



Original Article

## A Study on Prevalence of Overweight and Obesity among MBBS Medical Students in a Tertiary Care Hospital: A Cross-Sectional Study

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### ABSTRACT

**Background:** Obesity has emerged as a major global public health challenge and is associated with significant metabolic and cardiovascular complications. Medical students, despite their health awareness, may be vulnerable to obesity because of sedentary academic routines, stress, irregular dietary habits, and lack of physical activity. The present study aimed to determine the prevalence of overweight and obesity among MBBS students and assess its association with family history of obesity-related diseases.

**Methods:** A cross-sectional study was conducted among 261 MBBS students from four academic batches (2021–2024) at Laxmi Chandravansi Medical College and Hospital, Jharkhand, during January–February 2025. Universal sampling was used. Data were collected using a pre-tested self-designed Google Form questionnaire. Body mass index (BMI) was calculated using Quetelet's formula. Data were analysed using Microsoft Excel and SPSS software. Descriptive statistics and chi-square tests were applied, with  $p < 0.05$  considered statistically significant.

**Results:** Among 261 students, 119 (45.6%) were overweight, 22 (8.4%) had grade I obesity, and 2 (0.8%) had grade II obesity. The mean BMI was  $23.62 \pm 4.38$ . Male students showed a higher proportion of overweight/obesity compared to females. Association between gender and BMI category was found to be statistically significant ( $p < 0.001$ ) indicating that gender plays an important role in determining BMI distribution. Family history of hypertension was the most common associated factor, present in mothers of 84 students and fathers of 98 students.

**Conclusion:** The prevalence of overweight and obesity among MBBS students was high, particularly among male students. Strong family history of obesity, diabetes, and hypertension suggests increased long-term cardio metabolic risk. Early lifestyle interventions and institutional health promotion programs are recommended.

**Keywords:** Obesity, Overweight, BMI, MBBS students, Cross-sectional study, Family history

### INTRODUCTION

Overweight and obesity have become major global public health challenges of the 21st century, with a rapidly increasing prevalence across all age groups. According to the World Health Organization (WHO), in 2022 around 43% of adults were

overweight and 16% were obese, and the global prevalence of obesity has more than doubled since 1990 [1]. Recent estimates indicate that more than 1 billion people worldwide were living with obesity in 2022, accounting for approximately 13% of the global population, and the burden continues to rise steadily [2]. These conditions are commonly assessed using body mass index (BMI) and are strongly associated with an increased risk of non-communicable diseases such as cardiovascular diseases, type 2 diabetes mellitus, hypertension, and certain cancers [3,4].

An individual is classified as overweight if their body mass index (BMI) ranges from 25 to 29.9 kg/m<sup>2</sup>, while a BMI of 30 kg/m<sup>2</sup> or higher is considered obese [5,6]. According to the revised guidelines for Asian populations, individuals are categorized as overweight when their BMI is between 23 and 24.9 kg/m<sup>2</sup>, pre-obese when it ranges from 25 to 29.9 kg/m<sup>2</sup>, and obese when it is 30 kg/m<sup>2</sup> or above [7].

Young adults, particularly university students, represent a vulnerable group undergoing significant lifestyle transitions. Changes in dietary patterns, increased consumption of calorie-dense fast foods, reduced physical activity, prolonged screen time, and psychosocial stress contribute to weight gain in this population. Medical students, despite their knowledge of healthy lifestyle practices, are especially prone to these risk factors due to demanding academic schedules, irregular sleep patterns, and high stress levels. These factors collectively create a discrepancy between knowledge and personal health practices [8].

Recent global evidence highlights a substantial burden of overweight and obesity among medical students. A 2024 systematic review and meta-analysis reported a pooled prevalence of 18% for overweight and 9% for obesity, with an overall combined prevalence of approximately 24%, indicating a rising trend over time [9]. Similar findings have been reported in various regional studies, including India, where prevalence rates of overweight range from about 14% to 18% and obesity from 3% to 6% among MBBS students [10]. Other studies have reported even higher figures, with overweight and obesity affecting up to 20% and 8% of medical students respectively [11]. These variations reflect differences in lifestyle, dietary habits, and sociocultural factors.

Multiple determinants have been identified for overweight and obesity among medical students, including physical inactivity, unhealthy dietary habits, frequent consumption of fast food, and academic stress [12]. Studies have consistently shown that sedentary behavior and poor lifestyle choices significantly contribute to increase in BMI in this group [13]. Additionally, factors such as gender, family history, and irregular meal patterns have been found to influence the risk of obesity [14].

The presence of overweight and obesity among future healthcare providers is of particular concern. Physicians' personal health behaviours influence their attitudes and effectiveness in counselling patients regarding lifestyle modification. Therefore, unhealthy practices among medical students may adversely affect their future role in promoting public health. Given the increasing prevalence and its long-term implications, it is essential to assess the magnitude of overweight and obesity among MBBS students, especially in tertiary care settings where academic and environmental pressures are substantial. Hence, the present study aims to determine the prevalence of overweight and obesity among MBBS students in a tertiary care hospital and to emphasize the need for early preventive and lifestyle-based interventions.

#### **Objectives:**

1. To determine the prevalence of overweight and obesity among MBBS students.
2. To assess gender-wise distribution of BMI categories.
3. To study the association of BMI with family history of obesity, diabetes, and hypertension.

#### **MATERIALS AND METHODOLOGY:**

##### **Study Design and Setting**

This institution-based cross-sectional study was conducted at Laxmi Chandravansi Medical College and Hospital, a tertiary care teaching hospital located in Bishrampur, Palamu district of Jharkhand, India.

##### **Study Duration**

The study was carried out over a period of two months, from January 2025 to February 2025.

##### **Study Population**

The study population comprised undergraduate MBBS students from the 2021, 2022, 2023, and 2024 batches enrolled at the institution during the study period.

##### **Sample Size and Sampling Technique**

Questionnaires were distributed to all MBBS students of the college, with a total student strength of 400 across all batches. Students who provided informed consent were included in the study and submitted the completed forms. A total of 261

students participated. Universal sampling was employed, whereby all eligible students from the selected batches were invited to participate, and those who consented were included in the final analysis.

### Inclusion Criteria

- All MBBS students from the selected batches who were willing to participate and provided informed consent.

### Exclusion Criteria

- Students who were unwilling to participate
- Students who submitted incomplete questionnaire responses

### Data Collection Tool and Procedure

Data were collected using a self-designed, structured, and pre-tested questionnaire administered via Google Forms. The questionnaire was pilot-tested on a small group of students (not included in the final analysis) to ensure clarity, validity, and reliability.

The questionnaire collected information on socio-demographic characteristics, anthropometric measurements, and relevant family history. Participants were instructed to provide accurate self-reported height and weight measurements.

### Study Variables

The following variables were assessed in the study: sociodemographic variables, including age and gender; anthropometric variables, including height (in meters), weight (in kilograms), and body mass index (BMI); and the primary outcome variable, which was BMI classification. In addition, relevant risk factors were evaluated, including family history of obesity, family history of diabetes mellitus, and family history of hypertension.

### BMI Calculation and Classification

Body Mass Index (BMI) was calculated using Quetelet's index ( $BMI = \text{weight in kg}/\text{height in m}^2$ ) [15]. BMI was classified according to Asia-Pacific guidelines, where  $BMI < 18.5 \text{ kg/m}^2$  was considered underweight,  $18.5\text{--}22.9 \text{ kg/m}^2$  normal,  $23\text{--}24.9 \text{ kg/m}^2$  overweight,  $25\text{--}29.9 \text{ kg/m}^2$  pre-obese, and  $\geq 30 \text{ kg/m}^2$  obese [16,17].

### Statistical Analysis

Data were entered into Microsoft Excel and subsequently analyzed using IBM SPSS Statistics version 25.0. Continuous variables, such as age and body mass index (BMI), were expressed as mean  $\pm$  standard deviation (SD), while categorical variables, including gender and BMI categories, were summarized using frequencies and percentages. The association between categorical variables was assessed using the Chi-square test. A p-value of less than 0.05 was considered statistically significant.

### Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee prior to the commencement of the study. Participation was voluntary, and informed consent was obtained from all participants. Confidentiality and anonymity of the data were strictly maintained throughout the study in accordance with ethical research guidelines.

### RESULTS:

A total of 261 MBBS students participated in the study. In Table 1, the distribution of body mass index (BMI) categories revealed that the majority of students were either overweight or had normal BMI. Specifically, 119 (45.6%) students were overweight, 107 (41.0%) had normal BMI, 22 (8.4%) were classified as obese grade I, and 2 (0.8%) as obese grade II, while only 11 (4.2%) students were underweight. The mean BMI was  $23.62 \pm 4.38$ . Overall, the combined prevalence of overweight and obesity was notably high, accounting for more than half of the study population.

**Table 1: Prevalence of BMI Categories (N =261)**

BMI Category	Frequency (N=261)	Percentage (%)
Underweight	11	4.2
Normal	107	41.0
Overweight	119	45.6
Obese Grade I	22	8.4
Obese Grade II	2	0.8
<b>Total</b>	<b>261</b>	<b>100</b>

Note: Mean BMI:  $23.62 \pm 4.38$

In Table 2 gender-wise analysis demonstrated clear differences in BMI distribution. Among male students (n = 139), a substantial proportion were overweight (82; 59.0%) and obese (20; 14.4%), while only 36 (25.9%) had normal BMI and 1 (0.7%) was underweight. In contrast, among female students (n = 122), the majority had normal BMI (71; 58.2%), followed by overweight (37; 30.3%), obese (4; 3.3%), and underweight (10; 8.2%). These findings indicate a higher burden of overweight and obesity among male students compared to females.

**Table 2: Gender-wise Distribution ( N=261)**

Gender	Obese	Overweight	Normal	Underweight	Total
Male	20	82	36	1	139
Female	4	37	71	10	122
<b>Total</b>	<b>24</b>	<b>119</b>	<b>107</b>	<b>11</b>	<b>261</b>

Table 3 shows the assessment of family history of diseases showed that a considerable number of students reported a positive family history. Obesity was reported in 51 mothers and 48 fathers, diabetes mellitus in 60 mothers and 76 fathers, and hypertension in 84 mothers and 98 fathers, suggesting a significant familial presence of these conditions.

**Table 3: Family History of Diseases (N =261)**

Disease	Mother	Father
Obesity	51	48
Diabetes Mellitus	60	76
Hypertension	84	98

Table 4 shows the analysis of BMI categories in relation to family disease history and demonstrates a clear trend of higher prevalence of obesity, diabetes mellitus, and hypertension among students belonging to higher BMI categories. For instance, among students with a maternal history of obesity, the majority were either obese (24) or overweight (12), with fewer falling in normal (14) and underweight (1) categories. A similar pattern was observed with paternal history. In the case of diabetes mellitus and hypertension, both maternal and paternal histories were more frequently associated with overweight and obese students compared to those with normal or underweight BMI. These findings indicate a strong familial clustering and suggest both genetic and shared lifestyle influences contributing to higher BMI among students.

**Table 4: Disease status among Family of different BMI categories of students (N = 261)**

Family disease status	Family member	Obese	Overweight	Normal	Underweight	Total
Obesity	Mother	24	12	14	1	51
	Father	20	12	14	2	48
Diabetes mellitus	Mother	22	18	15	5	60
	Father	30	25	17	4	76
Hypertension	Mother	37	21	22	4	84
	Father	38	32	25	3	98

Table 5 shows the association between gender and BMI category was found to be statistically significant. The Chi-square test showed a highly significant relationship ( $\chi^2 = 45.58$ ,  $df = 3$ ,  $p < 0.001$ ), indicating that gender plays an important role in determining BMI distribution. Male students exhibited a markedly higher prevalence of overweight and obesity compared to female students, whereas female students were more likely to have normal or underweight BMI. This statistically significant association highlights the need for gender-specific interventions in addressing overweight and obesity among medical students.

**Table 5: Association between gender and BMI category among MBBS students**

(N = 261)

Gender	Underweight N (%)	Normal N (%)	Overweight N (%)	Obese N (%)	Total	Chi-square test( $\chi^2$ )	p value
Male	1 (0.7)	36 (25.9)	82 (59.0)	20 (14.4)	139	45.58	< 0.001
Female	10 (8.2)	71 (58.2)	37 (30.3)	4 (3.3)	122		
<b>Total</b>	<b>11</b>	<b>107</b>	<b>119</b>	<b>24</b>	<b>261</b>		

Table 6 shows the association between diet category and BMI category, which was not statistically significant. The Chi-square test showed no significant relationship ( $\chi^2 = 9.87$ ,  $df = 6$ ,  $p = 0.130$ ), indicating that dietary habit did not significantly influence BMI distribution among the study participants.

**Table 6: Association between diet category and BMI category (261)**

DIET CATEGORY		Vegetarian	Eggeterian	Non-vegetarian	Total	Chi square and P VALUE
BMI Category	Underweight	2(3.2)	1(5.9)	8(4.42)	11	$\chi^2 = 9.87$ $p = 0.130$
	Normal	35 (55.56)	8(47.05)	64(35.35)	107	
	Overweight	21(33.34)	8(47.05)	90 (49.73)	119	
	Obese	5(7.9)	0	19(10.50)	24	
<b>Total</b>		<b>63(100)</b>	<b>17 (100)</b>	<b>181 (100)</b>	<b>261</b>	

**DISCUSSION:**

The present study found that 54.8% of MBBS students were either overweight or obese, indicating a substantial burden of excess body weight among future healthcare professionals. This prevalence is considerably higher than the pooled global prevalence of excess weight (24%) reported by Shafiee et al. in a recent systematic review and meta-analysis of 99 studies among medical students, suggesting that the burden in our institution may be particularly high [9]. The relatively higher prevalence observed in the present study compared to other studies may be attributed to the use of self-reported anthropometric measurements, which may introduce reporting bias. Additionally, sedentary lifestyle, academic stress, and institution-specific environmental factors could have contributed to increased BMI among students.

A study by Mehmood et al. reported a mean age of  $21.49 \pm 1.59$  years among medical students, with 126 out of 405 students having BMI between 25 and 45.6. Among these, both male and female students were almost equally affected. Additionally, a proportion of these students had comorbid conditions such as hypertension and gallstones [18].

A recent North Indian study reported 17.8% overweight and 5.8% obesity among medical undergraduates, with significant associations between BMI and gender as well as family history of obesity [14]. The markedly higher prevalence in the present study may be explained by differences in lifestyle, dietary patterns, academic stress, and local sociocultural factors. Gender-wise analysis in our study demonstrated a significantly higher prevalence of overweight and obesity among male students ( $\chi^2 = 45.58$ ,  $p < 0.001$ ). Similar observations were reported in studies from Central India and North India, where male gender was significantly associated with increased BMI [19]. This may be attributed to sedentary lifestyle, higher caloric intake, frequent fast-food consumption, lower body image concerns, and reduced health-seeking behavior among male students.

Family history analysis revealed clustering of obesity, diabetes mellitus, and hypertension among overweight and obese students. This finding is in agreement with previous evidence showing that family history of obesity significantly predicts higher BMI among medical students, highlighting the role of genetic predisposition and shared household lifestyle behaviors [20].

The findings of the present study are supported by similar research conducted at Government Medical College Thrissur, which reported that 20.7% of MBBS students were overweight and 13.3% were obese based on Asia-Pacific BMI classification. Although the prevalence observed in the current study is comparatively higher, both studies highlight a substantial burden of excess weight among medical students. The Thrissur study further identified significant associations of obesity with factors such as sex, type of accommodation, and frequency of junk food consumption, emphasizing the role of lifestyle and environmental influences. These findings reinforce the notion that medical students, despite their knowledge, are vulnerable to obesity due to sedentary habits, academic stress, and unhealthy dietary practices. Given that obesity is a major risk factor for various non-communicable diseases, these results underscore the need for early preventive interventions targeting modifiable risk factors within medical colleges [21].

The findings of the present study are comparable to those of similar studies, which have reported a considerable prevalence of overweight among medical students [22]. In a study involving 385 students, 75 (19.48%; 95% CI: 15.53%–23.44%) were found to be overweight, with a markedly higher proportion among males (14.85%) compared to females (4.69%). This gender disparity is consistent with the observations in the present study, where male students also exhibited a higher prevalence of overweight and obesity. Such differences may be attributed to variations in lifestyle behaviors, including dietary habits, physical activity levels, and health awareness. The relatively lower overall prevalence in that study compared to the current findings may be due to differences in study setting, population characteristics, or BMI classification criteria; however, both studies highlight the growing concern of excess body weight among medical students, particularly among males.

Universities and colleges are in a strategic position to encourage healthy behaviors among students. However, unhealthy lifestyle practices are widespread in this group, highlighting the need for comprehensive health education programs. [23,24]

Addressing obesity among medical and healthcare students is particularly important, as they are future healthcare professionals and serve as role models within their communities.

Another study reveals a high prevalence of overweight and obesity (53.2%) among medical students, which is considerably higher than that observed in the general population, highlighting a growing health concern in this group [25]. A greater proportion of male students (57.6%) were overweight compared to females, although nearly half of the female students (49.7%) were also affected, indicating that both genders are substantially vulnerable. The higher proportion of obesity (30.3%) compared to overweight (22.9%) suggests a shift toward more severe forms of excess weight. Notably, over half of the late adolescents were either overweight or obese, emphasizing early onset of the problem. Although only a small percentage (6.8%) reported a family history of obesity, the clustering of unhealthy behaviors such as smoking and alcohol consumption—with around 60% of such individuals being obese—suggests a strong lifestyle influence. Additionally, the psychosocial impact is evident, with over one-fourth of students experiencing dissatisfaction with their appearance and weight-related bullying. Encouragingly, a majority (61%) reported taking steps to reduce their weight, reflecting awareness and motivation. Overall, these findings underscore the urgent need for targeted interventions addressing lifestyle modification, behavioral risk factors, and mental well-being among medical students.

The findings emphasize the need for periodic BMI screening, nutrition education, regular physical activity promotion, and behavior change interventions within medical colleges. These findings further emphasize the need for early lifestyle interventions targeting modifiable risk factors among medical students.

#### **CONCLUSION:**

The present study demonstrates a high prevalence of overweight and obesity among MBBS students, indicating a significant burden of excess body weight in this population. Association between gender and BMI category was found to be statistically significant ( $p < 0.001$ ) indicating that gender plays an important role in determining BMI distribution. Male students were found to be more affected compared to females. Additionally, a positive family history of metabolic disorders such as obesity, diabetes, and hypertension may further increase the future risk among these students. These findings highlight the urgent need for early preventive strategies within medical institutions, including health education, routine BMI monitoring, and the promotion of regular physical activity to reduce the risk of obesity and its associated complications.

#### **Limitations of the Study:**

This study has certain limitations that should be considered while interpreting the results. Being a single-center study, the findings may not be generalizable to all medical student populations. The use of self-reported height and weight may have introduced reporting bias, potentially affecting the accuracy of BMI calculations. Furthermore, important factors such as detailed dietary habits and physical activity levels were not comprehensively assessed, which could have provided deeper insights into the determinants of overweight and obesity.

#### **Recommendations:**

Based on the findings of the study, several recommendations can be proposed. Regular annual BMI assessment and health screening should be implemented for all students to enable early detection and management of overweight and obesity. Nutrition and lifestyle counseling sessions should be organized to promote healthy eating habits and behavioral changes. Medical colleges should also encourage structured sports and fitness programs to increase physical activity among students. Additionally, awareness workshops focusing on the risks associated with obesity and the importance of maintaining a healthy lifestyle should be conducted to foster long-term health-promoting behaviors.

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#### **Conflict of Interest: None**

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