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Prevalence of overweight, obesity and it's risk factors among Undergraduate Medical students of Government Medical College, Akola, Maharashtra

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ABSTRACT

Introduction: Overweight and obesity are increasing public health problems, particularly among young adults. Medical students are exposed to academic stress, sedentary lifestyles, irregular dietary habits, and inadequate physical activity, which may increase the risk of excess body weight. The present study was conducted to determine the prevalence of overweight and obesity and their associated risk factors among undergraduate medical students of Government Medical College, Akola. **Methods:** A cross-sectional analytical study was conducted among undergraduate medical students from December 2022 to May 2023. Using systematic sampling, every third roll number from each academic year was selected, resulting in a sample of 325 students. Data were collected using a pretested, semi-structured questionnaire on socio-demographic characteristics, dietary habits, and physical activity. BMI was calculated, and overweight and obesity were defined using Asia-Pacific criteria. Data were analysed using Open Epi software. Frequencies and percentages were calculated, and the Chi-square test was applied. A p-value of <0.05 was considered significant. **Results:** Of the 325 students, 55% were males and 45% females, with a mean age of 21.13 ± 1.94 years. The prevalence of overweight was 16.7%, and obesity was 18.5%. Overweight and obesity were significantly higher among students aged 21–25 years and among males. Students who never exercised and those consuming a mixed diet had significantly higher prevalence of excess weight ($p < 0.01$).**Conclusion:** A considerable proportion of medical students were overweight or obese. Significant associations were observed with age, sex, physical activity, and dietary pattern. Regular screening and lifestyle interventions are recommended in medical colleges.

Key words: Overweight; Obesity; Medical students; BMI; Physical activity; Diet.

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Introduction

Overweight and obesity have emerged as major public health challenges worldwide, affecting populations across all age groups and socioeconomic strata.[1] The global prevalence of obesity has increased markedly over the past few decades, with studies showing a substantial rise in body mass index (BMI) across most countries since 1990.[2] This rapid increase has been attributed to urbanization, dietary transitions toward energy-dense foods, reduced physical activity, and increasingly sedentary lifestyles.[3]

Overweight and obesity are important risk factors for non-communicable diseases (NCDs) such as type 2 diabetes mellitus, hypertension, cardiovascular diseases, and certain cancers, contributing significantly to global morbidity and mortality.[1]

Low- and middle-income countries, including India, are experiencing a dual burden of undernutrition and over nutrition due to rapid socioeconomic and lifestyle transitions.[3] India has witnessed a steady rise in the prevalence of overweight and obesity among adults over the past two decades, particularly in urban and semi-urban settings.[4] Changes in dietary patterns, reduced physical activity, and increased consumption of processed and fast foods have contributed to this trend.[4] Young adults, especially college students, are considered a vulnerable group because of lifestyle modifications associated with academic life, such as irregular meals, inadequate sleep, stress, and reduced physical activity.[5] These behaviours may lead to unhealthy weight gain and the early onset of risk factors for NCDs.[5]

Medical students represent a distinct subgroup among young adults. As future healthcare providers, they are expected to adopt healthy lifestyles and serve as role models for their patients and the community.[6] However, the rigorous academic schedule, high levels of stress, sedentary study habits, irregular eating patterns, and sleep deprivation commonly experienced during medical training may predispose them to overweight and obesity.[6] Several studies conducted among medical students in India have reported varying prevalence rates of overweight and obesity, indicating that this population is not immune to the ongoing obesity epidemic.[7]

Overweight and obesity among medical students have implications beyond their personal health. Evidence suggests that physicians who maintain healthy lifestyles are more likely to counsel their patients regarding diet, exercise, and weight management.[8] Conversely, unhealthy personal habits among healthcare professionals may reduce the effectiveness of such counselling and influence patient perceptions.[8] Therefore, assessing the burden of overweight and obesity among medical students is essential not only for their well-being but also for the promotion of healthy behaviours in the wider community.

Despite the growing concern, there is limited region-specific data on the prevalence of overweight and obesity and their associated risk factors among medical students in many parts of India, including Maharashtra. Local evidence is important for identifying context-specific determinants and planning targeted interventions. Therefore, the present study was conducted to determine the prevalence of overweight and obesity and to identify associated risk factors among undergraduate medical students of Government Medical College, Akola.

Materials and Methods

The present study was a cross-sectional analytical study conducted among undergraduate medical students of Government Medical College, Akola, Maharashtra, India. The study was carried out over a period of six months, from December 2022 to May 2023.A systematic sampling technique was used to select the study participants. From each academic year, every third roll number was selected until the required sample size was achieved. The sample size was calculated as 325 students, based on an assumed prevalence of overweight/obesity of 17% among medical students,[9] as reported in a previous study.

The operational definitions of overweight and obesity were based on the Asia-Pacific BMI guidelines for the Asian population. According to these criteria, overweight was defined as a body mass index (BMI) of 23.0–24.9 kg/m² and obesity as a BMI ≥25.0 kg/m². Data were collected using a pretested, semi-structured, self-administered questionnaire. The questionnaire included information on socio-demographic characteristics, dietary habits, frequency of junk-food consumption, physical activity, and other lifestyle-related factors. Anthropometric measurements were recorded, and BMI was calculated using standard methods. Prior to the commencement of the study, ethical approval was obtained from the Institutional Ethics Committee of Government Medical College, Akola. Informed consent was obtained from all participants before data collection, and confidentiality of the information was maintained throughout the study.

The collected data were entered into Microsoft Excel and subsequently analysed using Open Epi software version 7.2.6.0. The results were expressed in the form of frequencies and percentages and presented using appropriate tables and graphs. The Chi-

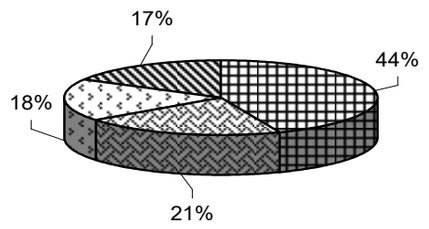
square test was applied to assess the association between overweight/obesity and various risk factors. A p-value of less than 0.05 was considered statistically significant.

Results

Among 325 students who participated in the study 177 (55%) were males and 148 (45%) were females. The mean age of the study participants was 21.13±1.94, of which mean age of males was 21.56±1.86 and mean age of the female was 20.58±1.81. Out of 325 participants, 55 (16.67%) were overweight and 60 (18.5%) were obese. Overweight and obesity were seen more among 21-25 years age group. Out of total overweight 36 (65.5%) were males and out of total obese 42 (70.0%) were males (Figure-1).

Table 1 shows the distribution of socio-personal characteristics of the study participants according to their BMI categories. Out of the total 325 students, the majority belonged to the 21–25 years age group (59.4%), while 40.6% were in the 18–20 years age group. A significantly higher proportion of overweight (20.7%) and obesity (20.2%) was observed among students aged 21–25 years compared to those aged 18–20 years (11.4% overweight and 15.9% obese) ($p<0.05$).With respect to sex, 54.5% were males and 45.5% were females. The prevalence of overweight and obesity was higher among males (20.3% and 23.7%, respectively) compared to females (12.8% and 12.2%). This difference was found to be statistically significant ($p<0.01$).

Figure-1: BMI category



Regarding physical activity, 58.5% of students reported exercising ≤3 days per week, 24.9% exercised more than 3 days per week, and 16.6% reported never exercising. The highest prevalence of overweight (29.2%) and obesity (27.1%) was observed among students who never exercised, and this association was statistically significant ($p < 0.01$).In terms of dietary habits, 62.5% of students consumed a mixed diet, while 37.5% were vegetarians. A higher proportion of overweight (25.6%) and obesity (32.1%) was observed among students consuming a mixed diet compared to vegetarians (18.9% overweight and 20.5% obese). This difference was also statistically significant ($p < 0.01$).Overall, age, sex, exercise habits, and dietary pattern showed a significant association with BMI status among the study participants.

Table-1: Distribution of socio-personal characteristics according to BMI (n=325)

Variable	Category	Total	Underweight		Normal		Overweight		Obese		P value
			No.	%	No.	%	No.	%	No.	%	
Age (yrs)	18–20	132	45	34.1	51	38.6	15	11.4	21	15.9	<0.05
	21-25	193	22	11.4	92	47.7	40	20.7	39	20.2	
Sex	Male	177	24	13.6	75	42.4	36	20.3	42	23.7	<0.01
	Female	148	43	29.1	68	45.9	19	12.8	18	12.2	
Exercise	>3 days	81	19	23.5	35	43.2	17	21.0	10	12.3	<0.01
	≤3 days	190	39	19.9	90	45.9	24	12.2	37	18.8	
	Never	54	9	18.8	18	37.5	14	29.2	13	27.1	
Diet	Mixed	203	40	19.7	46	22.6	52	25.6	65	32.1	<0.01
	Vegetarian	122	27	22.1	47	38.5	23	18.9	25	20.5	

Discussion

The present study assessed the prevalence of overweight and obesity and their associated risk factors among undergraduate medical students. The study revealed that 16.7% of students were overweight and 18.5% were obese, indicating that more than one-third of the students had excess body weight. Overweight and obesity were more common in the 21–25 years age group, among male students, and among those with low physical activity and mixed dietary habits. These findings indicate a considerable burden of excess weight even among young future healthcare professionals.

The prevalence observed in the present study is comparable with findings reported in other studies among medical students. A recent global systematic review reported a pooled prevalence of 18% overweight and 9% obesity among medical students; with a combined excess-weight prevalence of about 24%.[10] These findings suggest that overweight and obesity are common among medical students worldwide. The higher combined prevalence observed in the present study may be due to differences in lifestyle patterns, dietary habits, or the use of Asia-Pacific BMI criteria, which tend to identify overweight and obesity at lower BMI cut-offs in Asian populations. [12]

In the present study, overweight and obesity were more common among students aged 21–25 years compared to younger students. This may be explained by reduced physical activity, increased academic stress, irregular meal patterns, and sedentary study routines in the later years of medical education. Previous research has also shown presumed increases in BMI and obesity risk with age and prolonged exposure to unhealthy lifestyle behaviors.[12] These factors collectively contribute to progressive weight gain during young adulthood.

The study also demonstrated a significantly higher prevalence of overweight and obesity among male students compared to females. Similar gender differences have been reported in other studies, where male students were found to have a higher prevalence of excess weight. [11] Possible explanations include higher consumption of calorie-dense foods, less concern about body image, and lower engagement in weight-control practices among males compared to females.

Physical activity showed a strong association with BMI in the present study. Students who reported no regular exercise had the highest prevalence of both overweight and obesity. Lack of physical activity is a well-established determinant of weight gain, as sedentary behaviours reduce energy expenditure and promote fat accumulation. [13] Medical students often have demanding academic schedules, long study hours, and limited time for exercise, which may contribute to this pattern.

Dietary habits were also significantly associated with BMI. Students consuming a mixed diet showed higher levels of overweight and obesity compared to vegetarians. This could be attributed to higher intake of calorie-dense foods, frequent snacking, and irregular meal patterns. Similar associations between high-calorie diets and increased BMI have been reported in other studies among students and young adults. [12] Such dietary patterns, when combined with sedentary lifestyles, contribute substantially to the development of overweight and obesity.

Conclusion

The high prevalence of excess weight among medical students has important public health and professional implications. Medical students are future healthcare providers and are expected to serve as role models for healthy lifestyles. Evidence suggests that physicians who maintain healthy behaviors are more likely to counsel patients effectively regarding diet, physical activity, and weight management. [13] Therefore, unhealthy lifestyle habits among medical students may not only affect their personal health but also influence their future professional practice.

Strengths and limitations

The present study has certain strengths. It included an adequate sample size and used systematic sampling to select participants from different academic years. The use of Asia-Pacific BMI criteria ensured appropriate classification of overweight and obesity for the Asian population. Additionally, multiple lifestyle-related factors were assessed, providing a broader

understanding of associated risk factors. However, the study also has some limitations. Being a cross-sectional study, it cannot establish causal relationships between risk factors and overweight or obesity. The data on dietary habits and physical activity were self-reported, which may be subject to recall and reporting bias. Furthermore, as the study was conducted in a single medical college, the findings may not be generalizable to all medical students or to other regions.

Despite these limitations, the study highlights a substantial burden of overweight and obesity among medical students. Regular health screening, promotion of physical activity, availability of healthy food options in hostels and canteens, and stress-management programs should be incorporated into medical college settings. Such interventions can help inculcate healthy lifestyle habits among future healthcare professionals and reduce the risk of non-communicable diseases.

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