



ORIGINAL RESEARCH PAPER

Physical Education

EFFECTS OF THREE DIFFERENT TRAINING PROGRAMMES ON ABDOMINAL ADIPOSITY OF OVERWEIGHT COLLEGE GIRLS

KEY WORDS: Overweight, overweight, weight training, aerobics, graded circuit training, abdominal adiposity.

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ABSTRACT

The World Health Organization (WHO) describes overweight as one of the today's most important public health problems, which is escalating as a global epidemic. The purpose of the present study was an endeavor to the best method of handling overweight. Out of 96 selected participants from fluvio coastal zone of west Bengal, India on the basis of BMI, 80 overweight girls (average age:20) were consider for the study. The subjects were divided into four groups (20 for each group) randomly namely Weight Training Group (WTG), Aerobic Training Group (ATG), Graded Circuit Training Group (GCTG) and Control Group (CG). Separately designed 12 weeks training programme for WTG, ATG and GCTG was applied on the subjects at morning between 8.00 am to 9.15am for three alternative days per week. After every four weeks, total load was increased. Pre and post test on the groups were conducted to measure the training effect on Abdominal Adiposity of the subjects. The collected data were statistically analyzed by using the analysis of Co-variance ($p < 0.05$) to determine differences, the LSD test was applied as a post hoc test to find out the paired mean differences. From the obtaining result, it was concluded that weight training, aerobics and graded circuit training are found to be effective for reducing Abdominal Adiposity of overweight college girls.

INTRODUCTION

It is the natural passion of human being that he/she wants to see himself or herself in the mirror so young, so handsome, and so beautiful than what he or she is. But the main barrier to achieve all these things is the status of our physique and health. Desire to live a youthful life, in spite of his uninterrupted movement of chronological age, is an unremitting process of hunt of human folk. It will not be exaggeration that it was their lifestyle, surroundings, activity, and food led the primitive travellers a healthy, natural life and overall, it gave them a perfect shape. Shape of a human being seeks the balance distribution of the various components (like muscle, fat and bones etc) in the body. Among these components, fat is the main determining factors of giving right shape and healthy living of a human being. Excessive fat accumulation leads one to be an overweight individual. Abdominal fat accumulation or Abdominal Adiposity is one of the items that determines the overweight level of a person. **Abdominal Adiposity** is a concept that indicates amount of fat accumulated in the abdominal area and it has certainly some negative effects on human body. **Abdominal Adiposity** is the Maximum circumference taken between the last palpable rib and the top of the hip bone. Researchers first focused on abdominal obesity in 1980s when they identified it as an important player of cardiovascular disease, diabetes and dyslipidemia. Abdominal obesity was highly correlated with metabolic dysfunctions associated with cardiovascular disease. In the late 1980s and early 1990s, the invention of insightful and powerful imaging techniques helped the health practitioner to assess in advance the health risks interrelated with body fat accumulation. Computed Tomography and Magnetic Resonance Imaging made it feasible to sort out mass of adipose tissue placed at the abdominal area as intra-abdominal fat and subcutaneous fat. Ghroubi et al. (2007) reported that abdominal circumference is a more reliable indicator than B.M.I of the existence of knee osteoarthritis in obese patients.

Statement Of The Problem

The researcher was interested to assess the effects of weight training, aerobics and graded circuit training on Abdominal Adiposity and compare the results to identify the impacts of those training on Overweight college girls.

MATERIALS AND METHODS

96 overweight female students of "Fluvio-Coastal morphological zone" at Purba Medinipur district of West Bengal, India, were chosen randomly from Bajkul Milani

Mahavidyalaya, Kadmbini Women's College of Education, Vivekananda College of Education, and Sri Ramkrishna College of Education. 18 - 22 years old subjects were selected using B.M.I of the subjects. Out of 96 chosen overweight students eighty were finalised as "selected subject" and their average age was 20 years. 4 groups namely - WTG, ATG, GCTG and CG were formed at random and there have 20 girls in each group. Students underwent Weight Training (WT), Aerobics (AT) and Graded Circuit Training (GCT). All the tests of **Abdominal Adiposity** were conducted in the gymnasium of Bajkul Milani Mahavidyalaya before the beginning of the training (Pre-Training), after every four weeks to assess and determine the rate of increment of load and at the end of training (Post Training). The training programmed was scheduled at 8.00 A.M to 9.15 A.M including warm up and cool down in order to minimize the effect of diurnal variation. Separately designed 12 weeks training programmes for all the independent variables were applied on subjects for three alternative days per week. **Self-Tension Measuring Tape** was used for testing the variables. After every 4 weeks of the experimental period, further load was increased by considering individual ability through test-retest method for all the experimental groups.

After end of 12 weeks' training programme, **Abdominal Adiposity** data was collected. Co-variance (ANCOVA) was used to analyse the collected data to determine the differences (if any) among the groups of dependent variables. LSD test is applied for post hoc test to identify difference between paired mean. 0.05 level of confidence was set as the level of significance.

RESULT OF THE STUDY

Table:1 Analysis of co-variance on abdominal adiposity of overweight college girl students

TEST	WTG	ATG	GCTG	CG	Source of Variance	Sum of Square	Degree of Freedom	Mean Square	F
PRE TEST	90.78	90.9	89.8	89.0			(K-1)		
	95	26	46	535	AMG	46.11	=3	15.3	0.86
	±3.26	±5.0	±3.8	±4.4		61	(N-K)	720	78
	89	493	026	953			=76		
S D					WI	1346.1649		17.7	126

POST TEST	Ms	86.05 85 ±3.12 54	86.4 4 ±4.8 459	86.2 02 ±3.7 763	89.3 615 ±4.7 265	AMG	148.25 09	49.4 169	2.82 97
	S D					WI	1327.2 158	17.4 633	
A D J U S T E D P O S T T E S T M s	85.4 621	85.71 55	86.4 907	90.3 936	A M G	306.9 646	(K-1) =3 (N-K-1)= 75	102. 3215	53.8 362
					WI	142.54 55		1.90 06	

* Significant table value: $F_{0.05} (3, 76) = 2.72$; $N = 80$ (N = subjects' number); $F = F$ ratio; Ms = Means; SD = Standard Deviation; AMG = Among; WI = Within.

Above table presented the Pre-Test "F" ratio '0.8678' was found lower than table value [$0.8678 < tab_{0.05}(3,76)=2.72$]. The Post Test "F" ratio '2.8297' was higher than table value [$2.8297 > tab_{0.05}(3,76)=2.72$]. The calculated Adjusted Post Test Mean "F" value '53.8362' was found statistically significant [$F_{0.05}(3, 75) < 53.8362$]. To identify the critical difference of Adjusted Post Test Means, LSD test has been used and it has been analysed in Table no. 2.

Table:2 Analysis of critical difference of adjusted post test means on abdominal adiposity of overweight college girl students

WTG	ATG	GCTG	CG	MD	C D (5%)
85.4621	85.7155			0.2534NS	0.8631
85.4621		86.4907		1.0286*	
85.4621			90.3936	4.9315*	
	85.7155	86.4907		0.7752NS	
	85.7155		90.3936	4.6781*	
		86.4907	90.3936	3.9029*	

Significant level: 0.05; NS=Not Significant; MD= Mean Difference; CD=Critical Difference

The Adjusted Post Test Mean analysis of **Abdominal Adiposity** presented at above table has confirmed that the differences between WTG and GCTG, WTG and CG, ATG and CG, GCTG and CG were significant. The results of this table have also provided evidence that Adjusted Post Test Mean Difference between WTG and CG was higher significant than other pair groups.

DISCUSSION OF THE FINDINGS

Finding of this research work has revealed that (Table no. 1) the significant differences between WTG and GCTG, WTG and CG, ATG and CG, GCTG and CG were found. This finding on Abdominal Adiposity has also reflected that (Table no. 2) the difference between WTG and CG has confirmed highest significant result. Besides, the results were assisted by some related findings of different researchers (Nindi et al-2000, Hansen D, et al.,-2007, Lean ME, et al.,-1995, and Donnelly JE, et al.,-2009). It has pointed out that the level of Abdominal Adiposity improves if organised training is employed. Participation in regular exercise could decrease waist circumference in overweight and obese people, (Villareal et al.,-2006) and, in this respect, body pump exercise (weight training exercise) for 8 weeks showed significant changes in waist circumference in obese female college students (Stensvold D, et al.,-2010). On the other hand, waist circumference was positively changed after 12 week circuit training and it is used as most effective index to determine abdominal adiposity (Lean et al.,-1995). Likewise, intervention of aerobic dance for 8 weeks reduced waist circumference, hip circumference, waist to hip ratio and suprailiac skinfold of obese women in Turkey (Arslan,-2011). In the present study, weight training group has shown better result than other two experimental groups may be due

to more body fat reduction and localized exercise (Wilmore and Costill,-2004). In contrary, no significant difference in Abdominal Adiposity has been identified between the ATG and GCTG may be due to the training exercises load applied on these two groups were equivalent and statistically the improvement of the groups was almost identical. Therefore, different types of specific training plans may be enough to decrease the Abdominal Adiposity of the Overweight college girl students.

CONCLUSION

From the obtaining result, it was concluded that weight training, aerobics and graded circuit training are found to be effective for reducing abdominal adiposity of overweight college girls.

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