

# Effect of Aerobic Exercises on Health Related Physical Fitness Variables of School Boys

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## Abstract

The purpose of the study was to find out the effect of aerobic exercises on selected health related physical fitness variable of school boys such as muscular strength endurance, cardio respiratory endurance, flexibility and body mass index. To achieve the purpose of this study thirty school boys were selected at random from Sengthuthura higher secondary school, in Thuriayur. Their age ranged from 12 to 15 years. They were divided in to two groups and designed as Experimental group and Control group. The Experimental group was given aerobic and calisthenics exercises for a period of twelve weeks, both morning and evening for five days in a week, whereas control group is not involved any specific exercise programme other than their regular physical activities programme as per their school curriculum. The data were collected before and after the exercises programme and statistically analyzed by using analysis of covariance (ANCOVA). Result of the study indicated that muscular endurance and cardio respiratory endurance have significantly improved and it was also observed that body mass index significantly reduced.

**Key words:** Aerobic exercise, Body mass index, Basel metabolic rate, Body fat.

## Introduction

Human body is one of the most beautiful as well as the most complicated systems that God has created. The intelligent ways with which this unique creation acts, reacts and interacts is a rare phenomenon. Not only should it look out –worldly ‘beautiful’ but also ‘work’ efficiently to enable man to achieve the ultimate goal of life. Neglect of the body leads to decay, disintegration and destruction whereas its proper care enables a man “to live most and cherish best.” Cardio vascular function, the first physical fitness component, is regarded by fitness experts as the most important of the fitness qualities, particularly in the area of health related physical fitness. The vigorous physical activity improves cardiovascular function and thus reduces the incidence of circulatory disease (Bucher,1983) Aerobic exercises is one of the best exercise any kind of people because it is not involved vigorous body movements, through this exercise one can able to achieve optimum health in a relatively short period. Bernard (1984) Russell (1982) and Agro (1998) stated that aerobic exercise program significantly reduced the sum of skin folds and significantly improved such as flexibility, muscular endurance and cardio respiratory endurance. Physical exercise may produce extensive change in the respiratory system, the increased stretching of the lung tissue can accommodate more air, so the amount of vital capacity may be increased after a period of training programme (Miller and Morehouse,1971)

## **Purpose of the Study**

The purpose of this study was to find out the effect of twelve weeks aerobic exercises on selected health related physical fitness variables of school boys.

## **Hypothesis**

It was hypothesized that would be a significant improvement on muscular strength endurance, cardio respiratory endurance and flexibility and there would be significant reduction in body composition (Body Mass Index).

## **Methods**

The purpose of the study was to find out the effect of aerobic exercises on selected health related physical fitness variable of school boys such as muscular endurance, cardio respiratory endurance, flexibility and Body mass index. To achieve the purpose of this study thirty school boys were selected at random from Sengthuthura higher secondary school, in Thuriayur. Their age ranged from 12 to 15 years. They were divided in to two groups and designed as Experimental group and Control group. The Experimental group was given aerobic exercises for a period of twelve weeks, both morning and evening for five days in a week, whereas control group is not involved in any specific exercise programme other than their regular physical activities as per their school curriculum. To find out the muscular endurance modified st-ups, for Cardio-respiratory endurance Cooper's 12 minutes run and walk test, for flexibility sit and reach test and for body mass index the Anthropometric measurements such as height and weight were measured. Height was measured using a stadiometer to the nearest 1.0cm without shoes. Body weight was measured to the nearest 0.1 kg with weighing machine,  $(BMI = \text{Weight(kg)} / \text{Height}^2)$  were used. The data were collected before and after the exercises programme and statistically analyzed by using Analysis of Covariance (ANCOVA).

## **Results**

The data of the above mentioned variables were collected prior to the training (Pre test) and after twelve weeks of aerobic exercises (Post test) were statistically examined by analysis of covariance and the result have been presented in Table - I.

**Table-I**  
**Analysis of Covariance for Pre Test and Post Test on Muscular Strength and Endurance of Control and Experimental Groups**

	Experimental group	Control group	Source Of variance	Sum of squares	df	Mean squares	'F'
Pre-test mean SD	13.00 1.36	12.60 1.24	Between within	2.133 47.33	1 28	2.133 1.690	1.262
Post-test mean SD	14.07 1.39	12.60 1.30	Between within	16.13 50.53	1 28	16.13 1.81	8.939*
Adjusted post-test mean	14.07	12.60	Between within	7.01 12.43	1 27	7.01 0.460	15.218*

\*significant at 0.05 level (The table value required for significance at 0.05 level with df 1 and 27 is 4.20)

It was observed from the Table - I that there is no significant difference in pre test ( $F=1.262 < 4.20$ ) at 0.05 level of confidence level is observed, however training effects are clearly evident in post test ( $F= 8.939 > 4.20$ ) at 0.05 level and in adjusted post test ( $F=15.218 > 4.20$  at 0.05 level) respectively. It clearly indicated that the experimental groups showed significantly higher improvement on muscular endurance than the control group.

These results logically reflect and that the aerobic exercise programme undertaken in this study have greater influence on improvement of muscular strength and endurance.

**Table-II**  
**Analysis of Covariance for Pre Test and Post Test on Cardio Respiratory Endurance of Control and Experimental Groups**

	Experimental group	Control group	Source of variance	Sum of squares	df	Mean squares	'F'
Pre-test mean SD	1873.33 357.50	1926.66 263.13	Between Within	21333.33 2758666.7	1 28	21333.3 98523.81	0.22
Post-test mean SD	2100.00 364.50	1866.66 212.69	Between Within	408333.33 2493333.3	1 28	408333.33 89047.67	4.59*
Adjusted post-test mean	2124.58	1842.08	Between Within	593968.95 148525.05	1 27	593968.95 5500.92	108.0*

\*significant at 0.05 level (the table value required for significance at 0.05 level with df 1 and 27 is 4.20)

It was observed from Table - II that there is no significant difference in per test ( $F=.22 < 4.20$ ) at 0.05 level of confidence level is observed, however training effects are clearly evident in post test ( $F= 4.59 > 4.20$ ) at 0.05 level and in adjusted post test ( $F=108.0 > 4.20$  at 0.05 level) respectively. It clearly indicate that the experimental groups showed significantly higher improvement than the control group.

The results shows that the aerobic exercise programme undertaken in this study have greater influence on improvement of Cardio respiratory endurance.

**Table-III**  
**Analysis of Covariance for Pre Test and Post Test on Flexibility of Control and Experimental Groups**

	Experimental group	Control group	Source Of variance	Sum of squares	df	Mean squares	'F'
Pre-test mean SD	14.17 1.06	13.70 1.09	Between within	1.699 32.55	1 28	1.699 1.1636	1.462
Post-test mean SD	15.26 1.00	13.70 1.09	Between within	18.57 29.983	1 28	18.57 1.071	17.338*
Adjusted post-test mean	15.26	13.70	Between within	9.787 6.810	1 27	9.787 0.252	38.79*

\*significant at 0.05 level

(The table value required for significance at 0.05 level with df 1 and 27 is 4.20)

It was observed from the above table that there is no significant difference in per test ( $F= 1.462 < 4.20$  at 0.05 level of confidence) is observed, however training effects are clearly evident in post test ( $F= 17.338 > 4.20$  at 0.05 level ) and in adjusted post test ( $F= 38.79 > 4.20$  at 0.05 level) respectively. It clearly indicated that the experimental groups showed significantly higher improvement than the control group.

These results shows that the aerobic exercise programme undertaken in this study have greater influence on improvement of flexibility.

**Table-IV**  
**Analysis of Covariance for Pre Test and Post Test on Body Mass Index of Control and Experimental Groups**

	Experimental group	Control group	Source Of variance	Sum of squares	df	Mean squares	'F'
Pre-test mean SD	21.49 2.00	22.0 2.01	Between within	1.37 112.00	1 28	1.37 4.00	0.341
Post-test mean SD	20.40 1.98	22.32 1.74	Between within	27.65 97.20	1 28	27.65 3.5	7.964*
Adjusted post-test mean	20.40	23.32	Between within	18.02 17.241	1 27	18.019 0.639	28.217*

\*significant at 0.05 level

(The table value required for significance at 0.05 level with df 1 and 27 is 4.20)

It was observed from Table -IV that there is no significant difference in per test (  $F = 0.341 < 4.20$  at 0.05 level of confidence ) is observed, however training effects are clearly evident in post test (  $F = 7.964 > 4.20$  at 0.05 level ) and in adjusted post test (  $F = 28.217 > 4.20$  at 0.05 level) respectively. It clearly indicated that the experimental groups showed significantly reduction than the control group.

These results shows that the aerobic exercise programme undertaken in this study have greater influence on reducing the body mass index.

**Figure-1**  
**Bar Diagram Showing the Pretest Posttest and Adjusted Post Test Mean Scores of Muscular Strength and Endurance, Flexibility and Body mass Index of Experimental Group**

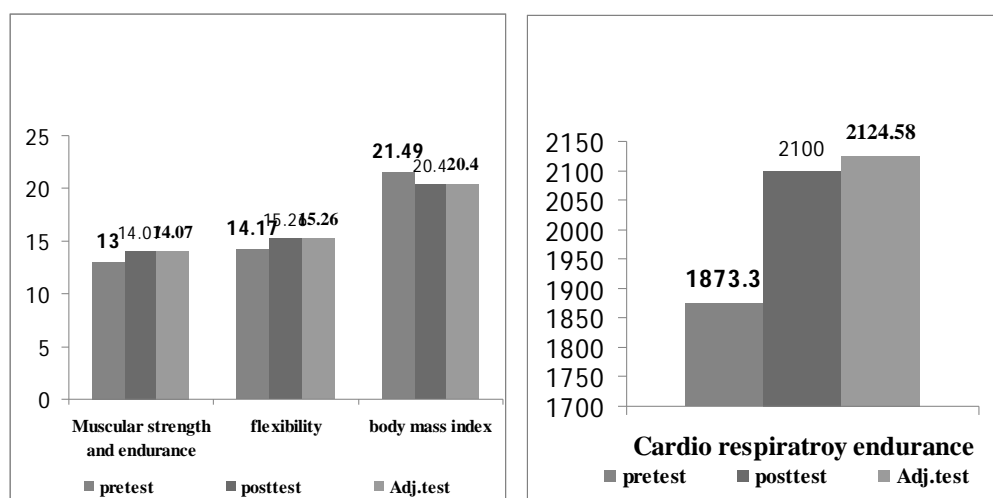
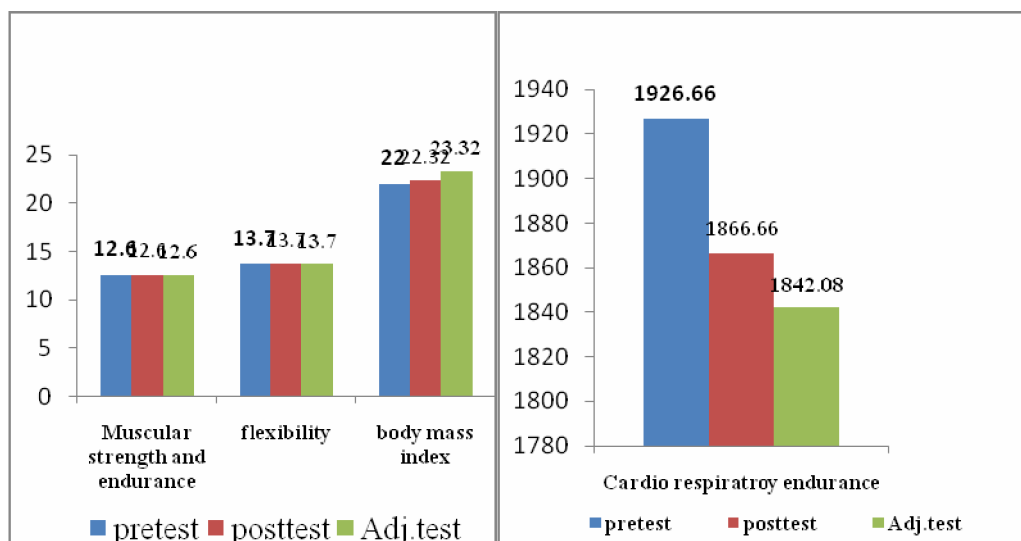


Figure-2

Bar Diagram Showing the Pretest Posttest and Adjusted Post Test Mean Scores of Cardio Respiratory Endurance of Control Group



### Discussion on Findings

The results of the study indicates that the aerobic exercise group improved significantly the selected dependent variable namely muscular strength and endurance, cardio-respiratory endurance, flexibility and body composition of the body mass Index. However control group do not show any improvement on the above said variables as it is not involved any of the specific training means. It is inferred from the results and calisthenics of the present study that all the dependent variables are significantly improved due to the influence of Twelve weeks of aerobic exercises. The present study findings were also in line with the studies conducted by Agro(1998) Testerman(1985) Sheales (1987)

### Conclusions

The results of the study reveals that the aerobic exercises are effective means for improving, muscular endurance, cardio respiratory endurance, flexibility, and significantly reduced the body composition (body mass index).

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