

EFFECT OF MEDICINE BALL EXERCISES ON SELECTED PHYSICAL FITNESS COMPONENTS OF BASKETBALL PLAYERS.

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ABSTRACT

The purpose of the study was to evaluate the effect of medicine ball exercise on selected motor components of basketball players. For the purpose of this study, thirty male basketball player from JCT and GCTA clubs of Coimbatore (T.N) were selected as the subject for this investigation. . The subjects were selected randomly and divided into two equal groups i.e. Experimental Group-A (N=15) and Control Group-B (N=15). Initially, all participants from Group-A and Group-B were tested on selected motor components i.e. speed, explosive power, muscular endurance before start the protocol. After than, Group-A went for nine week medicine ball training program and no training program was set for Group-B during this training period. After nine weeks medicine ball training program, all the subjects of Group-A and Group-B were tested again on selected. motor components in the same way as the initial done. The data was collected from both the groups before and after experimentation of motor fitness performance. To examine the effect of medicine ball exercise on selected motor components for Basketball players, t-ratio was computed at 0.05 level of significance. The result of the study indicated that basketball players of Group-A had improved more of speed, explosive power, muscular endurance performance after nine weeks medicine ball exercise program than the basketball players of Group-B. It was also concluded that the medicine ball exercise program had positive effect on physical performance of Basketball players.

Key Words: Medicine ball, Exercise, . Motor components, Training, Basketball player

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INTRODUCTION

Modern civilization has made life soft and luxurious. The diminished physical efforts and artificial life is responsible for physically weak population people today, lack both strength and endurance. The average man spends more time in attending his automobiles than in attending his body.

Modern age is an age of technology which inhibits physical activity. Machines are used to perform much of our work and we are forced to lead a sedentary life. Our life span is increasing but physical fitness is deteriorating. Most of our leisure time is also passed in a very inactive way sitting before television.

As in primitive society the fitness is very much essential in modern age also. However, the reasons for the two are entirely different. Today fitness is needed for top level performance in sporting activities and maintaining good health. Now a days the level of competitions have reached the nerve breaking stage only superbly fit athletes, players or team can think of achieving success at high levels.

Fitness is the deciding factor in our daily tasks and it decides the effectiveness of the activities we prefer. So the athletes seeking a place in competitive sports must admit the physical fitness first and motor fitness next. The principle in strength training is to overcome a given resistance, be it in the form of an apparatus, sports implement or one's own body weight. But for success, one must train with the use of a specific type of progressive resistance exercise to suit the individual needs and kind of sports concerned. Strength training can be very effective through a carefully planned program; which is a fundamental requirement to improve the performance, strength training progresses through basic strength, combined strength and specific strength. The above three qualities of strength can be improved systematically by using Medicine ball as a device for training.

The dominance of different components of physical fitness is not uniform in various activities of game and sports. There are certain activities in which speed is dominating factors, in some sports strength dominates whereas in a large number of activities endurance is limiting factors..

All areas of fitness are affected by regular physical activity but three that seem to be especially impacted by regular physical activity are muscular fitness, cardiovascular fitness (aerobic fitness) and anaerobic power. For most girls, muscular fitness increases until about age 14, but for sedentary girls it may slow more rapidly or even decrease (Blimkie, 1989).

The physical fitness is the sum of five motor abilities namely speed, strength, flexibility, endurance and coordinative abilities and their complex form like strength endurance, maximum strength, explosive strength, maximum speed and agility are the basic prerequisites of human motor action. Therefore the sports performance is depend to a greater extent on these abilities. The improvement and maintenance of specific physical fitness or condition is the main aim of sports training. Each sport requires different type and level of specific fitness as a result different types of fitness training is requiring for different sports. Some sports like running requires a very high level of endurance and low level of other motor abilities, sports like shooting and archery do not require high level of physical fitness (Singh, 1978).

Physical fitness is the capacity to carry out our various reasonable well forms of physical activities without being unduly tired and include qualities improvement to the individual's health and well being, regular participation in vigorous exercise increase physical fitness is

desirable for full productive life, sedentary living habits and poor physical fitness have a negative impact on both health and daily living (Albara, 1947).

. Sharma (2011) revealed that male School children engaged in aerobic dance activity demonstrated higher strength endurance, cardiovascular-endurance; and flexibility and confirmed the positive effects on them over six weeks. Chatzinikolaou A, et al., (2010) revealed in his study that performing an acute bout of intense plyometric exercise may induce short-term muscle damage and marked but transient inflammatory responses. Jumping performance seems to deteriorate for as long as 72 hours post exercise, whereas strength appears to remain unchanged. The acute-phase inflammatory response after a plyometric exercise protocol appears to follow the same pattern as in other exercise models. Khelifa, R, Aouadi, et al, (2010) revealed that loads added to standard plyometric training program may result in greater vertical and horizontal-jump performances in basketball players. Drinkwater EJ, et al, (2009) concluded that high-volume plyometric training results primarily in peripheral fatigue that substantially impairs force and rate of force development. We recommend that coaches carefully monitor the volume of plyometric training sessions to avoid neuromuscular impairments that can result in sub optimal training. Sedano Campo S., et al, (2009) concluded that a 12-week plyometric program can improve explosive strength in female soccer players and that these improvements can be transferred to soccer kick performance in terms of ball speed. Avery faigenbaum (2007) suggested that the addition plyometric training to a resistance training program may be more beneficial than resistance training and static stretching for enhancing selected measures of upper and lower body power in boys.

Therefore, the study of Learner is highly specific to the learning situation for the most effective assessment of the learner. Each teacher must individually measure and evaluate the characteristics and ability of the group for which he is responsible. The medicine Ball is a good tool for complete bodywork out. It can be used to strengthen shoulders, back, arms and legs as well as improving core trunk strength and joint integrity.

The purpose of the study was to evaluate the effect of medicine ball exercise on selected motor components of basketball players. It was also hypothesized that there would be significant effect of medicine ball exercise on motor components in college level basketball players.

METHODOLOGY

Subjects:

Thirty male Basketball players were selected randomly from JCT and GCTA clubs of Coimbatore (T.N) and divided into two equal groups, which were treated as Experimental group-A (N= 15) and control group –B (N=15), ranging in age between 18 to 21 years. Group-A will under go a program selected medicine ball exercises and Group-B will be control group. Group-A followed the program of instruction for a period of nine weeks and training was carried for 9 weeks.

Physical Fitness Tests and their Variables:

The fifty meter dash for speed, vertical jump for explosive power of leg and one minute maximum sit-ups for strength endurance of abdomen were conducted upon all the subjects of experimental and control groups.

Criterion Measures:

Measurement for various variables were taken at the beginning (pre- test) and at the end of experimental period, after nine weeks (post-test). The data was collected before and after six weeks of experimental period by using standard tests. Maximum vertical distance jumped from ground level to upward direction and reach at maximum height was recorded in to nearest Meter-centimeter, Number of correctly executed sit-ups performed in one minute, 50 meter dash test was measured in seconds.

Training Program:

The training schedule for the period of 60 minutes in a day for the duration of nine weeks in alternate days (Monday, Wednesday & Friday) for the experimental group was set. Twenty minutes warming up time was given for a experimental group of players before implementation of the training program. The training schedule is presented in TABLE 1.

TABLE 1
NINE WEEK MEDICINE BALL TRAINING PROGRAM FOR MALE
BASKETBALL PLAYERS

Week -1 to 3 for Monday, Wednesday & Friday		
1	Duration of each exercise	2 Minutes
2	Recovery period between each exercise	30 Seconds
3	Weight of medicine ball	1 Kg.
4	Number of exercises	08
5	Frequency of exercises	02 sets
Week -4 to 6 for Monday, Wednesday & Friday		
1	Duration of each exercise	2 Minutes
2	Recovery period between each exercise	30 Seconds
3	Weight of medicine ball	2 Kg.
4	Number of exercises	08
5	Frequency of exercises	02 sets
Week- 7 to 9 for Monday, Wednesday & Friday		
1	Duration of each exercise	2 Minutes
2	Recovery period between each exercise	30 Seconds
3	Weight of medicine ball	3 Kg.
4	Number of exercises	08
5	Frequency of exercises	02 sets

Selection of Medicine Ball Exercises:

In the present study, various exercises with the medicine ball were performed on Monday, Wednesday and Friday is unchanged throughout the training period. Here, only the weight of the medicine ball was changed, as mentioned in the training schedule. The weight of the medicine ball used for giving exercise was 1 kg, 2 kg and 3 kg. A total of eight exercises in a day were performed during the training period as mentioned below in Table 2.

TABLE 2
LIST OF EXERCISES IN ALTERNATE DAYS WITH VARIATION IN WEIGHT OF THE MEDICINE BALL

S.NO.	Days	Medicine ball exercise
1.	Monday	Overhead Throw, Under hand Throw, Half Twist Pass, Standing Chest Pass, Medicine Ball Lunge, Over and under Pass, Running with medicine ball , and Sit-ups Leg-Arms extended (08 exercises)
2.	Wednesday	Backward throw, Standing Overhead Side, Standing squat throws out , Standing squat throws out , Kneeling overhead (one leg kneeling) , Zig-Zag pass in between legs, Medicine Ball Crunches, Shovel Toss and Scoop Toss (08 exercises)
3.	Friday	Underhand Throw, Medicine ball Lunge, Full Twist Pass, Kneeling Over Head , Standing Overhead slide, Kneeling Over-Head Side, Standing Chest pass and Scoop Throw (08 exercises)

RESULTS AND DISCUSSION

In order to find out the significance of difference in the mean scores gained by each group for selected variable, means, standard deviations, and t-ratios were computed for obtained data by using SPSS 16.0 program. The difference of initial and finals scores was taken into the account. The level of significance was set at .05 level of confidence and data pertaining to this have been presented in Table 2 to 5.

TABELE 3
DESCRIPTIVE STATISTICS OF PHYSICAL FITNESS COMPONENTS OF BASKETBALL PLAYERS OF EXPERIMENTAL AND CONTROL GROUPS ON PRE-TEST AND POST-TEST

Test Variables	Treatment	Experimental Group (N=15)		Control Group (N=15)	
		Mean	SD	Mean	SD
50 meter Dash	Pre-test	6.827	0.070	6.833	0.072
	Post-test	6.513	0.092	6.900	0.085
Vertical jump	Pre-test	1.089	0.018	1.049	0.018
	Post-test	1.155	0.016	1.049	0.018
Sit-ups	Pre-test	20.733	1.624	19.333	1.589
	Post-test	29.933	1.438	19.467	1.727

The mean scores of various components of physical fitness on pre-test and post-test of experimental and control group of male Basketball players have been depicted in figures 1 to 3.

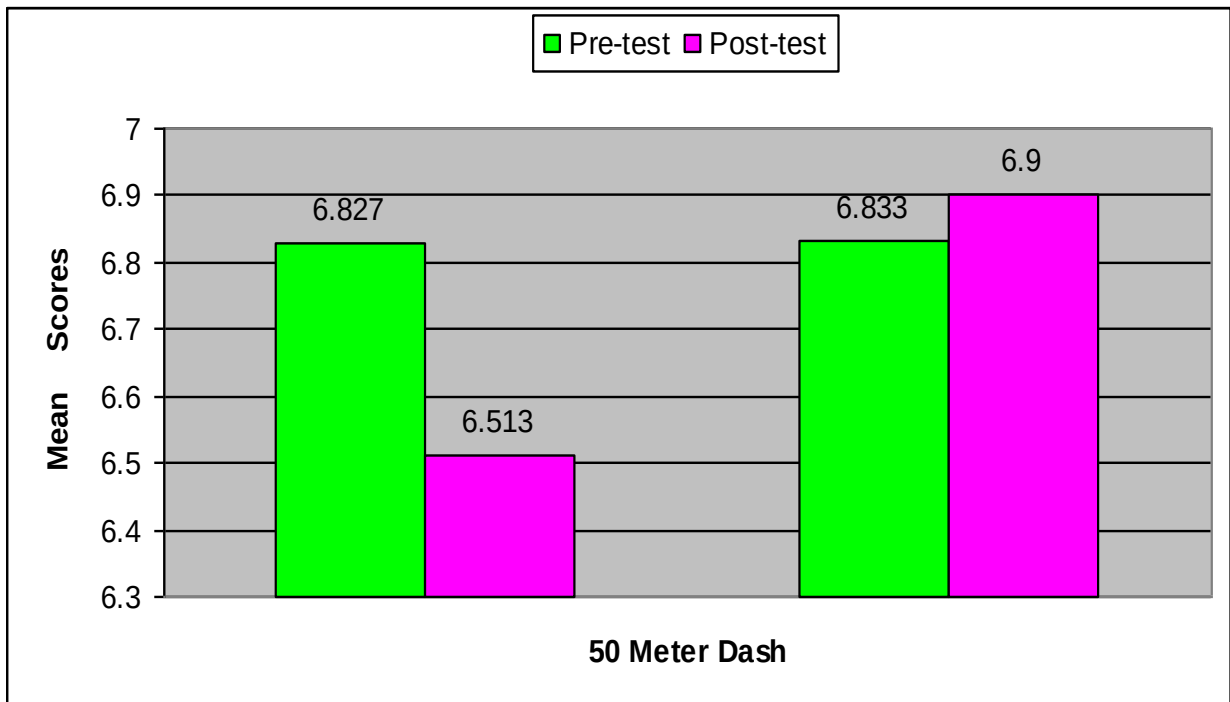


Figure-1: Mean Scores of 50 Meter Dash on Pretest and Post-test of Experimental and Control Group of Basketball Players

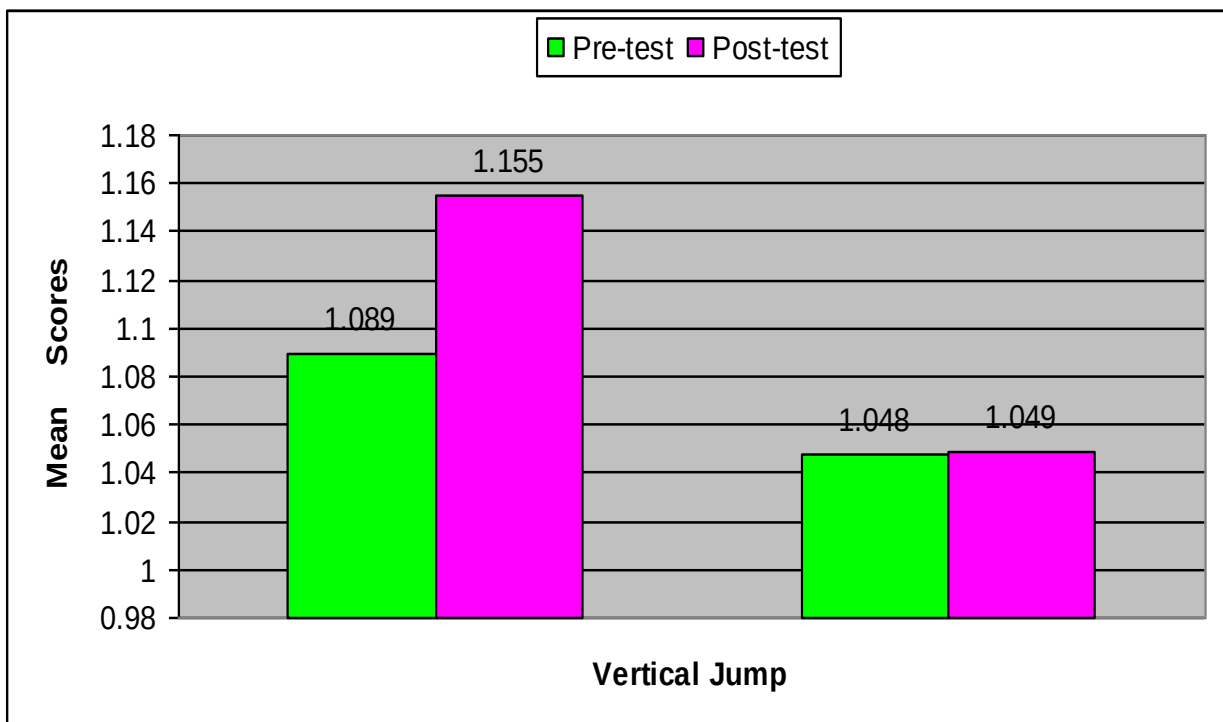


Figure-2: Mean Scores of Vertical Jump on Pretest and Post-test of Experimental and Control Group of Basketball Players.

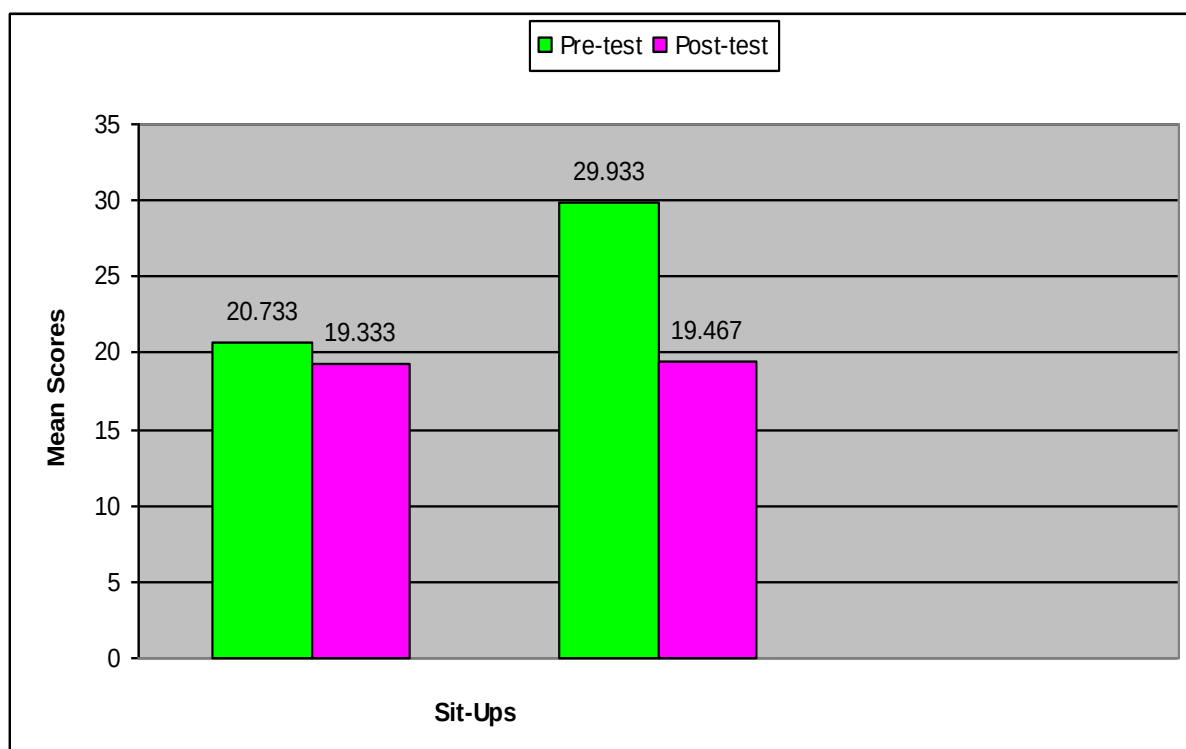


Figure-3: Mean Scores of Sit-Ups on Pretest and Post-test of Experimental and Control Group of Basketball Players

TABLE 4
SIGNIFICANCE OF DIFFERENCE BETWEEN PRE-TEST AND POST-TEST MEAN SCORES OF 50 METER DASH OF EXPERIMENTAL AND CONTROL GROUP OF BASKETBALL PLAYERS

Test	Groups	Mean	M.D.	σ DM.	t-value
Pre-test	Experimental group	6.827	.0006	0.026	0.26
	Control Group	6.833			
Post-test	Experimental group	6.513	0.687	0.032	12.01*
	Control Group	6.900			

Significant level at 0.05

$t_{.05(28)} = 2.00$

It is evident from Table 4, that statistically significant difference was not found between the pre-test means of 50 meter dash of experimental group and control group, as the obtained t-value of 0.26 was less than the required value of $t_{.05(28)} = 2.00$. This implies that both the groups are homogeneous with respect to speed performance at pre-test point. But the significant difference was found between the post-test means of 50 meter dash of experimental group and control group, as the obtained t-value of 12.01 was much higher than the required value to be significant. This suggests that there is a effect of treatment on the speed test performance.

TABLE 5
SIGNIFICANCE OF DIFFERENCE BETWEEN PRE-TEST AND POST-TEST
MEAN SCORES OF VERTICAL JUMP OF EXPERIMENTAL AND
CONTROL GROUP OF BASKETBALL PLAYERS

Test	Groups	Mean	M.D.	σ DM.	t-value
Pre-test	Experimental group	1.089	0.041	0.006	6.12*
	Control Group	1.049			
Post-test	Experimental group	1.555	0.106	0.006	17.32*
	Control Group	1.049			

*Significant level at 0.05

t.05 (28) = 2.00

It is clearly evident from Table 5, that the statistically significant difference was found between the pre-test means of vertical jump of experimental group and control group, as the obtained t-value of 6.12 was higher than the required value of t.05(28)=2.00. But the significant difference was also found between the post-test means of vertical jump of experimental group and control group, as the obtained t-value of 17.32 was much higher than the required value to be significant. This suggest that there is an effect of treatment on the sit ups test performance i.e. strength endurance of the subjects at pre-test point and post-test point.

TABLE 6
SIGNIFICANCE OF DIFFERENCE BETWEEN PRE-TEST AND POST-TEST
MEAN SCORES OF SIT-UPS OF EXPERIMENTAL AND CONTROL
GROUP MALE SCHOOL GOING CHILDREN

Test	Groups	Mean	M.D.	σ DM.	t-value
Pre-test	Experimental group	1595.10	11.93	5.45	2.39*
	Control Group	1583.17			
Post-test	Experimental group	1635.87	30.67	7.47	18.04*
	Control Group	1605.20			

*Significant level at 0.05

t.05 (28) = 2.00

Table 6 reveals that there was no statistically significant difference between the pre-test means of sit-ups of experimental group and control group, as the obtained t-value of 0.18 was less than the required value of t.05(28)=2.00. But the significant difference was also found between the post-test means of sit-ups of experimental group and control group, as the obtained t-value of 18.04 was much higher than the required value to be significant. This suggest that there is an effect of treatment on the sit ups test performance i.e. strength endurance of the subjects at post-test point.

DISCUSSION

Today, it is generally accepted that resistance exercise can be safe and worthwhile for children and teenagers provided that the training intensity and training duration are sufficient (Faigenbaum et al. 1996; Guy & Micheli, 2001). In general, it seems that boys and girls can increase their strength by about 30-50% during the first eight weeks of resistance training (Falk & Tenebaum, 1996). The present results are comparable with these findings as the progressive training program that included explosive types of medicine ball exercises resulted in gains in upper body and lower strength of 42% and 34%, respectively. The mechanisms responsible for these gains are not entirely understood nor were they examined in this study, but changes in motor unit activation and motor unit coordination, recruitment and firing are probable mechanisms that can explain, at least in part, these short-term training-induced gains (Ramsay et al., 1990).

The primary finding of this investigation was that regular participation in a progressive medicine ball training program produced greater magnitudes of improvement in muscular fitness and speed performances of experimental group than control group after short-term training. No injuries occurred as a result of medicine ball training throughout the study period. The present observations suggest that incorporating medicine ball training into the basketball coaching and training may be a safe and valid means to promote physical fitness in college level Basketball players. These findings have important practical relevance for designing training program for college level Basketball players since muscular fitness is an important health related fitness component that contributes to tasks of daily life, participation in sports activities, and reduction of disease (National Association for Sport and Physical Education, 2004).

The present study confirmed the positive effects on speed, explosive power of legs and strength endurance of abdomen of college level male Basketball players over six weeks. Male Basketball players engaged in medicine ball training program of nine weeks demonstrated the development in speed, explosive power of legs and strength endurance of abdomen. The results of the present study was partially supported by Hopkin (1999) & Sharma (2011).

In the present study, students who participated in the medicine ball training program made significantly greater gains on the speed, explosive power and strength endurance than changes in the control group. These results show that college level Basketball players respond to medicine ball training by increasing their ability to perform selected strength endurance and explosive power. Moreover, medicine balls provide a unique type of resistance that can be used for a variety of exercises that can be performed at different movement speeds (from slow to explosive). Thus it is likely that the ability of medicine ball training to enhance skill's performance is due to the ability to create exercises with medicine balls that mimic natural body positions and movement speeds that occur in daily life and game situations. Medicine ball training also resulted in significant gains in speed of basketball players as compared to control group gains.

It was also hypothesized that there would be significant effect of medicine ball exercise on motor components in college level basketball players is partially accepted, as the positive effects was found on speed, explosive power of legs and strength endurance of abdomen parameters of physical fitness over nine weeks school children engaged in medicine ball training program.

A limitation of this study is that it addressed only the initial phase of medicine ball training in college level Basketball players. Thus, the results from this investigation may not be applicable to other populations nor do the results provide insight into long-term training adaptations. Notwithstanding these limitations, the practical importance of incorporating medicine ball training into a basketball training schedule should not be overlooked. Athletes in this study had an opportunity to learn proper medicine ball training procedures and develop the skills necessary to design a personal medicine ball fitness program that can help them achieve and maintain a health-enhancing level of physical fitness. In addition, a medicine ball training program may be more acceptable and certainly will be more cost-effective for enhancing muscular fitness in college level Basketball players than other type of training program.

CONCLUSIONS

Within the framework of the present investigation, the following conclusions may be drawn:

Training with medicine ball exercises has significantly increased speed. The findings of the study demonstrated that medicine ball training has significant improvement in explosive power. Muscular endurance has improved significantly as a result of medicine ball exercise. The result of the study indicates that speed, explosive power, and muscular endurance has been improved significantly after the implementation of medicine ball exercise training program.

RECOMMENDATIONS

Further studies to classify fitness levels obtained by these programs based on more detailed analysis for training duration, training schedules as well as fitness indices will enable assessment of the most optimal training methods. Additionally this methodology could be applied to a female student population to investigate any differences in response between genders to fitness training in other countries.

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A COMPARISON OF SELECTED PHYSICAL VARIABLES BETWEEN UNIVERSITY AND STATE LEVELS BASKETBALL PLAYERS

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ABSTRACT

The purpose of this study was to compare selected physical variables between University and State levels Basketball players. For the purpose of this study, sixty Basketball players (thirty University level and thirty state level) were randomly selected as subjects. All the subjects belong to the state of Uttar Pradesh and their ages were between 17 and 25 years. For this purpose following physical variables were selected: Arm Strength, Grip Strength and Wrist Flexibility. Arm strength was measured by Roger's formula (pull ups + dips) ($w/10 + H - 60$). Grip Strength was measured by grip dynamometer and the Wrist Flexibility was measured by Goniometry. To compare arm strength, grip strength and wrist flexibility between university level and state level basketball players "t" test was computed. The result reveals that there were significant difference between university and state levels basketball players in their right and left grip strength. The result also reveals that there were significant difference between university and state levels basketball players in arm strength. Whereas, there were no significant difference between university and state level basketball players in their right and left wrist flexibility.

Keywords: Participation levels, Flexibility, strength, Hand grip, Wrist

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INTRODUCTION

Grip strength, arm strength, wrist flexibility and certain anthropometric measurements appear to be contributing factors in basketball performance. A player needs supple wrists, in order to pass the ball at different speed as well as to deceive the opponents with sudden wrist movements in either direction. Besides this one of the most common element in the game of basketball is shooting this can possibly be executed effectively if a player possesses better arm strength besides longer arms. The purpose of this study was to compare selected physical variables between University and State levels Basketball players.

METHODOLOGY

Selection of Subjects:

For the purpose of this study sixty Basketball players (thirty University level and thirty state level) were randomly selected as a subjects. All the subjects belongs to the state of Uttar Pradesh and their ages were between 17 and 25 years.

Instrumentation :

For this purpose following physical variables were selected: Arm Strength, Grip Strength and Wrist Flexibility. Arm strength was measured by Roger's formula (pull ups + dips) ($w/10 + H - 60$) (Clarke & Clarke,). Grip Strength was measured by Grip dynamometer and the Wrist Flexibility was measured by Goniometer.

RESULTS AND DISCUSSION

To compare arm strength, grip strength and wrist flexibility between university level and state level basketball players "t" test was used. The level of significance was set . at 0.05 level and data pertaining to the comparison of arm strength, grip strength and wrist flexibility between university and state level basketball players has been presented in Table 1 to 5 and depicted figure 1 to 5.

TABLE 1

SIGNIFICANCE OF DIFFERENCE BETWEEN UNIVERSITY AND STATE LEVEL BASKETBALL PLAYERS IN RIGHT GRIP STRENGTH

Participation Levels	Mean	MD	σ_{DM}	t-ratio
University level	58.90	11.44	1.50	7.14*
State level	47.54			

*Significant at 0.05 level

$t_{.05}(58) = 2.00$

Table 1 reveals that there were statistically significant differences between university and state level basketball players in right grip strength, as the obtained t-value of 7.14 was greater than the $t_{.05}(58) = 2.00$

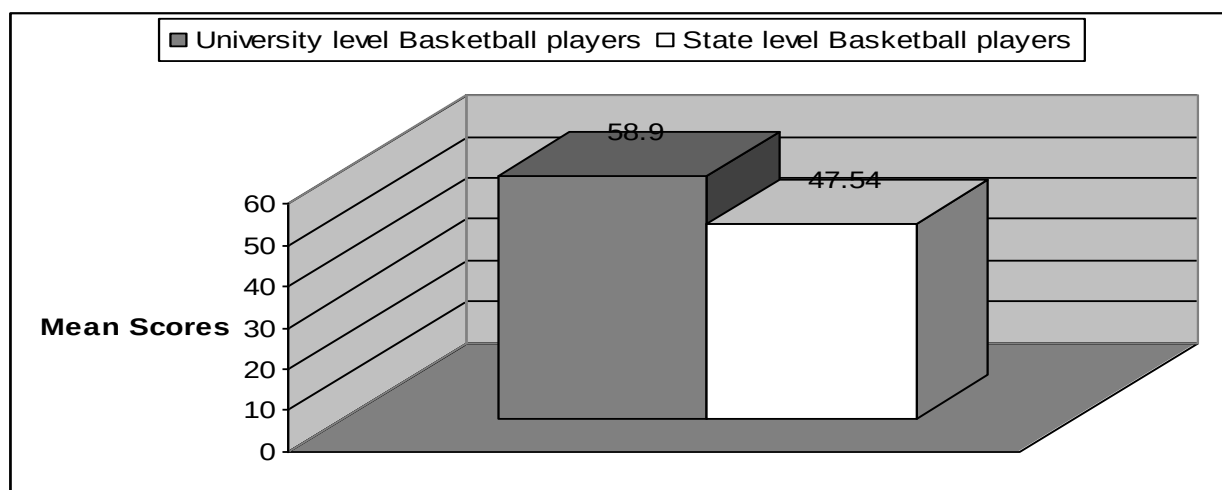


Fig.1: Mean Scores on Right Hand Grip Strength of University and State Levels Basketball Players.

TABLE 2
SIGNIFICANCE OF DIFFERENCE BETWEEN UNIVERSITY AND STATE LEVELS BASKETBALL PLAYERS IN LEFT GRIP STRENGTH

Participation Levels	Mean	MD	σ_{DM}	t-ratio
University level	54.41	12.76	1.51	6.71*
State level	41.65			

*Significant at 0.05 level

$t_{.05}(58) = 2.00$

Table 2 reveals that there were statistically significant differences between university and state level basketball players in left grip strength, as the obtained t-value of 6.71 was greater than the $t_{.05}(58) = 2.00$

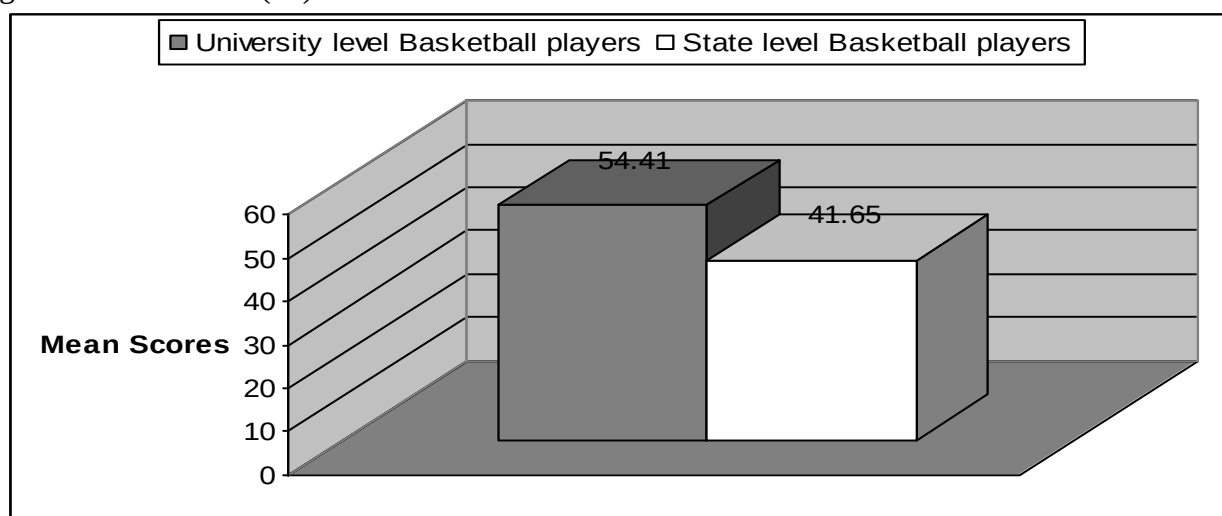


Fig.2: Mean Scores on Left Hand Grip Strength of University and State Levels Basketball Players

TABLE 3
SIGNIFICANCE OF DIFFERENCE BETWEEN UNIVERSITY AND STATE
LEVELS BASKETBALL PLAYERS IN ARM STRENGTH

Participation Levels	Mean	MD	σ DM	t-ratio
University level	4832.54	866.73	195.43	4.90*
State level	3965.81			

*Significant at 0.05 level

t.05 (58) = 2.00

Table 3 reveals that there were statistically significant differences between university and state level basketball players in arm strength, as the obtained t-value of 4.90 was greater than the t.05 (58) = 2.00

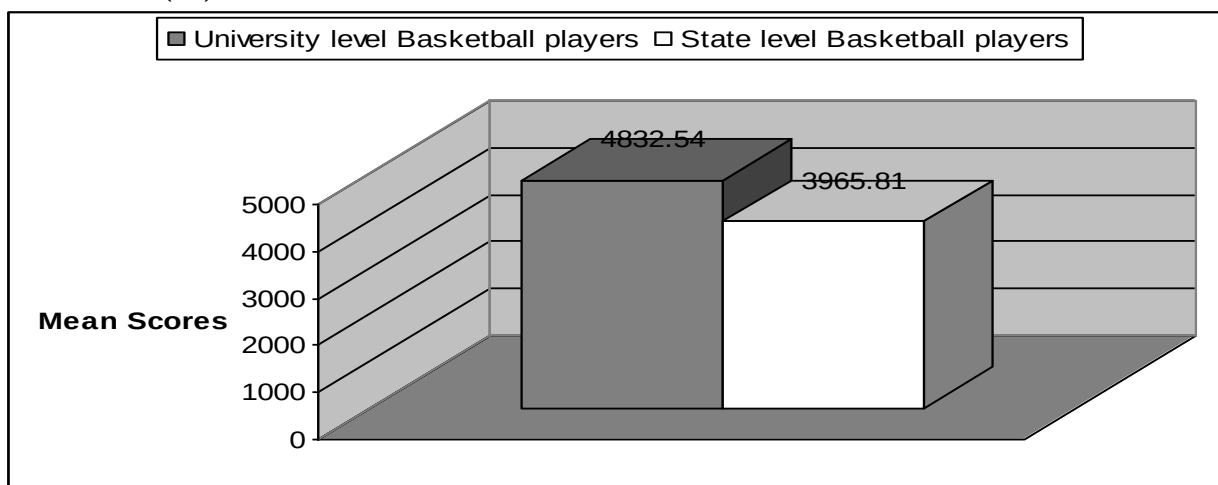


Fig.3: Mean Scores on Arm Strength of University and State Levels Basketball Players

TABLE 4
SIGNIFICANCE OF DIFFERENCE BETWEEN UNIVERSITY AND STATE
LEVELS BASKETBALL PLAYERS IN RIGHT HAND
WRIST FLEXIBILITY

Participation Levels	Mean	MD	σ DM	t-ratio
University level	69.12	2.87	2.65	1.62
State level	66.25			

Insignificant at 0.05 level

t.05 (58) = 2.00

Table 4 reveals that there were statistically significant differences between university and state level basketball players in right hand wrist flexibility, as the obtained t-value of 1.62 was less than the required t-value to be significant.

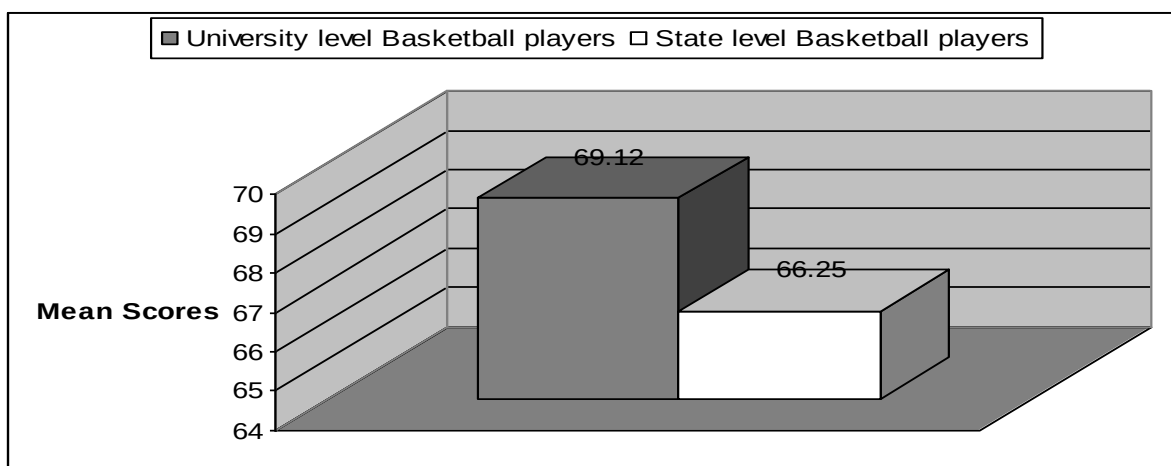


Fig.4: Mean Scores on Right Hand Wrist Flexibility of University and State Levels Basketball Players

TABLE 5

SIGNIFICANCE OF DIFFERENCE BETWEEN UNIVERSITY AND STATE LEVELS BASKETBALL PLAYERS IN LEFT HAND WRIST FLEXIBILITY

Participation Levels	Mean	MD	σ DM	t-ratio
University level	68.76	3.22	2.47	1.39
State level	65.54			

Insignificant at 0.05 level

$t_{.05(58)} = 2.00$

Table 4 reveals that there were statistically significant differences between university and state level basketball players in left hand wrist flexibility, as the obtained t-value of 1.39 was less than the required t-value to be significant.

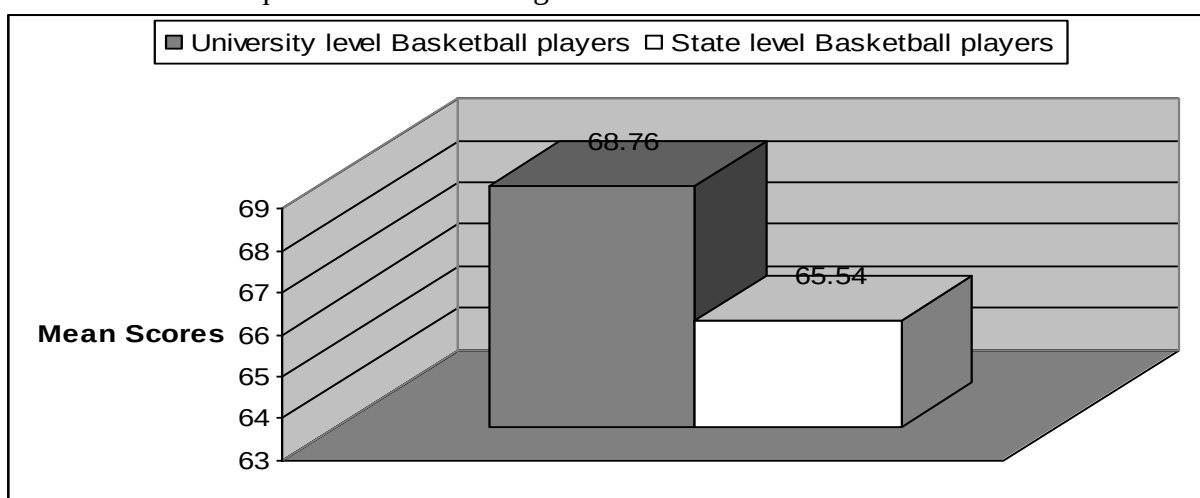


Fig.5: Mean Scores on Left Hand Wrist Flexibility of University and State Levels Basketball Players

CONCLUSIONS

1. There were significant difference between university and state levels basketball players in their right grip strength, left grip strength and arm strength.
2. Similarity was found between university and state level basketball players in their right and left wrist flexibility variables.

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COMPARISON OF SPORT FACILITIES IN CENTRAL SCHOOLS AND STATE SCHOOLS OF BILASPUR REGION

Milind Bhandeo*

ABSTRACT

The purpose of this study was to compare the existing physical education facilities in Central schools with State schools of Bilaspur region in accordance with the standards laid down in the National Plan of Physical Education proposed by Government of India. The study was conducted by administering a questionnaire to the Principals /Physical Education Teachers of Central Schools and State Schools of Bilaspur Region. Survey method was used to assess the Physical Education facilities in Central Schools and State Schools of Bilaspur region. No statistics were involved in the study. The research scholar put the collected data in tables for assessment of the-existing facilities in accordance with the standards prescribed by the National Plan of Physical Education only the average was calculated To analyzing the data. The survey revealed the true picture facts, draw backs. Weakness, difficulties as well as a few strong points.

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INTRODUCTION

Physical education and education are two sides of same coin. Physical education is education through meaningful physical activities and it is an integral part of general education. Physical education is "an integral part of total education process which has its aim – the development of physically, mentally, emotionally and socially fit citizen through the medium of physical activities which have been related with a view of realizing these outcomes.

Physical education is an old and fundamental education. The first physical education was the parent who taught his son to throw a spear, to climb a tree, to leap a brook, to do all those things that were important for a youth to learn in the tribal life of uncivilized man. Over the century the civilized social scene has changed tremendously, ways of living have profoundly altered, and new stresses have pressed upon the old biological problems of man. The need to learn to throw a spear has passed but the need to throw remains, the need to climb a tree is gone, but the urge to comb appears in every child, the need to leap a brook rarely occurs, but the necessity to leap arises again and again in the urgent jumping and leaping of youth. The patterns developed by nature are old and fundamental forms. Which their demands in a highly industrial and complex present.

Facilities are the basic need to make the programme successful. Facilities include ground equipment, gymnasium hall, Swimming pool and finances etc. The achievement of the programme depends upon its available facilities. It is stated that recent trend is to enrich the programme of physical education and demands enough space and allied facilities which are largely responsible for the success of the programme. The facilities for physical education play an important part in the relation of acquiring educational objectives. The objectives achieved are respect to others, friendship, to learn and appreciate new skills, guide and help the youngsters. Keeping in view the production of good citizen.

Physical education facilities and programmes are not frills to educational programme. As the classroom furniture, laboratory, libraries, drawing-hall and other things are necessary, similarly physical education facilities have a high order of priority in the total educational step up.

But the extent of facilities like playgrounds, track and field, gymnasium, swimming pools etc. determines the level up to which physical education percolates to the masses. Regarding the availability of facilities, responsibility goes in the part of the government and the management of the institution.

But the reluctance on the part of managements towards physical education is a great set back. The need for classroom, classroom furniture, laboratories, libraries etc. are accepted as essential but facilities for physical education are grudgingly provided. This responsibility can be successfully discharged if we realize the need of attractive programme, standard facilities, as well as trained, enthusiastic dedicated teachers of physical education. Programme facilities and personnel as well as conducive environment and similar factors which make a strong chain in fulfillment of the desired aim. Though leadership plays an important part and may be considered to be uppermost by many, it has to be accepted that facilities and other factors are also equally vital. The fact remains that any weak link in chain would result in the poor achievement of the aim.

Facilities should be designed and constructed with one central purpose in view to serve particular kinds of educational programme. Large range planning for physical education

facilities is a continuous process of anticipating and prepared to meet facility needs. Functional facilities are the result of through and well organized planning. The time, effort, and expenditure thus invested will be amplified manifold in functional facilities at the lowest possible costs. Such facilities necessitate the use of extensive outdoor and indoor activity area as well as expensive equipment and service facilities. A well organized plan for a proposed structure therefore, helps to clarify the priority of needs and hastens the decision to provide the facility.

Several plans, schemes and commissions were set up to popularize physical education. National plan of physical education and recreation was first prepared in 1956 by the Union Ministry of Education. Tenth's plan included useful guidelines for a syllabus of physical education for primary and secondary schools. The Government of India framed a multi purpose programme of physical education for implementation in secondary school in 1965. The review committee on the ten years school curriculum headed by Shri. Ishwar Bhai J. Patel had laid special emphasis in physical education in schools.

The scholar intends, keeping in mind the adequate value of imparting physical education and sports to the students to find out minimum requirement to fulfill the condition and as such he engaged himself to investigate the facilities of physical education in the central and state schools of Bilaspur region. The purpose of the present study was to compare and analyses the sport facilities and physical education programme in central schools and state schools of Bilaspur region.

METHODOLOGY

Sources of Data:

Twelve central and state schools of Bilaspur Region and thirty three state schools of Bilaspur Region were selected for the study.

Construction of the Questionnaire:

The questionnaire was framed and constructed under the supervision of the advisor and other experts in field, with utmost care and seriousness of the purpose, taking into consideration the maximum coverage of the area of the field concerned with relevant aspects needed for the study. The Questionnaires were arranged in logical order and each question worked clearly to receive desired response without undue problem.

The questionnaire were prepared taking consideration various aspects like general information, sports facilities, physical education teacher equipments, budget, library facilities, books, journals, etc., so as get maximum worthwhile detailed and meaningful information from the sample.

Administration of the Questionnaires:

Copies of the questionnaire with covering letters and self addressed envelopes were mailed to Principal/Physical education teachers of fifteen central schools and forty five state schools of Bilaspur Region with the request that they would give correct and accurate answer and send the completed questionnaires to the investigator by post at their earliest convenience. In addition to this the investigator made personal visits and had interviews with the various Principal/Physical education teachers & other Physical Education personnel and also discussed with them their problems and difficulties of sports facilities, physical education teacher, equipments, budget, library facilities, books, journals, etc. Apart from the initial mailing of the questionnaires, aids to responses in

terms of reminders and follow-ups were made timely in order to ensure maximum response.

RESULTS AND DISCUSSION

The present study surveyed and critically analyzed the sports facilities in selected central and state schools of Bilaspur districts. The responses obtained from the questionnaire survey were carefully and systematically compiled with the frequencies of the responses for each of the question with specific categorizations. The ratios indication of physical education teacher- student in Central and State schools of Bilaspur District is presented in Table 1.

TABLE 1
INDICATION OF PHYSICAL EDUCATION TEACHER- STUDENTS RATIO IN
CENTRAL AND STATE SCHOOLS

Type of School	No. of Teachers	No. of Students	Teachers : Students
Central Schools	35	16074	1:459.25
State Schools	44	22066	1:501.50

The data present in Table1 shows that the mean physical education teacher- student ratios in central and state schools were 1:459.25 and 1:501.50 respectively. The usually accepted ratio is one physical education teacher for every 250 students on the rolls of higher secondary school. It is minimum requirement for every school as prescribed in National Plan of physical education. No one of the central as well as state schools fulfilling this aspect.

The percentage indication of Central and State schools in Bilaspur district having Gymnasium is presented in Table 2.

TABLE 2
PERCENTAGE INDICATION OF SCHOOLS HAVING GYMNASIUM

Type of Response	Central Schools		State Schools	
	Frequency	percentage	Frequency	percentage
Yes	04	33.33	01	3.03
No	08	66.67	32	96.97

Table 2 denotes that 33.33 % of Central Schools in Bilaspur have Gymnasium, while the 3.03% State schools have the facility of Gymnasium.

The percentage indication of Central and State schools in Bilaspur district having Swimming pool is presented in Table 3.

TABLE 3
PERCENTAGE INDICATION OF SCHOOLS HAVING SWIMMING POOL

Type of Response	Central Schools		State Schools	
	Frequency	percentage	Frequency	percentage
Yes	02	16.67	00	00
No	10	83.33	33	100

Table-3 denotes that 16.67 % of Central Schools have Swimming pool, while the State schools do not have any Swimming pool.

The percentage indication of Central and State schools in Bilaspur district having athletic track in Central and State schools is presented in Table 4.

TABLE 4
PERCENTAGE INDICATION OF SCHOOLS HAVING ATHLETIC TRACK

Type of Response	Central Schools		State Schools	
	Frequency	percentage	Frequency	percentage
Yes	08	66.67	08	24.24
No	04	33-33	25	75.76

Table 4 indicates that 66.67 % of Central Schools have Athletic track, while the 24.24 % State schools have the facility of Athletic track.

The percentage indication of Central and State schools in Bilaspur district having football grounds is presented in Table 5.

TABLE 5
PERCENTAGE INDICATION OF SCHOOLS HAVING FOOTBALL GROUND

Type of Response	Central Schools		State Schools	
	Frequency	percentage	Frequency	percentage
Yes	08	66.67	08	24.24
No	04	33-33	25	75.76

Table-5 indicates that 66.67 % of Central schools have Football grounds, while the 24.24 % State schools have the facility of Football grounds.

The percentage indication of Central and State schools in Bilaspur district having Basketball Courts is presented in Table 6.

TABLE 6
PERCENTAGE INDICATION OF SCHOOLS HAVING BAKETBALL COURT

Type of Response	Central Schools		State Schools	
	Frequency	percentage	Frequency	percentage
Yes	10	83.33	08	24.24
No	2	16.67	25	75.76

Table-6 indicates that 83.33% of Central schools in Bilaspur have Basketball courts, while the 24.24 % State schools have the facility of Basketball courts.

The percentage indication of Central and State schools in Bilaspur district having Volleyball courts is presented in Table 7.

TABLE 7
PERCENTAGE INDICATION OF SCHOOLS HAVING VOLLEYBALL COURT

Type of Response	Central Schools		State Schools	
	Frequency	percentage	Frequency	percentage
Yes	11	91.67	20	60.61
No	01	8.33	13	39.39

Table-7 indicates that 91.67% of Central schools have Volleyball courts, while the 60.61% State schools have the facility of Volleyball courts.

The percentage indication of Central and State schools in Bilaspur district having Badminton Courts is presented in Table 8.

TABLE 8
PERCENTAGE INDICATION OF SCHOOLS HAVING BADMINTON COURT

Type of Response	Central Schools		State Schools	
	Frequency	percentage	Frequency	percentage
Yes	11	91.67	20	60.61
No	01	8.33	13	39.39

Table-8 indicates that 91.67% of Central schools have Badminton courts, while the 60.61% State schools have the facility of Badminton courts.

The percentage indication of Central and State schools in Bilaspur district having Table tennis is presented in Table 9.

TABLE 9
PERCENTAGE INDICATION OF SCHOOLS HAVING TABLE -TENNIS

Type of Response	Central Schools		State Schools	
	Frequency	percentage	Frequency	percentage
Yes	10	83.33	12	36.36
No	02	16.67	21	63.64

Table-9 indicates that 83.33 % of Central schools have Table Tennis, while the 36.36% State schools have the facility of Table Tennis.

The percentage indication of Central and State schools in Bilaspur district having Kho-Kho court is presented in Table 10.

TABLE 10
PERCENTAGE INDICATION OF SCHOOLS HAVING KHO-KHO COURT

Type of Response	Central Schools		State Schools	
	Frequency	percentage	Frequency	percentage
Yes	11	91.67	30	90.91
No	01	8.33	03	9.09

Table-10 indicates that 91.67 % of Central schools have Kho-Kho court, while the 90.91% state schools have the facility of Kho-Kho court.

The percentage indication of Central and State schools in Bilaspur district Kabaddi court is presented in Table 11.

TABLE 11
PERCENTAGE INDICATION OF SCHOOLS HAVING KABADDI COURT

Type of Response	Central Schools		State Schools	
	Frequency	percentage	Frequency	percentage
Yes	11	91.67	31	93.94
No	01	8.33	02	6.64

Table-11 indicates that 91.67 % of Central Schools have Kabaddi court, while the 93.94% State schools have the facility of Kabaddi court.

The percentage indication of Central and State schools in Bilaspur having facilities of sport equipments is presented in Table 12.

TABLE 12
PERCENTAGE INDICATION OF SCHOOLS HAVING FACILITIES IN SPORTS EQUIPMENT

Type of Response	Central Schools		State Schools	
	Frequency	percentage	Frequency	percentage
Adequate	11	91.67	27	81.82
Not Adequate	01	08.33	06	18.18

Table-12 indicates that 91.67 % of Central Schools have adequate sport equipments, while the 81.82 % of State schools did not have the adequate facility of equipments.

The percentage indication of Central and State schools in Bilaspur district having annual budget for equipments is presented in Table13.

TABLE 13
PERCENTAGE INDICATION OF SCHOOLS HAVING ANNUAL BUDGET OF SPORTS

Type of Response	Central Schools		State Schools	
	Frequency	percentage	Frequency	percentage
Less than Rs.50000/-	02	16.66	19	57.57
Rs.50001/ to Rs.1,50000/-	06	50.00	13	39.39
More than Rs.1,50000/-	04	33.33	01	3.03

Table-13 indicates that 33.33 % of Central Schools have annual budget for sport more than Rs. 150000/-, while only 3.03 % of State schools have this provision.

The percentage indication of Central and State schools in Bilaspur district having total land allotted for sport fields is presented in Table 14.

TABLE 14
PERCENTAGE INDICATION OF SCHOOLS ALLOTTED LAND FOR SPORTS FEILDS

Type of Response	Central Schools		State Schools	
	Frequency	percentage	Frequency	percentage
0-2 Acre	08	66.67	20	90.91
2-5 Acre	00	00.00	03	9.09
Above 5 Acre	04	33.33	00	00.00

The above table 14 of percentage indication of land allotted for existing sport fields indicates that, 66.67 % of central schools and 90.91 % of state schools have,0 acre to 2 acres of land and none of central schools and 9.09 % of state schools have 2- 5 acres, 33.33 % of central schools and none of state schools had more than 5 acres of land of land allotted for sport fields.

The percentage indication of Central and State schools in Bilaspur district having sport magazines in library is presented in Table 15.

TABLE 15
PERCENTAGE INDICATION OF SCHOOLS HAVING SPORTS MAGAZINES

Type of Response	Central Schools		State Schools	
	Frequency	percentage	Frequency	percentage
Less than 50	07	58.33	25	75.75
51 to 100	01	8.33	06	18.18
More than 100	04	33.33	02	6.06

Table 15 indicates that 33.33 % of Central Schools have books more than 100 sport magazines in library, while only 6.06 % of State schools have this provision.

The percentage indication of Central and State schools in Bilaspur district having play fields is presented in Table 16.

TABLE 16
PERCENTAGE INDICATION OF SCHOOLS HAVING PLAY FIELDS

Type of Response	Central Schools		State Schools	
	Frequency	percentage	Frequency	percentage
Yes	11	91.67	31	93.94
No	01	8.33	2	6.06

Table-16 indicates that 91.67 % of Central schools have play fields, while the 93.94 % State schools have the facility of play fields. The graphical representation of percentage indication of schools having play fields is shown in Figure 12.

CONCLUSIONS

Within the limitations of the study and on the basis of analysis of data the following conclusions may be drawn:

1. The Physical Education Teachers pupil ratio in Central Schools is 1:459.25 and State Schools is 1:501.50. Neither the Central Schools nor State Schools are fulfilling the requirement of one Physical Education Diploma holder for every 250 students, which is recommended by the National Plan of Physical Education.
2. The study shows that the Central Schools are better relatively than State Schools in this aspect. Gymnasium and Swimming pool facilities are quite inadequate in both Schools.
3. The study shows that the more than three-fourth of Central Schools and State schools have the facilities of play fields.
4. The study shows that Athletic Track and Football grounds were available more than one and half of the central schools, whereas less than one-fourth of state schools had Athletic Track and Football grounds.
5. The study shows that Fifty percent of central schools had hockey grounds, whereas less than one-fourth of state schools had hockey grounds.
6. The study reveals that more than three-fourth of central schools had Basketball courts, Volleyball courts, Badminton courts, Kabaddi and Kho – Kho courts, Table-Tennis facilities.

7. The study reveals that more than fifty percent of state schools had Volleyball courts, Badminton courts, Kabaddi and Kho - Kho courts facility and less than one-fourth of state schools had Basketball courts and more than one-fourth of state schools had Table-Tennis facilities.
8. The data reveals that 91.67 percent of Central Schools have adequate equipments, where as only 81.82 percent of State schools have adequate equipments.
9. The annual budget for Physical Education, Table 24 shows that 33.33% of Central schools can spend more than Rs.150000/- per annum on sports and Physical Education, where as only 3.03 % of State schools can spend the same amount.
10. The study reveals that 41.57 per cent of Central Schools have more than ten acre allotted land, where as 30.31 percent of State Schools have this provision.
11. The study reveals that 33.33 percent of Central Schools have the adequate sport fields but none of State Schools have adequate sport fields according to the standards laid in the National Plan of Physical Education.
12. The study reveals that Central schools had adequate library facilities, where as State schools had not adequate library facilities.

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A COMPARISON OF SELECTED PHYSIOLOGICAL VARIABLES OF FOOTBALL PLAYERS AT DIFFERENT PLAYING POSITIONS

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ABSTRACT

The purpose of this study was to compare the selected physiological variables between players of different playing positions in Soccer. The subjects for the study were twenty defenders and twenty forward Football players were randomly selected from different clubs of Noida, U.P. Following physiological variables were selected for the study: aerobic capacity and anaerobic capacity. To measure the aerobic capacity Cooper's 12 m run/ walk test was used and to measure the anaerobic capacity 50 m dash was used. To compare the selected physiological variables between players of different playing positions in Soccer "t" test was applied at 0.05 level of significance. The result reveals that there were no significance difference between the aerobic capacity and anaerobic capacity of defender and forward players in soccer..

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INTRODUCTION

Physiology is one of the biomedical sciences which deal with the functions of living organism. The goal of physiology is to gain insight into the machinery of the human organism, the roles and interactions of its parts and the resultant output of these interactions i.e. the overall functioning of the organism. The field of exercise physiology however has generally taken a more biological view of fitness particularly in regard to how someone responds to the demands of exercise. Essentially, this approach has required the tests to focus on how well the human circulatory and respiratory systems handle the stress prescribed exercises. Soccer is anaerobic dominating sports with intermittent sprint with control. Anaerobic endurance along with good aerobic endurance is the basic requirement of the game of soccer.

Physical capacity of athletes is an important element of success in sports achievements. It involves a huge number of different capacities, with aerobic capacity being its major component. Physiological basis of physical capacity of an organism incorporates the functional capacity of the organism to increase the level of metabolic processes in keeping with the requirement of physical effort being exposed to. We metabolic processes in this sense mean the transformation of chemical energy into mechanical one (Bower & Fox, 1988).

Aerobic capacity denotes a general extent of metabolic processes occurring in the human organism, and stands for a larger portion of the total energetic capacity. Maximal oxygen uptake refers to the intensity of aerobic processes, and actually represents the capacity of the organism to utilize at a certain moment the maximum amount of oxygen (Wilmore & Costill, 1999).

However, as these two processes are highly interrelated, maximal oxygen uptake has been regarded by majority of authors as the best indicator of aerobic capacity of the organism, i.e. the functional capacities of cardiovascular and respiratory systems, as well as the capacity of tissues to utilize oxygen; at the same time, it is the best indicator of the athlete's physical capacity. Maximal oxygen uptake is defined as maximum amount of oxygen which the organism consumes per unit of time while performing the exercise of growing intensity, and which cannot be further increased with further rise of exercise intensity. Maximal oxygen uptake as a measure of aerobic capacity has been determined as the international standard of physical capacity (Fleg, Piila & Balady, 2002 ; Fletcher, Balady, & Froelicher, 1995) Continuing estimation of athletes' physical capacity is one of the most important tasks of the physiology of sport. In that way, one can get insight into the momentary physical capability of athletes and efficiency of the training process. Determination of aerobic capacity is possible to perform with great precision by direct measuring of maximal oxygen uptake in laboratory tests on maximal physical effort. More or less accurately, it can be indirectly estimated by means of various sub-maximal laboratory and field tests.

Past research indicates that muscular strength and anaerobic power may be important for increased running performance through neurological and muscular changes (Abernethy, 1994; Sale, 1988). These positive muscular adaptations may include increased anaerobic enzyme activity, increased force production, increased intramuscular glycogen, or shifts within major fibre type groups. Neural adaptations may include improved motor unit recruitment and synchronization, improved force development rate, and improvements in the

stretch-shortening cycle. But, little is known about the influence of strength training on aerobic and anaerobic power.

Proietti (2002) reported a significant correlation between the aerobic power (Synthesis test 1999) and the high speed running (> 21.6 km/h) during a soccer game (table 24,25,26). Further correlation was found also with the anaerobic sprint power (Rast test 1996).

The aim of the investigation was to provide valuable insight into aerobic capacity i.e. athlete's capability as an indicator of his physical capacity, difference in aerobic capacities of athletes with regard to the kind of sport they were practicing, as well as the differences obtained when compared with physically inactive subjects – the so called non-athletes.

METHODOLOGY

Selection of Subjects:

The subjects for the study were twenty defenders and twenty forward Football players were randomly selected from different clubs of Noida, U.P.

Instrumentation :

Following physiological variables were selected for the study: aerobic capacity and anaerobic capacity. To measure the aerobic capacity Cooper's 12 m Run/ Walk test was used and to measure the anaerobic capacity 50 m dash was used.

RESULTS AND DISCUSSION

To compare the selected physiological variables between players of different playing positions in Soccer "t" test was applied at 0.05 level of significance.

TABLE 1

SIGNIFICANCE OF DIFFERENCE BETWEEN DEFENDER AND FORWARD FOOTBALL PLAYERS IN THEIR AEROBIC CAPACITY

Variable	Defender		Forward		t-ratio
	M	SD	M	SD	
Aerobic Capacity	3564.50	267.50	3618.00	190.00	0.317

Significant at 0.05 level, $t_{0.05} (38) = 1.68$

Table 1 reveals that there were no significance between the aerobic capacity of defender and forward players in football because the calculated value of $t_{0.05} (38) = 0.317$ was lower than the value of $t_{0.05} (38) = 1.68$.

TABLE 2

SIGNIFICANCE OF DIFFERENCE BETWEEN DEFENDER AND FORWARD FOOTBALL PLAYERS IN THEIR ANAEROBIC CAPACITY

Variable	Defender		Forward		t-ratio
	M	SD	M	SD	
Anaerobic Capacity	6.45	0.31	6.18	0.12	0.644

Significant at 0.05 level, $t_{0.05} (38) = 1.68$

Table 2 reveals that there were no significance between the anaerobic capacity of defender and forward players in football because the calculated value of $t_{0.05} (38) = 0.644$ was lower than the tabulated value of $t_{0.05} (38) = 1.68$.

CONCLUSION

There was no significant difference between defender and forward football players in relation to aerobic capacity and anaerobic capacity.

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A COMARISION OF PRE-COMPETITION ANXIETY OF MALE AND FEMALE BADMINTON PLAYERS

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ABSTRACT

The study examined the multidimensional pre-competitive state anxiety of university badminton players. The sample consisted of 49 male players and 41 female players who had competed in the All India Inter-university badminton competition organized by the Manipur University, Imphal from 25.12.2009 to 31.12. 2009. The Revised Competitive State Anxiety Inventory-2 (CSAI-2R) (Cox, Martens & Russell, 2003) was used to examine their multidimensional pre-competitive state anxiety. Result indicated that there was no gender difference in pre-competitive somatic anxiety, however, gender difference was found with male players experienced higher than female players in pre-competitive cognitive anxiety.

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INTRODUCTION

. Badminton is an objective and individual sport. However, most of the research uses the sample of team players, such as basketball, volleyball, and rugby. More than that, the format of the competition might influence the result of the study. As the competition format includes 3 single games and 2 double games in one match that each of the player could participate in 1 single game and 1 double game in maximum, therefore, for those who took part in 2 games might elicit higher anxiety levels.

The perception of a substantial imbalance between environmental demand and response capabilities under conditions which a failure to meet demands is perceived as having important consequences will respond to increase levels of cognitive and somatic state anxiety. (Martens et al., 1990).

The state anxiety were “characterized by subjective, consciously perceived feelings of apprehension and tension, accompanied by or associated with activation or arousal of the autonomic nervous system” (Spielberger, 1966)). The role of situational factors play in mediating state anxiety of athletes prior to competitions. In this case, the ability to get into the right mindset which prior to competition is a key aspect of the game that discriminates successful from unsuccessful athletes. In order to achieve optimal performance, the identification of factors influencing anxiety is a crucial point (Krane & William, 1994)..

Therefore, the purpose of this study was to examine the multidimensional pre-competitive state anxiety of university badminton players. It was also hypothesized that there will be no significant difference between male and female players in their pre-competitive anxieties.

METHODOLOGY

Selection of Subjects

Samples were both male and female badminton team players from eight tertiary institutes who had competed in the All India Inter-university badminton competition organized by the Manipur University, Imphal from 25.12.2009 to 31.12. 2009. The total number of subjects 90 (49 boys and 41 girls) respectively.

Instrumentation

The Revised Competitive State Anxiety Inventory-2 (CSAI-2R) (Cox, Martens & Russell, 2003) was used to examine the multidimensional pre-competitive state anxiety of university badminton players. The questionnaire contains three subscales: Somatic Anxiety, Cognitive Anxiety and Self-confidence.

Procedure

Questionnaires were administered to subjects within 30 minutes prior to the start of the badminton competition and the nature of study was described at the top of the questionnaire to the subjects. Each questionnaire took approximately 5 minutes to complete. Subjects who had completed the personal information section represented that they had given their consent to provide the data under the condition of anonymity. The administering of the questionnaires was carried out on 21st November 2010. Investigator collected the questionnaires from each team captains before the beginning of the competition. A total of 90 questionnaires were collected.

RESULTS

In comparing the means difference between male players and female players in pre-competitive somatic anxiety and pre-competitive cognitive anxiety, the independent group t-test was computed.. The level of significant was set at .05 level and data pertaining to this have been presented in table 1-3

TABLE 1
DESCRIPTIVE STATISTICS OF PRE-COMPETITION ANXIETIES OF
MALE AND FEMALE UNIVERSITY BADMINTON PLAYERS

S. NO.	Subscales	Male		Female	
		M	SD	M	SD
1.	Somatic Anxiety	10.79	3.52	10.02	3.29
2.	Cognitive Anxiety	11.08	2.11	9.67	1.44

The mean scores on pre-competition anxieties of male and female university Badminton players have been depicted in figures 1 .

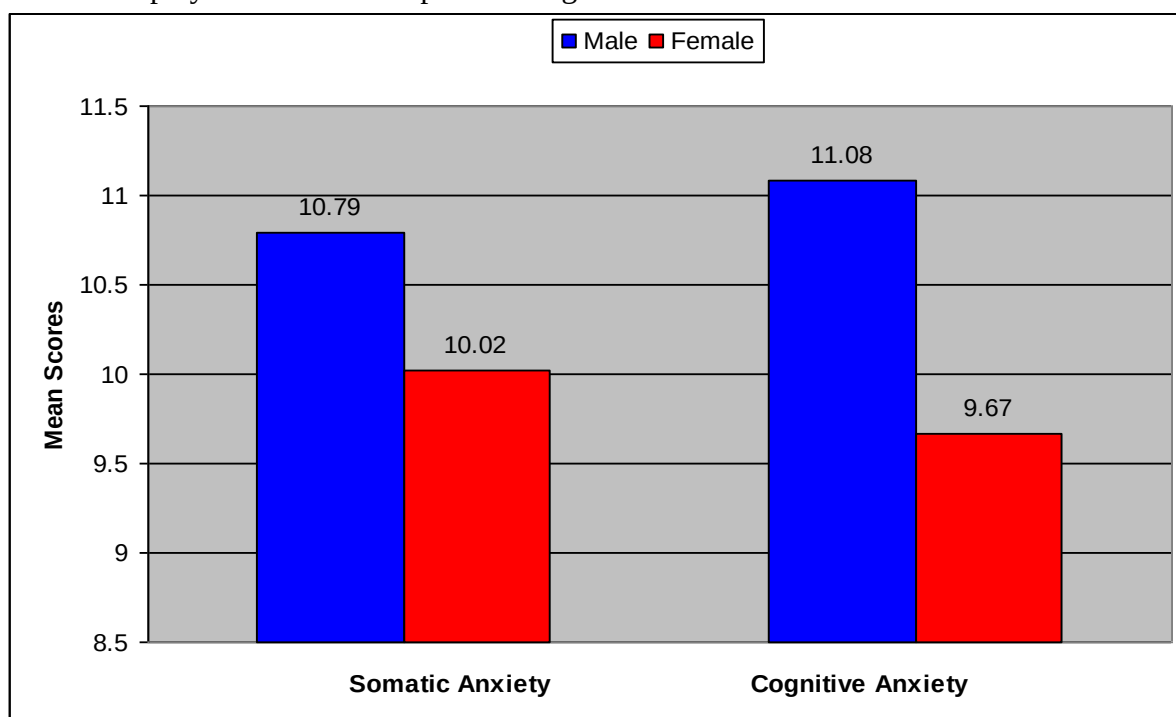


Fig. 1: Mean Scores on Pre-competition Anxieties of Male and female University Badminton Players

TABLE 2

SIGNIFICANCE OF DIFFERENCE BETWEEN MEAN SCORES OF MALE AND FEMALE UNIVERSITY BADMINTON PLAYERS IN PRE-COMPETITIVE SOMATIC ANXIETY

Subscales	Sex	Mean	MD	σ DM	t-ratio
Somatic Anxiety	Male	10.79	0.77	0.83	1.08
	Female	10.02			

Significant at .05 level

t.05 (88)=1.99

It is evident from Table 2 that there was no significant difference between male and female Badminton players in the pre-competitive somatic anxiety, as the obtained t-value of 1.08 was less than the required value t.05 (88)=1.99. Hence null hypothesis was accepted.

TABLE 3

SIGNIFICANCE OF DIFFERENCE BETWEEN MEAN SCORES OF MALE AND FEMALE UNIVERSITY BADMINTON PLAYERS IN PRE-COMPETITIVE COGNITION ANXIETY

Subscales	Sex	Mean	MD	σ DM	t-ratio
Cognitive Anxiety	Male	11.08	1.41	5.17	3.67*
	Female	9.67			

Significant at .05 level

t.05 (88)=1.99

It is evident from Table 3 that there was significant difference between male and female Badminton players in the pre-competitive cognition anxiety, as the obtained t-value of 3.67 was higher than the required value t.05 (88)=1.99. Hence null hypothesis was rejected

DISCUSSION

From the present research, result shown that there was no significant difference between male and female players in pre-competitive somatic anxiety, however, gender difference was found with male players experienced higher than those female players in pre-competitive cognitive anxiety. This phenomenon was partially consistent with the findings of Jones and Cale (1989) and Jones et al. (1991). According to their studies of gender differences in pre-competition temporal patterning of anxiety, no gender differences were reported on the somatic subscale, however, females had higher cognitive anxiety level than males 30 minutes prior to competition.

Apart from such partial consistency, the result of this study was in contrast to certain researches. Alexander and Krane (1996) found that female volleyball players scored higher in

both cognitive and somatic anxiety than male players. Similarly, same result was found in the study of Martens et al. (1990). On the other hand, Krane & Williams (1994) discovered that female athletes displayed higher somatic anxiety than male athletes and no gender differences were found in cognitive anxiety.

CONCLUSIONS

1. Similarity was found between male and female Badminton players in the pre-competitive somatic anxiety,
2. Male and female Badminton players differ significantly in the pre-competitive cognition anxiety,

RECOMMENDATION

1. Similar Study may be conducted on youth squad badminton players or elite badminton players.
2. Similar research should be conducted base on the nature of sports to test for the difference such as objective versus subjective, individual versus team, and contact versus non-contact.

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INJURY RISKS DURING PERFORMANCE IN CRICKET

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ABSTRACT

Cricket is a game of long endurance activity includes the fundamental skills i.e. batting, bowling and fielding, the three elements. that make up the game of cricket. each carry their own injury risks. The severity of the injury will determine how long the player must stay away from the field, but it is also important for therapists to take stock of the mode of injury. In the game of cricket during the performance of different type of skills and tactics of play, mostly head , neck, upper limb, lower limb and trunk related injuries may occurred due to some lacuna in health related and performance related fitness. The action of fast bowling places immense stresses on the spine and many fast bowlers are lost to the game because of low-back problems and others type of injury. In case of fielding, macroscopic and microscopic trauma, most commonly from the mid-supra-spinatus posterior to the mid-infraspinatus area, shoulder injury, head, neck, and facial injuries etc may occurred. In batting, mainly from the direct impact of the ball or from over-use injuries because of long hours at the crease. The eye, face, hand and wrist or soft tissue injury to shoulder and upper arm, stress fracture etc. may occurred in batsman. By the combined efforts of coach and sport medical officer, injury can be reduced among cricketers. They should take much care for them.

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INTRODUCTION

Batting, bowling and fielding, the three elements that make up the game of cricket, each carry their own injury risks, as can be seen from the table below.

The mean time spent off work by amateur cricketers is 1.4 weeks, but among professional cricketers this rises to 6.5 weeks. Clearly, the severity of the injury will determine how long the player must stay away from the field, but it is also important for therapists to take stock of the mode of injury, as a quarter of all injuries (25.4%) are 'acute on chronic' (flare-up of a pre-existing chronic problem). Chronic injuries by themselves account for 16.6% of total injuries, and acute injuries are 58%.

Incidence of injury to different parts of the body (Stretch, 1993 & 2003)				
	Head and neck	Upper limb	Lower limb	Trunk
% of total injuries occurring in this area	9.1	34.1	37.5	19.3
Injury Type	Muscle spasm and strain: cervical spine	Fractures: phalanges and metacarpal; joint injuries: shoulder	Muscle strains, tears (quadriceps, hamstring); joint injuries: knee, ankle, patella	Mainly muscle strain, spasm and stress fractures: lumbar spine, abdominal muscles, ribs

Bowling:

Bowling, not surprisingly, is the most risky activity, accounting for 41.3% of all injuries. The action of fast bowling places immense stresses on the spine and many fast bowlers are lost to the game because of low-back problems. The movements of hyperextension, lateral flexion and thoraco-lumbar rotation in combination with a jerk force occurring when the fast bowler lands during his delivery, can all contribute to the development of spondylosis and spondylolisthesis.

In both fast and spin bowling, technique problems and over-use have been implicated in stress fractures of the pars interarticularis (the arch at the bony bridge that holds together the superior and inferior articular processes of a vertebral body). Hard castle et al reported an incidence of 54% of pars interarticularis defects in their study (Hard castle, et al., 1966).

The diagnosis of pars interarticularis fracture can often be made clinically in fast bowlers who present with back pain causing loss of significant playing time (two weeks or more). On examination there is spasm of the back muscles with tenderness present in the line of the facet joints on the opposite side of the bowling arm with no loss of movement. Plain radiographs are often normal and the diagnosis of a pars interarticularis fracture is confirmed by CT scan.

For conservative management of pars defects, the initial treatment will be rest, supervised rehabilitation and re-education. It is vital to complement physiotherapy with analysis of the player's bowling action and appropriate modifications to technique. The main

aim here should be to develop a style that places less stress on the lumbar area, without decreasing performance.

If pain persists, temporary re-deployment may be advisable (getting an all-rounder, for example, to concentrate solely on batting). Surgery becomes an option if conservative methods are unsuccessful. In surgery, a screw is passed across the fracture with additional bone graft (Buck's repair). In the study by Ranawat et al. (2007) of 18 cricketers with stress-related pars interarticularis fracture, eight responded to conservative treatment and returned to active sport; and all 10 who required surgery returned to the professional game.

Shoulder injuries in cricket tend to result from throwing but can be aggravated by bowling, because of the repetitive forces involved. In a good bowling action, the shoulder should not be subjected to forces that lead to instability. The arm should not get into the position of 'apprehension' (abduction and forced external rotation), as this is the mechanism that subjects the capsular ligaments to forces that threaten instability.

Even with a good bowling action though, over-use injuries can weaken the rotator cuff and allow increased translational movement of the humeral head, resulting in instability and shoulder pain. With increased translation of the humerus, the long head of biceps is recruited to help stabilize the joint. This in turn can lead to traction on the long head of biceps tendon, predisposing the shoulder to tendonitis and superior labral anterior posterior (SLAP) lesions. Slow leg-spin bowlers develop internal rotation force at the end of their delivery and are therefore especially prone to these over-use injuries.

Fielding:

Fielding injuries comprise 28.6% of the total. Outfield players have to throw the ball accurately and at speed into the wicket, subjecting the shoulder of their throwing arm to the same forces and injuries that occur in baseball.

The later phases of throwing produce large 'distraction' forces (a force directed along the upper arm towards the elbow joint, in effect wrenching the arm away from the shoulder joint). The eccentric loading of rotator cuff muscles needed to resist these forces can stretch the muscles beyond their tensile limit, leading to both macroscopic and microscopic trauma, most commonly from the mid-supraspinatus posterior to the mid-infraspinatus area.

Injured outfield players tend to use a bowling action to return the ball when fielding (powerful throwing is impossible with a significant shoulder injury). This is less painful, can develop similar power to a throw and is very accurate. It does, however, take rather longer to prepare and deliver the ball.

The acute phase of a shoulder injury requires an accurate diagnosis, time for tissue healing, and reduction of pain and inflammation. This is followed by pain-free range-of-motion exercises, isometric exercises to prevent muscle atrophy, and efforts to regain scapular control. The acute phase ends when tissue healing, minimal pain and passive movements of 66% to 75% of the opposite side are achieved.

The recovery phase aims to regain normal active and passive shoulder movements, continued improvement in scapular control, and further improvements in upper extremity strength. Finally, the functional phase promotes increased power and endurance of the upper limb, continued increase in multi-plane neuromuscular control, and introduction of sports-specific activity before return to active play.

If out-fielders suffer with shoulder problems, close fielding carries a high risk of injury to the eyes, and facial or soft tissue injuries. Moreover, the role of the close-in fielders

in stopping fast traveling balls and rapidly returning them to the wicket predisposes them to injury to all parts of the body.

The speed of the ball, and the fact that fielders tend to keep their eyes on it rather than on other fielders means they occasionally collide with each other or the boundary fence, causing head, neck, and facial injuries.

Fielding injuries also reflect the vulnerability of the bare hands when struck by a cricket ball. (Belliappa and Barton, 1991) reviewed 64 cricketing injuries of the hand and found that most occurred during fielding. The peripheral digits were most frequently involved and joint injuries predominated. These included soft tissue injuries with minor avulsion fractures, fracture dislocation at the base of the middle phalanx with dislocation of the proximal interphalangeal (PIP) joints, mallet finger, recurrent collateral ligament injuries of the distal interphalangeal (DIP) and PIP joints, and thumb injuries – mainly fractures of the condyle of the proximal phalanx, with or without dislocation.

All the players on the fielding side are unprotected except for the occasional close-in fielder who uses shin-pads and a safety helmet (but who is not allowed to wear gloves) and the wicket keeper, who routinely wears leg pads, lower abdominal guards and inner and outer gloves. Despite this protection, wicket keepers frequently injure their hands. Repeated impact of the ball on their fingers causes recurrent collateral ligament damage leading to symptomatic degeneration of the DIP joints of the index and the little finger (Belliappa & Barton, 1991):

Finger injuries are usually treated by neighbor (buddy) strapping. If there is rotational deformity or the fracture fragments are not reduced properly, surgical intervention is required. Thumb fractures are mainly treated by open reduction and fixation of the fracture with either a wire or a screw.

Batting:

Batsmen incur 17.1% of the injury toll, mainly from the direct impact of the ball or from over-use injuries because of long hours at the crease.

Although batsmen always wear knee and shin pads, they do not always wear other protective clothing. It is common to wear a 'box' over the scrotal area, some use thigh pads, and most batsmen will wear a helmet when facing a fast bowler. A direct blow to the shoulder and upper arm area by a rising delivery is legal and bowlers use it tactically to unsettle a batsman. The rising ball can cause injury to the eye, face, hand and wrist or soft tissue injury to shoulder and upper arm. Simple soft-tissue treatment, including ice, non-steroidal anti-inflammatory medication, and early active mobilization, can help to reduce the effect of these injuries.

Batting can also cause stress fractures of the pars interarticularis. It usually responds to conservative management and may require a change of batting style.

Other common injuries

Both batting and bowling involve running cumulatively long distances during a game, so over-use injuries of the legs can arise, such as stress fractures, shin pain, patellar tendonitis and muscle tears. Treatment consists of initial rest, non-steroidal anti-inflammatory medication and later, active mobilization. Exercises to maintain lower-limb fitness and lumbar flexibility and strength should continue throughout the rehabilitation phase.

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EFFECT OF SPECIFIC CONDITIONING PROGRAMME ON REACTION TIME OF TRIPURA CRICKETERS.

Deepak Kumar Dogra^{*} & Dr. Ajay Kumar^{**}

ABSTRACT

Purpose of the study was to assess the effectiveness of 12 weeks specific conditioning programme on reaction time – hand & foot among selected Tripura cricketers. Pre test – post test randomized group design were undertaken for the present study which consist of an experimental group and control group. Equal number of subjects (n= 30) were assigned randomly to both the groups. The experimental group was exposed to 12 weeks specific conditioning programme whereas, no treatment was given to control group. For the purpose of the present research work a total of 60 Cricketers were randomly selected for the present research work. Reaction time was selected as a dependent variable and 12 weeks specific conditioning programme was considered as an independent variable. The data was analyzed by applying analysis of one tailed t- ratio was used to draw appropriate conclusions and to find out the effect of 12 weeks of specific conditioning programme on reaction time – hand & foot among selected Tripura cricketers. The significance level was set at 0.05. The results indicated that there was significant difference found in experimental group – A selected Tripura state cricketers on reaction time – hand & foot in comparison to control group. The findings of this study strongly reported that 12 weeks specific conditioning programme was an effective training programme to enhance cricketers' reaction ability.

Keywords: Specific, conditioning, programme, reaction time, cricketers

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INTRODUCTION

Several papers have been published focusing on the study of these post-exercise cognitive improvements by testing short-term and working memory; however, there have been fewer studies that have looked at the connection between cognitive and motor functions (Brisswalter et. al., 1997 and Keen et al., 1993). The studies that have looked at this "connection," have tested the reaction times of subjects following different types of physical activities. Reaction time, defined as being the time between the application of a stimulus and the beginning of an organism's response to it, has been shown to be a valid indicator of the central nervous system's ability to receive and synchronize movement expressed through the peripheral nervous system.

In sports, reaction time is the time it takes a cricketer to recognize a certain development, or information. Response time is the time it takes for the cricketer to process, decide, and then complete the action. You can be a very fast athlete, but if you are not reacting & responding quickly, that speed becomes void. Reaction time can be improved through external recognition drills and practicing predetermined responses to external cues. In many sports, maximum speed is rarely reached or needed, but explosive reaction is often necessary. Cricketers can improve reaction times by training to make the right choices reaction and response.

Hence, the main purpose of this study was to determine the effectiveness of 12 weeks specific conditioning programme on Tripura Cricketers' reaction time ability.

METHODOLOGY

Selection of Subjects

For the purpose of the present research study a total of 60 Cricketers were randomly selected. These subjects had represented Tripura Cricket Association (Affiliation to BCCI) in several national tournaments. The age of the subjects were ranging from 19 years to 31 years. The average age was being 25 years.

Instrumentation

Reaction Time – hand and reaction time – foot were selected as a dependent variable and 12 weeks specific conditioning programme was considered as an independent variable. The reaction time – hand and reaction time – foot were measured in centimeters rounded off 0.1 centimeter by using reaction timer scale. To test reaction time of Tripura cricketers the nelson reaction time test – hand & foot (reaction time) were respectively administered. Specific conditioning training was administered six times a week on experimental group – A at M.B.B. Stadium in Agartala for a period of 12 weeks (84 days) while the control group – B underwent general training and regular cricketing practice.

Before the administration of specific conditioning programme training, nelson reaction time test – hand & foot (reaction time) were respectively administered at same venue on both the groups namely experimental group – A and control group – B respectively to collect pre test data. After the completion of specific conditioning programme again the same reaction time tests were conducted to collect the post training data. One tailed t-ratio was computed to analyze the data and the significance level was set at 0.05.

Research Design

For the present study pre test – post test randomized group design which consisted of experimental group (n = 30) and control group (n = 30). Equal numbers of subjects were

assigned randomly to both the groups. One group served as experimental group – A on which treatment was administered. The other group served as the control group – B.

RESULTS

The findings of the study are given below:

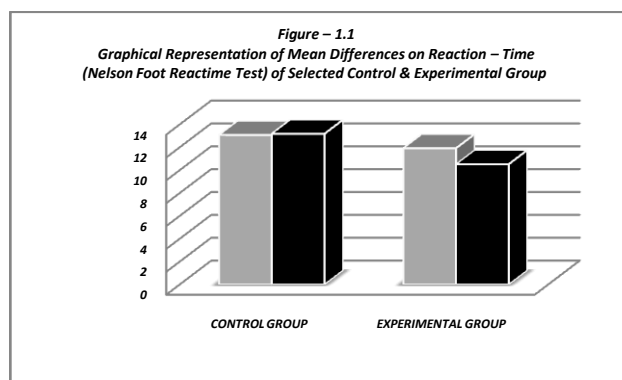
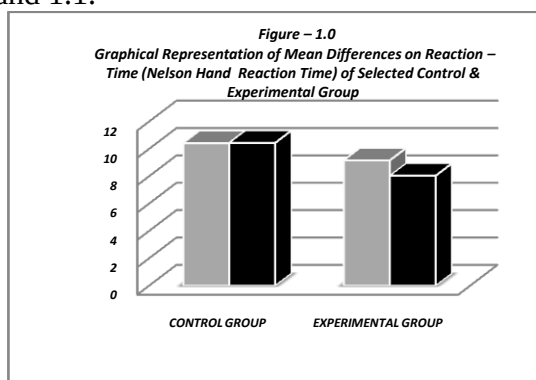
TABLE 1
ONE TAILED ‘T’ RATIO OF REACTION TIME (NELSON HAND & FOOT REACTION TIME TEST) FOR TRIPURA CRICKETERS

Reaction Time		df	Pre-test Mean	Post-test Mean	DM	‘t’
Reaction Time (Nelson hand reaction time test)	Control	29	10.42	10.44	0.02	0.34
	Experimental	29	9.16	8.04	-1.12	9.81*
Reaction Time (Nelson foot reaction time test)	Control	29	13.08	13.18	0.10	1.01
	Experimental	29	11.92	10.52	-1.40	13.83*

Significant at .05 level.

‘t’ 0.05 (29) = 1.70

Table 1 indicated the analysis of one tailed ‘t’ ratio of specific conditioning training on reaction time (Nelson hand reactiontime test and Nelson foot reaction time test) of control group differs insignificantly, as obtained ‘t’ value of 0.34 and 1.01 were respectively lower than the tabulated value of 1.70 at 0.05 level. The graphical representations of pre and post test means of control group for reaction time (Nelson hand reactiontime test and Nelson foot reaction time test) are presented in figure 1.0 and 1.1. Further, the analysis of one tailed ‘t’ ratio of specific conditioning training on reaction time (Nelson hand reactiontime test and Nelson foot reaction time test) of experimental group differs significantly, as obtained ‘t’ value of 9.81 and 13.83 were greater than the tabulated value of 1.70 at 0.05 level. The graphical representations of pre and post test means of experimental group for reaction time (Nelson hand reactiontime test and Nelson foot reaction time test) are presented in figure 1.0 and 1.1.



DISCUSSION

Research study findings were reported that selected reaction time hand and foot in experimental group - A Tripura cricketers had improved significantly by 12 weeks specific conditioning programme in contrast to control group. This significant difference was due to the fact that the experimental group were involved in practicing sports specific short

sprint drills with detailed distance and time; zig-zag runs, hexagon and ladder drills; upper and lower body plyometric exercises; phosphate recovery drill; core and stabilization training improvement of reaction time – hand & foot for 12 weeks as compared to control group – B. The results of the present study were supported by the findings of Brisswalter et. al., (1997) who identified that exercise programme improves physical function, strength, reaction time, neuro-muscular control and body sway in older people. Whereas, Keen et. al., (1994) investigated the influence of physical fitness and energy expenditure on a simple reaction time task performed during exercise and the findings of the study reported a significant effect of physical fitness on simple reaction time was noted during exercise. Another reason could be the fact that cricketers belonging to the experimental group were regularly in practice (six days a week) as per the designed specific programme and under the constant supervision of the researchers and support staff. In addition, they had access to modern infrastructure i.e., indoor stadium, ultra – modern fitness facilities than their counterparts belonging to different districts of the state. Whereas, Szymanski et. al., (2007) who evaluated the effect of 12 weeks of specific medicine ball training on high school baseball players and indicated that performing a 12-week medicine ball training program in addition to a stepwise periodized resistance training program with bat swings provided greater sport-specific training improvements for high school baseball players. The findings of the present study were also in consonance with the findings of Babault et. al., (2007), Calder et. al., 2009, Castagna et. al., (2009), and Herrero (2006). Thus, the results of present study showed that 12 week specific conditioning programme was an effective training technique to improve a cricketer's reaction time – hand and foot.

CONCLUSION

The findings reported that there was a significant improvement exhibited by experimental group – A cricketers on reaction time – hand & foot after exposed to 12 weeks specific conditioning programme in comparison to control group subjects. Hence, it is concluded that specific exercise training regime programme was an effective training programme to improve a cricketers' reaction time ability.

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The second title, the page following the title page should contain the title of the study, abstract and key words. The numbering of pages should begin here. The third page should contain the text including introduction, methodology, results, discussion, conclusion, and references. All these heads are to be typed on the left hand in upper lower type, in case there are no subheads like purpose of the study, review of literature, hypotheses, and limitations of

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Abstract

The abstract should be self-explanatory, of about 150 words; suitable for use by the abstracting journals, without rewording and should state what was aimed, what was done, what was found and what was concluded. For the review article, the abstract should be a concise summary.

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This section should include a complete description of subjects, materials, equipments, procedures and experimental techniques. It should also include the description of the statistical methods used to analyze the data. The methods and the statistical procedures published in detail before hand should be cited. Units of measurement, symbols and abbreviations must conform to the international standards. Metrics system is preferred.

Results

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data. The subjects must not be identified by name or any other recognizable label.

Discussion

The discussion part should contain the interpretation of the results with possible comparisons with other relevant studies. The discussion must be rigorous and correspond to the data and the hypothesis. New-hypothesis, if any, may be stated. Recommendations, if any, question of practical application, consistent with the limitations of the study, may be included.

Conclusion

This should briefly state the conclusions drawn from the study. Conclusions should not be drawn without any supporting data.

References

All sources, cited in the text, must be also cited in the reference list. The reference list includes circulated material, i.e., books, journal, proceedings, films, etc.

Tables

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