



The Influence of 12 Weeks of High and Low Intensity Aerobic Training on Body Composition, Physical Fitness, and Anthropometric Variables in College-Level Obese Boys

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ABSTRACT

This study aimed to investigate the effects of 12 weeks of high-intensity and low-intensity aerobic training on body composition, physical fitness, and anthropological variables in college-level obese boys. A total of 120 students from KG College of Health Sciences, Coimbatore, aged 17-22 years with moderate obesity, were selected based on BMI calculation. Sixty participants were divided into three groups: Group A (high-intensity aerobic training), Group B (low-intensity aerobic training), and Group C (control group). The training was conducted for one hour per session, four days a week, for twelve weeks. The results showed that both high-intensity and low-intensity aerobic training groups significantly improved the selected body composition variables in college-level obese boys. However, the high-intensity aerobic training group demonstrated better improvement in body mass and body fat compared to the low-intensity aerobic training group. The study concludes that aerobic training, particularly high-intensity training, can be an effective intervention for improving body composition in college-level obese boys. Further research is recommended to assess the effects of aerobic training on various other variables, such as biochemical and hematological parameters, in different populations and with larger sample sizes.

Key words: Aerobic training, obesity, Body Mass, Body Fat

Introduction

Energy is derived aerobically when oxygen is utilized to metabolize substrates that obtained from food and distributes the energy to the working muscles. A sports event, or an activity that will build cardio respiratory endurance, is termed aerobic when the major energy source for the athlete is derived aerobically (aerobic training is done without an oxygen debt). Aerobic training is the activity that is performed continuously for a minimum of 15 to 20 minutes at the level of 70% to 90% of maximum heart rate but not less than three times a week. The measure of obesity is done with BMI calculation. BMI is the Body Mass Index which has three grades. When the BMI rates above 25 it is considered as overweight. The best treatment for obesity is not by drugs but by the modification of one's life style. Daily exercise may help people to reduce obesity. In addition to exercise yoga and meditation may help to reduce the hypertension and overweight.

Material and Methods

Sixty students (N=60) were selected and the study duration was two years and individual training duration was twelve weeks. Simple random sampling method was used. The selected participants were divided into three groups and each group consists of twenty participants. Group A (Experimental group I) – participants received Low intensity Aerobic training. Group B (Experimental group II) – participants received High intensity aerobic training. The subjects were only boys with age of 17-22 years with moderate obesity who were able to perform the exercises were included for the study. Among the various body composition variables, Body mass and body fat were analyzed using Digital Body Composition Analyzer before and after the twelve weeks of the training.

Results

The data was collected from the selected 60 college student's prior to and after the training programme on the selected criterion variables. This data is statistically analyzed by Dependent 't' test to find out the significant improvement between pre & post-test. In order to find out significant

different, among the three groups ANCOVA is used whenever 'F' ratio is found to be significant, Scheffe's test is used as post hoc test determine which of the paired means differed significantly in all cases the criterion for statistical significance is set at 0.05 level of confidence ($P < 0.05$).

TABLE 1

ANALYSIS OF COVARIANCE AMONG THE HIGH INTENSITY AEROBIC TRAINING GROUP, LOW INTENSITY AEROBIC TRAINING GROUP AND CONTROL GROUP ON BODY MASS

	Group	Mean	Source	Sum of Square	df	Mean Square	F-ratio
Pre-test	HIATG	29.64	B/S	7.68	2	3.84	1.18
	LIATG	30.07	W/S	185.29	59	3.25	
	CG	30.51					
Post test	HIATG	27.81	B/S	42.94	2	21.47	5.63*
	LIATG	28.10	W/S	217.2	59	3.81	
	CG	29.73					
Adjusted Mean	HATG	27.81	B/S	82.14	2	41.07	99.19*
	LIATG	28.10	W/S	23.18	56	0.41	
	CG	29.73					

*Significant at 0.05 level (2.76)

RESULTS OF BODY MASS

The required table value at the 0.05 level of significance with df 2 and 59 is 2.76, and the same value for df 2 and 56 is also 2.76. The 'F' values obtained for the pre-test, post-test, and adjusted post-test means on the speed of high-intensity training group I, low-intensity training group II, and control group are displayed. The pre-test means on body mass index were 29.64, 30.07, and 30.51, respectively. The 'F' value obtained for the pre-test on body mass index was 1.18, which failed to reach the table value of 2.76 for df 2 and 56 at the 0.05 level of confidence. Based on these results, it was confirmed that the mean differences among the groups of high-intensity training group I, low-intensity training group II, and control group on body mass index before the start of the respective treatments were not significant. The post-test means on body mass index of high-intensity training group I, low-intensity training group II, and control group were 27.81, 28.10, and 29.73, respectively. The 'F' value obtained for the post-test on body mass index was 5.63, which was higher than the required table value of 2.76 for df 2 and 56 at the 0.05 level of confidence. Therefore, the observed F-value on post-test means among the groups, namely high-intensity training group I, low-intensity training group II, and control group on body weight, was not significant as the value was higher than the required table value of 2.76. Consequently, the results obtained showed that the training on body mass index produced not significant improvements among the experimental groups.

The adjusted post test means on body mass index of high intensity training group I, low intensity training group II, and control group were 27.81, 28.10 and 29.73 respectively. The 'F' value observed for the adjusted post test means on body weight was 99.19. It was greater than the table value of 2.76 for degree of freedom 2, 59 at 0.05 level of confidence. Since the observed F-value on adjusted post test means among the groups on body mass index was highly significant as the value was higher than required table value of 2.76. Thus the results obtained proved that the training on body mass index produced significant improvements among the experimental groups.

THE MEAN VALUE OF PRE TEST POST TEST AND ADJUSTED MEAN ON BODY MASS INDEX HIGH INTENSITY AEROBIC TRAINING GROUP , LOW INTENSITY AEROBIC TRAINING GROUP AND CONTROL GROUP

FIGURE - 2

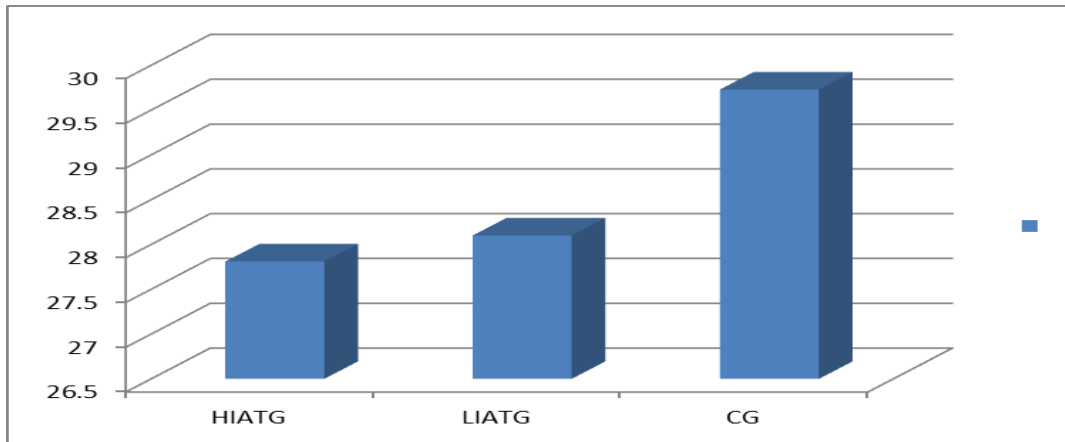


TABLE II

ANALYSIS OF COVARIANCE AMONG THE HIGH INTENSITY AEROBIC TRAINING GROUP, LOW INTENSITY AEROBIC TRAINING GROUP AND CONTROL GROUP ON BODY FAT

	Group	Mean	Source	Sum of Square	Df	Mean Square	F-ratio
Pre-test	HIATG	29.70	B/S	13.82	2	6.91	0.49
	LIATG	30.32	W/S	798.59	59	14.01	
	CG	30.88					
Post test	HIATG	27.16	B/S	78.77	2	39.38	2.96*
	LIATG	27.73	W/S	756.90	59	13.27	
	CG	29.82					
Adjusted Mean	HIATG	27.16	B/S	150.16	2	75.08	292.91*
	LIATG	27.73	W/S	14.35	56	0.256	
	CG	29.82					

*Significant at 0.05 level (2.76)

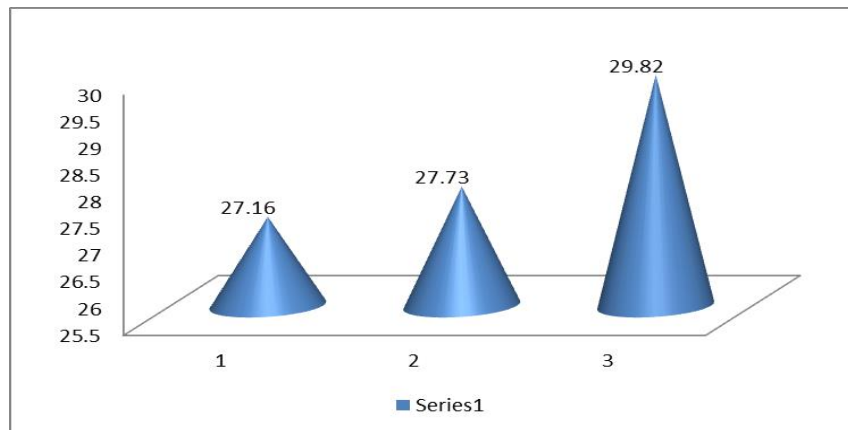
RESULTS OF BODY FAT

The obtained 'F' values on pre test, post test and adjusted post test means on speed of high intensity training group I, low intensity training group II, and control group. The pre test means on body fat were 29.70, 30.32 and 30.88 respectively. The 'F' value observed for the pre test on body fat was 0.49. It fails to reach the table value of 2.76 for degree of freedom 2, 56 at 0.05 level of confidence. Based on the results it was confirmed that the mean differences among the groups of high intensity training group I, low intensity training group II, and control group on body fat before the start of the respective treatments were found to be not significant. The post test means on body fat of high intensity training group I, low intensity training group II, and control group were 27.16, 27.73 and 29.82 respectively. The 'F' value observed for the post test on body weight was 2.96. It was higher than the table value of 2.76 for degree of freedom 2, 56 at 0.05 level of confidence. Since the observed F- value on post test means among the groups namely high intensity training group I, low intensity training group II, and control group on body fat was not significant as the value was higher than required table value of 2.76. Thus the results obtained proved that the training on body fat produced not significant improvements among the experimental groups.

The adjusted post test means on body fat of high intensity training group I, low intensity training group II, and control group were 27.16, 27.73 and 29.82 respectively. The 'F' value observed for the adjusted post test means on body fat was 292.91. It was greater than the table value of 2.76 for degree of freedom 2, 56 at 0.05 level of confidence. Since the observed F- value on adjusted post test means among the groups on body weight was highly significant as the value was higher than required table value of 2.76. Thus the results obtained proved that the training on body fat produced significant improvements among the experimental groups.

FIGURE - 2

THE MEAN VALUE OF PRE TEST POST TEST AND ADJUSTED MEAN ON BODY FAT HIGH INTENSITY AEROBIC TRAINING GROUP LOW INTENSITY AEROBIC TRAINING GROUP AND CONTROL GROUP



Conclusions

1. The twelve week high intensity aerobic training group and low intensity aerobic training group significantly improved the selected body composition variables in college level obesity boys.
2. From the findings of the study the high intensity aerobic training group had better improvement than the low intensity aerobic training group in body mass.
3. From the findings of the study the high intensity aerobic training group had better improvement than the low intensity aerobic training group in body fat.

Recommendations

1. A similar study can be done in other group of populations.
2. A similar study can be done assessing the various other variables based on the selected populations like of biochemical and hematological variables.
3. A similar study can be conducted with large sample size.

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