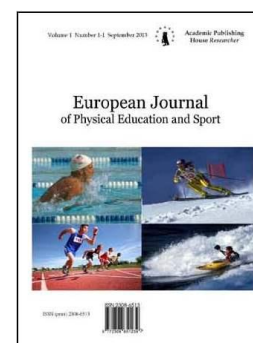


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UDC 79

## Effect of Selected Training Programmes on Health Related Physical Fitness Components of Obese Children

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### Abstract

The present study is mainly concerned with obese children. The purpose of the study was to check the effects of selected training programme on health related physical fitness components of obese children. The subjects were taken from Mussoorie International School aged between 10 to 14 years in the year 2004-2005. The data was collected by administering the fit youth today test to the obese children before and after giving the training programme to them in term of pre-test and post-test. Eighty (80) obese students were selected as the subjects in this study. In each group for each programme twenty (20) students were taken as the subjects. In order to find out the significance difference between the various training programmes, analysis of covariance was used and the level of significance was chosen at .05 level. Analysis of covariance was computed by the ANCOVA test. To find out the (LSD) least significance difference among the groups LSD was used. The results of the study reveals that there were highly significance differences between the three groups that is Brisk Walking, Jogging and Circuit training programme. Circuit training seems to be more effective than other groups. There was no improvement in control group participants as they did not take part in any of the training program. Obesity is not a disease but sick rate increase in this. So for good health obesity should be prevented and this study shows that the Circuit training is more effective training program as comparison of other program to reduce the fats from the body.

**Keywords:** obesity, health related physical fitness, fit youth test.

### Introduction

Obesity and overweight constitute two of the most significant medical and health problems in the world today. The effects appear to be as much psychological as physiological. It has been estimated that as ten million teenagers are overweight, representing approximately 20 percent of total teenage population in the United States. Thus we must consider the obesity as a big problem for the society and some good method should be adopted to reduce this problem. In the last decade, there have been a number of studies focusing on obesity reduction and the use of best method for it. (Beard, 1988) has conducted the study to see the effect of a Physical Fitness Program on Obese Children Ages Six to Eleven. He conducted investigation of the effects of a 10- week

physical training (aerobics) and nutrition education/counselling program on body fat of 443 children attending Tarrant Elementary School. He concluded that aerobics program was more effective than the regular physical education program for fat reduction. (Cooper, 1988) examined the effect of obesity on skill attainment in twelve year old children as measured by performance on three novel manipulative skills. The study was to determine if obesity was a significant, negative factor in the ability of children to learn manipulative, non locomotor skills, three novel manipulative skills were chosen for this study: jogging, flip sticks, and the Chinese yo-yo. The two groups were compared to each other on the amount of time to learn the three skills. T-test was used to test the groups statistically for significance between the group means, at the .05 level of significance. It should be noted that in some instances the obese subjects had a lower group composite time than their non-obese counterparts. The obese group of subjects and the obese girls sub group had lower times on the Chinese yo-yo skill. (Ladda & Mo Suwan, 1998) evaluated that exercise has been found to be effective for prevention of weight gain and maintenance of a stable weight in adults. The objective of this study was to evaluate the effect of a school based aerobic exercise program on the obesity indexes of pre-school children. (Humphrey & Reed, 1987) conducted study to check the effect of diet and cycle exercise on body composition and metabolic measures in obese children. The effect of cycle exercise and dietary caloric restriction on resting metabolic rate, body composition, and cardiovascular fitness were examined in young obese males. It was concluded that at a level of moderate caloric restriction, significant reductions in total body weight, body fat, and body weight, body fat, and LBM may be expected, and additional weight loss associated with aerobic exercise can be reasonably predicated. (Robert Paul, 1992) investigated the role of exercise and diet protocols on body composition in obese women. The results of this investigation demonstrated that a weight control program of diet alone, diet plus exercise, or exercise alone will have similar effects on weight and lean body weight in obese women. It also appears that a weight control program of diet plus exercise or exercise alone will result in lower percentage of body fat than will a weight control program of diet alone. (Judith S. et al., 2000) investigated the influence of three types of aerobic exercises class (aerobics dance, water aerobics, and general fitness conditioning) on exercise self efficiency and perceived competence in overweight women (n = 214). The results of the study further shows that overweight women enrolled in the water aerobics class had lower perceptions of competence in physical fitness than those enrolled in aerobic dance and fitness conditioning. Individual who scored high in perceived competence also scored high in self-efficacy the results are limited by the non randomized nature of the study design. (Lee, 1995) examined the degree of body fatness and the developmental trends of body composition of Korean youth. The goal of this study was to compare the body composition of Korean and American youth and to establish body fat standards of Korean youth. The result shows that prevalence of obesity in Korean girls was lower than U.S girls.

### **Selection of subjects**

Eight (80) female subjects were selected for the study. Their ages ranged from 10 to 14 years. These subjects belonged to Mussoorie International School, Mussoorie. The research scholar chose 20 female subjects for the brisk walking programme, 20 female subjects for the jogging programme, 20 female subjects for the circuit training programme and 20 female subjects for control group programme.

### **Experimental design**

Random group design was adopted for this study. Subjects as well as the experimental treatment were randomly assigned to the three experimental groups and one control group which consisted of twenty subjects each.

### **Collection of Data**

The scholar had taken the permission from the principal of the school in order to conduct the health related physical fitness test and also for giving the training schedule to the obese subjects. The research scholar had explained each and every item in details with the demonstration by explaining the purpose of the study and its importance to the subjects. After explaining all necessary points in details subjects were asked to do warming up exercise to avoid the injuries. Some practice trials were given about the testing items to become familiar with the test. The name

and age were procured from the school documents with the permission of concerned authority. The separate stations were setup for different items and the subjects moved from one station to another. The steady state jog test was conducted on the play field.

**Selection of Test Batteries/Variables**

The fit youth today test was conducted to check the health related physical fitness components. Test consisted of the following items; steady states jog, bent knee curl-up, sit and reach test and body composition. To start with the actual experiment of 16 weeks the subjects were divided into four groups. Brisk walking group A, Jogging group B, Circuit training exercise group C and Control group D. Fit youth today test was administered to the subjects before starting the training and after sixteen weeks of training programme.

**Statistical Technique**

For the study analysis of co-variance was used. Analysis of covariance was computed by the ANCOVA test. To find out the (LSD) least significance difference among the groups LSD was used. The purposed hypothesis was tested at .05 level of confidence.

**Analysis of Data**

Subjects participated in physical activity program and completed the pre-test and post-test programme testing. They met the necessary participation requirement of at least 5 days/week. For Fit Youth Today Test body fat was measured by applying the formula by slaughter i.e. %fat = (0.610x sum of skin fold) +5.0. In order to investigate and test the significance of difference if any, analysis of covariance was computed. The hypothesis was tested at .05 level of confidence.

Table 1: Analysis of Covariance of Steady State Jog Test

Sources of variance	d.f	Ssx	ssy	Ssxy	ssyx	Mssyx
Treatment group	4-1=3	370.199	437	400.836	1.02	0.34
Means						
Error	80-4 - =75	364.11	427.4	399.17	10.3	0.137
Total	78	734.30	864.4	800.006	11.3	

\* Significant at 0.05 level of confidence.

Tab F .05 (3, 75) 2.73  $F_{yx} = 2.48$

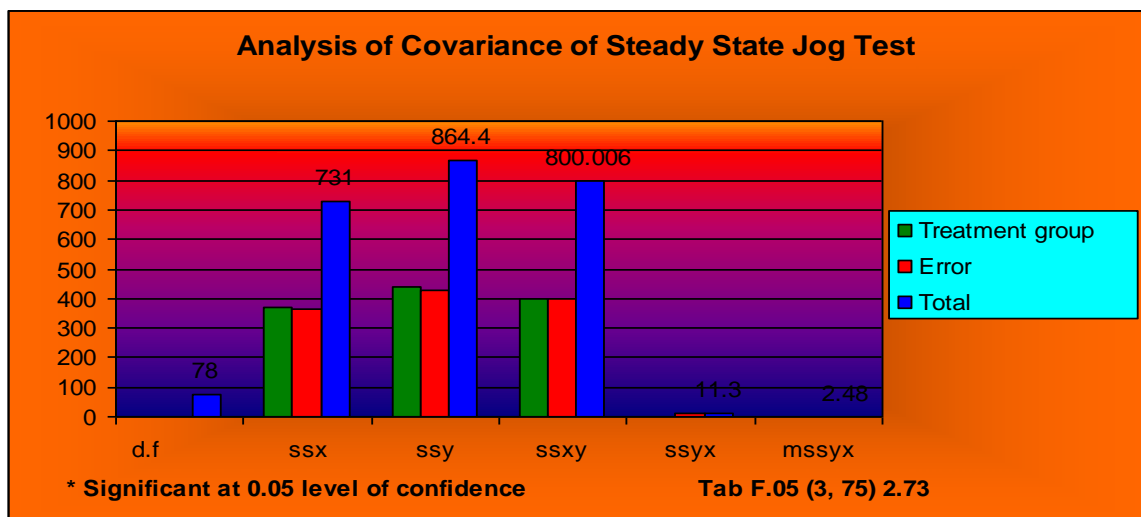


Figure 1

Table 1 and Graph 1 shows that  $F_{yx} 2.48$  is less than Tabulated  $F_{.05} 2.73$ . It is concluded that all the treatments are not equally effective. It may be concluded that there was a significance difference in the training programme on health related physical fitness components of obese

children. In order to find out which treatment is more effective, pair wise comparative analysis on adjusted means of post test had been computed by applying LSD.

Table 2: Comparative Analysis of Adjusted Means of Steady State Jog Test

<b>Brisk Walking</b>	<b>Jogging</b>	<b>Circuit Training</b>	<b>Control</b>
Group-A	Group-B	Group- C	Group-D
2.44	2.47	2.56	2.06

\* Significant at 0.05 level of confidence.

**Tab F .05 (3, 75) 2.73**

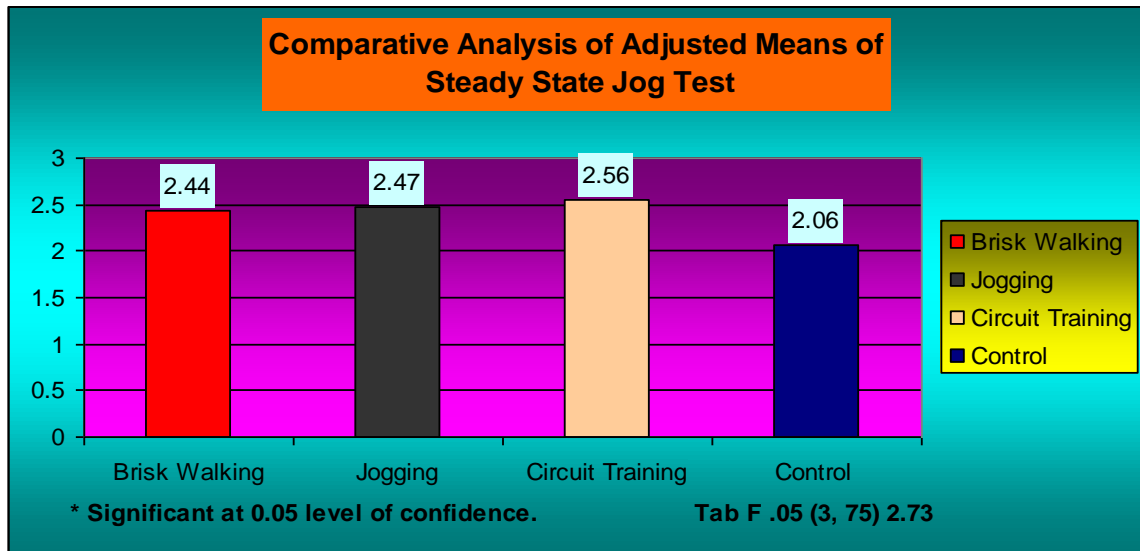


Figure 2.

Table 2 and Graph 2 shows that if a choice has to be made out of three treatments A, B and C, treatment C should be preferred. In other words circuit training programme is the best way to see the effect on health related physical fitness components (STEADY STATE JOG TEST) of obese children.

Table 3: Analysis of Covariance of Sit and Reach Test

<b>Sources of Variance</b>	<b>d.f</b>	<b>Ssx</b>	<b>ssy</b>	<b>ssxy</b>	<b>ssyx</b>	<b>mssyx</b>
Treatment group	4-1= 3	1233.3	179.0	1531.25	232.5	77.5
Means						
Error	80-4-1= 75	1003	15.26	1377	364.5	4.86
Total	78	2236.3	3316	2908.25	596.9	

\* Significant at 0.05 level of confidence.

**Tab F .05 (3, 75) 2.73**

$F_{yx} = 15.95$

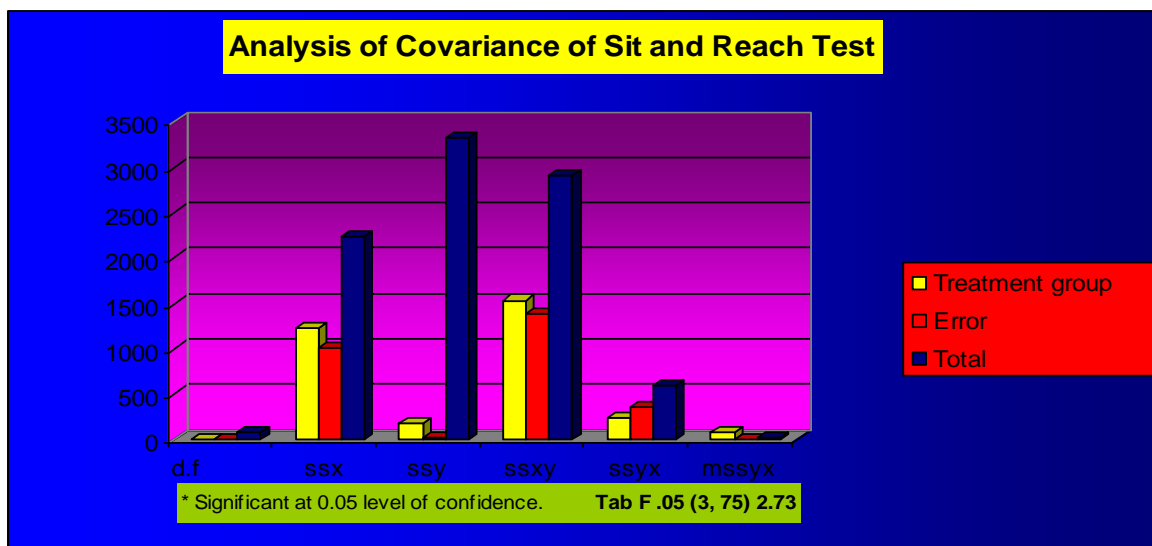


Figure 3.

On the basis of Table 3 and graph 3 it may be concluded that there was a significant difference in the training program. To find out which training program is better on health related physical fitness components of obese children pair wise comparative analysis on adjusted means of post test had been computed by applying LSD.

Table 4: Comparative Analysis of Adjusted Means of Sit and Reach Test

<b>Brisk walking</b>	<b>Jogging</b>	<b>Circuit Training</b>	<b>Control</b>
Group-A	Group-B	Group- C	Group-D
4.151	5.583	5.662	4.19

\* Significant at 0.05 level of confidence.

Tab F .05 (3, 75) 2.73

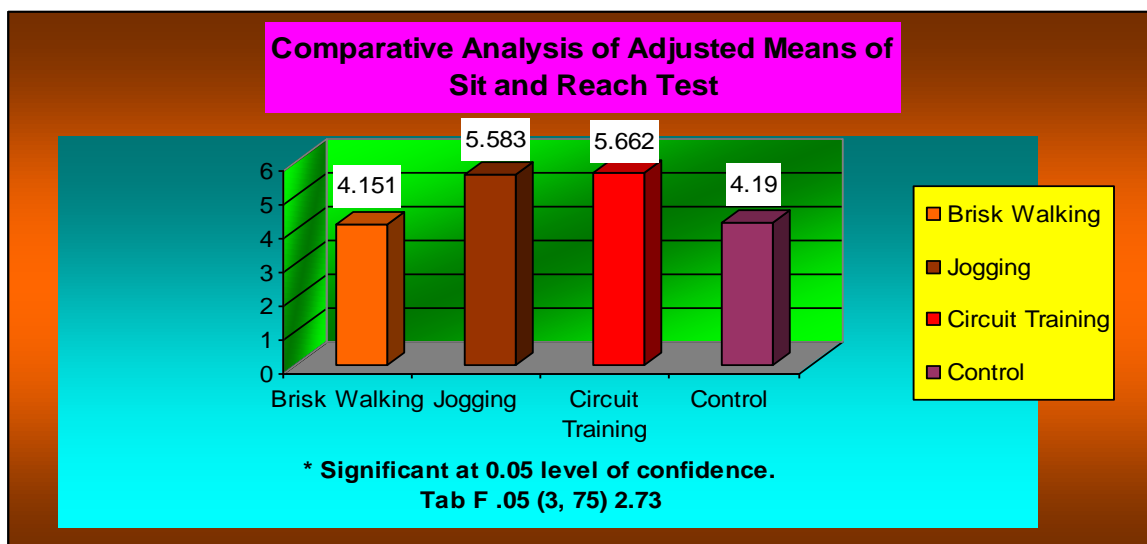


Figure 4.

Table 4 and Graph 4 reveals that treatment C and B are equally effective and also treatment B and A are equally effective whereas treatment D is least effective. It is therefore concluded that if a choice has to be made out of three treatments A, B, and C, treatment C should be preferred.

In other words circuit training program is more effective on health related physical fitness components (Sit and Reach) of obese children.

Table 5: Analysis of Covariance of Bent knee Curl-ups

Sources of variance	d.f	Ssx	ssy	ssxy	ssyx	Mssyx
Treatment group	4-1 =3	221156	30910	25370.79	24710.19	8236.73
Means						
Error	80-4-1=75	219144	28790	24178.09	26122.79	81.64
Total	78	440301	59701	49548.87	50832.98	

\* Significant at 0.05 level of confidence.  
 $F_{yx} = 100.9$

Tab F .05 (3, 75) 2.73

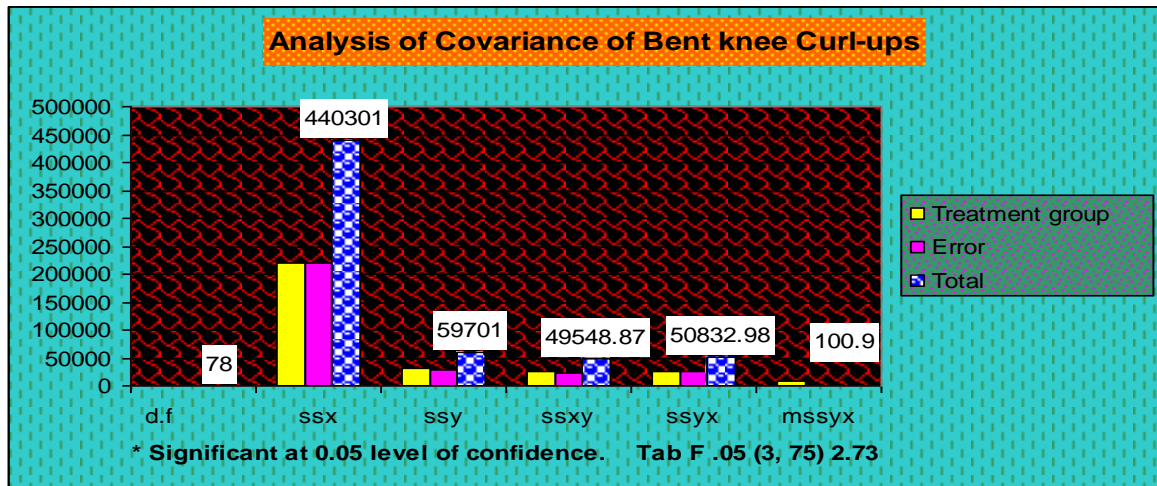


Figure 5.

Table 5 shows that there was a significant difference in the training program on health related physical fitness components of obese children age 10 to 14 years. To find out which training program is more effective on health related physical fitness components of obese children pair wise comparison analysis on adjusted means of post test had been computed by applying LSD.

Table 6: Comparative Analysis of Adjusted Means of Bent knee Curl-ups

Brisk walking	jogging	Circuit training	Control
Group-A	Group-B	Group- C	Group-D
18.37	21.62	22.95	17.2

\* Significant at 0.05 level of confidence.

Tab F .05 (3, 75) 2.73

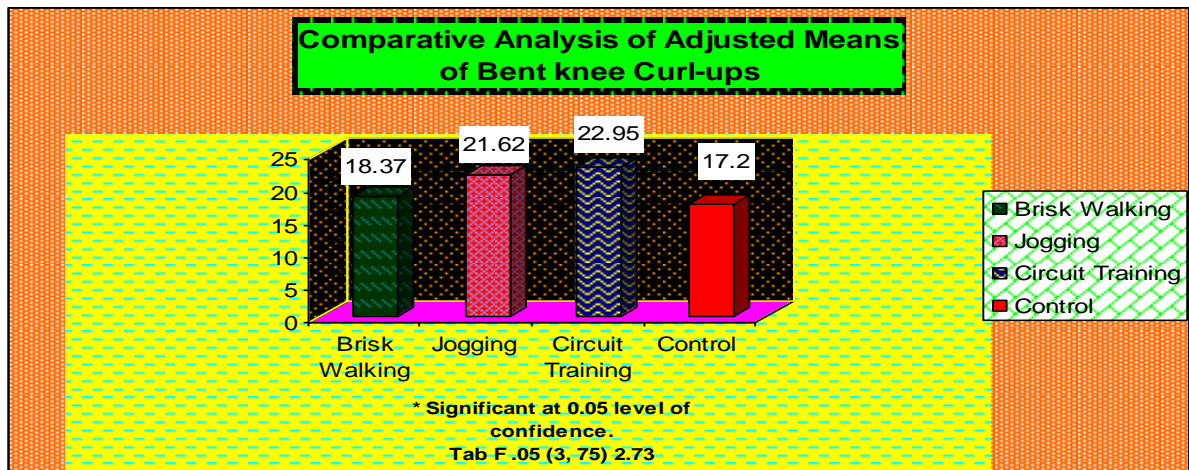


Figure 6.

It is evident from Table 6 and Graph 6 that treatment B and C are equally effective and also treatment A and B are equally effective whereas treatment D is least effective. It is therefore concluded that if a choice has to be made out of three treatments A, B and C treatment C should be preferred. In other words circuit training program is more effective on health related physical fitness components (bent knee curl ups) of obese children.

Table 7: Analysis of Covariance of Skinfold Thickness

Sources of variance	d.f	Ssx	ssy	ssxy	ssyx	Mssyx
Treatment group	4-1 =3	67134.5	57434.5	16994.2	52479.5	17493.2
Means						
Error	80-4-1=75	66802.8	57049.7	16842.5	52800.33	704
Total	78	133937.4	114483.3	33842.8	10527.83	

\* Significant at 0.05 level of confidence.  
 $F_{yx} = 24.84$

Tab F .05 (3, 75) 2.73

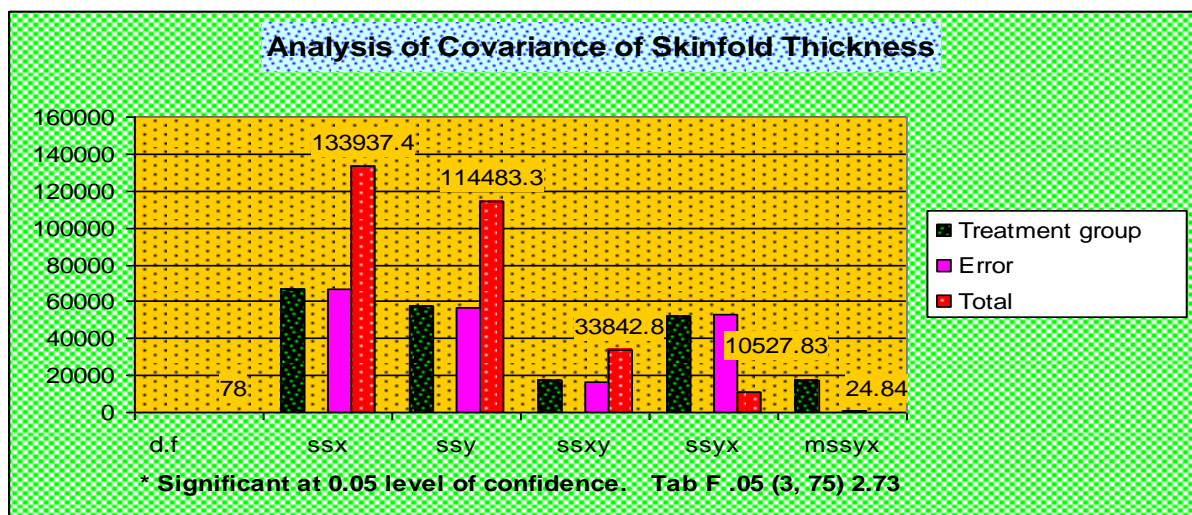


Figure 7.

The analysis of covariance for the above Table 7 and Graph 7 reveals that  $F_{yx} 24.84$  is greater than  $F_{.05} 2.73$  which concluded that all the treatments are not equally effective to see the effect on health related physical fitness components of obese children. Therefore, on the basis of Table -7 it

may be concluded that there was a significant difference in the training program on health related physical fitness components of obese children age 10 to 14 years.

Table 8: Comparative Analysis of Adjusted Means of Skinfold Thickness

<b>Brisk walking</b>	<b>Jogging</b>	<b>Circuit training</b>	<b>Control</b>
Group-A	Group-B	Group- C	Group-D
26.93	26.64	26.04	30.13

\* Significant at 0.05 level of confidence.

Tab F .05 (3, 75) 2.73

Graph-8

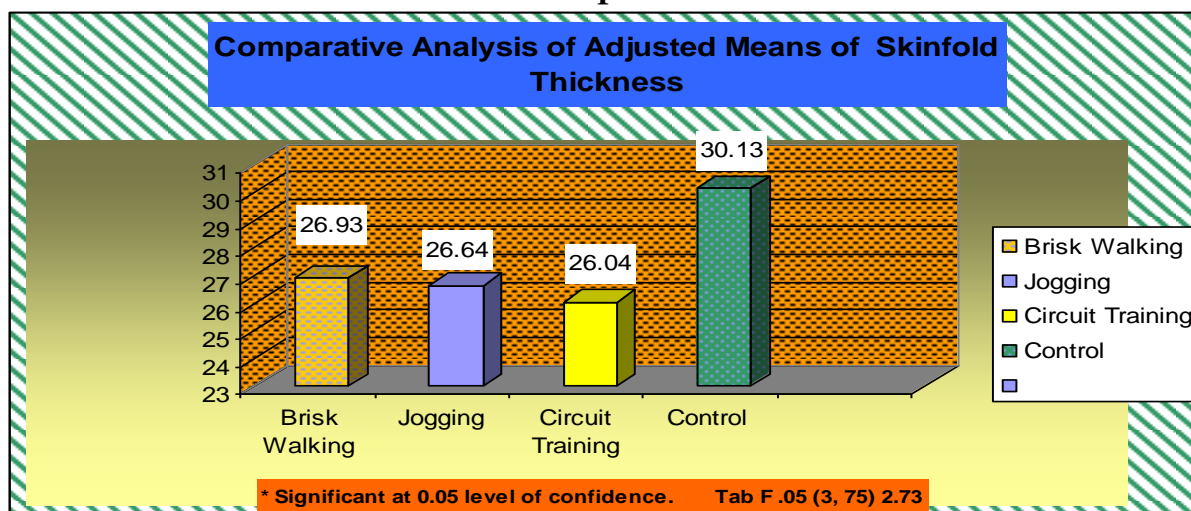


Table 8 and Graph 8 shows that treatment B and C are equally effective and also treatment A and B are equally effective whereas treatment D is least effective. Therefore it is concluded that if a choice has to be made out of three treatments A, B and C treatment C should be preferred. In other words circuit training program is more effective on health related physical fitness components of obese children, and also to reduce the fat percentage from the body.

### Discussion of Findings

The findings reveal that there was a significant difference in all three training programme that is brisk walking, jogging and circuit training. The significant difference show that circuit training programme is better than jogging and brisk walking programme to reduce the body fat percentage from the body and to increase the cardio respiratory efficiency, muscular strength and muscular endurance and flexibility.

### Conclusions

The results showed that there were highly significance difference between the three groups that is Brisk Walking, Jogging and Circuit training programme. Circuit training seems to be more effective than other groups. The participants of circuit training program reduced their body fat and improved their cardio respiratory efficiency, muscular strength and endurance and flexibility as a result of their participation five times per week in circuit training programme that emphasized inclusive participation and a positive atmosphere. Jogging programme was less effective than circuit training programme but participation of jogging programme also reduced their body fat and increases their cardio respiratory efficiency, muscular strength and muscular endurance and flexibility as a result of their participation five times per week in jogging training programme but it was less than circuit training programme. Brisk walking group also reduced their body fat and increase the cardio respiratory efficiency, muscular strength and muscular endurance and flexibility but improvement was less than circuit training and jogging training programme. Participants of control group programme increased their body fat and decreased their cardio respiratory efficiency, muscular strength and muscular endurance and flexibility as they did not take part in any of the training program. They were continuing with their regular routine.



### **Practical Applications**

- a. The findings of the study will help to understand the best exercise programme to reduce the fats.
- b. The findings of the present study will help the coaches and physical education teachers for the formation and recommendation of best exercises for obese children.

### **Acknowledgement**

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