

COMPARATIVE EFFECT OF AEROBIC EXERCISES ON PHYSICAL FITNESS OF COLLEGE VOLLEYBALL PLAYERS

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ABSTRACT

The purpose of the study was to find out the effect of aerobic exercises on physical fitness of various age group students of volley ball players. The subjects were selected from the Govt. Degree College Kulgam and Govt. Degree College Anantnag. The study consisted of total number of 40 subjects in age ranged from 18-21 & 22- 25 years. Subjects were selected randomly in Govt. Degree College Kulgam and Anantnag. These 40 subjects were divided into two equal groups 20-20. Again, they were further divided into two equal groups of 10-10. One was treated as Experimental and second was control in both groups. The Pre-test and Post-test were conducted on each group. The data for the study were collected by administering the physical fitness J.C.R. test. Results of the study concluded that the aerobic exercises showed the positive effect on the leg strength, power of arm and shoulder and agility of experimental Volleyball players in age between 18-21 years of age. Aerobic exercises also showed the positive effect on the leg strength and power of arm and shoulder of experimental Volleyball players in age between 22-25 years. Aerobic exercises did not have any positive effect on the agility of experimental Volleyball players in age between 22-25 years. Volleyball players of control group in the age between 18-21 and 22-25 did not improved their physical fitness factors i.e. leg strength, power of arm & shoulder and agility.

Keywords: Aerobic exercises, strength, agility, Power, physical fitness

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INTRODUCTION

Many people participate in sports and games for fun, happiness, pleasure for health and fitness. Increased participation in sports has resulted in competition which has become an important element of modern life. Competition provides the means by which one can show one's worth by competing successfully. For top level performance, it is very important to spot, select and nurture a budding sportsman as it is recognized by all that athletes must possess some inherent qualities, which can be developed by means of systematized and scientific training.

The training is a process of preparing an individual for any event or an activity or job. Usually in sports we use the term sports training which denote the sense of preparing sportspersons for the highest level of performance. But now-a-days sports training is not just a term but it is very important subject that affects each and every individual who takes up physical activity or sports either for health and fitness or for competition at different level.

Hence sports training are the physical, technical, intellectual, psychological and moral preparation of an athlete or a player by means of physical exercises.¹

Movement is essential to life not only life processes such as blood circulation, respiration and muscles contraction require motion, but activities such as walking bending and grasping inherently involve movement consider how the human organism seeks, consciously or not, to move. Children provide perhaps the best evidence of the inherent nature of humans to move.

When a general sports, it is called skill. Proper movements with greater efficiency to finish are the pre-requisite of games and sports. Control over movements leads to better skill to best performance.⁴

Sports training needs not be confused with physical exercise, which is more validly used in conjunction with health and fitness. It does not however, mean that the athlete do not engage in a physical activity programme. As a matter of fact, training for competitions require much harder regimes of physical exercise to condition body than one does to achieve health objective. The training programme for athletes, in reality, is a comprehensive it includes psychological, physical conditioning, nutritional and managerial factors. In its broadest sense, sports training are the physical, technical, intellectual, psychological, physiological and moral preparation of an athlete by the means of physical exercise.

Usually in sports we use term sport training which denote the sense of preparing sports persons for the highest level of performance. But nowadays sports training are not just a term but is very important subject that affects each and every individual who takes up physical activity or sports either for health and fitness or for competition at different level.⁶. We can say that a sports training is the overall scientific and systematic channel of preparation of sports person for highest level a sport performance sports training also consists of all those learning influences and processes that are aimed at enhancing sports performance. Scientific truth is not copy of an image passively received, but the fruit of laborious and endless dialogue between thought and reality.

The scientific results in the field of physical education and sports are a bone of to the athletes, trainers and coaches. The physical educationists and sports scientists have been trying to develop new method of training and techniques to attain higher level of performance

in sports and games through critical thinking and scientific training. Now a day's games and sports are not limited to self satisfaction but it has got a wide range of importance. Therefore, physical fitness is a basic need and base of excellence in performance in addition to physical and motor fitness,

Aerobic exercises are physical exercise of relatively low intensity and long duration, which depends primarily on the aerobic energy system. Aerobic means "with oxygen", and refers to the use of oxygen in the body's metabolic or energy-generating process. Many types of exercise are aerobic, and by definition are performed at moderate levels of intensity for extended periods of time.

In selecting your aerobic exercises, consider the following: the type of activity, the duration of activity, the frequency, the intensity and the progression. Fitness experts, such as doctors in American College of Sports Medicine, have established recommendations for the quantity and quality of exercises required for the development and maintenance of both body composition and cardio vascular fitness for cardio vascular health. To this aid, aerobic exercises are preferred. Aerobic activities stimulate breathing by using large muscle groups in a continuous and rhythmical manner. Exercises such as jogging, running, walking, hiking, dancing and swimming are such activities.

The positive effects of regular aerobic exercise on health have been demonstrated in many studies. Nevertheless, the effects of physical activity on the different body systems differ depending on duration intensity, number of sessions, type of exercise and age. Most of these studies were performed with young subjects and in some cases, a geriatric population, but very few were performed esthetic studies are carried out with well- controlled groups with good situation. However, in real life situations, physicians see "normal" midlife people who exercise a few times per week, without professional supervision. It is of interest to know the effects of aerobic exercises are as positive in these cases as in the scientific studies.

Dynamic aerobic exercise is defined as rhythmic contractions of skeletal muscle, with an intensity that would not produce an accumulation of lactate in blood, and could be maintained at least 20 minutes. Aerobic metabolism increases in proportion to the mass of muscle involved and the intensity of exercise. Blood flow is more than tenfold, due to a decreased arterial resistance and opening or dilatation of the capillary beds of working muscle. Cardiac output and heart rate increase three to four times with increasing oxygen uptake, whereas stroke volumes increases only to a minor extent.

There are very few studies about the effects of aerobic training in midlife people. Cross sectional studies do not indicate the actual effect of time on those tested. Longitudinal studies show what actually happens with aerobic training but are scarce. In most of them, the effects are similar to those produced in younger population. Many of the studies carried out with middle-aged populations focus on the effects of aerobic training on the plasma lipids profile and its relationship with coronary heart disease. For example, in a study of 14 sedentary middle-age men who increased their activity over two years by running approximately 12 miles per week, there was a decrease in their body fat content from 21.6% to 18% and at the same time, an increase in their caloric intake by an average of 400 calories per day. During this time, their mean total cholesterol (T-C) concentration decreased while their HDL-cholesterol (HDL-C) concentration increased, both significantly. The mechanism underlying these changes in lipoproteins after aerobic training is the enhanced capacity of skeletal

muscle to use free fatty acids as fuel during exercise due to the changes in mitochondrial size and number, enzyme activity and capillary density. All these have the ability of the muscle to oxidize fat.⁷

Physical fitness is one of the objective of physical education as their objective is round by physical education alone. Further this objective is basic to their functioning of man in every walk of life. Let alone sports performance, physical fitness is acclaimed as one of the essential requirement of personality development. It is equally required for man and women of all spheres of life. Physical fitness is one's richest possession it can be earned through a daily routine of games, sports and physical exercise.⁹

REVIEW OF RELATED LITERATURE

A limited amount of Plyometric training could improve jumping performance in elite junior basketball players and this improvement could be partly related with an increase in F of hip extensors and RFD of knee extensors. However, neither of the two initial weights of the applied drop jumps proved to be more effective (Matavulu, et. al., 2001). Physical characteristics of the participants indicated no significant differences for age, height and weight. Significant differences was not found, similarly no significant differences were found, with trunk intention or the dynamic flexibility performance (BoBo et. al., 1999). Aerobic training evinced larger changes on the self-report measures of well-being and stress than the anaerobic trainers and both groups showed significant improvement when compared to controls (Norris, 1990). Deflection point in heart rate does not often occur, and, when it does, it does not coincide with AT, either in pre-training or post-training conditions (Kele, 2006). The improvement was observed in cardio-respiratory endurance, flexibility, muscular strength endurance and no improvement was seen in body fat % among the experimental group of middle-aged women after 12 weeks of aerobic training (Nair, et. al., 2010). The cardiorespiratory endurance of secondary school students can be effectively improved by administered a programme of interval training. To bring about significant improvement cardio respiratory endurance varied frequency of training that is twice, thrice and five days a week may be employed endurance workouts using interval training method, administered thrice and five days a week and more effective in developing cardio respiratory endurance as compared to workouts twice a week (Uppal, 1984). Differences were observed between the exercises and the control group for maximal O₂ consumption and body composition were accepted there was also difference between the two groups for the treadmill test during training (Auderey, 1985). Predicted Vo₂max with increased training was either maintained or reduce back to pre-training levels through detraining. Skin-fold thickness was significantly reduce following training and after detraining either stabilized or returned to pre training levels. Body weight, heart rate, blood pressure under went almost no change from training through the detraining period (Tenderman, 1985). Significant improvement were found in aerobic threshold resting heart rate, blood pressure in the standing position, percent of body fat and under water weighting and all strength measures except right leg strength. Difference was not observed in the means of Vo₂ max, percentage of maximum Vo₂ at anaerobic threshold, resting blood pressure, resting heart rate and right leg strength (Salih, 1985). A aerobic dance performed 30-45 min. 3 day a week, for 10 weeks significantly improves physical work capacity, cardiovascular function, but without dietary

control, does not alter body composition in sedentary middle aged women (Dowedy, et.al.,1985).

The main purpose of the study was to find out the effect of aerobic exercises on physical fitness of various age group students of volley ball players. It was also hypothesized that. There would be significant effect of aerobic exercises on physical fitness of various age group volley ball players.

METHODOLOGY

Selection of Subjects:

The subjects were selected from the Govt. Degree College Kulgam and Govt. Degree College Anantnag. The study consisted of total number of 40 subjects in age ranged from 18 to 25 years. Subjects were selected randomly in Govt. Degree College Kulgam and Anantnag. These 40 subjects were divided into two equal groups 20-20. Again, they were further divided into two equal groups of 10-10. One was treated as Experimental and second was control in both groups. The Pre-test and Post-test were conducted on each group.

Description of Tests:

The data for the study were collected by administrating the physical fitness J.C.R. test. The items of the test consist are described as below:

1. vertical jump

Purpose:- To measure the power of legs in jumping vertically.

Equipment:-A black board (Jump board or marking wall) chalk and measuring tape.

Procedure:-The subjects were asked to stand erect facing towards the board. His dominant hands fingertips were marked with chalk powder and were asked to raise the marked fingertips to a maximum height on the marked black board without lifting the heel so as to mark his maximum reach point then taking position on spot. The subject jumped up maximum and touches with the maximum height point by the chalked finger tips and makes the highest point of jump.

Scoring:-Subjects were allowed three trials the maximum distance among all the trials between the reaching height and jumping height provided the score of the test and the said score were recorded as the raw score of the subjects.

2. chin ups

Purpose:-To measure the Shoulder strength.

Equipment:-A horizontal metal bar, magnesium powder.

Procedure:-The bar was adjusted high enough so that the subject could hang with his arms and legs fully extended and his feet free off the floor. The subjects were asked to use overhand grasp. After assuming the hanging position, the subject raised his body by his arms until his chin could be placed over the bar and then lowered his body to a full, hang as in the starting position. The exercise was repeated as many times as possible only on trial was allowed. The swing of the body was not allowed during the execution of the movement. The raising of the knees and kicking of the legs were also not permitted.

Scoring:-The number of completed pull up to the nearest whole number was recorded and it was considered as the score of the subject.

3. shuttle run

Purpose:-To measure the Agility.

Equipment:-Marked Ground, two small wooden blocks, clapper/whistle, Stop watch etc.

Procedure:- The subject was asked to stand behind the starting line and two blocks were placed behind the finishing line. On the signal “Ready” and “Go”, the timer started the watch and the subject runs towards the blocks, picks up one block, runs back to the starting line, places the block behind the starting line, turns back and picks up the second block. As soon as the second block is placed on the ground the timer stopped the watch and recorded the time. Two trials were permitted.

Scoring:-The time of the better of the two trials was recorded to the nearest 10th of a second as the score of the test item.

Training Programme for both Experimental Group:

Day	Duration Exercises (Min.)	Name of Exercises	Training Means and Methods	Distance (km.)	Intensity
Monday	25	Basic Endurance	Continuous Running and Bicycling	2	Medium
	10	Relaxation	Walking and Jogging		
Tuesday	15	Strength Exercise	Neck, shoulder, hip, ankle rotation etc. rope skipping and aerobic dance.		Medium and fast
	10	Relaxation	Jogging and walking		Slow
Wednesday	15	Stretching Exercise	Triceps, Side wing, Hamstring, Quadriceps, Calf muscles, abdominal forward and backward lean. Spot jumping.		
	10	Relaxation	Easy Walking and jogging		
Thursday	05	Speed, Strength	General warming up, 100 m, 200 m run.		
	10	Relaxation	Limbering down, Easy jogging and walk	1	Medium
Friday	25	Agility	Continuous running with changing speed and aerobic dance.	½	Medium, Fast
	5	Relaxation	Limbering down, Easy jogging and walk		
Saturday	15	Strength Development	Running with changing direction.	1	Medium
		Supplementary Training	Training Exercise standing Broad jump three times each		
	5	Relaxation	Easy Walking and jogging		
Sunday		Rest			

Statistical Analysis:

The data collected qualitatively on three different test of strength, agility, and speed of control groups (N=10+10), and experimental groups (N=10+10) were analyzed by using the ‘t’ test. The level of significance was set at 0.05 level of confidence.

RESULTS

The data collected on 40 subjects before and after six week training program on strength, agility, speed was analyzed by comparing the means of pre and post test of control and experimental groups and was again statistically analyzed by applying-test to check the significant difference among selected items. Therefore, separate tables and graphs have been presented for each item as follows.

TABLE 1
LEG STRENGTH BETWEEN PRE AND POST-TEST OF CONTROL GROUP OF THE AGE GROUP OF 18 TO 21 YEARS

Control Group	Mean	S.D.	M.D.	σ DM	t-ratio
Pre. Test	34.1	3.444	0.5	1.61	0.31
Post Test	34.6	3.777			

Insignificant at .05 level, $t_{.05}(18) = 2.10$

Table No. -1 reveals that there is no significant difference between means of pre and post test of control group, because mean of pre test is 34.1 is slightly less than mean of post test is 34.6, and their mean difference is 0.5. To check the significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre-test where S.D. = 3.444 and Post test where S.D. = 3.777 and their Combine standard error = 1.61. There was no significant difference between pre and post test of control group because value of calculated 't' = 0.61 which is less than tabulated 't' = 2.10 at 0.05 level of confidence, which shows no improvement in control group because no training was given to the subjects of control group.

TABLE 2
LEG STRENGTH BETWEEN PRE AND POST TEST OF EXPERIMENTAL GROUP OF THE AGE GROUP OF 18-21 YEARS.

Experimental Group	Mean	S.D.	M.D.	σ DM	t-ratio
Pre-test	37.2	1.84	9.8	1.571	6.238*
Post -test	47.0	4.618			

Significant at .05 level, $t_{.05}(18) = 2.10$

Table No. – 2 reveals that there is significant difference between means of pre and post test of experimental group, because mean of pre test is 37.2 is less than mean of post test which is 47.0, and their mean difference is 9.8. To check the significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre-test where S.D. = 1.84 and Post test where S.D. = 4.618 and their Combine standard error = 1.571. there was significant difference between pre and post test of control group because value of calculated 't' = 6.238 which is greater than tabulated 't' = 2.10 at 0.05 level of confidence, which shows good improvement found in experimental group after six weeks aerobic training.

TABLE 3
ARM AND SHOULDER STRENGTH BETWEEN PRE AND POST TEST OF
CONTROL GROUP OF THE AGE GROUP OF 18-21 YEARS.

Control Group	Mean	S.D.	MD	σ DM	t-ratio
Pre. Test	8.8	1.135	0.20	0.49	0.41
Post Test	8.6	1.075			

Insignificant at .05 level, $t_{.05}(09) = 2.10$

Table No. - 3 reveals that there is no significant difference between means of pre and post test of control group, because mean of pre test is 8.8 which are slightly less than mean of post test 8.6, and their mean difference is 0.2. To check the significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre-test where S.D. = 1.135 and Post test where S.D. = 1.074 and their Combine standard error = 0.492. There was significant difference between pre and post test of control group because value of calculated 't' = 0.406 which is less than tabulated 't' = 2.10 at 0.05 level of confidence, which shows no improvement in control group of the age group of 18-21 years.

TABLE 4
ARM AND SHOULDER STRENGTH BETWEEN PRE AND POST TEST OF
EXPERIMENTAL GROUP OF THE AGE GROUP OF 18-21 YEARS.

Experimental Group	Mean	S.D.	M.D.	σ DM	t-ratio
Pre. Test	9.3	1.152	2.1	0.579	3.62*
Post Test	11.4	1.429			

Significant at .05 level, $t_{.05}(18) = 2.10$

Table No. - 4 reveals that there is significant difference between means of pre and post test of experimental group, because mean of pre test is 9.3 is less than mean of post test which is 11.4, and their mean difference is 2.1. To check the significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre-test where S.D. = 1.152 and Post test where S.D. = 1.429 and their Combine standard error = 0.579. There was a difference between pre and post test of control group because value of calculated 't' = 3.62 which is greater than tabulated 't' = 2.10 at 0.05 level of confidence, which shows little improvement in experimental group after six weeks aerobic training.

TABLE 5
AGILITY BETWEEN PRE AND POST TEST OF CONTROL GROUP OF THE AGE
GROUP OF 18-21 YEARS.

Control Group	Mean	S.D.	M.D.	σ DM	t-ratio
Pre. Test	13.12	1.33	0.249	0.534	0.469
Post Test	12.87	1.069			

Insignificant at .05 level, $t_{.05}(18) = 2.10$

Table No. - 5 reveals that there is no significant difference between means of pre and post test of control group, because mean of pre test is 13.12 is slightly greater than mean of post test is 12.87, and their mean difference is 0.249. To check the significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre-test where S.D. = 1.33 and Post test where S.D. = 1.069 and their Combine standard error = 0.534. There was no significant difference between pre and post test of control group because value of calculated 't' = 0.469 which is less than tabulated 't' = 2.10 at 0.05 level of confidence, which shows no improvement in control group because no training was given to the subjects of control group.

TABLE 6
AGILITY BETWEEN PRE AND POST TEST OF EXPERIMENTAL GROUP OF
THE AGE GROUP OF 18-21 YEARS.

Experimental Group	Mean	S.D.	M.D.	σ DM	t-ratio
Pre. Test	13.25	1.258	1.370	0.435	3.15*
Post Test	11.88	0.55			

Significant at .05 level, $t_{.05}(18) = 2.10$

Table No. - 6 reveals that there is little difference between means of pre and post test of experimental group, because mean of pre test is 13.25 is greater than mean of post test is 11.88, and their mean difference is 1.370. To check the significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre-test where S.D. = 1.258 and Post test where S.D. = 1.55 and their Combine standard error = 0.435. There was significant difference between pre and post test of control group because value of calculated 't' = 3.150 which is greater than tabulated 't' = 2.10 at 0.05 level of confidence, which satisfactory little improvement in experimental group.

TABLE 7
LEG STRENGTH BETWEEN PRE AND POST TEST OF CONTROL GROUP OF
THE AGE GROUP OF 22-25 YEARS.

Control Group	Mean	S.D.	M.D.	σ DM	t-ratio
Pre. Test	38.6	2.547	0	1.139	0
Post Test	38.6	2.547			

Table No. - 7 reveals that there is no significant difference between means of pre and post test of control group, because mean of pre test and post test are the same and their mean difference is 0. To check the significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre-test where S.D. = 2.547 and Post test where S.D. = 2.547 and their Combine standard error = 1.39. There was no significant difference between pre and post test of control group because value of calculated 't' = 0 which is less than tabulated 't' = 2.10 at 0.05 level of confidence, which shows totally no improvement in control group because no training was given to the subjects of control group.

TABLE 8
LEG STRENGTH BETWEEN PRE AND POST TEST OF EXPERIMENTAL GROUP
OF THE AGE GROUP OF 22-25 YEARS.

Experimental Group	Mean	S.D.	M.D.	σ DM	t-ratio
Pre. Test	38.9	2.846	7.0	1.775	3.94*
Post Test	45.9	4.840			

Significant at .05 level, $t_{.05}(18) = 2.10$

Table No. - 8 reveals that there is significant difference between means of pre and post test of experimental group, because mean of pre test is 38.9 is less than mean of post test which is 45.9, and their mean difference is 7.0. To check the significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre-test where S.D. = 2.846 and post test where S.D. = 4.840 and their combine standard error = 1.775. There was significant difference between pre and post test of control group because value of calculated 't' = 3.943 which is greater than tabulated 't' = 2.101 at 0.05 level of confidence.

TABLE 9
ARM AND SHOULDER STRENGTH BETWEEN PRE AND POST TEST OF
CONTROL GROUP OF THE AGE GROUP OF 22-25 YEARS.

Control Group	Mean	S.D.	M.D.	σ DM	t-ratio
Pre. Test	9.4	0.843	0.3	0.425	0.70
Post Test	9.7	1.05			

Insignificant at .05 level, $t_{.05}(18) = 2.10$

Table No. - 9 reveals that there is no significant difference between means of pre and post test of control group, because mean of pre test is 9.4 which are slightly less than mean of post test 9.7, and their mean difference is 0.3. To check the significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre-test where S.D. = 0.843 and Post test where S.D. = 1.05 and their Combine standard error = 0.425. There was no significant difference between pre and post test of control group because value of calculated 't' = 0.70 which is less than tabulated 't' = 2.10 at 0.05 level of confidence, which shows no improvement in control group of the age group of 22-25 years.

TABLE 10
ARM AND SHOULDER STRENGTH BETWEEN PRE AND POST TEST OF
EXPERIMENTAL GROUP OF THE AGE GROUP OF 22-25 YEARS.

Experimental Group	Mean	S.D.	M.D.	σ DM	t-ratio
Pre. Test	9.3	0.948	1.6	0.639	2.50*
Post Test	10.9	1.79			

Significant at .05 level, $t_{.05}(18) = 2.10$

Table No. - 10 reveals that there is significant difference between means of pre and

post test of experimental group, because mean of pre test is 9.3 is less than mean of post test which is 10.9, and their mean difference is 1.6. To check the significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre-test where S.D. = 0.948 and Post test where S.D. = 1.79 and their Combine standard error = 0.639. There was a difference between pre and post test of control group because value of calculated 't' = 2.503 which is greater than tabulated 't' = 2.10 at 0.05 level of confidence, which shows little improvement in experimental group after six weeks aerobic training.

TABLE 11
AGILITY BETWEEN PRE AND POST TEST OF CONTROL GROUP OF THE AGE GROUP OF 22-25 YEARS.

Control Group	Mean	S.D.	M.D.	σ DM	t-ratio
Pre. Test	12.03	1.209	0.05	0.521	0.095
Post Test	12.08	1.123			

Insignificant at .05 level, $t_{.05}(18) = 2.10$

Table No. - 11 reveals that there is no significant difference between means of pre and post test of control group, because mean of pre test is 12.03 is slightly greater than mean of post test is 12.08, and their mean difference is 0.05. To check the significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre-test where S.D. = 1.209 and Post test where S.D. = 1.123 and their Combine standard error = 0.521. There was no significant difference between pre and post test of control group because value of calculated 't' = 0.095 which is less than tabulated 't' = 2.10 at 0.05 level of confidence, which shows no improvement in control group because no training was given to the subjects of control group.

TABLE 12
AGILITY BETWEEN PRE AND POST TEST OF EXPERIMENTAL GROUP OF THE AGE GROUP OF 22-25 YEARS.

Experimental Group	Mean	S.D.	M.D.	σ DM	t-ratio
Pre. Test	12.7	0.873	1.15	0.651	1.76
Post Test	11.6	1.866			

Insignificant at .05 level, $t_{.05}(09) = 2.26$

Table No. - 12 reveals that there is little difference between means of pre and post test of experimental group, because mean of pre test is 12.7 is slightly greater than mean of post test which is 11.6, and their mean difference is 1.15. To check the significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre-test where S.D. = 0.873 and Post test where S.D. = 1.866 and their Combine standard error = 0.651. There was

significant difference between pre and post test of experimental group because value of calculated 't' = 1.76 which is greater than tabulated 't' = 2.10 at 0.05 level of confidence, which shows little improvement in experimental group.

The obtained mean scores from JCR tests for experimental group and control groups belong to m Govt. Degree College Kulgam and Govt. Degree College Anantnag have been depicted figure 01 to 06.

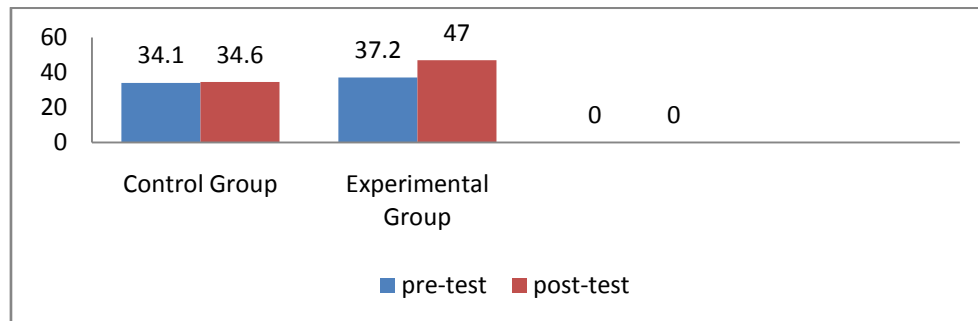


Figure.1: Mean Scores Between Pre and Post Test of Control and Experimental Group for Leg Strength

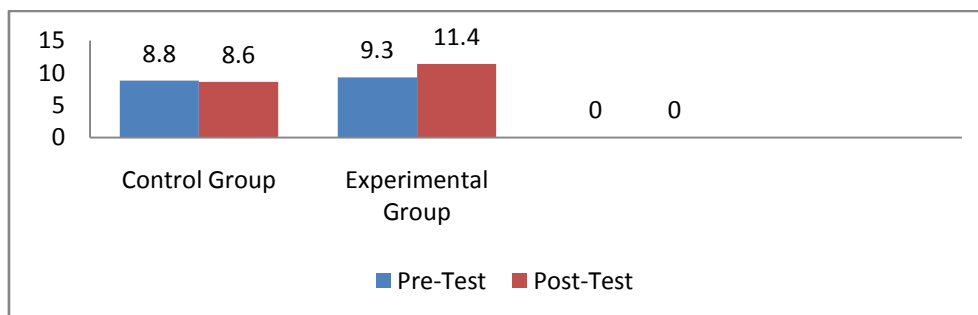


Figure.2: Mean Scores Between Pre and Post Test of Control and Experimental Group for Arm and shoulder Strength

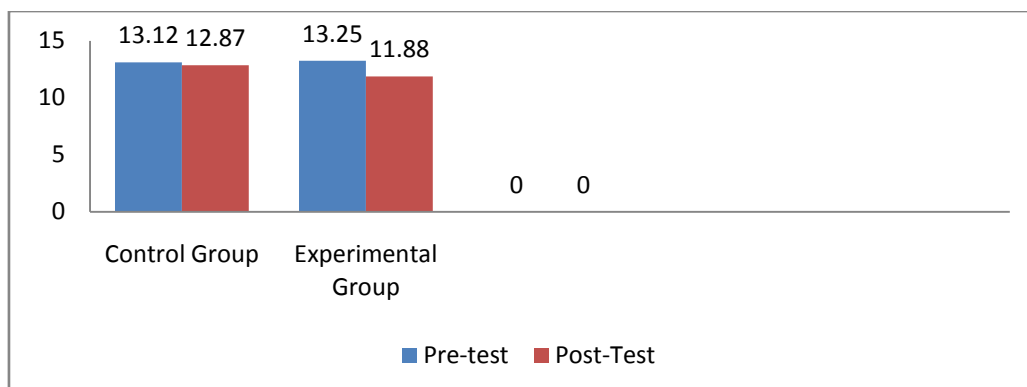


Figure. 3: Mean Scores Between Pre and Post Test of Control and Experimental Group for Agility Performance.

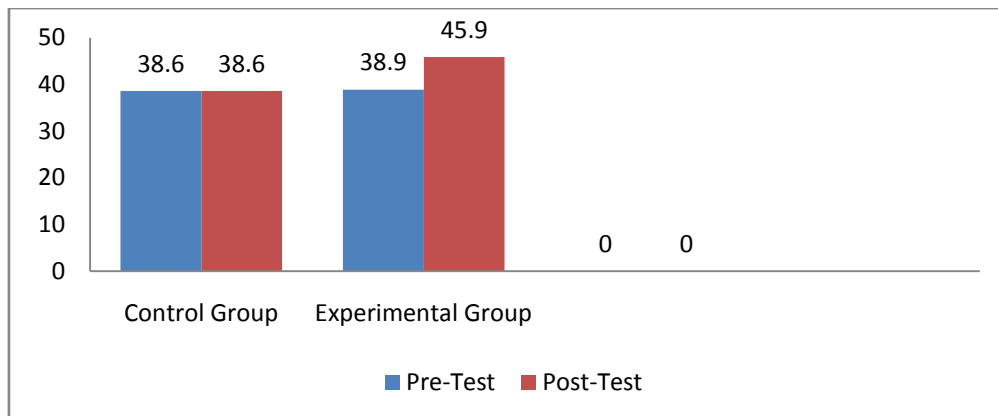


Figure. 4: Mean Scores Between Pre and Post Test of Control and Experimental Group for Strength Performance.

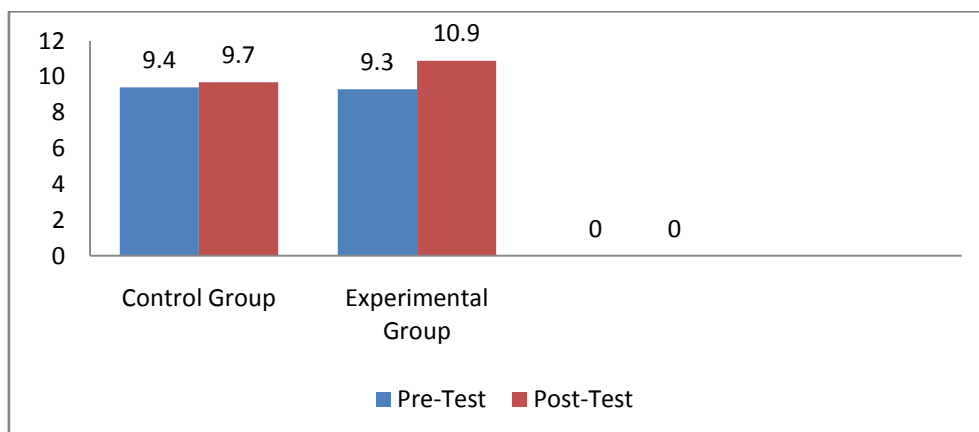


Figure.5: Mean Scores Between Pre and Post Test of Control and Experimental Group for Arm and shoulder Strength Performance.

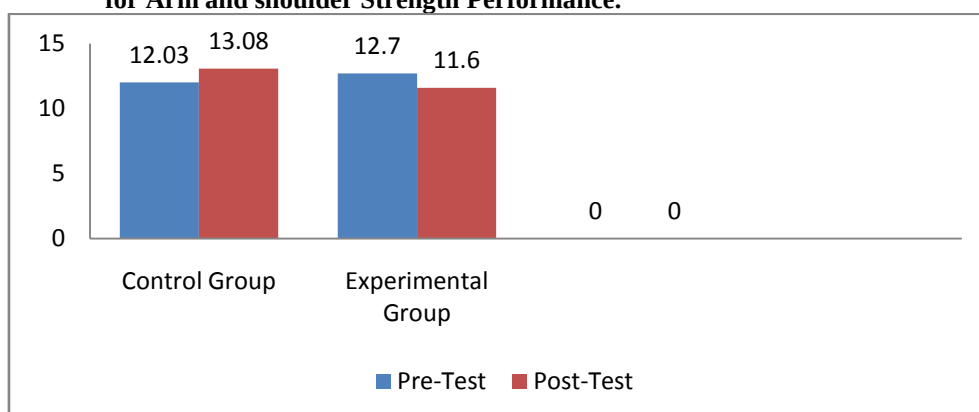


Figure.6: Mean Scores of Pre and Post Test of Control and Experimental Group for Agility Performance.

DISCUSSION

It has been observed from the analysis of data that there was significant difference between the same items among the groups after the administration of training programme. And there was great improvement in all the selected components of the body.

Leg Strength :-The results showed that there was good improvement within and among the groups.

Arm and Shoulder Strength :-The results showed that there was good improvement within and among the groups in arm and shoulder strength of experimental group.

Agility :-The agility showed significant improvement as the planned training program shows the significant effect. Hence aerobic training program of six weeks was adequate for agility.

Justification of Hypothesis :- It was hypothesized there would be significant effect of aerobic training on selected Physical Fitness components. And the effect of training showed the significant effect on leg strength, arm and shoulder strength and showed a significant effect on agility.

CONCLUSIONS

Within the limitations of the study and from statistical analysis the following conclusion was drawn.

1. Aerobic exercises showed the positive effect on the leg strength, power of arm and shoulder and agility of experimental Volleyball players in age between 18-21 years of age.
2. Aerobic exercises also showed the positive effect on the leg strength and power of arm and shoulder of experimental Volleyball players in age between 22-25 years.
3. Aerobic exercises did not have any positive effect on the agility of experimental Volleyball players in age between 22-25 years.
4. Volleyball players of control group in the age between 18-21 and 22-25 did not improved their physical fitness factors i.e. leg strength, power of arm & shoulder and agility.

APPLICATION IN SPORTS

The result of the study would be help the coaches, physical education teachers and athletes in planning the training programme to develop the strength and agility of players. This study would be helpful to reduce the undue fatigue and injuries of players. This study would be helpful to the students of physical education to understand the importance of Strength, Agility and Endurance etc. This study would be generate the interest in physical education teacher and coaches to improve the physical fitness level of players. The study would be help the coaches at the time of selection of players. The study would be help the coaches and physical education teachers to select suitable training programme. The effect of aerobic training would bring forward the merits and de-merits of each exercise. The findings would be helpful in introducing the new exercises in aerobic training programme.

FUTURE RESEARCH DIRECTIONS

The study may be repeated to other physical fitness components on the same subjects.. The same study may be constructed with longer duration of training programme.. The similar study may be repeated on the female subjects.. Coaches and physical education teachers are recommended to undertake this type of studies for selecting and planning the

training programme for the players.. The result of this study can be used to get better and advance outcome.. In this study only three components were taken, but this can be done on more or less components.. The similar study can be carried out on the total physical fitness.

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EFFECT OF 6-WEEKS AEROBIC TRAINING PROGRAMME ON CARDIOVASCULAR ENDURANCE OF SCHOOL BOYS

Ashaq Hussain Shan*

ABSTRACT

Aerobic exercises are physical exercise of relatively low intensity and long duration ,which depend primarily on the aerobic energy system. Aerobic means ‘with oxygen ’,and refers to the use of oxygen in the body’s metabolic or energy generating process. The purpose of the study was to find out the effect of aerobic exercise on endurance of school boys. The 30 students from Govt. High School Kilam, which is affiliated to Jammu and Kashmir Board of school education, were selected by using sample random sampling method. For the present study , 30 students(boys) were selected of 9th class randomly from Govt. High School Kilam and their age group was 14-15 years. The researcher divided 30 subjects into two homogeneous groups i.e. 15 subjects in group ‘A’ as Experimental group and 15 subjects in group ‘B’ as Control group. The six week aerobic exercises programme was implemented for experimental group of boys. No training was provided for control group of boys. The ‘t’ test was applied to find out whether any significance difference between the means of pre and post test score of the both groups after the period of six weeks training programme. Harvard Step Test was used to measure the cardiovascular endurance. The results of the study revealed that aerobic training have a considerable effect on endurance of school boys after 6-weeks training programme. The available evidence suggests that training may improve aerobic fitness , but that there is little carryover into activity.

Keywords: Cardio-vascular Fitness, Aerobic Training, School boys, Fitness Index

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INTRODUCTION

Exercise is a physical activity that is planned, structured and repetitive for the purpose of conditioning of any part of the body. Exercise is used to improve health, maintain fitness and is important as a means of physical rehabilitation. Repeatedly moving the human body to make it stronger or better at doing something, it is called physical exercise. Exercise is an important part of physical therapy, weight loss or sports performance. Physical exercise is any bodily activity that enhances or maintains physical fitness and overall health and wellness. It is performed for various reasons including strengthening muscles and the cardiovascular system, having athletic skills, weight loss or maintenance, as well as for the purpose of enjoyment. It also improves mental health, helps prevent depression, helps to promote or maintain positive self-esteem. Frequent and regular physical exercise boosts the immune system and helps prevent the disease of affluence such as heart disease, cardiovascular disease, diabetes and obesity. Childhood obesity is a growing global concern and physical exercise may help to decrease some of the effects of childhood and adult obesity.

Exercise strengthens your heart and trains it to use oxygen more efficiently. As your heart grows stronger, it can pump more blood through your body, which helps your body function. Regular exercise can help keep your arteries more elastic, and build your muscles and bones at the same time. It also keeps you flexible so you can do all the activities you like. Because your muscles need energy to function while exercising, you will burn calories, which helps you lose weight, lose body fat and gain lean muscles. Exercise can also help speed up your metabolism.

Walking, swimming, jogging, running, cycling, rowing and aerobic dance are prime aerobic forms of exercises. Aerobic exercise need not to be hard and tough exercise; in fact it is not advisable to push yourself too hard, although you do not need to make some physical effort to derive any benefit. Aim to build up the level of activity gradually. There are two types of aerobic exercise, low impact and high impact aerobic exercise. Both involve similar kinds of exercises, but high impact aerobic classes provide better cardiovascular exercise. A workout of 30 and 50 minutes designed to work on various parts of the body is the most beneficial type of calories burner.

In selecting your aerobic exercise, consider the following: the type of activity, the duration of activity, the frequency, the intensity and the progression. Fitness experts such as doctors in American College of Sports Medicine have established recommendations for the quantity of exercise required for the development and maintenance of both body composition and cardiovascular fitness for cardiovascular health to this end, aerobic exercise is preferred. Aerobic activities stimulate breathing by using large muscle groups in a continuous and rhythmical manner.

Changes in aerobic power: the most readily observable change with aerobic training are an increased ability to perform prolonged sub-maximal exercise and an increase in one's maximal aerobic capacity ($VO_2\text{Max.}$). Note, however, that there are wide individual variations in the degree of improvement in both sub-maximal endurance and $VO_2\text{ max.}$ with any given training programme. Whereas one individual may experience a 40% to 50% improvement in $VO_2\text{ max.}$ as a consequence of endurance cycling, another person may show

almost no change (less than 5%) as a result of the same training programme. Of course, the status of one's physical fitness at the start of a training programme will influence the magnitude of improvement observed during training individuals who already have a high level of fitness may show a smaller change in aerobic power than those who have led a sedentary life. Generally the average increase in VO_2 max from training studies that have used large members of subjects varies between 15% and 20%. (Wilmore and Costill, 2009, p.186)

Exercise programme should be aerobic in nature. Because the objective of aerobic dance programme is to improve those organs and systems involved in the body's processing of oxygen, the heart, lungs and blood vessels improve their function. It means better utilization of oxygen and carrying with it the benefit and protection. Minimum three to five minutes of warming up exercise must be done.. Exercise programme should be done safely, slowly, progressively and passively. In addition to aerobic dance programme, there should also be flexibility and strengthening exercises.. (Internet:<http://www.becomehealthy.com>., 1993) .

Cardiovascular and respiratory endurance, or what has been termed cardio-respiratory or aerobic endurance, is probably the one component of training that is at least understood by coaches and athletes. Training programmes for many non-endurance athletes completely ignore the aerobic endurance factor. This is understandable, because for maximum improvement in performance, training should be highly specific to the particular

Muscular endurance is specific to individual muscles, cardio-respiratory endurance relates to the body as a whole. Specifically, it refers to your body's ability to sustain prolonged, rhythmic exercise this type of endurance is used by the cyclist, distance runner or endurance swimmer who completes long distance at a fairly fast pace. Cardiovascular endurance is related to the development of cardiovascular and respiratory systems and thus aerobic development. This is why the term aerobic endurance is also used to represent cardiovascular endurance (Wilmore and Costill, 2009, pp. 272-273)

Robach et.al., (2014) indicated that six weeks of hypoxia training possess no ergogenic effect at sea level. It is not excluded that hypoxia training might facilitate endurance capacity at moderate altitude. Ritzmann et.al., (2014) expressed that a training program that includes whole body vibration can provide supplementary benefits in young and well trained adults compared to an equivalent program that does not include whole body vibration. Nair et al (2010) indicated the improvement in cardio respiratory endurance, flexibility, muscular strength endurance and decreased skin fold thickness among the experimental group of middle aged women after 12 weeks of aerobic training. Tian et al (2006) explained that proper intensity of anaerobic endurance training may be beneficial to improve the adaptability of human body for circumstances as aerobic endurance training. Chwalbinska-Moneta (2003) indicated that in elite rowers, creatine supplementation improves endurance (expressed by the individual lactate threshold) and anaerobic performance, independent of the effect of intensive endurance training. Helgerud et al. (2001) concluded that enhanced aerobic endurance showed no changes in any of the tested parameters. Enhanced aerobic endurance in soccer players improved soccer performance by increasing the distance covered enhancing work intensity, and increasing the number of sprints and involvements with the ball during a match. Bobo et al (1999) observed the

statistically significant differences was not found, similarly no significant differences were found, with trunk intention or the dynamic flexibility performance Norris (1990) provided that the exercise and in particular aerobic exercise has positive effects of well being. It is suggested that future research might usefully explore the particular contribution of different aspects of the training situation to these effects. Buttler(1990) concluded that there is limited evidence about the effect of cardio respiratory training in children with cerebral palsy. The available evidence suggests that training may improve aerobic fitness , but that there is little carryover into activity. Dowaly (1985) concluded that aerobic dance performed 30 -45 min 3 day a week , for 10 weeks significantly improves physical work capacity , cardiovascular function , but without dietary control, does not alter body composition in sedentary middle aged women. Auderey (1985) found the differences between the exercised and the control groups for maximal O₂ consumption and body composition were accepted there was statistically significant difference between the two groups for the treadmill test during training. Uppal (1984) expressed that the cardio respiratory endurance of secondary school students can be effectively improved by administered a programme of interval training. Powell (1977) found the significant improvements in leg and knee strength , calf size, jumping ability , running speed, agility , flexibility, chest volume and heart response.

The main purpose of the study was to find out the effect of aerobic exercise on endurance of school boys. it was also hypothesised that: there may be significant effect of aerobic exercise on endurance of school boys.

METHODOLOGY

Sample:

Sources of data.: For the present study ,30 students from Government High School Kilam, which is affiliated to Jammu and Kashmir Board of school education, were the sources of data. Subjects: The 30 students from Govt. High School Kilam, which is affiliated to Jammu and Kashmir Board of school education, were selected by using sample random sampling method. Criterion Measure: For the present study , 30 students(boys) were selected of 9th class randomly from Govt. High School Kilam and their age group was 14-15 years Formation of Groups: The researcher divided 30 subjects into two homogeneous groups i.e. 15 subjects in group 'A' as Experimental group and 15 subjects in group 'B' as Control group.

Training Programme:

Training programme was of six weeks .in each week 6 days training were given to the experimental group only the supervision of researcher and Sunday was given total rest. General warming up followed by , jogging, stretching, and specific exercise were performed by the subjects.

Administration of Test: Harvard Step Test

Purpose :To measure the cardiovascular endurance. Equipment :- A stop watch, 18-inch high bench metronome or tape-recorder(optional),stethoscope(optional) Procedure : I give a demonstration of the stepping up style to be followed by the subjects during the test. Depending upon the availability of 18- inch high bench area and pulse count testers, a group of 1 to 4 subjects may be asked to start the stepping up and down exercise by starting the stopwatch at the signal 'go'. Then the tester should do enough rehearsal of counting the pace up-up-sown-sown, 30 times a minute. The subject is given instructions that on the command

'up' he/she should place one foot on the bench; on the second command 'up' he/she should place both feet fully on the bench with the body erect straightening the legs and back. Immediately after reaching the erect posture, he/she should step down one foot at a time as the tester gives command 'down-down'. The subject is instructed to repeat the stepping up and down exercise in the above manner for four minutes at the pace of 30 steps per minute. The subject is also asked to take off and step down with the same foot each time. The tester starts the stop watch simultaneously with the first take off by the subjects and stops the watch after exactly four minutes by giving the 'stop' signal to the subjects who immediately sit down on the bench. In case, any subject stops the exercise or slows down the pace of exercise due to fatigue or exhaustion, his/her duration of exercise performed at the correct pace is noted (in seconds) and is asked to stop and sit down. Exactly one minute after the exercise, the tester starts counting the pulse rate and records the same for the duration from 1 to 1.5, 2 to 2.5 and 3 to 3.5 minutes. Scoring:- The pulse of all the 3 half minute counts recorded are added together and a fitness index is calculated by the following formula:

Fitness index (F.I.) = $\frac{\text{duration of exercise period in seconds} \times 100}{2 \times \text{sum of three pulse counts after exercise}}$

Collection of Data:

It was conducted on both the groups i.e. Experimental and Control Group before the training programme. After 6 weeks of training programme the post test was taken on both the groups. The data pertaining to this study was collected by administering the test items on the selected subjects in the premises of Govt. High School Kilam Kulgam.

RESULTS

All the data pertaining to the present study were examined by employing 't' test to find out whether any significant difference between the means of pre and post test score of the both groups after the period of six weeks training programme. Significant level was set at .05 level of confidence and data pertaining to this have presented in Table 1-2 and figure depicted in 1-2.

TABLE 1
MEAN DIFFERENCES BETWEEN THE PRE-TEST SCORES OF EXPERIMENTAL AND CONTROL GROUP ON ENDURANCE

Groups	N	Mean	S.D.	M.D.	σ DM	t-ratio
Experimental	15	75.88	8.00	2.98	2.89	1.03
Control	15	72.90	7.75			

Insignificant at .05 level, $t_{.05}(28) = 2.04$

Table 1 reveals that the mean of pre-test of Experimental and Control groups are 75.88 and 72.90 and their calculated 't' value is 1.03 which is smaller than that of tabulated value 2.04 (28 df at 0.05 level of confidence). It indicates that there is no significant

difference between the pre-test of experimental and control groups. Therefore , it is indicated that there is no significant difference found before the aerobic training programme between the experimental and control groups. It was indicated that before training the endurance of both the groups were same. Hence , null hypothesis is accepted. The pre-test mean values of experimental and control groups on endurance have been graphically presented in Figure 1.

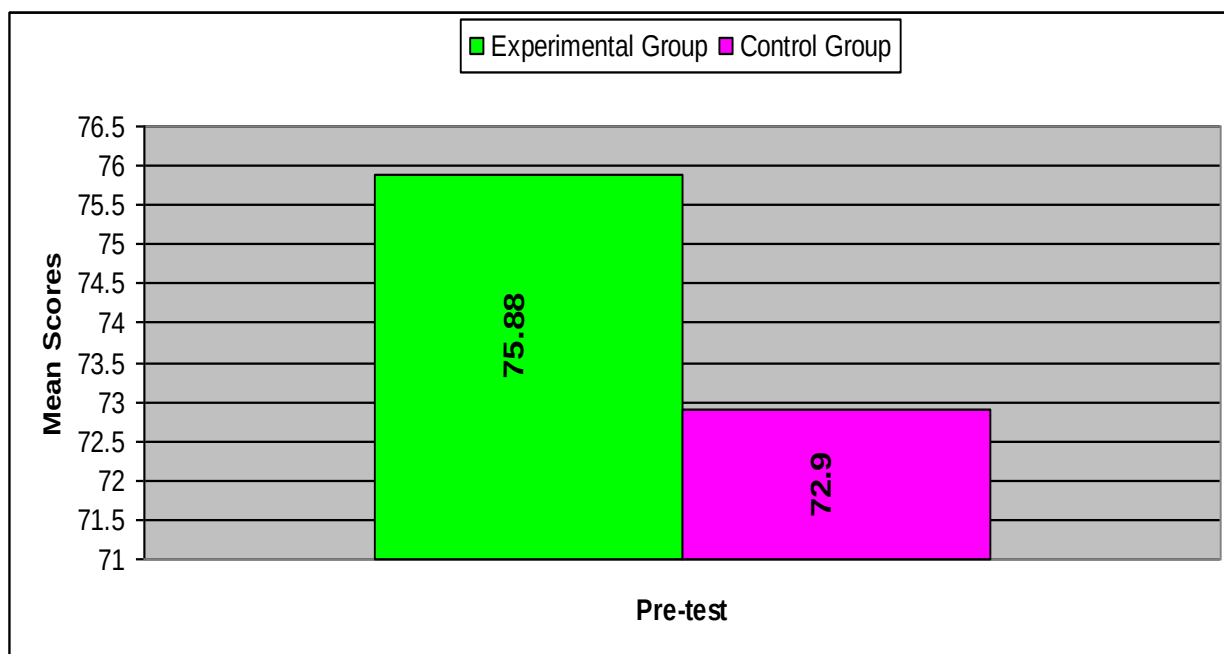


Figure 1. Graphical representation of mean differences between the test scores of experimental and control groups on endurance

TABLE 2
MEAN DIFFERENCES BETWEEN THE POST-TEST SCORES OF
EXPERIMENTAL AND CONTROL GROUP
ON ENDURANCE

Groups	N	Mean	S.D.	M.D.	σ DM	t-ratio
Experimental	15	81.46	9.11	7.90	3.12	2.53*
Control	15	73.56	7.99			

Significant at .05 level, $t_{.05}(28) = 2.04$

Table 2 reveals that the mean of pre-test of Experimental and Control groups are 81.46 and 73.56 and their calculated 't' value is 2.53 which is larger than that of tabulated value 2.04 (28 df at 0.05 level of confidence). It indicates that there was significant difference between the post-test of experimental and control groups. Therefore , it is

indicated that aerobic training have an effect on endurance of experimental group. It is due to the fact that aerobic training may effect on heart and lungs function. Hence the null hypothesis is rejected. The post-test mean values of experimental and control groups on endurance have been graphically presented in Figure 2.

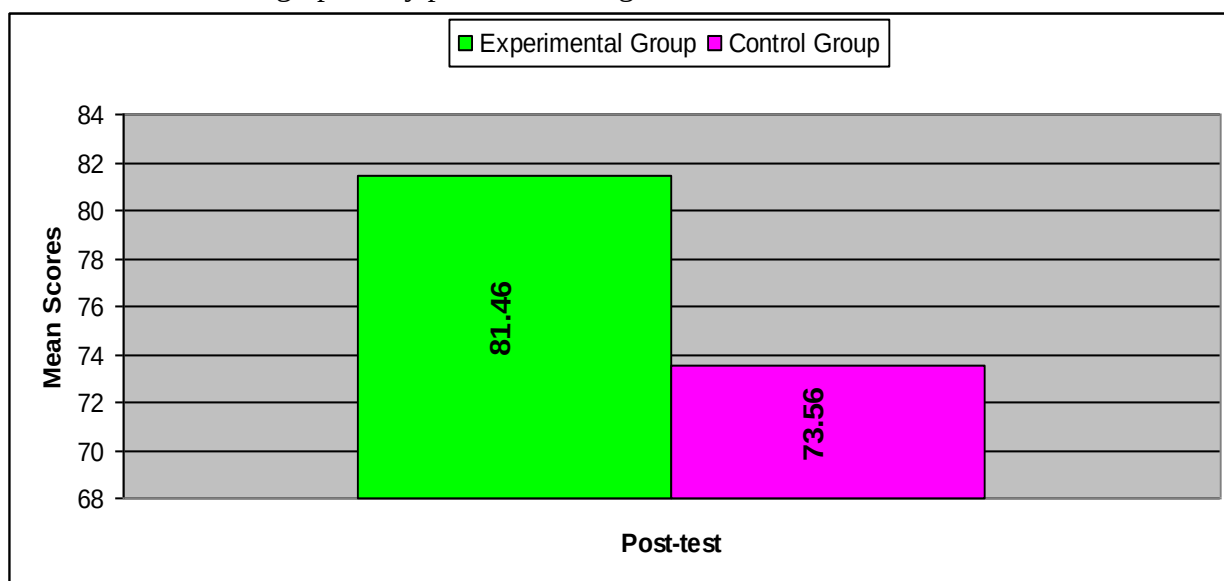


Figure 2. Graphical representation of mean differences between the test scores of experimental and control groups on endurance

DISCUSSION

It has been observed from the analysis of data that there was significant difference on endurance of school boys after the administration of training programme.

The results showed that there was good improvement after the training was given to the experimental group and good improvement was shown within and among the experimental group.

It was hypothesised that there would be significant effect of aerobic training on selected physical fitness component is accepted. The effect of training clearly indicated the significant effect on endurance.

CONCLUSION

After 6-week training the results were statistically analysed and the following conclusion was drawn:

The study revealed that aerobic training have a considerable effect on endurance of school boys after 6-weeks training programme.

RECOMMENDATIONS

The similar study may be done with greater number of subjects. The similar study can be repeated to other physical fitness components on the same subjects. The similar study may be conducted in both sex groups. It is recommended that similar study may be done with longer duration of training. The similar study may be done on different age groups. The similar study can be done by taking more or less components.

APPLICATION IN SPORTS

The result of this study would be help the coaches, physical education teachers and athletes in planning the training programme to develop the endurance of students or players. This study would be help to the students of physical education to understand the importance of endurance. This study would be the interest in physical education teachers and coaches to improve the endurance level of students/players.

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COMPARISION OF PHYSICAL FITNESS AND PHYSIOLOGICAL

COMPARISON OF PHYSICAL FITNESS AND PHYSIOLOGICAL VARIABLES BETWEEN VOLLEYBALL AND BASKETBALL PLAYERS

Mohd. Aakib Wani*

ABSTRACT

The aim of the study, was to compare the physical fitness variables and physiological variables between volleyball and basketball players. To achieve the purpose of this study, eighty male players, i.e. forty basketball players and forty volleyball players, were selected as subjects from various departments of Jammu & Kashmir University, and their age ranged from 19 to 25 years. The Speed, Agility, Muscular endurance, Resting Pulse Rate and. Breath Holding Time fitness variables were selected for this study. To ensure reliability of the data, test and retest method was adopted. Ten subjects were selected randomly to establish the reliability of the data. The mean, standard deviation and 't' ratio on speed, agility, muscular endurance, resting pulse rate, and Breath Holding Time between volleyball and basketball players were analyzed. Analysis of data revealed that significant difference existed between volleyball and basketball players on speed. Whereas basketball players were better in speed than volleyball players when compared with the mean values. There was also significant difference between volleyball and basketball players on agility. Whereas basketball players were better in agility than volleyball players when compared with the mean values. But significant difference was not found between volleyball and basketball players on muscular endurance., resting pulse rate. and breath holding time.

Keywords: Pulse rate, endurance, breath hold, agility, speed, fitness

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INTRODUCTION

‘Sports’ is a popular spectacle and a mass social movement of contemporary times. In the process of historical development sports has occupied a prominent place both in the moral culture of a society. Its social significance continues to soar. In the modern days ‘sports for all’ become a very popular slogan. Participation in sports will yield optimum physical fitness and positive health for all. In the hurry scenario of modern life people need more exercise to keep their body and mind fit to execute the day-to-day activities effectively.

Physical education experts and leaders in India feel that measures should be taken to develop a positive attitude among people towards sports to achieve international standards. It is a myth that foreign coaches would be able to perform miracle in our sports concern. It is stated that, better performance can be attained only through the introduction of scientific methods and techniques through systematically adopted training.

Physical fitness has now become the concern of many nations and has become a universal human movement. It has promoted considerable projects, innovations in scientific program, features for individual and mass participation, motivational and promotional techniques and organizational pattern. The need for administrative physical fitness program, in addition to technical training, in order to raise the level of performance among sports men and especially among the athletics are being increasingly felt in our country.

Physical fitness is one aspect of total fitness. The term has been defined in different ways. Physical fitness is a prime requisite in order to get the optimum in life and to live most and serve best in this modern world. A sound body and a sound mind are men’s most precious possessions (Hooks, 1974).

Nowadays great interest and importance to all concerned with physical education athletics is the speed with which an individual can react in a game situation. For example in swimming race or 100 meter start a difference in reaction to the pistol shoot can result in several fact gained or lost. On such slim margin hang the fruit victory in closely fought contest(Devries, 1966).

“Physical fitness provides capacity for activities--- greater the physical endurance and precision, movement will be --- which are essential for our daily walk of life. The greater the physical fitness, the longer can a person keep going and more efficient will be his performance and capacity for recover from fatigue(Willgoose, 1971).

“The benefits of physical fitness are numerous. The person who is physically fit has greater amount of strength ,energy and stamina on improved sense of well being, better protection from injury, because strong well developed muscles safeguard bones , internal organs and joints and keep moving parts linear and improved cardio respiratory function”(Bucher and William, 1985).

Exercise makes all the individual motors that power the organs, tissues, and cells in the body operate at higher revolutions per minute. In all forms of training with young children, strict consideration should be given to the balance, between carefully evaluated intervals of work and adequate rest periods. There are two kinds of endurances. They are aerobic and anaerobic endurance. Aerobic endurance refers to the process of taking in , transporting and using oxygen ,while muscular endurance represents the capacity of the muscles for continuous performance of localized activity.

Physiological systems are highly adoptable of exercise. Each task has major physiological components and fitness for the task requires effective functioning of appropriate systems. Much research has been conducted in this area and specific principles of training have been established on the basis of scientific findings for developing these aspects of physical process.

Robson and others found from the analysis of the data that boys have more shoulder strength than girls in all graders. In significant difference in performance between boys and girls of grade are and two boys of grade three and four in standing broad jump. It was also revealed that boys of grade four were significantly superior to the girls of the same grade in 50 meters run and shuttle run. Stefanik and others found at the end of an increasingly active year showed, that better physical performance was exhibited. Yadav conducted a study on standardization of physical fitness norms of the school children of Haryana (13-16 years age) with the purpose of estimating the fitness level, Singeseth and Holesh measured the flexibility of football players. They conducted that a higher degree of flexibility is essential for success in football. Jennet indicated significant difference between mean factor scores for various groups of players. Adams found to correlate Average power (AP) significantly. Also based on the results of these investigations the subject grouped high PP and AP were stronger and had greater power decline (PD). Robert Singer studied 18 male college students who were divided into two equal groups on the basis pretest performance on the Harvard Step test. Both the groups trained for five weeks, four days per week for 30 minutes a day. As a result of training both the groups showed significant improvement from the pre to post step trails. Berger and Paradis showed the black students significantly on the shuttle run, 50 yards dash 600 yards run and composite fitness scores. It was concluded that black male students of similar socio economic level to white students in the 70 grade have a higher physical fitness.

In this study, the researcher made an attempt to compare the physical fitness variables and physiological variables between volleyball and basketball players. It was also hypothesized that there would be a significant difference exists between basketball and volleyball players.

METHODOLOGY

Selection of subjects:

To achieve the purpose of this study, eighty male players, i.e. forty basketball players and forty volleyball players, were selected as subjects from various departments of Jammu & Kashmir University, and their age ranged from 19 to 25 years. Before conducting the tests, all the subjects were oriented and purpose of the test procedures clearly explained to the subjects. The research scholars of the department of physical education, helped to collect the data for the investigator.

Selection of variables:

1.Speed, 2. Agility, 3. Muscular endurance, 4. Resting Pulse Rate and 5. Breath Holding Time

Selection of Tests:

The present study was undertaken to analyze the selected physical fitness variables such as speed, agility, muscular endurance and physiological fitness variables such as resting pulse rate and breath holding time of basketball and volleyball players. The investigator

analyzed various literatures, has consulted the experts in physical education and selected the items, which were standardized and most suitable for the purpose of this study. They were presented in table – I.

Table 1
TESTS SELECTION

S. No.	Variables	Test Items	Units
1.	Speed	50meters dash	Seconds
2.	Agility	Shuttle Run	Seconds
3.	Muscular Endurance	Sit-ups	No.'s/minute
4.	Resting Pulse Rate	Pulse rate per minute	Numbers
5.	Breath Holding Time	Holding the breath for maximum duration	Seconds

Reliability:

The ensure reliability of the data, test and retest method was adopted. Ten subjects were selected randomly to establish the reliability of the data. The selected criterion variables in the present investigation were tested twice under similar condition. The obtained data on speed, agility, muscular endurance and resting pulse rate and breath holding time, were subjected to intra class correlation to find out the reliability for the data and they were presented in table-2

TABLE 2
INTRA CLASS CORRELATION CO-EFFICIENT VALUES ON SELECTED CRITERION VARIABLES

S.No	Test	'R' value
1	Speed	0.89*
2	Agility	0.86*
3	Muscular endurance	0.88*
4	Resting pulse rate	0.99*
5	Breath holding time	0.92*

*Significant at .05 level of confidence. (The table value required for significance at .05 level of confidence with df 9 was 0.767)

Administration of Test and Collection of the Data

Before administering the test, the investigator explained the nature and purpose of the study to the subjects. The investigator demonstrated the entire test items in a detailed manner. Each subjects was asked to perform as many trails as they wanted to familiarize themselves with the test items. The data on speed, agility, muscular endurance, resting pulse rate and breath holding time were collected by administering 50 meters dash, shuttle run, sit-up, pulse rate per minute and holding the breath for maximum duration in seconds respectively.

1. 50 Meter Run

Purpose: The purpose of this test was to measure speed of the subjects. **Equipment:** Starting clapper, measuring tape and stop watches. **Procedures:** After a short warm-up period the subject take a position behind the starting line. The starter used the command ready and clap, the subject run across the finish line, which will be drawn at 50 meters from the starting line as fast as possible. **Scoring:** The score is the elapsed time to the nearest tenth second between the starting signal and the subject crosses finish line.

2. Shuttle Run

Purpose: To measure the performer's running and changing direction. **Equipment and Material:** Marking tape, stop watches and two block of wood (2"x 2" x 2"). **Administration of the Test:** The performer starts behind the starting line on the signal "GO", and runs to the blocks, picks of one returns to the starting line, and places block behind the line, he then repeats the process with the second block. Allow some rest between the two trails. **Scoring:** The score for each performer is the length of time taken (to the nearest tenth of a second) to complete the course. Record only the best trail.

Bent Knee Sit-Ups

Purpose: To assess the abdominal strength and muscular endurance. **Equipments and materials** Mat and stop watch were used. **Procedure:** The subjects were asked to take a spine lying position on the mat knees bent to an angle less than 90 degrees, hands were locked behind neck. A partner held the ankles jointly on the ground. To perform the sit-ups, the subject lifted his trunk, head and then lowered his trunk touching the mat with his elbows. This exercise is done continuously without pause for one minute. Numbers of correctly executed sit-ups were recorded as the performance. To facilities counting and recording the subjects were paired one subjects performed this exercise while his partner counted. After the score was recorded the subjects inter changed their position, i.e., the partner become the performer and vice versa. **Scoring:** Recording the number of correctly executed sit-ups performed in one minute.

Pulse Rate

Purpose: The purpose of the test was to find out the pulse rate at rest of the individuals. **Equipments:** stop watch, pencil and score sheet was used to assess the pulse rate at rest. **Procedure:** he pulse rate of the subject was recorded in sting position. Before taking the normal pulse rate the subject was asked to relax in a sting position for 30 minutes. The pulse rate was taken at the radial artery at the rest in such a manner that palptation was clearly felt by the fingertips. The measurement of palptation was counted for one minute. **oring:** he pulse rate was recorded for one minute from each subject.

Breath Holding Time

Purpose: The objective was to measure the ability of the subject to hold the breath for longer time. **Equipments :** A stop watch with calibration of 1/10 seconds, score sheet and a pencil were used to administer the test. **Procedure:** The subject stood at ease and inhaled deeply after which he held his breath for a length of time possible to him. The index finger of the respondent served as indicator for the investigator to know the stand and end of the recording time. The thumb and centre finger were used to hold the nose to avoid letting the air through the nostrils. The subjects were requested not to let the air out by opening the mouth while

recording the breath holding time. **Scoring:** The time of holding the breath till the subject let the air out was closed by using the stop to the nearest 1/10 of a second as breath holding time.

Statistical Analysis

The static group design was used as experimental design in the study. The collected data on selected criterion variables were statistically analyzed by using independent 't' ratio to find out the significant difference between volleyball and basketball players.

RESULTS

The mean, standard deviation and 't' ratio on speed, agility, muscular endurance, resting pulse rate, and Breath Holding Time between volleyball and basketball players were analyzed and presented in Table 3 to 7.

Table 3
MEAN STANDARD DEVIATION AND 't' RATIO ON SPEED OF VOLLEYBALL AND BASKETBALL PLAYERS

Group	Mean	S.D.	't' ratio	Level of Significance
Volleyball Players	8.096	0.085	4.778*	0.05
Basketball Players	7.967	0.151		

* Significant at 0.05 level

t.05 (78) = 1.99.

Table 3 indicates that the mean, standard deviation and 't' ratio of speed of volleyball and basketball players. The mean and standard deviation values were 8.096 ± 0.085 for volleyball players and 7.967 ± 0.151 for basketball players respectively and the 't' ratio for these values was 4.778. The obtained 't' ratio for speed was found significant at 0.05 level of confidence and this value was higher than the required table value of 1.99 for degrees of freedom 78. The result of the study shown that the basketball players, have better speed than the volleyball players.

Table 4
MEAN STANDARD DEVIATION AND 't' RATIO ON AGILITY OF VOLLEYBALL AND BASKETBALL PLAYERS

Group	Mean	Standard Deviation	't' ratio	Level of Significance
Volleyball Players	12.722	0.309	3.09*	0.05
Basketball Players	12.499	0.336		

*Significant at 0.05 level, t.05 (78) = 1.99

Table 4 indicates the mean, standard deviation and 't' ratio of agility of volleyball and basketball players. The means and standard deviation values were 12.722 ± 0.309 for volleyball players and 12.499 ± 0.336 for basketball players respectively. The 't' ratio for these values was 3.09. The obtained 't' ratio for agility was found significant at 0.05 level of confidence and this value was higher than the required table value of 1.99 for degrees of freedom 78. The result of the study shown that the basketball players, have better agility than the volleyball players when compared with the mean values.

Table 5
MEAN STANDARD DEVIATION AND 't' RATIO OF MUSCULAR
ENDURANCE ON VOLLEYBALL AND BASKETBALL
PLAYERS

Group	Mean	Standard Deviation	't' ratio	Level of significance
Volleyball Players	55.525	3.167	0.692	0.05
Basketball Players	55.975	2.688		

Insignificant at 0.05 level, $t_{0.05}(78) = 1.99$.

Table 5 indicates the mean, standard deviation and 't' ratio of muscular endurance of volleyball and basketball players. The means and standard deviation values were 55.525 ± 3.167 for volleyball players and 55.975 ± 2.688 for basketball players respectively. The 't' ratio for these values was 0.692. The obtained 't' ratio for muscular endurance was found no significant difference at 0.05 level of confidence and this value was lesser than the required table value of 1.99 for degrees of freedom 78. The result of the study shown that there was no significant difference occurred between basketball players and volleyball players on muscular endurance.

Table 6
MEAN STANDARD DEVIATION AND 't' RATIO ON RESTING PULSE RATE
OF VOLLEYBALL AND BASKETBALL PLAYERS

Group	Mean	Standard Deviation	't' ratio	Level of significance
Volleyball Players	64.85	2.134	0.404	0.05
Basketball Players	65.025	1.739		

Insignificant at 0.05 level, $t_{0.05}(78) = 1.99$.

Table 6 indicates the mean, standard deviation and 't' ratio of resting pulse rate of volleyball and basketball players. The means and standard deviation values were 64.85 ± 2.134 for volleyball players and 65.025 ± 1.739 for basketball players respectively. The 't' ratio for these values was 0.404. The obtained 't' ratio for resting pulse rate was found no significant difference at 0.05 level of confidence and this value was lesser than the required table value of 1.99 for degrees of freedom 78. The result of the study shown that there was no significant difference occurred between basketball players and volleyball players on Resting Pulse Rate.

Table 7
MEAN STANDARD DEVIATION AND 't' RATIO ON BREATH HOLDING
TIME OF VOLLEYBALL AND BASKETBALL PLAYERS

Group	Mean	Standard Deviation	't' ratio	Level of significance
Volleyball Players	54.65	2.190	0.312	0.05
Basketball Players	54.5	2.356		

Insignificant at 0.05 level, $t_{0.05}(78) = 1.99$.

Table 7 indicates the mean, standard deviation and 't' ratio of breath holding time of volleyball and basketball players. The means and standard deviation values were 54.65 ± 2.190 for volleyball players and 54.5 ± 2.356 for basketball players respectively. The 't' ratio for these values was 0.312. The obtained 't' ratio for breath holding time was found no significant difference at 0.05 level of confidence and these value was lesser than the required table value of 1.99 for degrees of freedom 78. The result of the study was shown that there was no significant difference occurred between basketball players and volleyball players on breath holding time.

DISCUSSION

In this study the investigator found out there was a significant difference between volleyball and basketball players in speed and agility, whereas basketball players were better in speed and agility than the volleyball players when compared with the mean values. And also the results of the present study showed that there was no significant difference between volleyball and basketball players on muscular endurance, resting pulse rate and breath holding time.

This may be due to the fact that, basically volleyball and basketball players having better physical fitness and physiological fitness and both game players such as volleyball and basketball players need the same qualities for better performance.

The investigator hypothesized in earlier that there may be a significant difference between volleyball and basketball players on selected criterion variables. The results of this study indicated that there was a significant difference between volleyball and basketball players on speed and agility. There was no significant difference between volleyball and basketball players on muscular endurance, resting pulse rate and breath holding time. Hence, the investigator hypothesis was partially accepted.

CONCLUSIONS

1. There was a significant difference between volleyball and basketball players on speed. Whereas basketball players were better in speed than volleyball players when compared with the mean values.
2. There was a significant difference between volleyball and basketball players on agility. Whereas basketball players were better in agility than volleyball players when compared with the mean values.
3. There was no significant difference between volleyball and basketball players on muscular endurance.
4. There was no significant difference between volleyball and basketball players on resting pulse rate.
5. There was no significant difference between volleyball and basketball players on breath holding time.

APPLICATION IN SPORTS

This study provides an opportunity to find out the speed, agility, muscular endurance, resting pulse rate and breath holding time of the basketball and volleyball players. This research may be helpful to suggest ways and means for improving physiological through special type of physical exercise. This study will help the physical education teachers and coaches in selecting the athletes for the purpose of competition.

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COMPARISION OF ARM STRENGTH AND CARDIO-RESPIRATORY ENDURANCE OF HANDBALL AND BASKETBALL PLAYERS

Omer Abdullah Dar*

ABSTRACT

The purpose of the study was to compare the arm strength, and cardio respiratory endurance between basketball and handball players. Forty male national level players from team games like basketball and handball of Jammu and Kashmir were selected as the sample for the purpose of study on random basis and their age group was ranged between 18 to 27 years. The basketball and handball players were randomly selected from these who were talking part in the national level matches for the session 2012-2014. In order to find out the significance of difference between Basketball and Handball Players in their arm strength and cardio-respiratory endurance, means, SDs and t-ratio were computed. The results of the present investigation indicated that there is no any significant difference between the basketball and handball players of national level in Arm strength. In cardio respiratory endurance, there was a significant difference between the basketball and handball players of national level. Author finally concluded that the Handball players were better in cardio respiratory endurance than basketball players.

Keywords: Arm, Strength, Cardiovascular, Fitness, National level, Handball, Basketball, Players

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INTRODUCTION

Modern concept of physical education has given rise to a global perspective and has become one of the most viable factors in cross culture integration .Sports has its own language and can provide a medium for international understanding and goodwill among nations .It has assumed great importance not only for self actualization at the national level but for social maturation and survival at the global level.

In 21st century ,physical education is no more a physical training only ,or simply body building ,or merely indulging in play activities or mass drills or pertaining to physical fitness alone .It has emerged as multi-dimensional discipline.

Sports have assumed a world –wide importance .In a shrinking world which is coming nearer and nearer day by day it is playing an important role in bringing people together at national, regional and international level. It does not distinguish between religions, cast, creed or race's It embraces every sport and region of the world.

The decision to carry out a physical fitness program cannot be taken lightly. It requires a lifelong commitment of time and efforts. Exercise must become one of those things that you do without question, like bathing and brushing your teeth. Unless you are convinced of the benefits of fitness and the risks of unfitness (Singh, 2008), you will not succeed. It has been realized that fitness adds not only years to once life, but life once years.

Physical fitness is the capacity to carry out reasonable well various forms of physical activities without being unduly tired and includes qualities important to the individual's health and well being.

Physical fitness means different things to different people. It must be viewed as an individual matter and as such has little meaning unless considered in relation to the specific needs and interests of each individual(Uppal, 1992).

The most important muscles for basketball are those you can see, such as the quadriceps, calves and deltoids, as well as those you can't see as easily, such as the heart. The explosive and fast-paced nature of basketball requires muscles that provide great jumping ability and a powerful serve and spike and are flexible enough to respond to the diving, digging, blocking and running the sport requires.

Some of the most important muscles a basketball player are not those that get the biggest workouts. Instead they are the complementary muscles that help support those that do most of the work. Most of a Basketball players effort comes from muscles in the front of his body, such as arms and quadriceps, so working some of the posterior muscles, such as the hamstrings and the back of the shoulders, could help prevent overuse injuries. These can occur when one set of muscles is significantly stronger and bigger than its counterpart elsewhere in the body.

Basketball requires strength and flexibility in your shoulders to deliver powerful serves and hits of all kinds. Strong triceps and forearms are also valuable. Some helpful exercises for those muscle groups include the military press, upright rows, dumbbell lifts up from your side and triceps curls. Forearm curls focusing on the tops and bottoms of the forearms will also help get your arms in basketball shape.

The heart muscle also needs to be working at maximum efficiency for your best basketball playing. And the best way to do that is to exercise your heart at about 60 to 80 percent of your maximum heart rate about three days a week. That can include treadmill

running or biking or simply exercising by playing sports such as basketball and tennis. Those activities will also benefit your other big muscles (<http://www.livestrong.com>.).

Handball is relatively uncomplicated team game with twelve players to a side where six court players and a Goalie of one team oppose the same number from be substituted in form the side lines at centre at any time.

Handball is a game of brains over brawn, a truly thinking game .Because of the speed of the game and the way the ball caroms off of the walls, floor and ceiling quick mental reactions are a must .To improve your game you must think in the court as well as play in it .Every shot should be carefully studied, every mistake carefully analyzed. Hand ball requires and teaches quick mental reactions .This is good training for the immediate decisions needed in every day of life situations .It would be very difficult to accurately estimate the number of people currently playing handball in the United States(Jain, 2003).

Vijay Prakesh (2011) concluded that there was significant difference among Basketball, basketball and hockey players in vital capacity. There was no significant difference in resting pulse rate, systolic blood pressure, and diastolic blood pressure among basketball, basketball and hockey players. SuneetaDavi (2009) revealed that handball players were taller and heavier than basketball and athletes. Athletes have less deposition of fat than respective game players viz. Handball and basketball players. Satyanarayana (2002) found that sand training on experimental group improved jump abilities in standing vertical jump, standing broad jump and approach and jump reach respectively, but a significant improvement is not observed in speed and co-ordination dominating abilities in co-coordinating test, court speed test and 30 meter sprint respectively. A non significant improvement in all of the test performances was also seen in control group. Chittibabu (2004)demonstrated that short period of high intensity intermittent training improved neutrophils and lymphocytes percentage. Khalil Khayambashi (1986) concluded that males as the number of steps in the approach increased the height of the jump also increased. For females the number of steps in the approach had no effect on the height of the jump. For males and females and for all approaches the height of the jump that followed the pre-jump take-off was greater than the height of the jump that followed the step close take-off. The main players jumped higher than the female players. A.K.Dey ,P.K.Debnath and J.Nagehaudhuri (1979) suggested that the participation in both the games players efficiency had similar physical growth with similar efficiency level as per the test done. Hooks (1959) concluded that the left shoulder flexion is the best single measure found to predict baseball ability right shoulder flexion ranks second. Bhola (1984) found that the foot length, quality and dynamic power, as well as ankle flexibility had significant relationship with jumping ability using three strides rhythm whereas absolute and relative leg length did not correlate significantly. Sheppard et.al. (2008) demonstrated that in an elite population of basketball players, stretch-shortening cycle performance and the ability to tolerate high stretch loads, as in the depth jump, is critical to performance in the jumps associated with basketball performance.

The purpose of the study was to compare the arm strength, and cardio respiratory endurance between basketball and handball players.

METHODOLOGY

Sample:

Forty male national level players from team games like basketball and handball of Jammu and Kashmir were selected as the sample for the purpose of study on random basis and their age group was ranged between 18 to 27 years.

Design of the Study:

Design of the study was random group design, as the basketball and handball players were randomly selected from these who were taking part in the national level matches for the session 2012-2014 and comparison of arm strength, and cardio respiratory endurance between basketball and handball players was done.

Instrumentation:

1. Pull – Ups

Purpose: To Measure The Power Of Arm. Equipments: A Metal Or Wooden Bar. Test Administration: The palms- forward (over hand) grip was assumed, and the body was lowered to a fully stationary hang (arms and body full extended) the body was raised until the chin was placed over the bar. The body was lowered to a full hang, as in the starting, and the act was repeated as often as possible. Body swinging, knee raising or leg kicking were not permitted. Scoring: The number completed properly to the nearest whole number was recorded, one fair trial was allowed (Bosco and Gustafson, 1983).

2. YMCA 3 Minute Step Test

Purpose: To measure the cardio respiratory endurance of the subject. Equipment: 12 Inch High Bench, Stop-Watch, Metronome, Chairs. Test Administration: The subject listens to the metronome to become familiar with the cadence and begins when ready and the time starts. The subject steps “Up, Up, Down, Down” to the 96 beat per minute cadence, which allow 24 steps per minute. This continues for 3 minutes. After the final step down, the subject sits down and the heart rate was counted for 1 minute. Scoring: The 1 minute recovery heart rate was the score for the test. (James et.al., 1995)

RESULTS AND DISCUSSION

To find out the significance of difference between Basketball and Handball Players in their arm strength and cardiovascular endurance, means, SDs and t-ratio were computed and data pertaining to this have been presented in Table 1-3 and depicted figure 1-3.

TABLE 1
COMPARISON BETWEEN THE MEANS OF BASKETBALL AND HANDBALL PLAYERS IN PULL UPS

Test	Game	Mean	SD	MD	S.E	‘t’ ratio
Pull ups	Basketball players	7.8	1.91	0.95	0.69	1.38
	Handball Players	8.75	2.41			

Insignificant at 0.05 level

t.05 (38) =2.03

The value of basketball and handball players in pull ups is 7.8 and 8.75 respectively. Standard Deviation value of basketball and handball players is 1.91 and 2.41 respectively. Value of t’ ratio is 1.38; this value is not significant at 0.05 level. To be significant at 0.05 level, the value of t’ ratio should be greater or equal to 2.03.

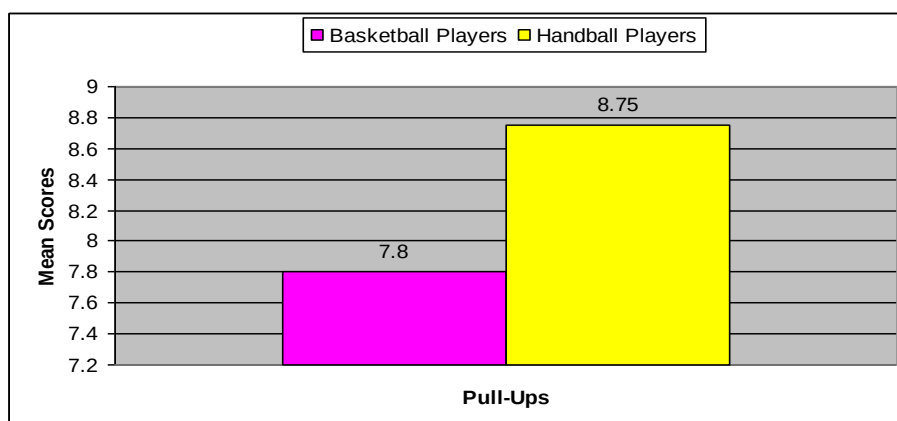


Figure 1.

TABLE 2
COMPARISON BETWEEN THE MEAN OF BASKETBALL AND HANDBALL PLAYERS IN STANDING BROAD JUMP

Test	Game	Mean	SD	MD	S.E	't' ratio
Standing broad jump	Basketball Players	2.12	0.14	0.05	0.056	0.89
	Handball Players	2.17	0.21			

Insignificant at .05 level

$t_{.05 (38)} = 2.03$

The mean value of basketball and handball players is 2.12 and 2.17 respectively. Standard Deviation value of basketball and handball players is 0.14 and 0.21 respectively. Value of 't' ratio is 0.89; this value is not significant at 0.05 level. To be significant at 0.05 level, the value of 't' ratio should be greater or equal to 2.03

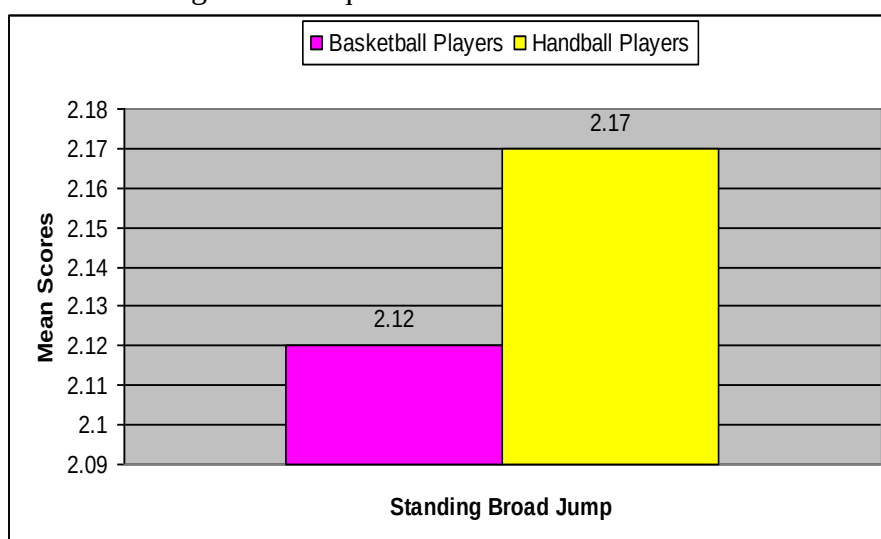


Figure 2.

TABLE 3
COMPARISON BETWEEN THE MEANS OF BASKETBALL AND HANDBALL
PLAYERS IN YMCA 3-MINUTE STEP TEST

Test		Mean	SD	MD	S.E	't' ratio
YMCA 3-minute Step test	Basketball Players	103.00	8.42	8.65	2.73	3.17*
	Handball Players	94.35	8.82			

*Significant at .05 level

t.05 (38) =2.03

The mean value of basketball and handball players in YMCA3-minute step test is 103 and 94.35 respectively. Standard Deviation value of basketball and handball players is 8.42 and 8.82 respectively. Value of 't' ratio is 3.17, this value is significant at .05 level

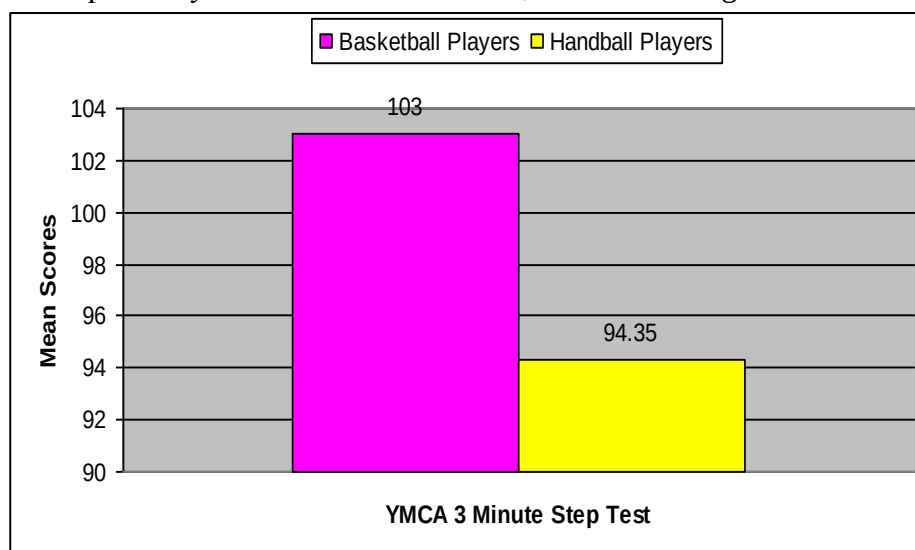


Figure 3

DISCUSSION

The purpose of the study was to compare Arm strength, and cardio respiratory endurance of national level players of basketball and hand ball players of Jammu and Kashmir state. From the analysis of data it was evident that there is no significant difference found in arm strength of basketball and hand ball players. It was also found from the data that there is no significant difference found in basketball and handball players. But from the analysis, there is significant difference found in cardio respiratory endurance of basketball players. It was also hypothesized that "handball players have more arm strength and cardio respiratory endurance than basketball players". After the analysis it was revealed that there was no significant difference between the arm strength of basketball players and handball players. There was significant difference found in cardio respiratory endurance of basketball and handball players. Handball players were better in cardio respiratory endurance than basketball players.

CONCLUSIONS

1. In Arm strength there is no any significant difference between the basketball and handball players of national level.
2. In cardio respiratory endurance there was a significant difference between the basketball and handball players of national level.
3. Handball players were better in cardio respiratory endurance than basketball players.

RECOMMENDATIONS

On the basis of findings of the study it is recommended that similar study may be conducted on female basketball and basketball players. Similar study may be conducted by taking other variables than those selected for the purpose of the study. Similar study may also be conducted by taking subjects of different age groups than those selected for the purpose of the study. It is recommended that the findings of study should be given due consideration while selecting players for specific position in the game.

APPLICATION IN SPORTS

Result of the study will help the coaches in planning the coaching program to develop arm strength explosive and cardio respiratory endurance. It will also motivate the basketball players and handball players to develop arm strength, explosive and cardio respiratory endurance which is a major factor, in their performance in respective field. The study will also help the profession with its comparative findings of the requirement of strength and cardio respiratory endurance of handball and basketball players. The finding of the study will provide scope for further

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COMPARATIVE STUDY OF AEROBIC CAPACITY AND ANAEROBIC CAPACITY OF SELECTED TEAM GAME PLAYERS

Dr. Gulbahar khan*

ABSTRACT

The sportsman is able to achieve a high level of performance by concentrating on the physiological efficiencies. The physiological demand is entirely different from player to player and game to game. A good base of aerobic and anaerobic parameters are the foundation of elite sport performance of athletes.. The purpose of the study was to compare aerobic capacity and anaerobic capacity of selected team game players. for this purpose, Ninety female players were selected randomly for this study from volleyball (N = 30), football (N = 30) and basketball (N = 30) games participated in inter-university tournaments. The aerobic Capacity and anaerobic Capacity were measured through 12 minute run/ walk test and 50 meters dash. The distance in 12 minute run/ walk test was recorded in meters and the 50 meters dash time recorded in seconds. To compare the aerobic capacity and anaerobic capacity of inter university female volleyball, football and basketball players, Analysis of Variance (ANOVA) was computed. The results of study revealed that there was no significant difference among female players of Volleyball, Football and Basketball in their aerobic and anaerobic capacity.

Keywords: Aerobic Capacity, Anaerobic Capacity, Team Games, Female players

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INTRODUCTION

Aerobic conditioning supplies the energy for low intensity exercise over a long duration and allows a player to recover more completely and quickly. It is ability of the individual to work under the condition of fatigue with desired movement. (Singh, 1995.)

Anaerobic literally means without air. Anaerobic fitness determines the level at which one can work at high intensity. This means short bursts of activity with the maximum or sub-maximum intensity, where a player will often be out of breath. Players are working at a level where their body cannot provide enough oxygen.

Helgerud et.al., (2001) concluded that enhanced aerobic endurance in soccer players improved soccer performance by increasing the distance covered, enhancing work intensity, and increasing the number of sprints and involvements with the ball during a match.

Meckel et.al.(2009) expressed that the aerobic system plays a significant role in the maintenance of intensity level during a soccer game, which is characterized by short bursts of activities. Anaerobic performance of repeated brief efforts imposes different physiological stress than a single prolonged activity and, thus, may reflect different physiological capabilities Hoff (2002) expressed that the Soccer specific exercise using ball dribbling or small group play may be performed as aerobic interval training. Heart rate monitoring during soccer specific exercise is a valid indicator of actual exercise intensity. McMillan et.al., (2005) indicated that the performing high intensity 4 min intervals dribbling a soccer ball around a specially designed track together with regular soccer training is effective for improving the VO₂max of soccer players, with no negative interference effects on strength, jumping ability, and sprinting performance

Popadic et.al., (2009) expressed that the influence of anaerobic capacity in different sports and the referral values of these variables for the elite male athletes. Explosive power presented a new dimension of anaerobic power, i.e., how fast maximal energy for power development can be obtained, and its values are high in all sports activities that demand explosiveness and fast maximal energy production

Banne and Sharma (2015) concluded in their investigation that the twelve weeks systematic training programme consisting of plyometric exercises had contribute effect on anaerobic capacity of football players. But the plyometric exercises did not have any significant effect for improving the aerobic capacity of football players.

Talent identification and development has given new dimension to the selection and nurturing of sports talents which concludes that participation is only enjoyed by the talented and gifted youngsters. So, the process of selection of young budding athletes into different sports and games should be according to their age, physique, ability and interest should be done after thorough scientific investigations made by the sports science experts.. The purpose of the present study was to compare aerobic capacity and anaerobic capacity of selected team game players.

METHODOLOGY

Selection of Subjects:

Ninety female players were selected randomly for this study from the inter-university tournaments from the three different team games i.e. Volleyball (N = 30), Football (N = 30) and Basketball (N = 30) for this study.

Selection of Variables:

The following variables were selected for the purpose of the study:-

1. Aerobic Capacity,
2. Anaerobic Capacity.

Criterion Measure:

To determine the aerobic capacity, 12 minute run/ walk test was used and the distance recorded in meters. To determine the anaerobic capacity, 50 meters dash was used and the time recorded in seconds.

Collection of Data:

The data pertaining to the physiological characteristics were collected from the subjects belonging to different games, who had represented the respective university at inter university tournaments.

RESULTS AND DISCUSSION

To compare the aerobic capacity and anaerobic capacity of inter-university level female volleyball, football and basketball players, Analysis of Variance (ANOVA) was computed and data pertaining to this have been presented in Table 1 and 2

TABLE 1
ANALYSIS OF VARIANCE OF VOLLEYBALL, FOOTBALL AND
BASKETBALL PLAYERS IN RELATION TO
AEROBIC CAPACITY

Sources of Variance	d.f.	SS	MSS	F-value
Treatment	2	270.781	135.3905	1.30
Error	87	9056.886	104.1021	

Insignificant at .05 level

Table 1 indicates that there was no significant difference among female volleyball, football and basketball Players of inter-university level in relation to aerobic capacity, as the obtained t-value of 1.30 was lower than the required value of $F_{.05}(2, 87) = 3.011$.

TABLE 2
ANALYSIS OF VARIANCE OF VOLLEYBALL, FOOTBALL AND
BASKETBALL PLAYERS IN RELATION TO
ANAEROBIC CAPACITY

Sources of Variance	d.f.	SS	MSS	F-value
Treatment	2	108.213	54.1065	1.081
Error	87	4351.452	50.0166	

Insignificant at .05 level

Table 2 reveals that there was no significant difference among the female volleyball, football and basketball Players in relation to Anaerobic Capacity, as the obtained t-value of 1.081 was lower than the required value of $F_{.05}(2, 87) = 3.011$.

DISCUSSION

To compare the three different team games female player of inter-university level in relation to anaerobic capacity and aerobic capacity, one way ANOVA resulted insignificant difference among female volleyball, football and basketball players in their anaerobic capacity as well as in their aerobic capacity. Mostly, these three different team games were of aerobic in nature and for few second, they were anaerobic in nature. This similarity in physiological capacities may be due the similarity in nature of games and training for physical, technical and tactical aspect of the players.

CONCLUSION

It was concluded from the present physiological investigation that the significant difference was not observed among the inter-university level female volleyball, football and basketball Players in their aerobic and Anaerobic Capacity.

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