

# EFFECT OF CIRCUIT TRAINING ON SELECTED PHYSICAL FITNESS VARIABLES OF JUNIOR SCHOOL BOYS

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## ABSTRACT

*The purpose of the study was to find out the effect of circuit training on selected physical fitness variables of junior school boys. The investigator selected a total of thirty (N=30) male students between the age group of 12 - 15 years from Government Higher Secondary School, Vayakkara, Payyannur. 15 subjects each were assigned to the experimental groups and control group respectively. The experimental group had to undergo circuit training programme. Total duration was for 6 weeks with 3 days per week. The total duration of each workout session including warming up, training & cooling down was of seventy minutes. An experimental group was followed circuit training and control group acted as the control group and was not involved in any training. All the subjects were tested on the selected physical fitness variables such as strength, flexibility, agility, speed and endurance before and after six week of circuit training programme.*

*Endurance was tested by ACSM 3 minutes' step test, flexibility was measured by sit and reach test, agility by 9mtsX4 shuttle run and Speed by 50 Mt dash. The data pertaining to the selected physical fitness variables were analyzed by paired 't' test to determine the difference between initial and final mean for experimental and control groups. The level of significant chosen was 0.05 levels. In experimental group, significant different were seen in strength, flexibility, speed and in the case of. recovery heart rate on endurance and no change in case of agility. In the case of control group there found to be no significant changes in their selected physical fitness variables for the same period.*

**Key Words:** *Circuit Training, Physical Fitness Variables.*

## INTRODUCTION

Physical fitness is defined as the state or condition of being physically sound and healthy, especially as the result of exercise and proper nutrition. It is, thus, a state of general well-being, marked by physical health as well as mental stability. Physical fitness is not just about having a lean body; it is about having cardiovascular and overall muscular endurance, as well as a strong immunity system, and most importantly, a satisfied and happy state of mind.

## OBJECTIVES OF THE STUDY

The purpose of the study was to find out the effect of six weeks of circuit training on selected physical fitness variables of junior school boys.

## HYPOTHESIS

It was hypothesized that there will be a significant improvement on selected physical fitness variables after six weeks of circuit training.

## METHODOLOGY

The investigator selected a total of thirty (N=30) male students between the age group of 12 - 15 years from Government Higher Secondary School, Vayakkara, Payyannur. 15 subjects each were assigned to the experimental groups and control group. Prior to the administration of tests and training, a meeting was held with the subjects, who were made clear about the objectives and purpose of the study. The testing and training procedure was explained to them in detail. They were requested to co-operate and participate actively in the same.

As per the purpose of the study 30 students selected was divided into two equal groups of 15 each, i.e. experimental and control group respectively. The experimental group had undergone circuit training programme for six weeks. The frequency of the training session will be thrice a week, that is Monday, Wednesday and Friday from 08.00Am to 10.00Am. The duration of the training was 30-45 minutes excluding warm-up and cool-down. Approximately 30 seconds rest between exercise and sets and given 90 seconds between each circuit will be maintained respectively. The load and volume of the training will be increased with time and same. On the other hand, the control group did not under gone any physical training programme for the whole six weeks of experiment.

## ANALYSIS OF THE DATA

The pre and post test data pertaining to the respective physical variable were collected by employing standard test used on both the experimental and control group. The statistical analysis of data collected on the selected physical fitness variables have been presented in this chapter. The mean difference between the initial and final scores of experimental and control groups were compared by using dependent 't' test. The level of significance chosen was 0.05 level of confidence throughout the study to determine the significance different with 19 degree of freedom.

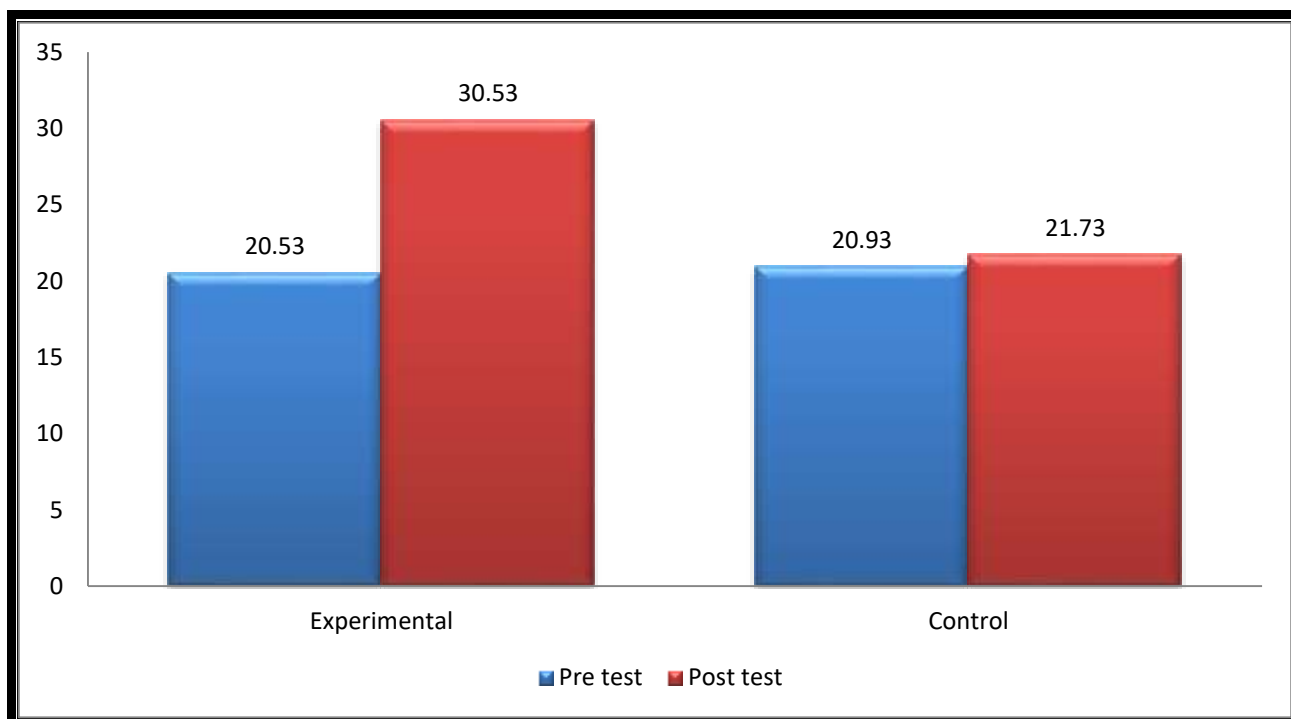
**Table 1: t-ratio of experimental and control group on Push-ups**

Control Factors	Pre test			Post test			t-ratio
	N	Mean	SD	N	Mean	SD	
Experimental	15	20.53	5.75	15	30.53	7.48	8.15*
Control	15	20.93	6.63	15	21.73	5.82	0.34

\* Significant at the 0.05 level of confidence

The above table 1 indicates that, there was a significant difference between the pre and post-test performance on push-ups, since the calculated ‘t’ value of 8.15 is higher than tabulated ‘t’ value of 2.14 at 0.05 level of significance with 14 degrees of freedom. In the case of control group there was no significant difference in push-ups was found.

**Figure 1: Illustration of pre and post mean score of Push-ups**

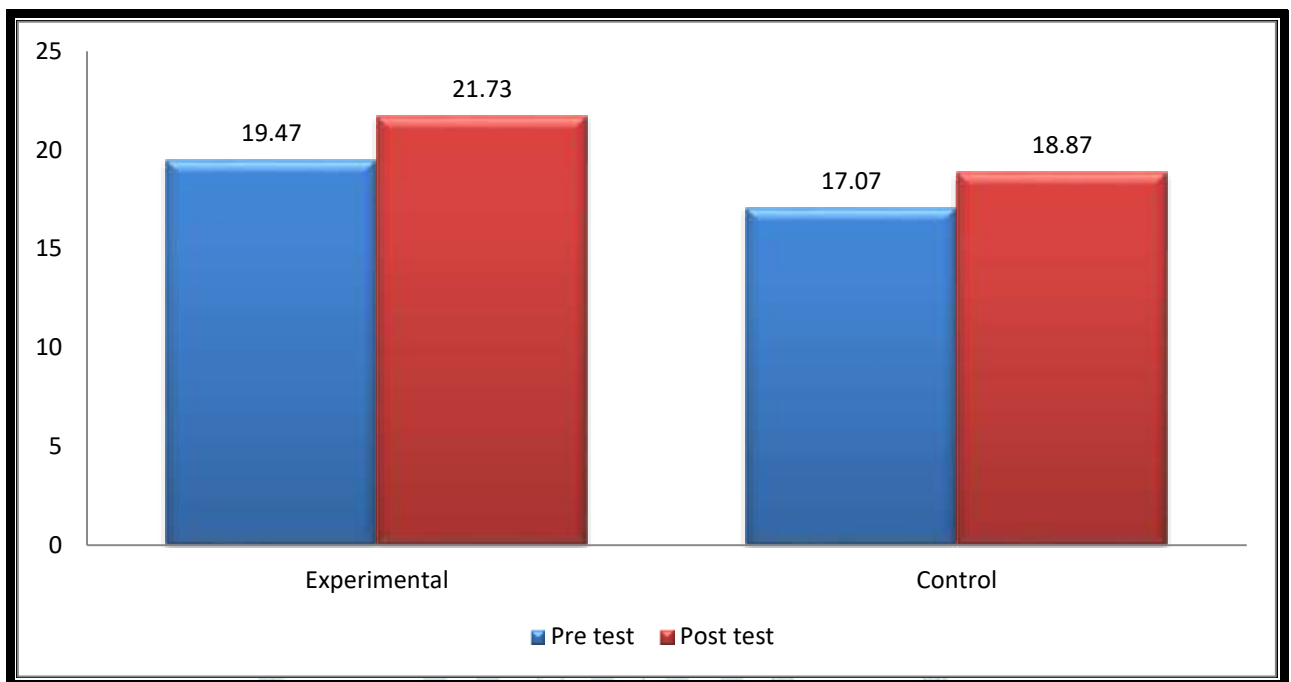


**Table 2: t-ratio of experimental and control group on Sit and Reach Test**

Control Factors	Pre test			Post test			t-ratio
	N	Mean	SD	N	Mean	SD	
Experimental	15	19.47	6.91	15	21.73	6.32	4.69*
Control	15	17.07	6.82	15	18.87	6.92	0.68

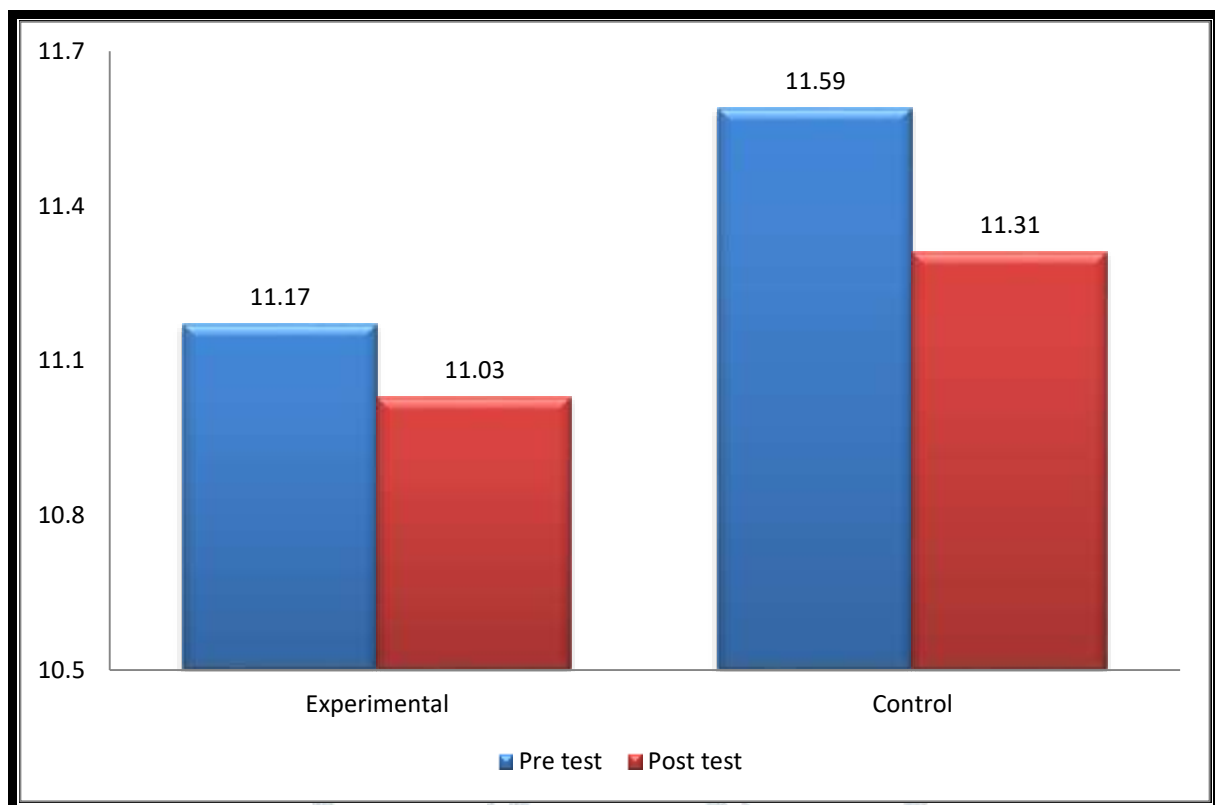
\* Significant at the 0.05 level of confidence

The above table 2 indicates that, there was a significant difference between the pre and post-test performance on flexibility, since the calculated ‘t’ value of 4.69 is higher than tabulated ‘t’ value of 2.14 at 0.05 level of significance with 14 degrees of freedom. In the case of control group there was no significant changes in flexibility was founds.

**Figure 2: Illustration of pre and post-test mean score of Sit and Reach Test****Table 3: t-ratio of experimental and control group of Shuttle Run**

Control Factors	Pre test			Post test			t-ratio
	N	Mean	SD	N	Mean	SD	
Experimental	15	11.17	0.64	15	11.03	0.59	1.55
Control	15	11.59	0.51	15	11.31	0.43	1.62

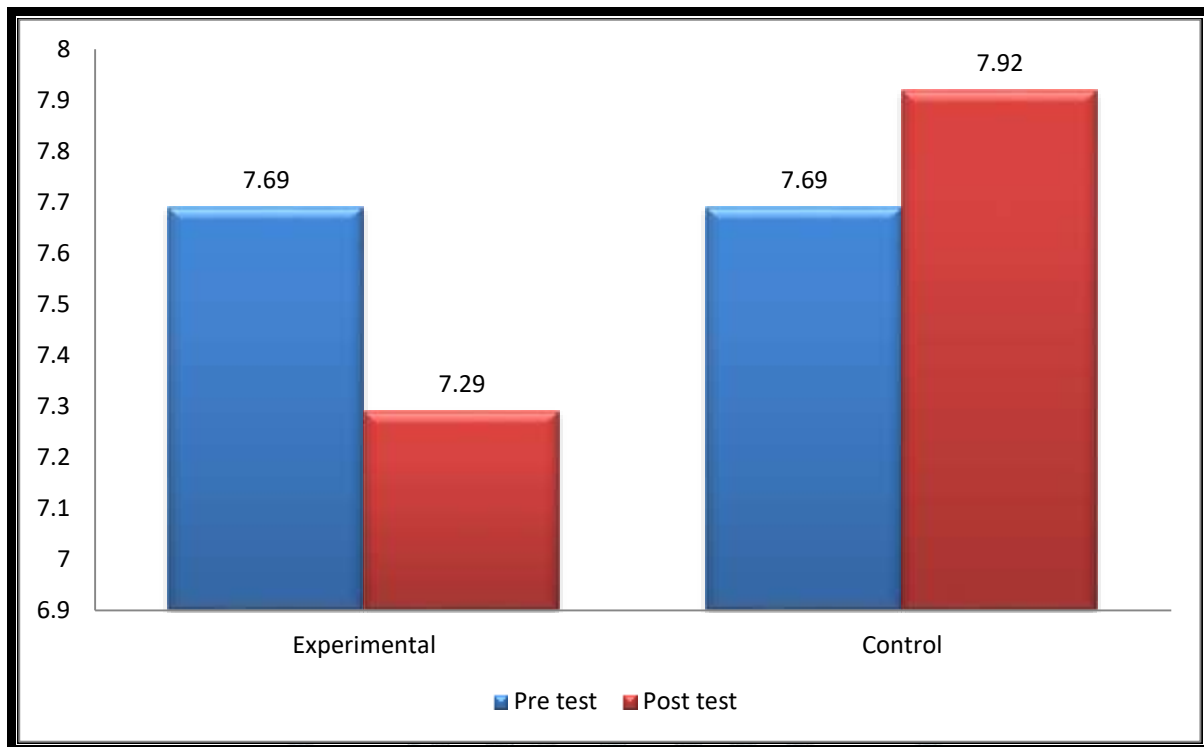
The table 3 indicates that in the case of the experimental group there was no significant changes were noticed in shuttle run following experiment. Since the 't' value obtained for experimental group was 1.55 which was lesser than the required table value (2.14), which shows not significant changes in shuttle run. In the case of control group there was also no significant changes in shuttle run.

**Figure 3: Illustration of pre and post-test mean score of Shuttle Run****Table 4: t-ratio of experimental and control group on 50 meters dash**

Control Factors	Pre test			Post test			t-ratio
	N	Mean	SD	N	Mean	SD	
Experimental	15	7.69	0.53	15	7.29	0.53	3.29*
Control	15	7.69	0.61	15	7.92	0.51	1.04

\* Significant at the 0.05 level of confidence

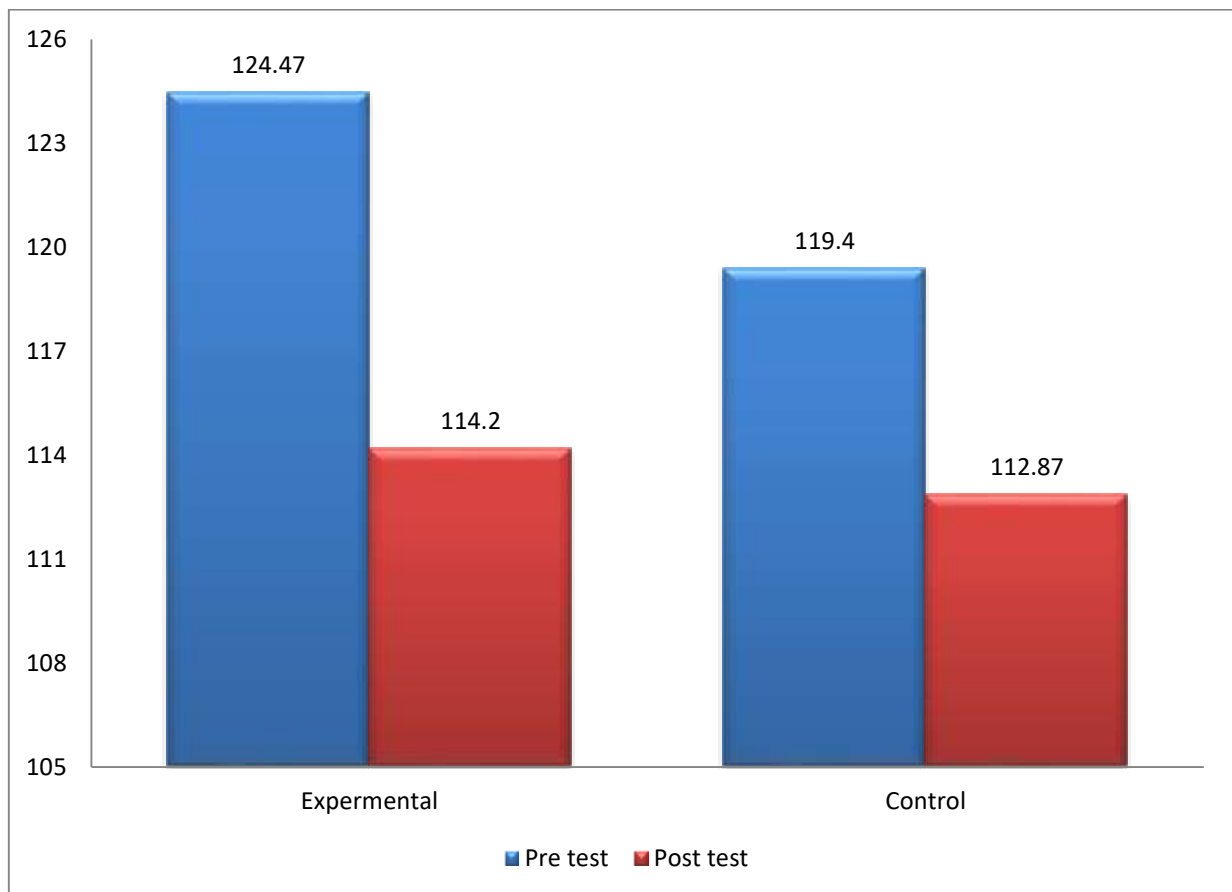
The above table 4 indicates that, there was a significant difference between pre and post-test performance on speed. Since the calculated 't' value of 3.29 is higher than tabulated 't' value of 2.41 at 0.05 level of significant with 14 degree of freedom. In the case of control group there was no significant changes in speed was found.

**Figure 4: Illustration of pre and post-test mean score of 50 mts Dash****Table 5: t-ratio of experimental and control group on 1 minute heart rate, ACSM test**

Control Factors	Pre test			Post test			t-ratio
	N	Mean	SD	N	Mean	SD	
Experimental	15	124.47	17.22	15	114.20	15.19	2.14*
Control	15	119.40	13.22	15	112.87	14.97	1.18

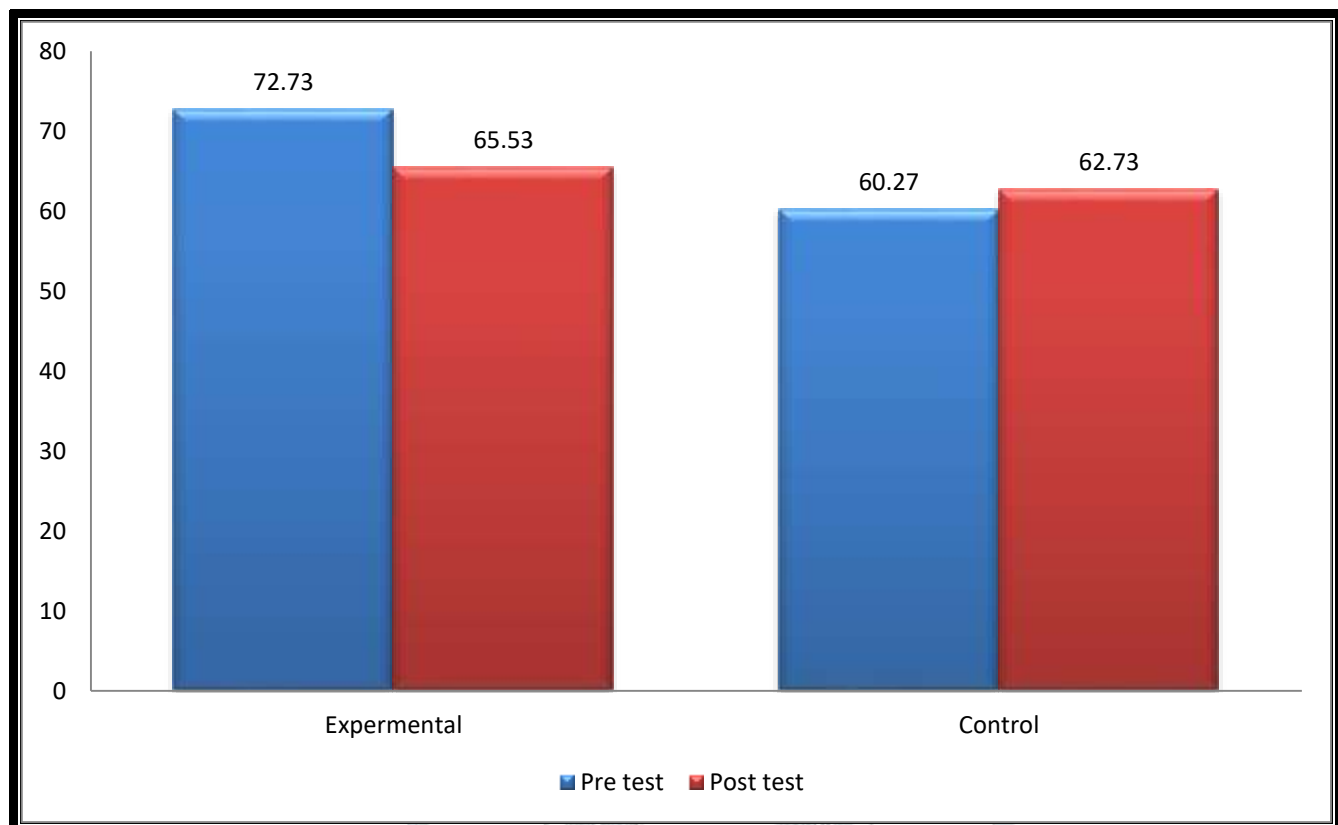
\* Significant at the 0.05 level of confidence

The above table 5 indicates that, there was a significant difference between pre and post-test performance in 1 minute recovery. heart rate of ACSM test. Since the calculated 't' value of 2.14 is higher than tabulated 't' value of 2.14 at 0.05 level of significant with 14 degree of freedom. In the case of control group there was no significant changes in 1 minute recovery heart rate of ACSM test.

**Figure 5: Illustration of pre and post-test mean score of 1 minute recovery heart rate, ACSM test****Table 6: t-ratio of experimental and control group on 5 minutes' recovery heart rate, ACSM test**

Control Factors	Pre test			Post test			t-ratio
	N	Mean	SD	N	Mean	SD	
Experimental	15	72.73	17.03	15	65.53	16.99	1.43
Control	15	60.27	16.45	15	62.73	16.52	0.53

The table 6 indicates that, there was no significant difference pre and post-test performance on 5 minutes recovery heart rate of ACSM test. Since the calculated 't' value of 4.73 is higher than tabulated 't' value of 3.71 at 0.05 level of significant with 19 degree of freedom in the case of control group there was no significant changes in the on 5 minutes recovery heart rate of ACSM test.

**Figure 6: Pre and post-test mean score of on 5 minutes recovery Heart Rate, ACSM test**

## RESULTS

Thus, hypothesis stated earlier was accepted in the case of selected physical fitness variables except agility and partially in endurance.

## CONCLUSIONS

The results of the study permit the following conclusions;

- Participation in six weeks of circuit training programme resulted in the improvement of arm strength.
- Participation in six weeks of circuit training programme resulted in the improvement of flexibility.
- Participation in six weeks of circuit training programme resulted in the improvement of speed.
- Participation in six weeks of circuit training programme resulted in the improvement of endurance.
- Participation in six weeks of circuit training programme resulted in no change in agility.

## RECOMMENDATIONS

In the light of conclusions, the following recommendations are made,

- Awareness should be given to school students regarding the benefits of circuit training.



- Circuit training should be incorporated in the fitness training programme for the students to develop health related physical fitness.
- Similar study will be undertaken for a longer duration of training and increasing the intensity.
- Similar study will be undertaken by involving other types of exercises in circuit training.
- Similar study will be undertaken with different age group and sex other than one as selected in this study.

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