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## **Effect of aerobic exercise with and without dieting regulations on flexibility and percentage body of fat among obese school boys**

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### **Abstract**

Childhood obesity is a condition where excess body composition negatively affects a child's health or wellbeing. As methods to determine body composition directly are difficult, the diagnosis of obesity is often based on BMI. Due to the rising prevalence of obesity in children and its many adverse health effects it is being recognized as a serious public health concern. The term overweight rather than obese is often used in children as it is less stigmatizing. The Present study The Purpose of the study find out the effect of aerobic exercise with and without dieting regulations on flexibility and percent of body fat 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 of 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. It was found that aerobics exercise with and without diet were significantly better than control group in improving Flexibility of the obese school boys. Thus, it was found that Aerobics with diet was significantly better than Aerobics without diet and control group in reducing Percent Body Fat of the obese school boys.

**Keywords:** flexibility and percentage of body fat

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### **Introduction**

Proper growth and maintenance of good health, participation in daily physical activities is an indispensable one. 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.

### **Methodology**

Sixty obese school boys, who were studying in different schools in Andhra Pradesh, were selected for the study. The age of the subjects was from 13 to 15. The subjects were healthy other than their obesity. Those students who have more than 25% of percentage body fat were considered as obese for the purposes of this study (Steven, 2007). Body fat percentage was estimated from a person's BMI by the following formula:

$$\text{Bodyfat\%} = (1.2 * \text{BMI}) + (0.23 * \text{age}) - 5.4 - (10.8 * \text{gender})$$

where gender is 0 if female and 1 if male

Before the administration of the test, all the subjects were oriented for the purpose of the experimental treatments and the tests. They were made known about the importance of the treatment and tests. They were taught about the food exchange test and how to adjust their daily calorie intake. All the subjects wholeheartedly co-operated for this study.

### **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 Flexibility 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 Flexibility

	Aerobics without diet	Aerobics with diet	Control Group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F
Pre Test Mean	7.80	8.15	8.30	Between	2.63	2	1.32	0.20
				Within	373.95	57	6.56	
Post Test Mean	11.00	12.15	8.95	Between	105.10	2	52.55	7.17*
				Within	417.50	57	7.32	
Adjusted Post Test Mean	11.25	12.09	8.76	Between	119.76	2	59.88	25.78*
				Within	130.07	56	2.32	
Mean Diff	3.20	4.00	0.65					

Required 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 flexibility on Aerobics without diet group was 7.80, Aerobics with diet group was 8.15 was and control group was 8.30. The obtained pretest F value was 0.20 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 Flexibility on Aerobics without diet group was 11.00, Aerobics with diet group was 12.15 was and control group was 8.95. The obtained posttest F value was 7.17 and the required table F value was 3.16, which

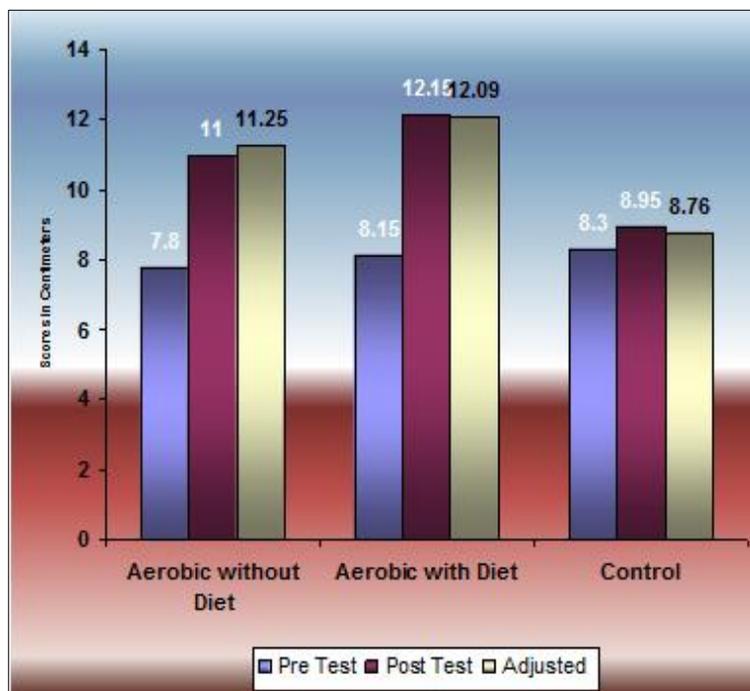
proved that there was significant difference among post test scores of the subjects. Taking into consideration of the pretest means and posttest means adjusted posttest means were determined and analysis of covariance was done and the obtained F value 25.78 was greater than the required value of 3.16 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 Flexibility

Means				Required C I
Aerobics without diet Group	Aerobics with diet Group	Control Group	Mean Difference	
11.25	12.09		-0.843	1.210
11.25		8.76	2.488*	1.210
	12.09	8.76	3.332*	1.210

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: 2.488). There was significant difference between Aerobics with diet group and control group (MD: 3.332).

There was no significant difference between treatment groups, namely, Aerobics without diet group and Aerobics with diet group. (MD: 0.843).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 Pre Test, Post Test and Ordered Adjusted Means on Flexibility

In order to find out the effect of Aerobics without diet and Aerobics with diet on Flexibility the 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 Flexibility 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 25.78 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: 2.488) and Aerobics with diet group and control group (MD: 3.332). 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. Thus, it was found that aerobic exercise with diet was found to be better than aerobic exercise without diet. However, this difference was not significant. Hence, it was found that aerobics exercise with and without diet were significantly better than control group in improving Flexibility of the obese school boys. The statistical analysis comparing the initial and final means of Percent Body Fat 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 Percent Body Fat

	Aerobics Without Diet	Aerobics with Diet	Control group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F
Pre Test Mean	26.74	26.75	26.57	Between	0.41	2	0.21	0.21
				Within	56.60	57	0.99	
Post Test Mean	25.46	24.71	26.37	Between	27.82	2	13.91	12.21*
				Within	64.92	57	1.14	
Adjusted Post Test Mean	25.41	24.65	26.48	Between	33.51	2	16.75	46.75*
				Within	20.07	56	0.36	
Mean Diff	-1.28	-2.04	-0.19					

Required Table Value 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 II, the obtained pretest means on Percentage of Body Fat on Aerobics without diet group was 26.74, Aerobics with diet group was 26.75 was and control group was 26.57. The obtained pretest F value was 0.21 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 Percent Body Fat on Aerobics without diet group was 25.46, Aerobics with diet group was 24.71 was and control group was 26.37. The obtained posttest F value was 12.21 and the required table F value was 3.16,

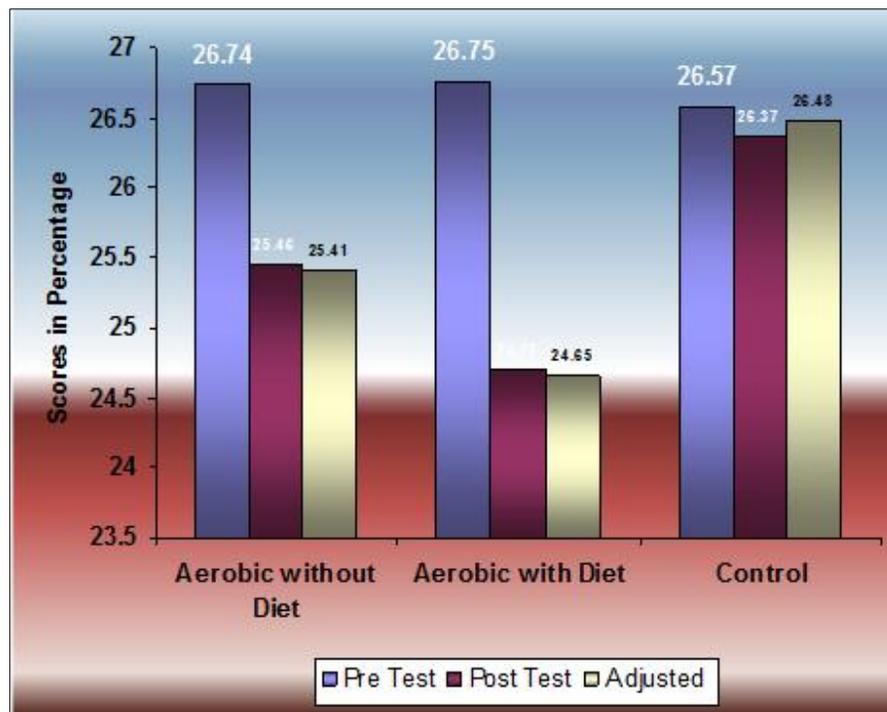
which proved that there was significant difference among post test scores of the subjects. Taking into consideration of the pretest means and posttest means adjusted posttest means were determined and analysis of covariance was done and the obtained F value 46.75 was greater than the required value of 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 Percentage of Body Fat

MEANS				Required. C I
Aerobics without diet Group	Aerobics with diet Group	Control Group	Mean Difference	
25.41	24.65		0.761*	0.475
25.41		26.48	1.067*	0.475
	24.65	26.48	1.828*	0.475

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: -1.067). There was significant difference between Aerobics with diet group and control group (MD: -1.828).

There was significant difference between treatment groups, namely, Aerobics without diet group and Aerobics with diet group. (MD: 0.761). 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 Pre Test, Post Test and Ordered Adjusted Means on Percent Body Fat

### Discussions on Findings

The effect of Aerobics without diet and Aerobics with diet on Percent Body Fat is presented in Table I. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 46.75 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: -1.067) and Aerobics with diet group and control group (MD: -1.828). Comparing between the treatment groups, it was found that there was significant difference between Aerobics without diet and Aerobics with diet group among obese school boys. Thus, it was found that Aerobics with diet was significantly better than Aerobics without diet and control group in reducing Percent Body Fat of the obese school boys.

### Conclusions

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

It was concluded that aerobic exercise with and without diet significantly improved, flexibility 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. It was concluded that aerobic exercise with and without diet significantly improved percent body fat 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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