

Obesity and Lifestyle Disease Risk Factors amongst Undergraduate Medical Students in a Medical College of Assam

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Abstract:

Background: Obesity is a major risk factor for lifestyle diseases. Medical students are particularly vulnerable due to stress, irregular eating, and sedentary lifestyles.

Objective: To estimate the prevalence of obesity, assess physical activity, and identify lifestyle risk factors among undergraduate medical students.

Methods: A cross-sectional study was conducted among 99 students aged 18–25 years. A structured self-designed questionnaire was used to collect the data and necessary anthropometric measurements were taken. Body mass index (BMI) and waist–hip ratio (WHR) were classified using Asia-Pacific cut-offs. Associations between lifestyle factors and BMI were analyzed using chi-square test.

Results: The mean age of participants was 21.4 years. Overall, 21.2% were overweight or obese (BMI \geq 23 kg/m²), and 2.97% were obese (BMI \geq 25 kg/m²). Overweight/obesity was significantly associated with frequent junk food consumption, low physical activity, short sleep (<6 hours), and tobacco/alcohol use ($p < 0.05$).

Conclusion: A substantial proportion of medical students were overweight/obese, despite awareness of health risks. Targeted lifestyle interventions and stress management are urgently required in medical colleges.

Keywords: Obesity, Lifestyle diseases, Medical students, Assam.

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Introduction

Overweight and obesity are rising at an alarming rate globally and India is no exception. Its prevalence has been increasing, especially among young people and people of all ages [1]. Obesity hampers one's physical and mental well-being, thereby reducing quality and expectancy of life. According to recent global estimates, in 2022, 2.5 billion adults were found to be overweight and 890 million were obese. This corresponds to 43% of adults aged 18 years and over (43% of men and 44% of women) who were overweight; which was only 25% in 1990 [2]. In the Southeast Asia region, the prevalence of overweight is 31%. Obesity is a major contributor to non-communicable diseases (NCDs) such as diabetes, hypertension, stroke, and cardiovascular disease [3]. Alarming, in low- and middle-income countries, 29% of NCD-related deaths occur before age 60, compared to 13% in high-income countries [4]. In Indians, cardiovascular disease occurs at a younger age and with greater severity compared to Western populations, making obesity an especially

important public health concern in this region [5]. Medical students, despite their health knowledge, are particularly vulnerable to obesity due to irregular schedules, academic pressure, and high levels of stress, sedentary lifestyles, and poor dietary habits. Medical students often skip regular meals and instead consume high-fat, high-energy snacks [6]. Long-term stress may also create cravings for calorie-dense foods while simultaneously increasing the likelihood of smoking and alcohol consumption [7]. Furthermore, inadequate sleep, lack of physical activity, and excessive screen time add to their risk profile. Since medical students are future physicians and role models for society, their lifestyle choices has influence not only for their own health but also for the effectiveness of public health interventions they may promote in their careers [8]. Although several studies have been conducted across India to assess obesity and its associated factors [9,10], most are concentrated in metropolitan or southern regions, with limited

focus on the Northeastern states. The Northeast of India is unique in terms of dietary patterns, cultural practices, and lifestyle behaviors, which may influence obesity prevalence differently compared to other regions. However, there is a lack of data from this region, particularly among young adults in professional courses such as medicine. Therefore, this study was undertaken to assess the prevalence of obesity and lifestyle-related risk factors among undergraduate medical students in Assam.

Materials and Methods

Study design and setting: A cross-sectional, observational study was conducted among undergraduate medical students of Nalbari Medical College, Assam, from August to September 2025.

The study was designed to assess the prevalence of overweight and obesity and to explore associations with lifestyle-related risk factors.

Study population: The study population comprised undergraduate medical students aged between 18 and 25 years. The study included 99 students who fulfilled the eligibility criteria and gave their consent to participate.

Inclusion and Exclusion Criteria: Undergraduate medical students who were willing to participate and provided written informed consent were included. Students who were unwilling to participate or absent during the study period were excluded.

Sample Size: A total of 99 students participated in the study. Since the investigation was done in a newly established medical college, the sample size was determined based on feasibility and availability of students during the study period.

Data collection tools: Data was collected using a semi-structured questionnaire. The questionnaire was divided into the following sections: Socio-demographic details—age, gender, year of study, residence (hostel/day scholar), and socioeconomic background. Dietary habits include the type of meals, number of meals, consumption of fruits and vegetables, the intake of high-fat/junk foods and soft drinks. Physical activity—type, frequency, and duration of exercise, daily walking, and sedentary behavior (screen time, sitting hours). Sleep patterns—average sleep duration per day, and perceived quality of sleep. Substance use—smoking, alcohol consumption.

Anthropometric measurements: Standardized protocols recommended by the World Health Organization (WHO) were followed (11): Weight: Measured using a calibrated digital weighing machine, recorded to the nearest 0.1 kg with participants in light clothing and barefoot. Height:

Measured using a stadiometer to the nearest 0.1 cm. Body Mass Index (BMI): Calculated as weight (kg) / height (m²). Classification was done as per Asia-Pacific guidelines (13): Underweight: <18.5 kg/m²; Normal: 18.5–22.9 kg/m²; Overweight: 23–24.9 kg/m²; and Obese: ≥25 kg/m². Waist Circumference (WC): Measured at the midpoint between the lower margin of the last palpable rib and the top of the iliac crest using a non-stretchable measuring tape. Hip Circumference (HC): Measured at the widest part of the buttocks. Waist-Hip Ratio (WHR): Calculated as WC/HC. Central obesity was defined as WHR >0.90 for males and >0.85 for females (12).

Data collection procedure: After obtaining necessary permissions from the college authorities, participants were briefed about the objectives and significance of the study. Prior to data collection written informed consent was obtained from study participants. Each student was interviewed individually, and anthropometric measurements were recorded in a separate room to ensure privacy.

Study variables: The dependent variables were Body Mass Index (BMI) and Waist Hip Ratio (WHR), categorized as normal, overweight, obese, or centrally obese. Independent variables included dietary habits, physical activity, sleep duration, smoking, alcohol consumption, socio-demographic factors, and life style disease risk factors.

Ethical considerations: Approval for conducting the study was obtained from the Institutional Ethics Committee of Nalbari Medical College. Informed written consent was obtained from all participants, and anonymity was assured. Participation was voluntary, and students were free to withdraw at any stage without any academic consequences.

Statistical analysis: The collected data was entered into Microsoft Excel and checked for completeness and accuracy. Descriptive statistics were presented as frequencies and percentages for categorical variables and mean ± standard deviation (SD) for continuous variables. Associations between BMI categories and lifestyle factors were analyzed using the chi-square test. A p-value of <0.05 was considered statistically significant.

Results

Risk Factors: Lifestyle disease related risk factors were found to be present among under graduate medical students (Figure 1).

Consumption of fast junk food was reported by 83.8%, poor sleep (<6 hours/day) by 73.7%, low physical activity by 59.6%. High stress levels were present in 30.7% of participants. In terms of family history, 56.6% reported a family history of hypertension, and 26.3% reported a family history of diabetes.

Table 1: Prevalence of lifestyle-related risk factors and family history of metabolic conditions among undergraduate medical students (n = 99)

Risk Factor / Family history	Frequency (n)	Percentage (%)
Lifestyle-related risk factors		
Fast food consumption	83	83.8
Poor sleep (<6 hours/day)	73	73.7
Low physical activity	59	59.6
High stress levels	30	30.7
Family history of metabolic conditions		
Hypertension	56	56.6
Diabetes	26	26.3

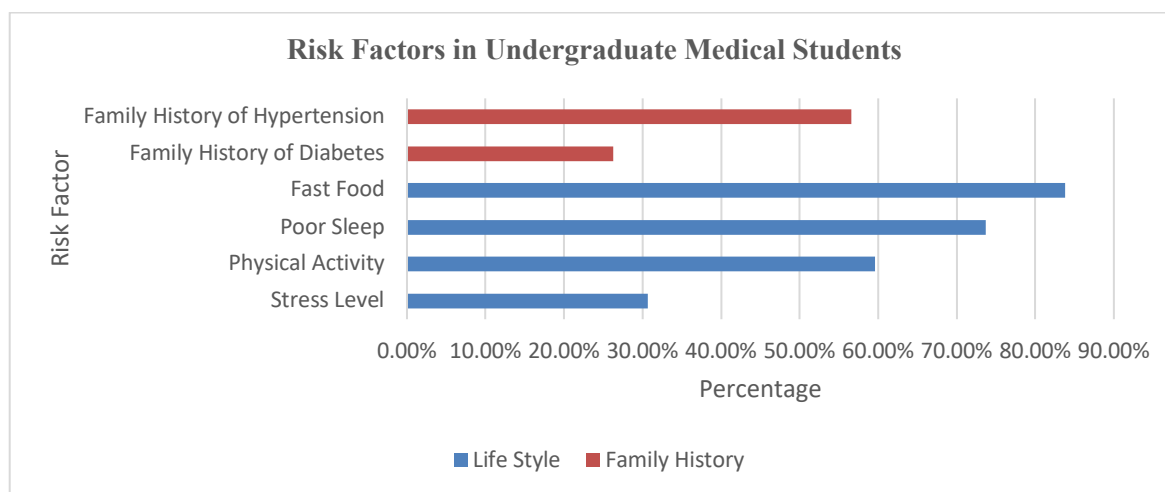


Figure 1: Risk factors for obesity and lifestyle diseases among under-graduate medical students

BMI distribution: The majority of students (67.7%) had a normal BMI, while 18.2% were overweight, 12.1% underweight, and 2.97% obese (Figure 2).

Collectively, 21.2% of students were overweight/obese (BMI ≥ 23 kg/m²), consistent with Asia-Pacific cut-offs.

Table 2. Distribution of BMI categories among undergraduate medical students (n = 99)

BMI Category (Asia-Pacific cut-off)	Frequency (n)	Percentage (%)
Underweight (<18.5 kg/m ²)	12	12.1
Normal (18.5–22.9 kg/m ²)	67	67.7
Overweight (23–24.9 kg/m ²)	18	18.2
Obese (≥25 kg/m ²)	3	2.97
Overweight/Obese (≥23 kg/m²)	21	21.2

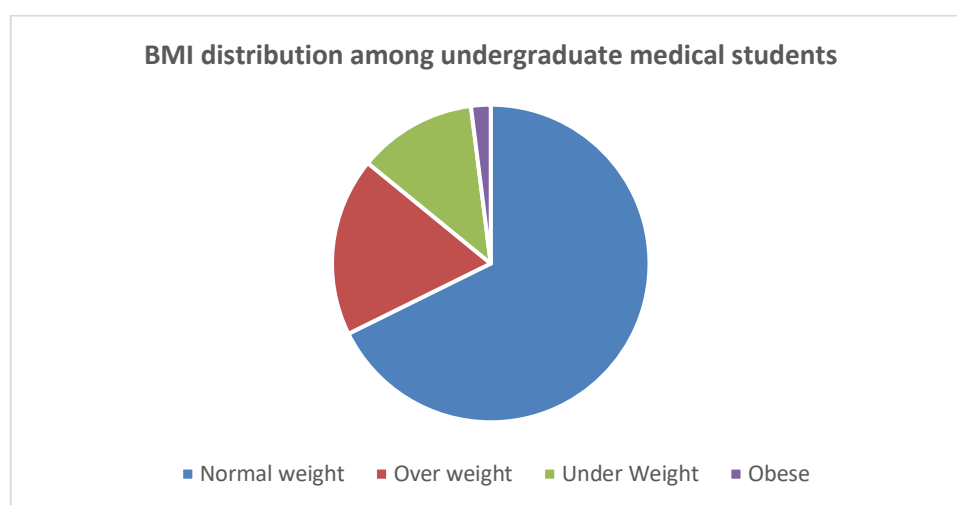


Figure 2: BMI categories of the under-graduate medical students

Mean BMI by family history: Students with a positive family history of metabolic conditions consistently exhibited higher mean BMI (Figure 3). Mean BMI was higher among those with family history of obesity: 24.11 vs. 21.97 (no history),

Diabetes: 24.35 vs. 21.71. Hypertension: 22.99 vs. 21.70. Heart disease: 23.64 vs. 22.23. This indicates a significant genetic predisposition compounding lifestyle risks.

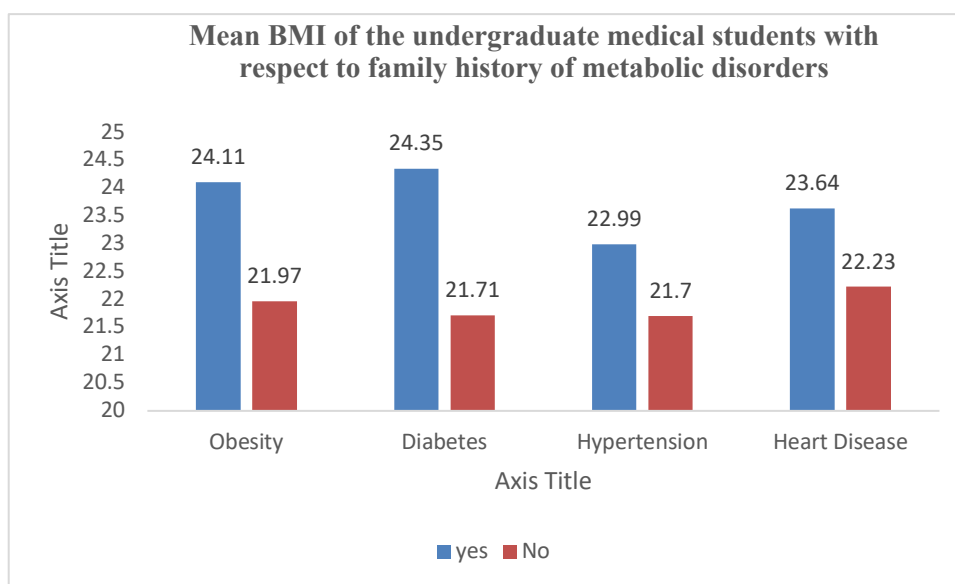


Figure 3: Mean BMI of the undergraduate medical students with respect to family history of metabolic disorders

Table 3: Association between family history of metabolic disorder and Mean BMI among the undergraduate medical students

Family history of metabolic disorder	Mean BMI (kg/m ²) with family history of metabolic disorder	Mean BMI (kg/m ²) without family history of metabolic disorder	Difference (kg/m ²)
Obesity	24.11	21.97	+2.14
Diabetes	24.35	21.71	+2.64
Hypertension	22.99	21.70	+1.29
Heart disease	23.64	22.23	+1.41

Discussion

The present study was performed to assess the prevalence of obesity and lifestyle-related risk factors among undergraduate medical students of Nalbari Medical College, Assam. The findings revealed a considerable burden of modifiable risk factors which included high fast-food consumption, low physical activity, poor sleep and high stress levels collectively contributing to overweight and obesity. Although the most of the students were in the normal BMI range 67.7% but 21.2% were overweight or obese according to the Asia-Pacific cut-off. This is a concern for an emerging health concern in this young adult population.

Although most students were within a normal BMI range, nearly one in five were overweight and 2.97 % were obese, a concerning figure for such a young, health-aware population. Similar prevalence rates have been reported from South India and Kanchipuram studies [10,11]. While the prevalence of obesity in our study was relatively low, the clustering of unhealthy lifestyle behaviors suggests

a higher risk of future weight gain and metabolic disorders. Fast-food consumption was reported by 83.8% of participants, where medical students showed a strong preference for high-fat, calorie-dense foods due to academic stress, lack of time, and ease of availability. Mandal et al. and Dutta et al. [12, 13] reported similar findings, with >75% of students reporting frequent consumption of fast food. The findings highlighted a dual burden of presence of unhealthy lifestyle behaviour and hereditary factors among medical students. Poor sleep quality was reported by 73.7% participants because medical students often sacrifice sleep due to long study hours and irregular schedules. Chronic sleep deprivation has been strongly associated with increased BMI and metabolic risk. These behaviours are known contributors to obesity, insulin resistance, and metabolic syndrome in young adults. High perceived stress was present in 30.7% of students, reflecting the competitive and rigorous nature of medical training. Stress has been linked to increased cortisol levels, higher appetite for high-energy foods, and greater risk of obesity

Physical inactivity was reported by 59.6% of participants and similar findings were also seen among other Indian and Southeast Asian studies [13-16] This depicts a declining physical activity among youth, particularly students in demanding technical courses.

An important finding of this study was the presence of positive family history of metabolic disorder and higher BMI among students. Those with a family history of diabetes, obesity, hypertension, or heart disease consistently exhibited higher mean BMIs compared to their peers without such histories. For instance, mean BMI was 24.35 in students with a family history of diabetes versus 21.71 among those without.

This finding highlights the interaction between genetic predisposition and lifestyle diseases. Previous studies [19-21] have similarly shown that individuals having positive family history of metabolic syndrome are at higher risk of overweight and central obesity. Therefore it is crucial to modify lifestyle behaviors along with early identification and monitoring of those who are genetically predisposed.

The findings of this study have dual implications. First, medical students themselves represent a vulnerable group requiring health promotion interventions, including structured physical activity programs, stress management workshops, and nutritional counseling. Second, as future physicians, their health behaviors influence their credibility in counseling patients. Different studies done previously has shown that physicians who practice healthy lifestyles are more likely to counsel patients effectively on obesity and related risks.

This study provides valuable data from Northeast India, a region known for its distinct dietary and lifestyle practices, which often remain underrepresented in national surveys. The use of Asia-Pacific BMI cut-offs enhances the sensitivity of detecting obesity in this population.

However, limitations include the cross-sectional design, which precludes causal inference, and reliance on self-reported data for lifestyle behaviors, which may be subject to recall or social desirability bias. The relatively small sample size from a single institution also limits generalizability.

Future studies should include larger and more diverse student populations across multiple institutions in the Northeast. Longitudinal follow-up of medical students could help clarify the progression from unhealthy lifestyle behaviors to obesity and metabolic syndrome. Additionally, intervention-based studies targeting diet, physical activity, and stress management in medical colleges are warranted.

Conclusion

This study concludes that large percentage of first-year medical students were found to be overweight or obese and engaged in other harmful lifestyle habits like poor sleep, less physically active and leading a stressful life. Their chance of developing metabolic and cardiovascular diseases in the future is already high due to the presence of a genetic predisposition.

Student life at medical schools should include stress management techniques, nutrition counseling, exercise promotion, and awareness activities. Student's health will be protected, and they will be better equipped to promote public health as role models in such nurturing circumstances.

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