

## Research Article

# A study to assess prevalence of obesity among medical students of G.R. medical college, Gwalior, M. P., India

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## ABSTRACT

**Background:** Obesity is emerging as a serious problem throughout the world, not only among adults but also children, teenagers and young adults. Medical education is stressful throughout the whole course of training. Overweight and obesity is one of the preventable cause of morbidity and mortality. The social implications of obesity are a major problem that is often neglected. Objectives of current study were to assess the prevalence of overweight and obesity in medical students and to assess the factors influencing the development of overweight and obesity.

**Methods:** The present study was a cross sectional study of II<sup>nd</sup> semester medical students in which, a total of 131 students were included. The study involved administration of a pretested questionnaire to the students and their anthropometric measurements.

**Results:** In a batch of 150 students 131 participated in the study in which 90 (68.70%) were males and 41 (31.30%) were females. The prevalence of overweight was 13 (9.93%) and the prevalence of obesity was 2 (1.53%).

**Conclusion:** The study showed a high prevalence of overweight and obesity among the medical students. At the time of anthropometric measurements awareness was created for their weight and for the promotion of physical activity among medical students.

**Keywords:** Medical students, Obesity, Overweight, Physical activity

## INTRODUCTION

Overweight and obesity are defined as abnormal or excessive fat accumulation in the body that may impair health. Body mass index is a simple index of weight for height that is commonly used to classify overweight and obesity among adults. It is defined as a person's weight in kilograms divided by the square of his height in meters ( $\text{kg}/\text{m}^2$ ). The WHO definition of overweight is a BMI greater than or equal to 25 and the definition of obesity is a BMI greater than or equal to 30. Overweight and obesity are the fifth leading risk factors for global death.

At least 2-8 million adults die each year as a result of being overweight or obese. In addition, 44% of the diabetes burden, 23% of the ischemic disease burden and between 7% & 41% of certain cancer burdens are attributable to overweight and obesity.<sup>1</sup>

The prevalence of obesity was higher among boys than in among girls and slightly higher in urban areas (12%) than rural areas.<sup>2</sup> Body mass index has been one of the commonest way to determine the transition of a person from normal weight to obesity. It is simple to calculate and to categorize a person as underweight, normal,

overweight and obese with its stages. Thus BMI not only identifies obesity but also person's in pre obese stages.<sup>3</sup> So a screening program based on BMI would be helpful not only in identifying obese but also pre- obese persons so that timely measures could be taken for its correction, prevention and control in students and in community as a whole.

In recent years occurrence of and overweight and obesity are very high affecting both developed and developing countries like India.<sup>4,5</sup> The causes of adult obesity include a variety of factors like diet, genetic predisposition, lack of physical activity and other behavioral factors.<sup>6,7</sup>

In India little attention has been paid to childhood and adulthood obesity until recently.<sup>8</sup>

Studies on medical students and health personnel in many countries suggested that obesity is a problem among these population groups.<sup>9-13</sup>

Considering all these factors the present study has been undertaken.

## METHODS

The present study was a cross sectional descriptive study done on II<sup>nd</sup> semester Students of G.R. medical college Gwalior. In a batch of 150 students, 131 students participated in the study. 11 students were not included in the study due to certain administrative problems, 8 students were absent due to some or the other reasons. The study was done for a period of 4 months from Jan 2014 to April 2014.

A brief introduction on obesity and overweight and its implications were explained and a written consent was obtained for the participation in the study. The general details of the students like name, age, sex, type of diet (Veg/nonveg) and anthropometric measurements were taken. Body Mass Index (BMI) was calculated using the formula weight in kg / height in meters.<sup>2</sup> The WHO BMI classification was followed, i.e.

Underweight <18.50, normal range 18.50-24.99, overweight ≥25.00 which is further subdivided as pre obese 25-29.99, obese class I 30-34.99, obese class II 35.00-39.99, obese class III ≥ 40.

The weight was taken by bathroom scale weighing machine (accurate upto 0.5 kg), the marking of the height in cm was made on the wall up to an accuracy of 0.5 cm. The height was measured by asking them to stand barefoot and facing the back in approximation to the wall and keeping a scale straight on the head. A point was marked by the pencil on the wall. The reading was taken and then communicated to the participants to write on the questionnaire and then to calculate its BMI and to classify their own self so as to make them aware that in which category they lie.

The weighing machine was checked and corrected, if required, for zero error before the start of the study. They were also checked and corrected, if required, after every 10<sup>th</sup> reading during the study period. The dietary habits were enquired regarding the vegetarian or non-vegetarian diet. If the student is consuming non vegetarian food more than or three times in a week then he/she labeled as non-vegetarian. They were also asked regarding the physical activity (if duration <60 minutes/week labeled as non-performer and if duration ≥60 minutes/week labeled as performer) performed or not performed. The study was approved by the ethical committee of the college.

Statistical analysis was done after collection of the data and it was analyzed and interpreted. Percentages and Chi square test were applied to it.

## RESULTS

In a total of 131 students the age range of the students was from 18 to 24 years. Among them 90 (68.70%) were males and 41 (31.30%) were females. The mean age of the male medical students who participated in the study was 21.18 ± 2.38 years and the mean age of the females was 19.26 ± 1.43 years as shown in Table 1. The prevalence of overweight was 13 (9.93%) and the prevalence of obesity was 2 (1.53%). The prevalence of underweight was 25 (19.08%) as shown in Table 2. The mean BMI which was observed in males was 21.51 ± 3.03 and for females 21.32 ± 3.30. The height and weight for males and females respectively as, 168.74 ± 5.71, 155.53 ± 5.32 and 60.91 ± 9.94, 51.12 ± 8.13. It was correlated with the category of the students and it showed that the prevalence of overweight/obesity was more in unreserved category in comparison to other categories (OBC, SC, ST) as shown in Table 3. Table 4 shows religion-wise distribution in which the maximum prevalence of obesity was in Hindus 13 (10.84%). Table 5 shows the distribution in relation to their origin, dietary habits and physical activity. The maximum prevalence of obesity was seen in urban origin who lacks physical activity 2 (2.43%).

**Table 1: Showing the age and sex-wise distribution of the participants.**

Age (years)	Sex		Total	
	Males (68.70%) n=90	Females (31.30%) n=41	No. n=131	%
18	10 (11.11)	13 (31.70)	23	17.56
19	12 (13.33)	11 (26.83)	23	17.56
20	18 (20.00)	10 (24.39)	28	21.37
21	17 (18.91)	04 (09.76)	21	16.03
22	07 (07.77)	02 (04.88)	09	06.87
23	13 (14.44)	01 (02.22)	14	10.68
24	13 (14.44)	00 (00.00)	13	09.93

**Table 2: Sex-wise distribution of participants in relation to classification of BMI.**

BMI	Sex		Total	
	Males (%) n=90	Females (%) n=41	No. n=131	%
<18.50 (Underweight)	14 (15.56)	11 (26.82)	25	19.08
18.50-24.99 (Normal)	65 (72.22)	26 (63.42)	91	69.46
25-29.99 (Pre obese)	10 (11.11)	03 (07.32)	13	09.93
30-34.99 (Obese class I)	01 (1.11)	01(02.44)	02	01.53
35-30.99 (Obese class II)	00 (00)	00 (00)	00 (00)	00 (00)
≥40 (Obese class III)	00 (00)	00 (00)	00 (00)	00 (00)

**Table 3: Showing category and sex-wise distribution of participants in relation to classification of BMI.**

BMI	UR n=47		OBC n=39		SC n=22		ST n=23	
	Males (%) n=27	Females (%) n=20	Males (%) n=31	Females (%) n=08	Males (%) n=20	Females (%) n=02	Males (%) n=12	Females (%) n=11
<18.50 (Underweight)	04 (14.81)	04 (20.00)	05 (16.13)	01 (12.50)	03 (15.00)	00 (00)	02 (16.67)	06 (54.35)
18.50-24.99 (Normal)	16 (59.24)	14 (70.00)	24 (77.42)	06 (75.00)	15 (75.00)	02 (100)	10 (83.33)	04 (36.36)
25-29.99 (Pre obese)	06 (22.22)	01 (05.00)	02 (6.45)	01 (12.50)	02 (10.00)	00 (00)	00 (00.00)	01 (09.10)
≥30 (Obese)	01 (37.03)	01 (05.00)	00 (00)	00 (00)	00 (00)	00 (00)	00 (00)	00 (00)

**Table 4: Religion and sex-wise distribution of participants in relation to classification of BMI.**

BMI	Hindus		Muslims		Sikhs		Christians	
	Males (%) n=83	Females (%) n=37	Males (%) n=04	Females (%) n=02	Males (%) n=00	Females (%) n=01	Males (%) n=03	Females (%) n=01
<18.50 (Underweight)	14 (16.88)	09 (24.33)	00 (00)	01 (50)	00 (00)	01 (100)	00 (00)	00 (00)
18.50-24.99 (Normal)	58 (69.88)	24 (64.87)	04 (100)	01 (50)	00 (00)	00 (00)	03 (100)	01 (100)
25-29.99 (Pre obese)	10 (12.04)	03 (08.10)	00 (00)	00 (00)	00(00)	00 (00)	00 (00)	00 (00)
≥30 (Obese)	01 (01.20)	01 (02.70)	00 (00)	00 (00)	00 (00)	00 (00)	00 (00)	00 (00)

**Table 5: Distribution of participants according to their origin, dietary habits and physical activity.**

BMI	Sex	Origin			Diet			Physical activity		
		Rural (%) n=49	Urban (%) n=82	X <sup>2</sup>	Veg (%) n=71	Nonveg (%) n=60	X <sup>2</sup>	Yes (%) n=83	No (%) n=48	X <sup>2</sup>
<18.50 (Underweight)	M	07 (14.29)	07 (08.54)	0.46	09 (12.67)	05 (08.33)	0.24	11 (13.25)	03 (06.25)	06.58
	F	04 (08.16)	07 (08.54)	Df=1 P=0.49	06 (08.45)	05 (08.33)	Df=1 P=0.62	03 (03.61)	08 (16.67)	Df=1 P=0.01
18.50-24.99 (Normal)	M	29 (59.19)	36 (43.90)	06.87	27 (38.03)	38 (63.34)	07.39	40 (48.19)	25 (52.08)	03.11
	F	04 (08.16)	22 (26.83)	Df=1 P0.009	19 (26.76)	07 (11.67)	Df=1 P=0.007	21 (25.30)	05 (10.43)	Df=1 P=0.07
25-29.99 (Pre Obese)	M	04 (08.16)	06 (07.32)	0.43	07 (09.86)	03 (05.00)	01.31	06 (07.23)	04 (08.33)	0.43
	F	01 (02.04)	02 (02.44)	Df=1 P=0.83	01 (01.41)	02 (03.33)	Df=1 P=0.25	02 (02.42)	01 (02.08)	Df=1 P=0.83
≥30 (Obese)	M	00 (00)	01 (01.22)	00	01 (01.41)	00 (00)	00	00 (00)	01 (02.08)	00
	F	00 (00)	01 (01.22)		01 (01.41)	00 (00)		00 (00)	01 (02.08)	

## DISCUSSION

The prevalence of overweight and obesity among the II<sup>nd</sup> semester students was similar to that of general population in India. In the present study 13 (9.93%) were overweight and pre obese classification, and 2 (1.53%) were obese class I. Similar study reported a prevalence of 11.7% overweight & 2% obesity among medical students in Delhi.<sup>14,15</sup>

The results were quite similar to Chhabra et al. study<sup>16</sup> which reported a prevalence of 11.7% overweight and 2% obesity among medical students of Delhi.

In a study conducted in Kelantan by the department of medicine, University Sains Malaysia, the overall prevalence of overweight & obesity was 21.3% & 4.5% respectively.<sup>17</sup> A study conducted on prevalence of overweight & obesity from AIMST University in Malaysia showed a prevalence of pre obesity (BMI 25-29.9) & obesity as 15.9% & 5.2% respectively<sup>18</sup> which was quite high in comparison to this study.

Boo NY et al.<sup>19</sup> conducted a study to determine the prevalence of obesity among medical students in a private medical school in Malaysia & found that 30.1% of the students were overweight or obese, Malays & Indians were more obese than the Chinese & unlike the national data a significantly higher proportion of the male students were found to be overweight. This was dissimilar to the present study finding.

The International Diabetes Foundation has accepted BMI >25 kg/m<sup>2</sup> and >23 kg/m<sup>2</sup> as cut off value for Obesity for Asian men and women respectively and according to this, the prevalence of obesity among males was 32% and among Females was 52% which was alarming.

In the present study 65% of overweight and obese give history of either or of both parents. This is almost similar to the fact that if one parent is obese there are 50% chances of children being obese. When both parents are obese the children have an 80% chances of being obese.<sup>16,18,20</sup>

Results from a previous study done in Pakistan provided evidence that obesity was common with a family history of Diabetes.<sup>20</sup>

In the present study it was noted that unreserved category had the maximum percentage of overweight and obesity in comparison to OBC, SC or ST respectively. Similarly the Hindus had a higher prevalence in comparison to Muslims, Sikhs and Christians respectively.

The present study revealed that urban origin with BMI 18.50-24.99 kg/m<sup>2</sup> had significance (P = 0.009) regarding their life style.

## CONCLUSION

It can be concluded from the present study that obesity and overweight are quite prevalent in the medical students. BMI is a simple and effective way to screen them so that timely measures could be taken to prevent their progression and complications.

Measures to increase physical exercise could be undertaken using the behavior change communication strategy. Awareness regarding dietary habits should also be perceived by them. Persons with BMI >24.99 kg/m<sup>2</sup> should be motivated for regular physical activity.

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