

# A Comparative analysis of BMI among Males and Females Aged between 15-75 Years

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## ABSTRACT

**Introduction:** Obesity trend has increased drastically both in developing and developed countries. Even in many low income countries its incidence is increasing. A simple marker recommended by WHO as a reflection of total body fat is body mass index (BMI). The aim of the present study was to compare the BMI amongst males and females between 15-75 years.

**Material and methods:** The present prospective cross sectional survey was conducted in the Department, Institute during a period of 6 months. On the basis of BMI subjects were categorised as normal, obese and overweight. The study sample was divided into two groups. All the data thus obtained was arranged in a tabulated form and analysed using SPSS software. Student t test was used for the analysis of data.

**Results:** The present study included 270 men and 300 women. The mean age of the subjects was 42.37 $\pm$  11.53 years. There were 10.4% men between 20-30 years of age and 7.6% men between 31-40 years of age with BMI  $\geq$  28 Kg/m<sup>2</sup>. There were 7.6% women between 20-30 years of age and 8.3% men between 31-40 years of age with BMI  $\geq$  28 Kg/m<sup>2</sup>.

**Conclusion:** From the above study we can conclude that there is considerable variation in the BMI amongst men and women. There were a higher proportion of women with high BMI as compared to men.

**Keywords:** BMI, Obesity, Prospective

## INTRODUCTION

Obesity trend has increased drastically both in developing and developed countries. Even in many low income countries its incidence is increasing. As per World Health Organization (WHO), about 1.6 billion adults are overweight, and 400 million of them are obese.<sup>1,2</sup> Approximately 1 amongst 5 obese subjects in the world are obese.<sup>3</sup> Both obesity and overweight carry a significant risk of various health problems like diabetes, hypertension and cardiovascular diseases. The amount of adipose tissue in the body can affect insulin resistance and causes release of proinflammatory mediators and hence increasing the risk of thrombosis.<sup>1,4</sup> A simple marker recommended by WHO as a reflection of total body fat is body mass index (BMI). However it is the indicator of weight excess but not the type of body's fat composition. Various studies have been conducted amongst different populations to show association between BMI, fat distribution and body fat percentage.<sup>5</sup> Metabolic risks associated with obesity are greater amongst Asian subjects as compare to subjects of European descent.<sup>6</sup> There have been certain cut BMI off points for overweight and obese subjects to reduce the incidence of discrepancy<sup>7-9</sup> but the best

obesity index is still non conclusive.<sup>10</sup> The aim of the present study was to compare the BMI amongst males and females between 15-75 years.

## MATERIAL AND METHODS

The present prospective cross sectional survey was conducted in the Department, Institute during a period of 6 months. The study included all the subjects reporting to the department between the ages of 20-80 years. Subjects with chronic debilitating diseases affecting the weight were excluded from the study. Subjects with congenital disorders or hereditary conditions were also excluded from the study. All the subjects were informed about the study and a written consent was obtained from all in their vernacular language. The ethical committee clearance was obtained from the Institutional ethical committee. The demographic details like age, gender of all the subjects was obtained. Body mass index of the subjects was obtained by dividing weight in kilograms with height in metre square. On the basis of BMI subjects were categorised as normal, obese and overweight. The study sample was divided into two groups. Subjects with BMI  $\geq$  28 were taken in Group I and subjects with BMI  $\geq$  30 were taken into Group II. The data was calculated in mean  $\pm$  standard deviation. All the data thus obtained was arranged in a tabulated form and analysed using SPSS software. Student t test was used for the analysis of data.

## RESULTS

The present study included 270 men and 300 women. The mean age of the subjects was 42.37 $\pm$  11.53 years. Table 1 shows the Anthropometric variables amongst men. There were 10.4% men between 20-30 years of age and 7.6% men between 31-40 years of age with BMI  $\geq$  28 Kg/m<sup>2</sup>. There were 5.2% men between 41-50 years of age and 9.6% men between 51-60 years of age with BMI  $\geq$  28 Kg/m<sup>2</sup>. There were 2.8% men between 41-50 years of age and 4% men between 51-60 years of age with BMI  $\geq$  30 Kg/m<sup>2</sup>. There was no significant difference between the subjects with both BMI. There were 5.2% men between 20-30 years of age and 2.4% men between 31-40 years of age with BMI

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Age Group	BMI	BMI $\geq$ 28 (kg/m <sup>2</sup> )	BMI $\geq$ 30(kg/m <sup>2</sup> )	P value
20-30 years	23.4 $\pm$ 4.3	26(10.4%)	13(5.2%)	<0.05
31-40 years	23.2 $\pm$ 3.2	19(7.6%)	6(2.4%)	>0.05
41-50 years	23.0 $\pm$ 3.3	13(5.2%)	7(2.8%)	>0.05
51-60 years	23.9 $\pm$ 3.5	24(9.6%)	10(4%)	>0.05
61-70 years	25.0 $\pm$ 3.2	25(10%)	11(4.4%)	<0.05
71-80 years	23.3 $\pm$ 3.5	22(8.8%)	4(1.6%)	<0.05

**Table-1:** Anthropometric variables amongst men(270)

Age Group	BMI	BMI $\geq$ 28 (kg/m <sup>2</sup> )	BMI $\geq$ 30(kg/m <sup>2</sup> )	P value
20-30 years	21.4 $\pm$ 3.3	23(7.6%)	4(1.3%)	<0.05
31-40 years	23.2 $\pm$ 3.5	25(8.3%)	12(4%)	>0.05
41-50 years	23.5 $\pm$ 3.7	25(8.3%)	9(3%)	>0.05
51-60 years	24.7 $\pm$ 3.8	47(15.6%)	13(4.3%)	<0.05
61-70 years	25.0 $\pm$ 3.1	48(16%)	15(5%)	<0.05
71-80 years	24.3 $\pm$ 3.0	46(15.3%)	21(7%)	<0.05

**Table-2:** Anthropometric variables amongst women(300)

$\geq$  28 Kg/m<sup>2</sup>. There was a significant difference between the subjects with these BMI. The mean BMI between 20- 30 years and 31-40 years was 23.4 $\pm$ 4.3 and 23.2 $\pm$ 3.2 respectively. The mean BMI between 61-70 years and 71-80 years was 25.0 $\pm$ 3.2 and 23.3 $\pm$ 3.5 respectively.

Table 2 shows the Anthropometric variables amongst women. There were 7.6% women between 20-30 years of age and 8.3% men between 31-40 years of age with BMI  $\geq$  28 Kg/m<sup>2</sup>. There were 8.3% women between 41-50 years of age and 15.6% women between 51-60 years of age with BMI  $\geq$  28 Kg/m<sup>2</sup>. There were 3% women between 41-50 years of age and 4.3% women between 51-60 years of age with BMI  $\geq$  30 Kg/m<sup>2</sup>. There was no significant difference between the subjects with both BMI. There were 1.3% women between 20-30 years of age and 4% women between 31-40 years of age with BMI  $\geq$  28 Kg/m<sup>2</sup>. There was a significant difference between the subjects with these BMI. The mean BMI between 20- 30 years and 31-40 years was 21.4 $\pm$ 3.3 and 23.2 $\pm$ 3.5 respectively. The mean BMI between 61-70 years and 71-80 years was 25.0 $\pm$ 3.1 and 24.3 $\pm$ 3.0 respectively.

## DISCUSSION

BMI is usually regarded as an ultimate marker of excess body fat in terms of overweight and obesity.<sup>11,12</sup> It is considered as an ideal alternative for measuring fatness of body rather of body mass. In our present study, There were 10.4% men between 20-30 years of age and 7.6% men between 31-40 years of age with BMI  $\geq$  28 Kg/m<sup>2</sup>. There were 5.2% men between 41-50 years of age and 9.6% men between 51-60 years of age with BMI  $\geq$  28 Kg/m<sup>2</sup>. There were 2.8% men between 41-50 years of age and 4% men between 51-60 years of age with BMI  $\geq$  30 Kg/m<sup>2</sup>. There was no significant difference between the subjects with both BMI. There were 5.2% men between 20-30 years of age and 2.4% men between 31-40 years of age with BMI  $\geq$  28 Kg/m<sup>2</sup>. There was a significant difference between the subjects with these BMI. The mean BMI between 20- 30 years and 31-40 years was 23.4 $\pm$ 4.3 and 23.2 $\pm$ 3.2 respectively. The mean BMI between

61-70 years and 71-80 years was 25.0 $\pm$ 3.2 and 23.3 $\pm$ 3.5 respectively. Obesity has been a major epidemic worldwide affecting almost more than 300 million people around the globe. Obese subjects carry a risk of various metabolic diseases like diabetes mellitus, disorders of fat, protein and carbohydrate metabolism. From the clinical point of view, visceral adipose tissue generates diabetogenic substances<sup>13</sup> and, may be considered as more diagnostic as compared to total fat. Waist circumference and waist/hip ratio have been considered as useful tools for measurement of central obesity and body mass index (kg/m<sup>2</sup>) has been a useful indicator of general obesity.<sup>14</sup> In a study conducted by Ford et al.<sup>15</sup>, they supported the use of waist circumference as a tool to measure obesity to predict its health risk. According to them waist circumference is a better and good predictor than BMI for predicting metabolic syndromes, CVD. According to present study, There were 7.6% women between 20-30 years of age and 8.3% men between 31-40 years of age with BMI  $\geq$  28 Kg/m<sup>2</sup>. There were 8.3% women between 41-50 years of age and 15.6% women between 51-60 years of age with BMI  $\geq$  28 Kg/m<sup>2</sup>. There were 3% women between 41-50 years of age and 4.3% women between 51-60 years of age with BMI  $\geq$  30 Kg/m<sup>2</sup>. There was no significant difference between the subjects with both BMI. There were 1.3% women between 20-30 years of age and 4% women between 31-40 years of age with BMI  $\geq$  28 Kg/m<sup>2</sup>. There was a significant difference between the subjects with these BMI. The mean BMI between 20- 30 years and 31-40 years was 21.4 $\pm$ 3.3 and 23.2 $\pm$ 3.5 respectively. The mean BMI between 61-70 years and 71-80 years was 25.0 $\pm$ 3.1 and 24.3 $\pm$ 3.0 respectively. Various other indicators have been used to describe body fat distributions that are associated with abdominal obesity.<sup>14</sup> Like subscapular/triceps skin fold ratio has been used for description of central versus peripheral obesity. Other indicators like waist/hip ratio and the waist/thigh ratio are used to identify the upper versus lower body fat. Various other indices like waist/height ratio and abdominal to mid-thigh girth, are used to identify obesity on the basis of a different criteria. However, the

only negative effect is these ratios are difficult to interpret biologically, are not much sensitive to gain in weight, and they carry statistical limitations.<sup>16-19</sup>

## CONCLUSION

From the above study we can conclude that there is considerable variation in the BMI amongst men and women. There were a higher proportion of women with high BMI as compared to men. Obesity is a risk factor for various health related disorders like diabetes, hypertension etc. Education regarding obesity is crucial to prevent various metabolic disorders.

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