

# Status Analysis and Intervention of Fitness Programme on Selected Psychological Variables among Obese School Boys

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## Abstract

The purpose of the study was to analyze the body mass index status and to determine the effect of fitness programme intervention on selected psychological variables among obese school boys. For the purpose of the study, twenty schools in Chennai educational district which were situated at the core heart of the city were chosen at random. Two thousand male students were chosen at random from these schools for Body Mass Index status analysis. They were between the age group of thirteen and seventeen years. The Body Mass Index status was analyzed for the selected subjects on the basis of BMI for age guidelines given by World Health Organization (WHO) for the children aged 5-19 years in percentiles. After the Body Mass Index status analysis, sixty obese category subjects (BMI for age equal to and above 95<sup>th</sup> percentile) were selected at random. Then they were tested (pre-test) on the selected psychological variables such as self esteem and assertiveness. The selected sixty obese category subjects were assigned in to two groups at random such as experimental group and control group each consisting of thirty subjects. The experimental group underwent the fitness programme for a period of 13 weeks and the control group did not undergo any such experimental treatment. The fitness programme was scheduled 60 minutes a day for 6 days a week except Sunday for a total period of 13 weeks. The fitness programme consisted of the following components such as Class room education, Parent involvement, and Fitness training. The first week was allotted for Class room education and Parent involvement. The remaining twelve weeks were allotted for fitness training. After the fitness programme intervention, post test was conducted on the subjects of the experimental and control group to collect the data of all the selected variables. The collected data were analyzed through one way Analysis of Covariance (ANCOVA) and the level of significance was fixed at 0.05. The selected psychological variables such as self esteem and assertiveness were improved significantly due to the intervention of fitness programme among obese school boys.

**Key words:** Obesity, Fitness programme, Self esteem, Assertiveness, Body mass

## Introduction

Obesity is recognized as a major health problem in many parts of the world and the incidents of the conditions is escalating at an alarming rate. Obesity is a condition with excess accumulation of body fat in relation to the lean body mass. "Indian educational system favours academics over everything else, compromising the overall development of children" (Ramya Kannan, 2010a). Chennaiites are less aware of obesity and children have poor knowledge on balanced and healthy diet. Children in the 8 to 16 age group had lack of knowledge of obesity and hardly had any physical activity during the day. Changing life styles and eating habits are causing obesity in children and scientifically, excess body fat in children is the cause for many clinical and biochemical abnormalities (Ramya Kannan, 2010b). Children acquire fat by an increase in the size of existing adipose cells (hypertrophy) and by new fat cell formation before adulthood (hyperplasia). New fat cells are unlikely to form after age 21 (approximately) unless someone becomes extremely obese (Jerrold et al. 2004). Shepard (1997) found that a reduction of 240 minutes per week in academic class time to provide additional time for physical activity led to consistently higher math scores.

Obesity has an adverse impact on the psychosocial and psychological well being of the children and adolescents. Obesity is one of the most stigmatizing and least socially acceptable conditions in childhood (Schwimmer et al. 2003). Young children are often stigmatized because of obesity and such behaviors can start at ages as young as 3-5 years (Morgan et al. 2002a; Zimetkin et al. 2004). Obese children are often teased and are targets of bullying. Stigmatization could have a marked impact on childhood psychological development (Morgan, 2002b; Puhl & Brownell, 2003), and could explain some of the psychological disorders obese children experience. Zimetkin et al. (2004) reported that obesity is associated with depression, suicidal thoughts and suicide attempts among children. Bogle and Sykes (2011) suggested that multi-component family-based behavioural interventions aimed at reducing sedentary behaviour and increasing physical activity would help to improve psychological behaviour of obese adolescents. Overweight and obesity in childhood have significant impact on both physical and psychological health. In addition, psychological disorders such as depression occur with increased frequency in obese children (Dehghan, Danesh & Merchant, 2005). Shin and Shin (2008) found that childhood obesity may be linked to body dissatisfaction, leading to low self-esteem and high levels of depressive symptoms.

Alan et al. (2004) suggest that the most effective treatments include substantial parental involvement and mental health professionals should help obese children build self-esteem to help them lead full lives regardless of weight. Strauss (2000) found that obese children with decreasing levels of self-esteem demonstrate significantly higher rates of sadness, loneliness, and nervousness and are more likely to engage in high-risk behaviors such as smoking or consuming alcohol. Since, there is a very few studies conducted in this area, the investigator was interested to analyze the body mass index and to determine the effect of fitness programme intervention on selected psychological variables such as self esteem and assertiveness among obese school boys.

### **Purpose of the study**

The purpose of the study was to analyze the body mass index status and to determine the effect of fitness programme intervention on selected psychological variables such as self esteem and assertiveness among obese school boys.

### **Hypothesis**

It was hypothesized that there would be a significant effect on the selected psychological variables such as self esteem and assertiveness due to the intervention of fitness programme among obese school boys.

### **Review of related literature**

Atkinson et al. (1992) conducted a study on Combination of very-low-calorie diet and behavior modification in the treatment of obesity and found that the major components of a BMOD program altered nutrition and eating habits with alteration of amount and patterns of eating improved self-awareness and assertiveness and coping techniques for long-term alteration of lifestyle. Yu et

al. (2008) confirm the 6-week program of either diet-only or diet-and-strength training improved overweight/obese children's self-perception of muscular strength and body composition. Benedicte, Ilse, and Ann (2006) suggest that interventions in youngsters with weight problems should try to increase participation in sports by making activities more fun and attractive for these youngsters.

## **Methods**

The purpose of this was to investigate the effect of intervention of fitness programme on selected psychological variables among obese school boys. Twenty schools in Chennai educational district which were situated at the core heart of the city were chosen at random. Sixty subjects were selected at random (WHO-BMI for age equal to or greater than the 95th percentile). They were between the age group of thirteen and seventeen years. The body mass index was measured by Weight (kg)/Height (m<sup>2</sup>) formula. The selected sixty obese category subjects were tested on the selected psychological variables and assigned in to two groups at random such as experimental group and control group, each consisting of thirty subjects. The experimental group underwent the fitness training programme for a period of 13 weeks and the control group did not undergo any such experimental treatment. The research design of the study was random group design. Both the groups were tested on their selected psychological variables after the experimental period. The self esteem was measured by Rosenberg self esteem scale (1965) and assertiveness was measured by Rathus assertive schedule (1973).

## **Fitness Programme**

The fitness programme was scheduled for 6 days a week except Sunday for a total period of 13 weeks. The fitness programme consisted of class room education, parent involvement, and fitness training. The first week was allotted for class room education and parent involvement. The remaining twelve weeks were allotted for fitness training. Four class room lessons were developed for class room teaching. The lessons dealt with healthy nutrition, active living and healthy life style choices. Central theme of the lessons was to create awareness among the subjects regarding fitness and healthy lifestyle. Parents are important agents in shaping children's eating and physical activity behaviours (Golan & Crow, 2004; Golan, 2006). Four class room lessons were conducted to the parents and the class room lesson dealt with healthy life style, focusing on reducing sedentary activities (watching TV and playing on the computer), promotion of out door play, and reduction of sugar sweetened beverage intake and promotion of having breakfast daily. All of these behaviours have been shown to be associated with childhood obesity.

## **Training Schedule**

The training schedule formulated is given in table I.

Table-I

Day	Fitness Training	Duration
Monday	Warm up, stretching, Cardiorespiratory endurance training and cool down	Warm up and stretching-15 minutes. Cardiorespiratory endurance training-30 minutes. Cool down – 15 minutes.
Tuesday	Warm up, stretching, Weight training and cool down	Warm up and stretching-15 minutes. Weight training-30 minutes. Cool down – 15 minutes.
Wednesday	Warm up, stretching, Minor games and cool down	Warm up and stretching-15 minutes. Minor games - 30 minutes. Cool down – 15 minutes.
Thursday	Warm up, stretching, Weight training and cool down	Warm up and stretching-15 minutes. Weight training-30 minutes. Cool down – 15 minutes.
Friday	Warm up, stretching, Cardiorespiratory endurance training and cool down	Warm up and stretching-15 minutes. Cardiorespiratory endurance training-30 minutes. Cool down – 15 minutes.
Saturday	Yoga and Meditation	Loosening exercise-10 minutes. Surya Namaskar-15 minutes. Asanas- 20 minutes. Meditation – 15 minutes.

The intensity of the exercise for the cardiorespiratory endurance was fixed based on Karvonen method and the intensity was fixed at 55% at the beginning of the fitness programme. The intensity was increased by 5% once in three weeks. The intensity for weight training was fixed between 65 and 75 percent of intensity (8-12 repetitions, 2 sets in each exercise with adequate 30-60 seconds rest in between sets).

### Statistical Procedure

ANCOVA was used to find out the effect of intervention of fitness programme on selected biomechanical gait variables. The 0.05 level of significance was fixed as a test of significance.

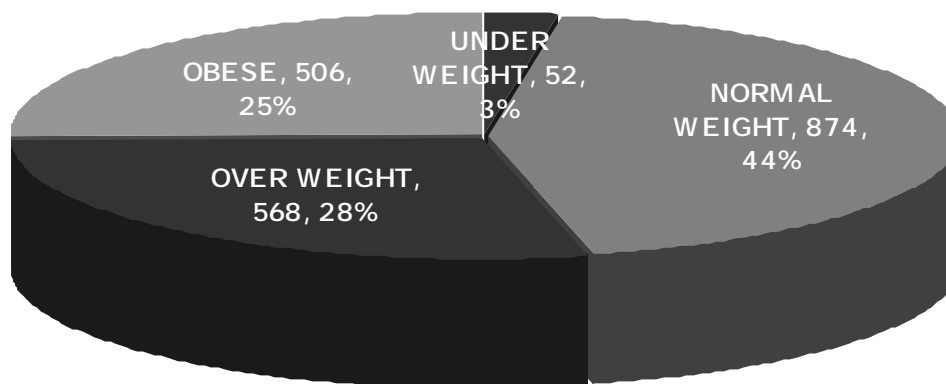
## Results

**Table-II**  
**Showing the Percentage and Number of Subjects in Underweight, Normal Weight, Over Weight and Obese Category in Body Mass Index Status Analysis**

Category	Under weight	Normal weight	Over Weight	Obese
Percentage	2.6%	43.7%	28.4%	25.3%
Number of students	52	874	568	506

**Figure-1**  
**Pie-diagram on Body Mass Index Status of the Subjects (Scores in Numbers and Percentage)**

**Figure 1**  
**Pie diagram on Body Mass Index status of the subjects (Scores in Numbers and Percentage)**



**Table-III**  
**Computation of Analysis of Covariance on Body Mass Index (Scores in kg/m<sup>2</sup>)**

Mean	Control Group	Exp Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre-Test Mean	25.68	25.61	Between	0.06	1	0.06	0.05
			Within	73.25	58	1.26	
Post Test Mean	25.83	23.89	Between	56.33	1	56.33	70.93*
			Within	46.06	58	0.79	
Adjusted Mean	25.81	23.91	Between	53.91	1	53.91	185.45*
			Within	16.57	57	0.29	
Mean Gain	0.15	-1.73					

Table F-ratio at 0.05 level of confidence for df 1 at 57 = 4.09 and for df 1 at 58= 4.06

\*Significant

The pre test scores of control group and experimental group on body mass index were 25.68 and 25.61 respectively. The post test scores of control group and experimental group on Body Mass Index were 25.83 and 23.89 respectively. The ordered adjusted mean scores of control group and experimental group on body mass index were 25.81 and 23.91 respectively. The obtained F value of post test means 70.93 was greater than the required F value 4.06.

**Table-IV**  
**Computation of Analysis of Covariance on Self Esteem**

(Scores in numbers)Mean	Control Group	Exp Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
<b>Pre-Test Mean</b>	12.33	11.53	Between	9.60	1	9.600	<b>1.02</b>
			Within	544.13	58	9.38	
<b>Post Test Mean</b>	12.00	16.27	Between	273.07	1	273.07	<b>53.53*</b>
			Within	295.87	58	5.10	
<b>Adjusted Mean</b>	11.76	16.50	Between	331.33	1	331.33	<b>180.82*</b>
			Within	104.45	57	1.83	
<b>Mean Gain</b>	0.33	4.73					

Table F-ratio at 0.05 level of confidence for df 1 at 57 = 4.09 and for df 1 at 58= 4.06

\*Significant

The pre test scores of control group and experimental group on self esteem were 12.33 and 11.53 respectively. The post test scores of control group and experimental group on self esteem were 12.00 and 16.27 respectively. The ordered adjusted mean scores of control group and experimental group on self esteem were 11.76 and 16.50 respectively. The mean gain in the control group and experimental group on self esteem were 0.33 and 4.73 respectively. The obtained F value of post test means 53.53 was greater than the required F value 4.06.

**Table-V**  
**Computation of Analysis of Covariance on Assertiveness**  
**(Scores in numbers)**

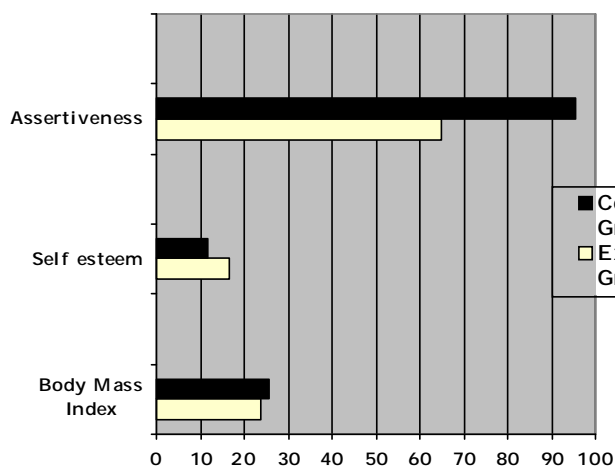
Mean	Control Group	Exp Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
<b>Pre-Test Mean</b>	94.93	98.10	Between	150.42	1	150.417	<b>2.25</b>
			Within	3884.57	58	66.98	
<b>Post Test Mean</b>	94.30	66.20	Between	11844.15	1	11844.15	<b>174.13*</b>
			Within	3945.10	58	68.02	
<b>Adjusted Mean</b>	95.42	65.08	Between	13291.71	1	13291.71	<b>378.07*</b>
			Within	2003.95	57	35.16	
<b>Mean Gain</b>	0.63	- 31.90					

Table F-ratio at 0.05 level of confidence for df 1 at 57 = 4.09 and for df 1 at 58= 4.06

\*Significant

The pre test scores of control group and experimental group on assertiveness were 94.93 and 98.10 respectively. The post test scores of control group and experimental group on assertiveness were 94.30 and 66.20 respectively. The ordered adjusted mean scores of control group and experimental group on assertiveness were 95.42 and 65.08 respectively. The obtained F value of post test means 174.13 was greater than the required F value 4.06.

**Figure-2**  
Showing the ordered adjusted means of experimental group and control group on self esteem and assertiveness



## Discussions

**Goldfield (2007)** found that increases in PA were associated with increases in perceived physical conditioning, body satisfaction, and overall physical self-worth independent of changes in body mass index (BMI). Reductions in TV viewing were also related to increased physical and global self-worth.

The mean gain on body mass index in control group and experimental group were 0.15 and -1.73 respectively and it was evident that the fitness programme intervention reduced the body weight (6.7%) significantly among the subjects of experimental group.

**Knopfli et al. (2008)** found that eight weeks of multidisciplinary inpatient programme improved body composition among obese adolescents. Huang et al. (2007) proved that twelve week heart health education and physical activity programme improved body mass index. **Taylor, Mazzone and Wrotniak (2005)** found that education and exercise based intervention on overweight children improved body mass index. **Eliakim et al. (2002)** found that the weight management programme reduced the body weight and body mass index (BMI) and increased the fitness in obese children and adolescents.

As shown in table IV, the obtained F value on the scores of pre test means 1.02 was less than the required F value 4.09, which proved that the random assignment of the subjects were successful and their scores in self esteem before the training were equal and there was no significant difference.

The obtained F value on the ordered adjusted means 180.82 was greater than the required F value 4.09, which revealed that the fitness programme intervention had a significant improvement on self esteem among the subjects of experimental group.

The mean gain on self esteem in control group and experimental group were 0.33 and 4.73 respectively and it was evident that the fitness programme intervention improved the self esteem significantly among the subjects of experimental group.

**Duncan, Al-Nakeeb and Nevill (2009)** examined the effect of 6-week circuit-based training on body esteem and body mass index and found significant improvement on self esteem. The finding of the present study is in line with the findings of Duncan, Al-Nakeeb and Nevill (2009).

**Huang et al. (2007)** reported that one-year intervention targeting physical activity, sedentary, and diet behaviors among adolescents improved body image and self-esteem which agree with the results of the present study.

**Marco Bonhauser et al. (2005)** concluded that school-based physical activity program improved the self esteem of adolescents which supports the findings of the present study.

The mean gain on assertiveness in control group and experimental group were 0.63 and -31.90 respectively and it was evident that the fitness programme intervention increased (32.51% reduction of scores) the assertiveness significantly among the subjects of experimental group.

**Atkinson, Fuchs, Pastors and Saunders (1992)** reported that combination of very-low-calorie diet and behavior modification improved assertiveness among obese subjects. Atkinson, Fuchs, Pastors and Saunders (1992) findings supports the findings of the present study. The reduction in the body mass index had positive benefits on the self esteem and assertiveness of obese school boys.

## Conclusions

It was concluded that the intervention of fitness programme had a significant effect on the selected psychological variables self esteem and assertiveness among obese school boys. It is recommended that obese students should be given fitness programme to gain the psychological benefits.

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