PATTERN OF OVERWEIGHT AND OBESITY AMONG MEDICAL STUDENTS OF ESIC MEDICAL COLLEGE KALABURAGI: A DESCRIPTIVE CROSS-SECTIONAL STUDY

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Abstract
Background: The study was conducted to assess the prevalence and determinants of overweight and obesity among medical students. It was conducted among 309 undergraduate students at ESIC Medical College and Hospital Kalaburagi. The study aimed to identify patterns of overweight and obesity and the factors influencing their development. The study utilized a descriptive cross-sectional design and was conducted over a period of 15 days in November 2022. Data were collected using a pre-validated semi-structured questionnaire and standard techniques for measuring height and weight. The results showed that the overall prevalence of overweight and obesity was 16.25%, with 2.91% of students being obese. A higher prevalence of obesity was observed among males (8.41%) compared to females (8.09%). Additionally, 89.47% of the students reported actively attempting to reduce their weight, a figure that aligns with similar studies conducted in other regions. Lifestyle factors such as physical activity, exercise habits, and snack consumption were also analyzed, revealing that students with higher BMI were more likely to engage in exercise and consume snacks between meals.

Introduction
Overweight and obesity are defined as an abnormal or excessive fat accumulation that may impair health.[1] Body Mass Index (BMI) is a simple index of weight for height that is commonly used to classify overweight and obesity in adults .The World Health Organization (WHO) defines normal weight as a Body Mass Index of 18.5 - 224.9 ,overweight as a BMI of 25 - 30 and obesity as a BMI of ≥30.[2]Obesity leads to multiple non communicable diseases such as Hypertension, Coronary artery disease ,Stroke and Diabetes mellitus .
Globally, in 2016, more than 1.9 billion adults aged 18 years and older were overweight, of these over 650 million adults were obese[1].In India according to the study conducted by ICMR-INDIAB, more than 135 million individuals were affected by obesity[2].
Medical students are the future healthcare providers and the role models to general population but the sedentary lifestyle followed by many of the students, their eating-disorders and lack of physical activity has led to overweight and obesity[3].Hence this study was undertaken to identify the pattern of overweight and obesity among medical students of ESIC Medical College, Kalaburagi.

Objectives
1. To identify the pattern of obesity and overweight among medical students.
2. To identify the factors influencing the development of obesity and overweight among medical students.

Materials and Methods
This descriptive cross-sectional study was conducted among 309 undergraduate Medical Students of ESIC Medical College and Hospital, Kalaburagi in the year 2022 over the period of 15 days from 5th November to 20th November2022.

Online informed consent was taken from all the study participants. Students who were absent during study, unwilling to participate and interns were excluded from the study. Data was collected through Google forms. A pre-validated, semi structured self- administered questionnaire was used to collect the socioeconomic data and other credentials. Height and weight were collected using standard techniques.

Results
Table No .1. Socio-demographic profile of participants (n=309)

Particulars		N	%
Age	18 – 20	100	32.36
	21 – 23	199	64.4
	24 – 29	10	3.24
Sex	Male	115	37.21
	Female	194	62.78
Residence	Urban	196	63.43
	Rural	113	36.57

Table No 1 shows the socio-demographic profile of the participants. Majority of the individuals (64.38%) were in the age group of 21-23 yrs. About a third (32.35%) was in the age group of 18-20 yrs and a small fraction (3.22%) is in the 24-29 age range. Majority (62.78%) were females. Majority (63.43%) of the students were from urban areas.

Table no. 2: Gender wise distribution of BMI

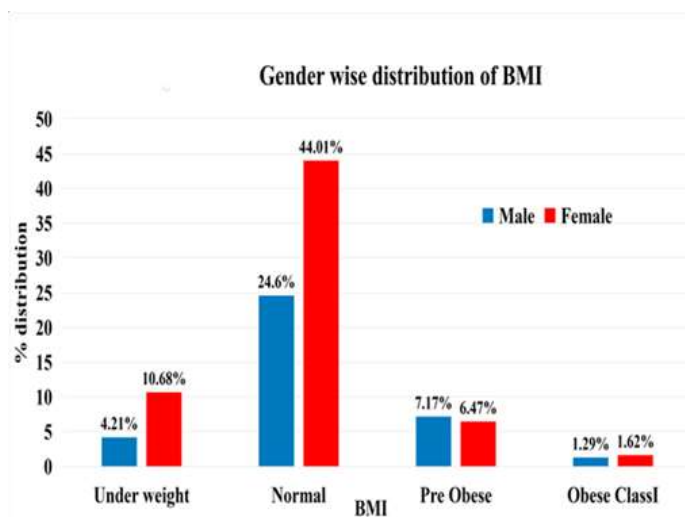| BMI			Males		Females		Total	
			N	%	N	%	N	%
< 18.5 underweight			13	4.21	33	10.68	46	14.89
18.5 -24.9 normal weight			76	24.6	136	44.01	212	68.61
≥25 Overweight	**Pre obese**	25-29.99	22	7.12	20	6.47	42	13.59
	Obese class I	30-34.99	4	1.29	5	1.62	9	2.91
	Obese class II	35-39.99	0	0	0	0	0	0
	Obese class III	>=40	0	0	0	0	0	0

Figure 1

Table 3 depicts gender wise distribution of BMI. Majority (68.61%) of individuals fell within the normal weight range. There were higher percentage of underweight females (10.68%) compared to males (4.21%) but the overweight category was fairly balanced between males and females. Very few individuals fell into the obese category, and none are in the higher obesity classes (II and III).

Table no.4: Life style related variables

Life style related variables	Under weight		Normal		Pre obese		Obese class	
	N	%	N	%	N	%	N	%
Not doing exercise	21	45.65%	90	42.45%	19	73.07%	2	8%
Do exercise	25	54.34%	122	57.545	23	26.92	7	92%
Total	46		212		42		9	
If so, type of exercise								
Light	17	68%	89	72.95%	14	60.87%	5	71.42%
Moderate	6	24%	26	21.31%	7	30.43%	1	14.29%
Vigorous	2	8%	7	5.74%	2	8.6%	1	14.29%
Total	25		122		23		7	
Duration of physical activity								
<30 min	23	92%	72	59.02%	11	47.83%	2	28.57%
>30 min	2	8%	50	40.98%	12	52.17%	5	71.43%

This table presents lifestyle variables across four weight categories: underweight, normal, pre-obese, and obese. Exercise habits vary significantly, with pre-obese individuals showing the lowest participation (26.92%) and obese individuals the highest (92%). Normal and underweight groups have similar exercise rates (57.545% and 54.34% respectively). Across all categories, light exercise is most common, followed by moderate and then vigorous. The duration of physical activity shows an interesting trend: as weight category increases, so does the proportion of individuals exercising for more than 30 minutes. This is most pronounced in the obese category, where 71.43% exercise for over 30 minutes, compared to only 8% in the underweight group.

Table no.5: Association of BMI with consumption of snacks in between food

Consumption of snacks in between food	Underweight N (%)	Normal N (%)	Pre-obese N (%)	Obese class N (%)	Total
No	9 (13.24)	43 (63.24)	13(19.12)	3 (4.4)	68
Yes	37(15.35)	169 (70.12)	29 (12.03)	6(2.9)	241

The table illustrates the relationship between the consumption of snacks between meals and various body weight categories. Among those who do not consume snacks between meals, 13.24% are underweight, 63.24% are of normal weight, 19.12% are pre-obese, and 4.4% are classified as obese, with a total of 68 individuals. For those who do consume snacks between meals, 15.35% are underweight, 70.12% are of normal weight, 12.03% are pre-obese, and 2.9% are obese, totaling 241 individuals. This indicates that snack consumption between meals is more common among those of normal weight, with a slightly higher prevalence of underweight individuals and a lower prevalence of pre-obese and obese individuals.

Table no.6: Association of BMI with Alcohol consumption

Response Alcohol consumption	Underweight (N) %	Normal (N) %	Pre obese (N) %	Obese class (N) %	Total
No	43(15.03)	197(68.88)	37(12.94)	9(3.15)	286
If yes,	3(13.04)	15(65.22)	5(21.74)	0	23

Table 6 depicts the relationship between alcohol consumption and different body weight categories. Among those who do not consume alcohol, 15.03% are underweight, 68.88% are of normal weight, 12.94% are pre-obese, and 3.15% are classified as obese class, with a total of 286 individuals. In contrast, among those who do consume alcohol, 13.04% are underweight, 65.22% are of normal weight, 21.74% are pre-obese, and none are in the obese class category, with a total of 23 individuals. This suggests that alcohol consumption is associated with a higher percentage of individuals in the pre-obese category, while the majority in both groups maintains a normal weight.

Discussion

The study conducted at ESIC Medical College Gulbarga provides a comprehensive overview of obesity and overweight prevalence among medical students, with a reported overall prevalence of 16.25%. Among the participants, 2.91% were identified as obese. Interestingly, the study found a slightly higher prevalence of obesity among males (8.41%) compared to females (8.09%). These findings are consistent with other research, such as a study conducted by Keshab Parajuli[5] at Jawaharlal Nehru Medical College in Karnataka, which reported even higher prevalence rates of overweight and obesity, particularly among male students (28.7%) compared to female students (18.6%).

Moreover, the study highlights that 89.47% of students are actively attempting to reduce their weight, a figure that aligns with findings from a similar study in Saudi Arabia,[4] where 75.6% of students reported efforts to control their weight. In contrast, only 10.52% of students from Tamil Nadu[3] reported making such efforts, suggesting potential regional differences in health behaviors and awareness.

A particularly noteworthy aspect of the ESIC study is the higher prevalence of obesity among alcohol consumers, at 22%, which is significantly higher than the 7.32% reported in Tamil Nadu.[3] This stark contrast may indicate regional or lifestyle factors influencing the relationship

between alcohol consumption and obesity. Studies have shown that factors like stress, dietary habits, and physical activity levels, which vary across different regions, could significantly impact obesity rates among medical students.

These findings underscore the importance of targeted health interventions that consider both regional and lifestyle variations in addressing obesity among medical students.

Conclusion

The study concludes that overweight and obesity are prevalent among medical students at ESIC Medical College Kalaburagi, with similar rates observed between males and females. The findings highlight the need for health promotion initiatives focusing on lifestyle modifications, including healthier eating habits, increased physical activity, and reduced sedentary behaviour.

Recommendations

Implement counselling and motivational programs to encourage healthy eating and regular physical activity. Reduce sedentary behaviours, such as prolonged sitting hours. Discourage alcohol consumption among students.

Limitations

The study's findings are limited by its cross-sectional design, small sample size, and reliance on self-reported data, which may introduce bias. Future research should include larger, more diverse samples and longitudinal designs to better understand the dynamics of weight gain in this population.

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