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## Effect of aerobic exercise with and without dieting regulations on abdominal strength and body mass index (BMI) among obese school boys

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### Abstract

Aerobic exercise reduces the risk of many conditions, including obesity, heart disease, high blood pressure, type 2 diabetes, metabolic syndrome, stroke and certain types of cancer. Weight-bearing aerobic exercises, such as walking, help decrease the risk of osteoporosis. For general health and fitness benefits, such as reducing your risk of heart disease and improving your stamina, it is recommended that you do some form of moderate intensity aerobic exercise on most, and preferably all, days of the week, for a minimum of 30 minutes a day. The Present study the purpose of the study find out the effect of aerobic exercise with and without dieting regulations on abdominal strength and body mass index (BMI) among obese school boys. The study was formulated as a true random group design, consisting of a pretest and posttest. The subjects (n=60) were randomly assigned to three equal groups of twenty obese school boys in each. The groups were assigned as Experimental Groups I, II and control group respectively. Pre tests were conducted for all the subjects on flexibility and percent body fat. After the experiment period of twelve weeks post test scores were obtained. The difference between the initial and final scores was considered the effect of the experimental treatment. To test statistical significance, statistical tool ANCOVA was used to find out the effect of aerobic exercise and dieting regulations on obese school boys. Even though the mean values proved that aerobic exercise with diet was better than aerobic exercise without diet in improving abdominal strength the difference was not significant. Hence, it was found that Aerobics with and without diet were significantly better than control group in improving Abdominal Strength of the obese school boys.

**Keywords:** Abdominal strength and body mass index (BMI)

### Introduction

The high level of physical fitness comes from years of daily experience in a selected variety of vigorous physical activities. It is a biological principle that function builds structure and structure decides function. Man needs vigorous exercises for growth and development. To perform the daily activities in a more efficient manner, a condition of muscles, their strength and endurance are essential to man. Every human being participates in some kind of sports activity or physical exercise during the course of his life. This exercise may assume different forms for different individuals. It may be walking, jogging, cycling, working in a factory, participation in games and sports etc. Regular participation in exercise programme markedly influences physical, physiological and mental fitness of an individual.

### Methodology

The study was formulated as a true random group design, consisting of a pretest and posttest. The subjects (n=60) were randomly assigned to three equal groups of twenty obese school boys in each. The groups were assigned as Experimental Groups I, II and control group respectively. Pre tests were conducted for all the subjects on selected abdominal strength, and body mass index, The experimental groups participated in their respective experiments, namely, aerobic exercises with dieting regulations and aerobic exercises without dieting regulations for twelve weeks.

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**Training Procedure**

The study was formulated as a true random group design, consisting of a pretest and posttest. The subjects (n=60) were randomly assigned to three equal groups of twenty obese school boys in each. The groups were assigned as Experimental Groups I, II and control group respectively. Pre tests were conducted for all the subjects on flexibility and percentage of body fat. After the experiment period of twelve

weeks post test scores were obtained. The twelve weeks aerobic exercise were given obese school boys.

**Results and Discussion**

The statistical analysis comparing the initial and final means of Abdominal Strength due to Aerobics without diet and Aerobics with diet among obese school boys is presented in table I

**Table 1:** Ancova results on effect of aerobics without diet and aerobics with diet compared with controls on abdominal strength

	Aerobics without diet	Aerobics with diet	Control group	Source of variance	Sum of squares	df	Mean squares	Obtained F
Pre Test Mean	19.90	20.10	20.30	Between	1.60	2	0.80	0.04
				Within	1093.80	57	19.19	
Post Test Mean	23.20	24.00	21.00	Between	96.53	2	48.27	2.42
				Within	1137.20	57	19.95	
Adjusted Post Test Mean	23.39	24.00	20.81	Between	115.02	2	57.51	30.03*
				Within	107.24	56	1.92	
Mean Diff	3.30	3.90	0.70					

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.

As shown in table I the obtained pretest means on Abdominal Strength on Aerobics without diet group was 19.90, Aerobics with diet group was 20.10 and control group was 20.30. The obtained pretest F value was 0.04 and the required table F value was 3.16, which proved that there was no significant difference among initial scores of the subjects. The obtained posttest means on Abdominal Strength on Aerobics without diet group was 23.20, Aerobics with diet group was 24.00 and control group was 21.00. The obtained posttest F value was 2.42 and the required table F value was 3.16, which proved that there was no significant difference among post

test scores of the subjects.

Taking into consideration of the pretest means and posttest means adjusted posttest means were determined and analysis of covariance was done and the obtained F value 30.03 was greater than the required value of 3.16 and hence it was accepted that there was significant differences among the treated groups.

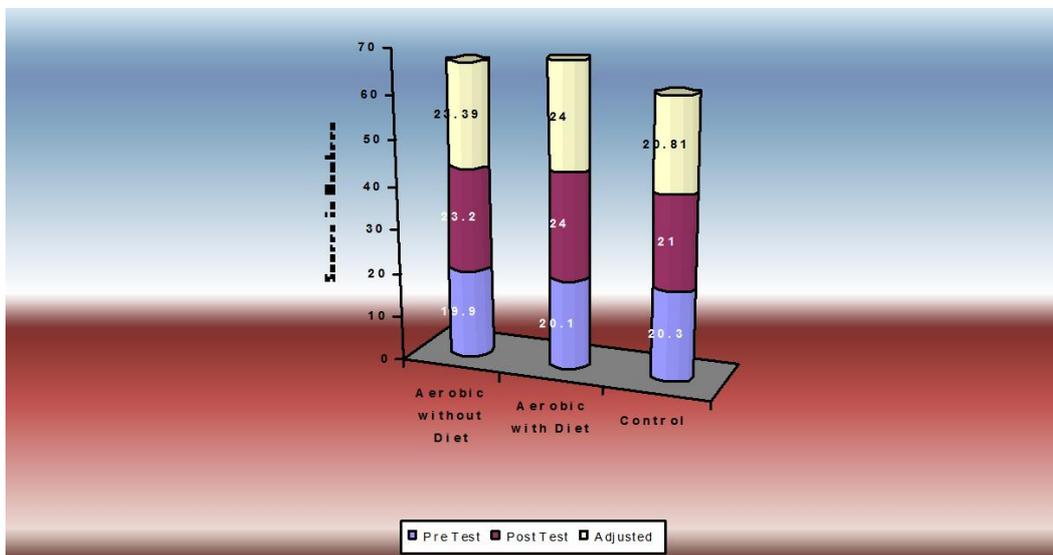
Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe’s Confidence Interval test. The results were presented in table II.

**Table 2:** Multiple Comparisons of Paired Adjusted Means and Scheffe’s Confidence Interval Test Results on Abdominal Strength

Means				Required. C I
Aerobics without diet Group	Aerobics with diet Group	Control Group	Mean Difference	
23.39	24.00		0.606	1.098
23.39		20.81	2.588*	1.098
	24.00	20.81	3.194*	1.098

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between Aerobics without diet group and control group (MD: 2.588). There was significant difference between Aerobics with diet group and control group (MD: 3.194). There was no

significant difference between treatment groups, namely, Aerobics without diet group and Aerobics with diet group. (MD: 0.606). The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure I.



**Fig 1:** Bar diagram showing pretest, posttest and ordered adjusted means on abdominal strength

The statistical analysis comparing the initial and final means of Body Mass Index due to Aerobics without diet and

Aerobics with diet among obese school boys is presented in table III.

**Table 3:** Ancova results on effect of aerobics without diet and aerobics with diet compared with controls on body mass index

	Aerobics without diet	Aerobics with diet	Control group	Source of variance	Sum of squares	df	Mean squares	obtained f
Pre Test Mean	25.997	26.621	26.490	Between	4.321	2	2.161	1.105
				Within	111.415	57	1.955	
Post Test Mean	25.297	25.417	26.702	Between	24.247	2	12.123	6.989*
				Within	98.872	57	1.735	
Adjusted Post Test Mean	25.612	25.204	26.600	Between	20.596	2	10.298	30.429*
				Within	18.952	56	0.338	
Mean Diff	-0.700	-1.204	0.212					

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.

As shown in table III, the obtained pretest means on Body Mass Index on Aerobics without diet group was 25.997, Aerobics with diet group was 26.621 and control group was 26.490. The obtained pretest F value was 1.105 and the required table F value was 3.16, which proved that there was no significant difference among initial scores of the subjects. The obtained posttest means on Body Mass Index on Aerobics without diet group was 25.297, Aerobics with diet group was 25.417 and control group was 26.702. The obtained posttest F value was 6.989 and the required table F value was 3.16, which proved that there was significant

difference among post test scores of the subjects.

Taking into consideration of the pretest means and posttest means adjusted posttest means were determined and analysis of covariance was done and the obtained F value 30.429 was greater than the required value of 3.16 and hence it was accepted that there was significant differences among the treated groups.

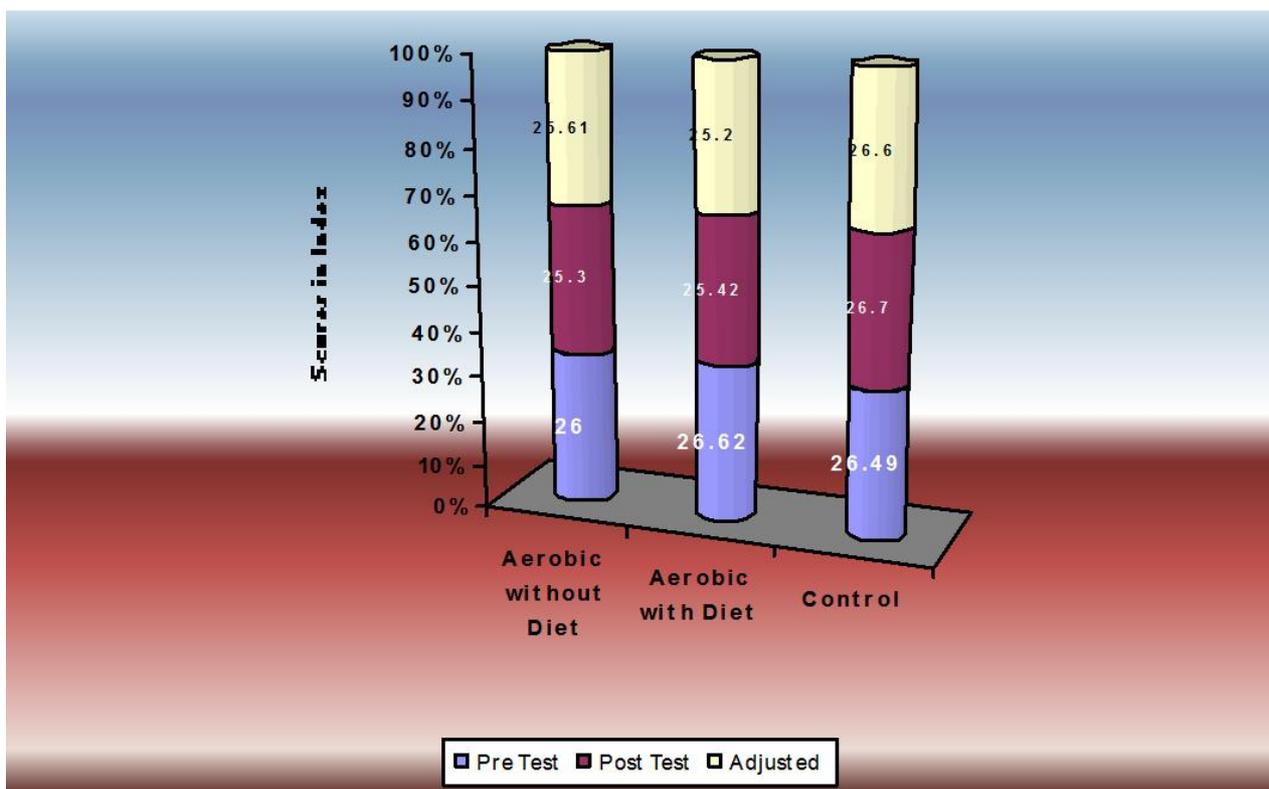
Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe’s Confidence Interval test. The results were presented in table IV.

**Table 4:** Multiple Comparisons of Paired Adjusted Means and Scheffe’s Confidence Interval Test Results on Body Mass Index

Means				Required. C I
Aerobics without diet Group	Aerobics with diet Group	Control Group	Mean Difference	
25.612	25.204		0.408	0.462
25.612		26.600	-0.987*	0.462
	25.204	26.600	-1.396*	0.462

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between Aerobics without diet group and control group (MD: -0.987). There was significant difference between Aerobics with diet group and control group (MD: -1.396). There was no

significant difference between treatment groups, namely, Aerobics without diet group and Aerobics with diet group. (MD: 0.408). The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure II.



**Fig 2:** Bar diagram showing pretest, posttest and ordered adjusted means on body mass index

## Results and Discussion

In order to find out the effect of Aerobics without diet and Aerobics with diet on Abdominal Strength obtained pre and posttest means were subjected to ANCOVA and post hoc analysis through Scheffe's confidence interval test. The effect of Aerobics without diet and Aerobics with diet on Abdominal Strength is presented in Table III. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 30.03 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to post hoc analysis and the results presented in Table IV proved that there was significant difference between Aerobics without diet group and control group (MD: 2.588) and Aerobics with diet group and control group (MD: 3.194). Comparing between the treatment groups, it was found that there was no significant difference between Aerobics without diet and Aerobics with diet group among obese school boys. Even though the mean values proved that aerobic exercise with diet was better than aerobic exercise without diet in improving abdominal strength the difference was not significant. Hence, it was found that Aerobics with and without diet were significantly better than control group in improving Abdominal Strength of the obese school boys.

The effect of Aerobics without diet and Aerobics with diet on Body Mass Index is presented in Table V. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 30.429 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to post hoc analysis and the results presented in Table VI proved that there was significant difference between Aerobics without diet group and control group (MD: -0.987) and Aerobics with diet group and control group (MD: -1.396). Comparing between the treatment groups, it was found that there was no significant difference between Aerobics without diet and Aerobics with diet group among obese school boys.

The results proved that aerobic exercise with diet was better than aerobic exercise without diet in reducing BMI. However, this difference was not significant at 0.05 level. Hence, it was found that Aerobics with and without diet were significantly better than control group in reducing Body Mass Index of the obese school boys

## Conclusions

Within the limitations and delimitation of the study, the following conclusions were drawn.

1. It was concluded that aerobic exercise with and without diet significantly improved abdominal strength compared to control group of obese school boys. Even though aerobic exercise with diet regulation influenced better than aerobic exercise without diet regulation, the difference was not significant.
2. It was concluded that aerobic exercise with and without diet significantly improved body composition variable, body mass index compared to control group of obese school boys. Even though aerobic exercise with diet regulation influenced better than aerobic exercise without diet regulation, the difference was not significant.

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