

## **A comparative study of obesity and per cent body fat among the college going girls (18-22 years)**

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### **ABSTRACT**

Obesity in India has reached epidemic proportions in the 21<sup>st</sup> century, with morbid obesity affecting 5 per cent of the country's population. Obesity is major risk factor for cardiovascular diseases, NGOs such as the INDIAN HEART ASSOCIATION have been raising awareness about this issue. In the present study was done to comparative study of obesity and Per cent body fat among college going girls. The sample comprised of 150 girls (mean age = 20.6 years) selected randomly from post graduate student of Banasthali University. A questionnaire was framed to collect the information from the respondent regarding personal profile, physical activity and dietary pattern, different anthropometric measurements such as height, weight, mid upper arm circumferences and skin fold thickness. BMI and Per cent body fat were calculated using standard techniques. According to BMI 93.8 per cent of respondents were normal or underweight categories (below 17 - 25). Only 5.9 per cent of respondents were in obese category. The result revealed that 18 per cent of the respondents had high per cent of body fat above 35. On the other hand 69.33 per cent of the respondents were obese and had their Per cent of body fat ranged between 30 –34.9. When BMI and per cent body fat analyzed simultaneously then the study revealed that 55 per cent of respondents were having normal BMI and but high per cent of body fat. It was found that 13 per cent of respondents had low BMI but high per cent of body fat. 12 per cent of respondents had low BMI and low per cent of body fat. Only 8.6 per cent of respondents had high BMI as well as high per cent of body fat. Result showed that the respondents had high BMI as well as High Per cent body fat. The study revealed that as the BMI increased mean per cent body fat also increased. According to study BMI strongly correlate with the Per cent body fat.

**Key Words :** Obesity, Body fat, College going girls, Indian heart association

### **INTRODUCTION**

With worldwide rates of obesity increasing steadily, the National Institutes of Health (NIH) and the World Health Organization (WHO) recently adopted similar body weight guidelines for overweight and obesity (Gallaghedympna *et al.*, 2000). Overweight specifically refers to an excess body weight compared to set standards (Zafar *et al.*, 2007).

Obesity is a major health concern all over the world. There are number of health hazards associated with obesity including diabetes, hypertension, cardiovascular disease, arthritis, anesthesia

risk, respiratory problems and breast cancer (Bamji, 2004).

Anthropometry is one of the most basic classification for assessing nutritional status. A variety of methods are available to measure body fatness and body thinness. The most frequently used tools in public health evaluation and clinical screening are anthropometric based measurement such as skinfold thickness or circumference measurement such as various height and weight- based indexes, weight for height Body Mass Index (Soni and Verma, 2013).

The assessment of obesity should ideally based on measurement of body fat. According to WHO females having per cent body fat more than 30 are obese. The measurement of body fat done through skin fold thickness (SFT). High adult body fatness is better predicted by SFT (skin fold thickness) should therefore be used are the preferred screening tools to determine high body fatness (Bisla and Mishra, 2009).

## METHODOLOGY

The present study was carried out in Banasthali University, Rajasthan. The study was taken to assess the anthropometrical indicators such as height, weight and per cent body fat among 150 post graduate students (girls) between the age of 18 – 22 years selected randomly. All girls were belonged to different state and were vegetarians. Personal information about age, dietary pattern and demographic profile were collected through questionnaire. Each student was contacted personally at their hostel. The body height measured with an anthrometer in standing erect position to the nearest 0.9 cm. Body weight was measured on electronic digital scale with in aquracy of up to 0.1 kg. Skin fold thickness was measured from four sites with the help of caliper. These were biceps, triceps, subscapular and suprailiac. Per cent mean and standard deviation was calculated. BMI = weight (kg) / height (m<sup>2</sup>) and per cent body fat were calculated for assessment of overweight and obesity.

## RESULTS AND DISCUSSION

### Selection of the respondents :

All selected respondents were females and belongs to post graduate courses in Banasthali University. The respondents belong to different state and they live in hostel. All were vegetarian because they had to strictly follows vegetarianism in University. They were from middle or upper income group and have sedentary life style. They took four meal diet which provide around 1996.7 kcal and 76.38 g protein.

Table 1 indicated that majority of the respondent *i.e.* 40 per cent were belonged to the UP state while 22 per cent of the respondent were belonged to the Rajasthan. Only 10 per cent of the respondents were belonged to the Bihar.

**Table 1 : Distribution of respondent according to their belongingness (n = 150)**

State	Number of student	Per cent
Punjab	21	14
Bihar	15	10
UP	60	40
MP	4	2.6
Rajasthan	33	22
Uttarakhand	17	11.3

**Anthropometric evaluation of the respondents :**

**BMI (Body Mass Index) :**

The present study revealed that 49.3 per cent of respondents were having normal BMI range 20-25 and their mean was  $22.16 \pm 1.62$ . The result showed that they have normal weight status. The respondents who had slightly lower weight were 18.6 per cent. BMI and their mean  $\pm$  SD was  $19.30 \pm 0.34$  in Table 2.

The Table 2 indicated that 18.6 per cent of the respondents bound to have BMI (range 17 – 18.5) and their mean was  $17.86 \pm 0.48$ . They were prone to malnutrition. On the other hand 7.3 per cent of respondents lie below the 17 BMI range and they had their BMI mean was  $16.22 \pm 0.59$ . They all were in the malnutrition category. The study revealed that only 4.6 per cent of the respondents come in overweight category (25-30 BMI range). They were prone to obesity and associated diseases and their BMI mean was  $28.73 \pm 1.25$ . Another 1.3 per cent of the respondents had BMI range 30-40.

BMI range	No. of respondents	Per cent	Mean $\pm$ SD(BMI)
Above 40(obese grade 3 )	0	0	0
30 – 40 (obese grade 2 )	2	1.3	$32.40 \pm 0.14$
25 – 30 (obese grade 1)	7	4.6	$28.13 \pm 1.25$
20 – 25 (normal)	74	49.3	$22.16 \pm 1.62$
18.5- 20(low weight- normal)	28	18.6	$19.30 \pm 0.34$
17- 18.5 (chronic energy deficiency grade 1- mild)	28	18.6	$17.86 \pm 0.48$
Below 17 (chronic energy grade 2- moderate)	11	7.3	$16.22 \pm 0.57$
Total	150	-	20.80

**Per cent Body Fat :**

Table 3 revealed that 12.26 per cent of the respondents had normal body fat (< 30 %). They were not obese. Their mean body fat was  $27.32 \pm 3.43$ . On the other hand 69.33 per cent of the respondents had body fat > 30 and their mean per cent body fat was  $35.56 \pm 0.40$ . They had high body fat and more prone to obesity associated diseases. On the basis of total fat content 87.33 per cent of the respondents had high fat content (30 - above 35).

Per cent body fat	No. of respondents	Per cent	Mean $\pm$ SD (Per cent body fat)
Below – 30	19	12.26	$27.32 \pm 3.43$
30 – 34.9	104	69.33	$32.64 \pm 1.32$
Above – 35	27	18	$35.56 \pm 0.40$
Total	150	-	32.49

**Per cent body fat and BMI :**

Table 4 showed that 55 per cent (n=83) of the respondents had normal BMI and high per cent body fat and their BMI and Per cent body fat mean were  $21.19 \pm 1.81$  and  $33.06 \pm 1.55$  respectively. According to the study only 13 per cent (n=20) of respondents had low BMI and high per cent body fat. Their BMI mean was  $17.5 \pm 1.01$  and per cent body fat mean was  $32.36 \pm 2.00$ . While 12 per cent (n=18) of the respondents had low BMI and low per cent body fat. Their BMI and per cent body fat mean was  $17.18 \pm 0.80$ ,  $26.38 \pm 2.72$ , respectively.

Other 10 per cent (n=16) of respondents had normal BMI and low per cent body fat. Their BMI mean was  $21.16 \pm 1.65$  and per cent body fat mean was  $27.88 \pm 3.68$ .

Remaining 8.6 per cent (n=13) of respondents had high BMI and high per cent body fat. Their BMI mean was  $27.89 \pm 2.62$  and per cent body fat mean was  $33.61 \pm 1.58$  according to the Table 4.

<b>Table 4 : BMI and per cent body fat status of respondents (n=150)</b>				
	No. of respondents	Per cent	mean $\pm$ SD ( BMI )	Mean $\pm$ SD (Per cent body fat)
Normal BMI(18.5 - 25) and Low per cent body fat ( $\geq 30$ )	16	10	$21.16 \pm 1.59$	$27.88 \pm 3.55$
Normal BMI(18.5 - 25) and High per cent body fat ( $> 30$ )	83	55	$21.19 \pm 1.80$	$33.06 \pm 1.51$
Low BMI( $< 18.5$ ) and low per cent body fat ( $\leq 30$ )	18	12	$17.18 \pm 0.78$	$26.38 \pm 2.64$
Low BMI ( $< 18.5$ ) and High per cent body fat ( $> 30$ )	20	13	$17.5 \pm 0.98$	$32.36 \pm 1.95$
High BMI ( $> 25$ ) and High per cent body fat ( $> 30$ )	13	8.6	$27.89 \pm 2.52$	$33.61 \pm 1.52$
Total	150	-	21.05	32.49

### Conclusion :

According to the study, it was concluded that 8.6 per cent of respondents had high BMI and High body fat. No respondents lie in category of high BMI and low per cent of body fat. So maximum per cent from total respondents had normal and low BMI but all had high per cent of body fat which were not highlighted by their BMI. So this study shows that BMI may not good predictor about per cent of body fat of a respondent. This study confirmed the significant positive relationship between BMI and Per cent body fat which was demonstrated in most of the studies.

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