies support the results of present investigation that resting pulse rate indicates the status of cardiovascular system of individuals. Both aerobic dance and pranayama reduces the resting pulse rate of individual which indicates that both training programmes help to improve good health of students.

CONCLUSION

The resting pulse rate was significantly improved after the aerobic dance and pranayama when compared with the control group. Whereas aerobic dance and

pranayama group did not differ significantly in improving resting pulse rate. The study has implications for college stakeholders in general for good health. Better results can be obtained by following training regimen based upon either aerobic dance as well as pranayama.

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