

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

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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_{2Max}). Note, however, that there are wide individual variations in the degree of improvement in both sub-maximal endurance and VO_{2max} , with any given training programme. Whereas one individual may experience a 40% to 50% improvement in VO_{2max} 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 e, 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.) = 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 significance 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.	6 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.

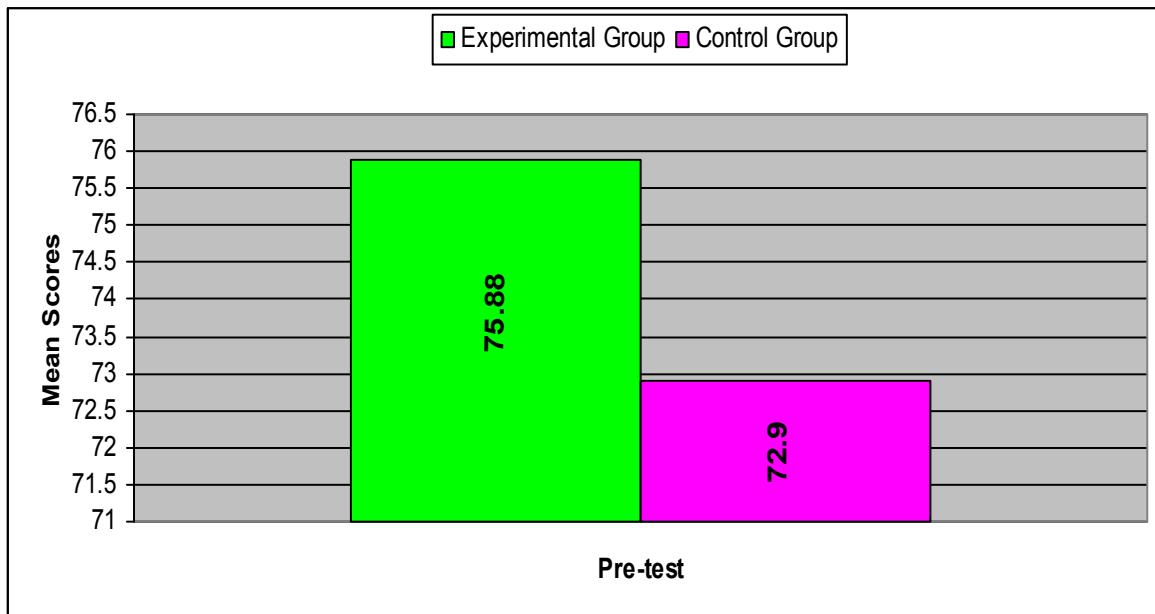


Figure 1. Graphical representation of mean differences between the test scores of experimental and control groups on endurance

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.

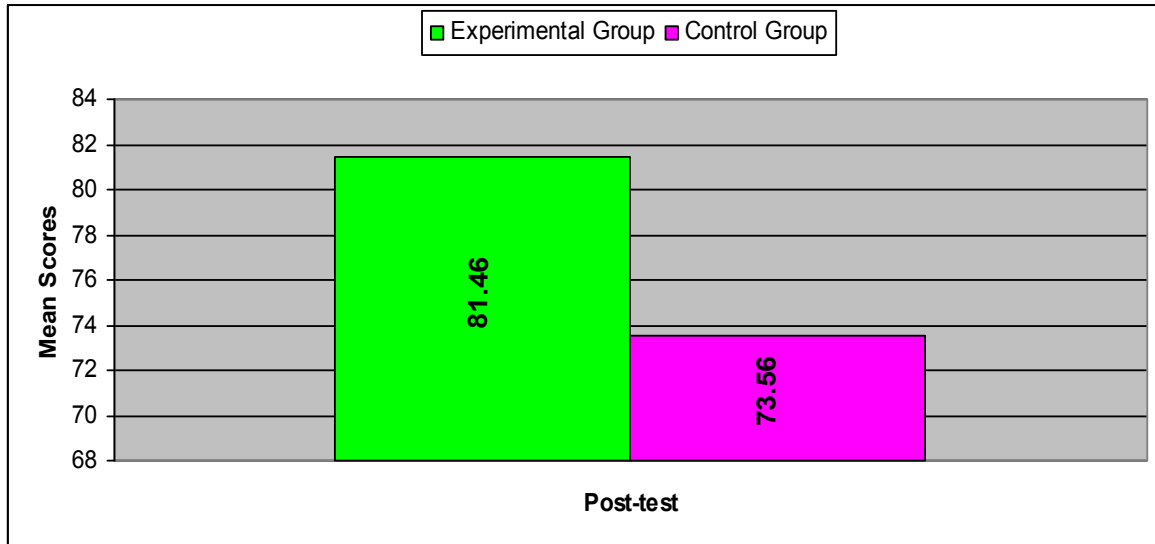


Figure 2. Graphical representation of mean differences between the test scores of experimental and control groups on endurance

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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