

Original Article

Prevalence of Overweight and Obesity among Medical Students of Enam Medical College, Savar, Dhaka

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Abstract

Background: Overweight and obesity are recognized as “escalating epidemics” affecting both developed and developing countries. Of the factors contributing to obesity, stress seems to be particularly important as stressful condition leads to irregularity in diet, lack of exercise and addiction. Medical students are exposed to a lot of stress throughout their education. Hence, this study was undertaken to find out the prevalence of overweight and obesity among undergraduate medical students. **Objectives:** The present cross-sectional study was intended to find out the prevalence of overweight/obesity among medical students of Enam Medical College and its association with their sociodemographic and life-style pattern. **Materials and Methods:** This cross-sectional study was conducted among medical students in Enam Medical College, Savar, Dhaka from March to July 2017. A total of 283 1st and 2nd year MBBS students were included in the study. After getting permission from college authority and concerned Ethical Committee data were collected using a semi-structured questionnaire containing the variables of interest. Blood pressure and anthropometric measurements (weight and height) were noted. Data were analysed using SPSS (Statistical Package for Social Sciences) version 16.0. **Results:** In the present study, the prevalence of overweight and obesity was 21.2% and 6.0% respectively. Males were found more overweight or obese (70.1%) compared to females (29.9%) ($p=0.041$). No other sociodemographic variables were found associated with overweight or obesity. Family history of obesity was observed for evaluation of overweight/obesity among the respondents ($p=0.018$) although family history of hypertension and/or diabetes did not influence the overweight/obesity. Systolic and diastolic blood pressures of the overweight/obese group were higher than their normal counterparts ($p=0.003$ and $p=0.002$). There was no association between BMI and behavioral variables such as exercise, sleep, entertainment and food behavior. **Conclusion:** More than one-quarter of the undergraduate medical students are overweight or obese and overweight or obesity are more predominant in males. Overweight and obese students generally have family history of overweight or obesity. Behavioural factors such as taking exercise, time spent on sleep and entertainment and food habit are not associated with BMI.

Key words: Overweight; Obesity; Medical students; BMI

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Introduction

Overweight and obesity are considered major epidemic health problems in both developed and underdeveloped countries as many studies showed a remarkable rise.¹ Burden of non-communicable diseases in general and cardiovascular disease, in particular, is largely attributed to obesity both in the developed and developing countries.² Overweight and obesity are leading causes of hypertension, cardiovascular disease (CVD), type 2 diabetes and several other morbidities.³ At least 2.8 million adults die each year as a result of being overweight or obese.⁴ In addition 44% of diabetes, 23% of ischemic heart disease and between 7–41% of certain cancers globally are attributable to overweight or obesity.⁴

Obesity has reached epidemic proportions globally.⁵ In 2016, 39% of adults aged 18 years were overweight and 13% obese.⁵ Several recent studies in the United States showed that overweight and obesity prevalence is increasing dramatically and suggesting that 86.3% of adults will be overweight or obese and over 50% will be obese by 2030.⁶ Data from the years 1996, 2003 and 2006 showed that there has been a rise in both overweight (20.7%, 26.7% and 29.1%) and obesity (5.5%, 12.3% and 14.0%) among adult Malaysians.⁷

Sedentary lifestyle is associated with high risk of coronary, cerebral, and peripheral vascular diseases and all-cause morbidity and mortality among both gender at all ages.⁸ It is estimated that more than two million deaths annually in the world are attributed to physical inactivity.⁹

Evidence indicates that the pathophysiological process of cardiovascular (CV) disease begins at early age, though the manifestations of the disease do not appear until middle age adulthood. Risk factors for CV disease, particularly lipoprotein profiles, are affected by physiological abnormalities, and lifestyle related issues.¹⁰ Although obesity has important genetic and familial components, environmental factors are probably the predominant factors in the current epidemic. The present cross-sectional study was intended to find the prevalence of overweight/obesity among 1st and 2nd year medical students of Enam Medical College and its association with their

socio-demographic correlates, their life-style pattern including food behavior and physical activity. The college years are a formative period when many young adults shape their life-style that can have an impact on the rest of their lives. So medical schools can use the opportunity to reach students during their undergraduate years and address the issue of overweight and obesity.

Materials and Methods

This cross-sectional study was conducted in Enam Medical College, Savar, Dhaka from March to July 2017 among 1st and 2nd year medical students. Data were collected in the classes on a previously informed particular day. The students who were absent on that particular day were contacted in next classes. Students who were not able to contact even after three consecutive attempts and students who were not willing to participate in the study were excluded. Thus, a total of 283 subjects from 1st and 2nd year MBBS students could be included in the study.

After getting permission from college authority and concerned Ethical Committee, students were briefed regarding the nature of the study, confidentiality and about the questionnaire. Data were collected using a semi-structured questionnaire containing the variables of interest which, among others, included socio-demographic characteristics, and life-style related information (such as, taking exercise, mode of exercise, sleep hours, leisure time activity and food habit), following which blood pressure and anthropometric measurements (weight and height) were noted. Weight and height were measured using standardized weighing machine and height measurement scale. Body Mass Index (BMI) was calculated by dividing the weight of the students in kilograms by their heights in meters squared [(BMI= weight (kg)/height (m²)]. BMI 18.5 to 24.9 was considered as normal, BMI less than 18.5 was considered as underweight, BMI of 25 to 29.9 as overweight and BMI of more than 30 was considered as obese. Data were analyzed using SPSS (Statistical Package for Social Sciences) version 16.0. The test statistics used to analyze data were descriptive statistics and Chi-square (χ^2). The level of significance was set at 5% and $p < 0.05$ was considered significant.

Results

Based on BMI, 27(9.5%) respondents were underweight (BMI <18.5 kg/m²), 179(63.3%) were of normal BMI (BMI 18.5-24.99 kg/m²), 60(21.2%) overweight and the rest 17(6.0%) were obese (Table I). Distribution of subjects based on BMI and sexes is shown in Fig. 1. The figure shows that overweight and obesity were higher in the male students than that in the female students. To find the association of BMI with respect to socio-demographic and other variables of interest the respondents were divided (based on BMI) into two groups – normal/underweight [(n=206(72.8%)] and overweight/obese [(n=77(27.2%)]]. The age distribution was almost similar in the two groups of respondents with mean age being >19 years in either group (Table I). Male respondents demonstrated their significant presence in overweight or obese group (70.1%) compared to their female counterparts (29.9%) (P=0.041). No other socio-demographic variables (religion, income, father’s and mother’s occupation) presented in Table II was found to be associated with overweight or obesity (P>0.05 in each case). Although the mean systolic and diastolic blood pressures of the two groups of respondents were within physiological range, the blood pressures of the overweight/obese group were found to lie nearer the upper limits of the range and were significantly higher from those of their normal/underweight peers (P=0.003 and P=0.002) (Table III). Family history of obesity was frequently common among overweight/obese group (35.1%)

than that in the normal/underweight group (21.4%) (p = 0.018). Family history of hypertension and diabetes were considerably higher in the former group than those in the latter group although the differences were not significant (P=0.114 and P=0.349 respectively) (Table IV).

Around 60% of the respondents in either group reported that they used to take exercise regularly. Of them more than 60% practice walking, 20% running and the rest practice other methods including Yoga. The two groups were almost identical in terms of type of exercise they practice (P=0.921). Half of the respondents in either group spent time on sleep 6–8 hours and almost half <6 hours, with no significant difference between the groups (P=0.726). Eighty percent of the respondents in both groups spent time on internet/mobile for entertainment. Very few students spent time watching TV. Taking of fast/junk food was reported to be considerably higher in the overweight/obese group than that in the underweight/normal group (P=0.249) (Table V).

Table I. Distribution of respondents by their BMI (n=283)

BMI (kg/m ²)	Frequency	Percentage
<18.5 (Underweight)	27	9.5
18.5-24.9 (Normal)	179	63.3
25-29.9 (Overweight)	60	21.2
30-39.9 (Obese)	17	6.0

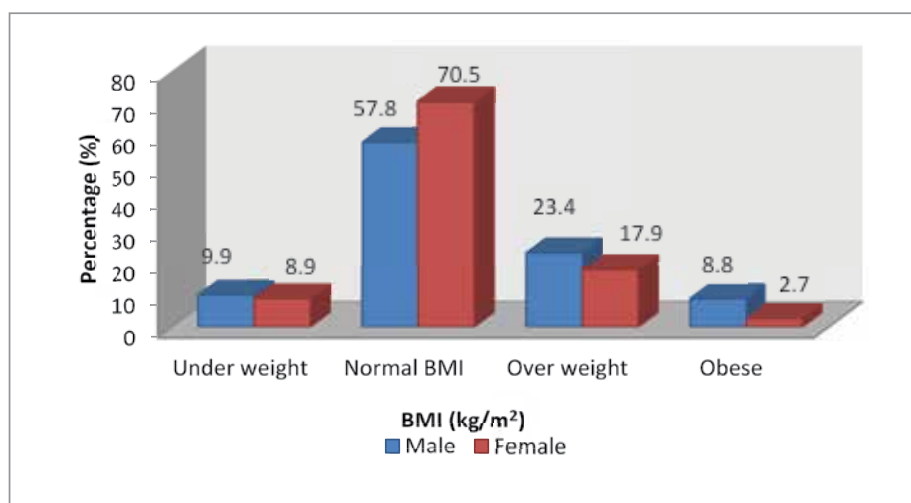


Fig.1: Distribution of subjects according to BMI and sex

Table II. Association between socio-demographic characteristics and BMI (n=283)

Socio-demographic characteristics	BMI		p values
	Normal/Underweight (n = 206)	Overweight/Obese (n = 77)	
<i>Age (years)</i>	19.4 ± 1.0	19.6 ± 1.0	0.282
<i>Sex</i>			
Male	117(56.8)	54(70.1)	0.041
Female	89(43.2)	23(29.9)	
<i>Religion</i>			
Muslim	153(74.27)	59 (76.6)	0.554
Hindu	50(24.27)	18(23.4)	
Buddhist	3(1.46)	0(0.0)	
<i>Nationality</i>			
Bangladeshi	142(68.93)	62(80.5)	0.114
Nepali	34(16.51)	10(13.0)	
Kashmiri	26(12.62)	3(3.9)	
Others	4(1.94)	2(2.6)	
<i>Annual Income (Taka)</i>	876527 ± 109298	759636 ± 417325	0.362
<i>Fathers' Occupation</i>			
Business	29(14.08)	12(15.58)	0.542
Service	15(7.28)	3(3.9)	
Government service	86(41.75)	33(42.86)	
Doctor	39(18.93)	14(18.18)	
Engineer	31(15.05)	15(19.48)	
Others	6(2.91)	0(0.0)	
<i>Mothers' Occupation</i>			
Housewife	149(72.3)	61(79.2)	0.345
Government service	6(2.9)	2(2.6)	
Doctor	2(1.0)	0(0.0)	
Business	12(5.8)	1(1.3)	
Service	30(14.6)	8(10.4)	
Others	7(3.4)	5(6.5)	

Figures in the parentheses indicate corresponding %

Table III. Distribution of blood pressure between two groups of respondents (n = 283)

Blood pressure (mmHg)	BMI (kg/m ²)		p values
	Normal/Underweight (n = 206)	Overweight/Obese (n = 77)	
Systolic BP	107.6 ± 16.7	114.3 ± 16.0	0.003
Diastolic BP	74.3 ± 9.9	78.3 ± 8.1	0.002

Table IV. Association between family history of non-communicable diseases and BMI (n = 283)

Family history of non-communicable diseases & their risk factors	BMI		p values
	Normal/Underweight (n = 206)	Overweight/Obese (n = 77)	
Obesity	44(21.4)	27(35.1)	0.018
Hypertension	70(34.0)	34(44.2)	0.114
Diabetes	68(33.3)	30(39.0)	0.349

Figures in the parentheses indicate corresponding %;

Table V. Association between life-style pattern and BMI (n=283)

Life-style-related variables	BMI		p values
	Normal/Underweight (n = 206)	Overweight/Obese (n = 77)	
<i>Take exercise</i>	122(59.2)	48(62.3)	0.634
<i>If so, type of exercise</i>			
Running	26(21.3)	9(18.75)	
Walking	74(60.65)	30(62.5)	
Yoga	3(2.45)	2(4.17)	0.921
Others	19(15.6)	7(14.58)	
<i>Time spent on sleep</i>			
< 6 hours	94 (45.63)	39 (50.6)	
6-8hours	108 (52.43)	37 (48.1)	0.726
> 8 hours	4 (1.94)	1 (1.3)	
<i>Time spent on Entertainment</i>			
Watching TV	10(4.9)	3(3.9)	
Internet/mobile	164(79.6)	62(80.5)	0.943
Others	32 (15.5)	12 (15.6)	
<i>Taking fast/junk food</i>			
Daily	40 (19.4)	22(28.6)	
Per weekly	126(61.2)	41 (53.2)	0.249
Per monthly	40(19.4)	14(18.2)	

Figures in the parentheses indicate corresponding %

Discussion

In the present study, the prevalence of overweight and obesity was 21.2% and 6.0% respectively. Akhter et al¹¹ conducted a cross sectional study on medical students in Dhaka and found the prevalence of overweight 20.5% and obesity 4.5%. A similar result was found in the study done by Gupta et al¹² (overweight 17.5% and obesity 3.4%) among undergraduate medical students of Medinipur, West Bengal in 2007. Another study from

India showed somewhat low prevalence of overweight (11.7%) and obesity (2%) among medical students of Delhi.¹³ Kalasker et al¹⁴ recently demonstrated that 16.2% of the 1st year medical students were overweight and 3.4% were obese. Sugathan and Bagh¹⁵ in a recent study found prevalence of overweight and obesity among medical students of Malaysia 11.2% and 2.8% respectively. In a community-based cross-sectional study done by Brahmhatt et al in Ahmedabad city in

2009 overweight and obesity were found 13.3% and 5.4% respectively.¹⁶ Higher prevalence was found by Hussain et al (overweight 13.22% and obesity 6.8%) in 2009 and Bansal et al (overweight 14.83% and obesity 5.69%) in 2013 among students aged 10–15 years.¹⁷⁻¹⁸

When BMI of the respondents was correlated with their demographic characteristics, males were more often found overweight or obese (70.1%) compared to their female counterparts (29.9%) ($P=0.041$). No other socio-demographic variables (age, religion, income, nationality, father's and mother's occupation) was found associated with overweight or obesity. Sugathan and Bagh¹⁵ also showed that male medical students were overweight and obese significantly more than their female counterparts bearing consistency with the findings of the present study. They also did not find any significant association of overweight or obesity with other demographic variables. Kalasker et al¹⁴ in a recent study in India found 16.2% of the first year MBBS students overweight and 3.4% obese, but they did not find any association between overweight/obesity with any of the socio-demographic variables. Family history of obesity was observed to be a determinant of overweight/obesity among the respondents ($p=0.018$), although family history of hypertension and/or diabetes did not influence the overweight/obesity. The mean systolic and diastolic blood pressures of the two groups of respondents were within physiological range; the systolic and diastolic blood pressures of the overweight/obese group were on an average 7 and 4 mm Hg higher respectively than their normal counterparts ($P=0.003$ and $P=0.002$). However, Kalasker et al¹⁴ found positive family history of obesity, DM and HTN significantly associated with higher prevalence of overweight and obesity. The prevalence of overweight and obesity was not significantly higher in students with sleep duration of <6 hrs and >8 hrs per day in present study. Saraswathi et al found that prevalence of overweight-obesity was significantly higher among students aged 13–17 years of age in 2009 with sleep duration >10 hrs/day.¹⁹

Behavioral variables such as taking exercise, time spent on sleep and entertainment and food behavior were not found associated with BMI. In this study, no significant association was found between prevalence of overall overweight and sedentary activities like watching TV, internet and mobiles; but significant association was found in the study done by Thakre et

al²⁰ in 2011 among students aged 5–16 years in Nagpur city. Vohra et al²¹ found no significant association between sedentary activities and prevalence of overall overweight among adolescents aged 10–18 years in Lucknow city. Sugathan and Bagh¹⁵ showed that overweight and obese students were taking exercise for longer period of time than their peers of normal BMI, which might be due to the fact that being overweight and obese, they became more health conscious.

Summarizing the findings of the present study and those of other investigators, it appears that more than one-quarter of the undergraduate medical students are overweight or obese and male students are more often have the condition than the female students. Overweight and obese students generally have family history of overweight or obesity. The systolic and diastolic blood pressures of the overweight/obese medical students are on an average 7 and 4 mm Hg higher respectively than their normal fellows. Behavioral factors such as taking exercise, time spent on sleep and entertainment and food behavior were not found associated with BMI.

As this study was conducted in medical students who are future physicians, it is very important that they should be aware of increasing obesity as this may influence the outlook of patients. This study was conducted in 283 medical students. It was recommended to conduct a study with a larger sample size.

Limitations

1. Study population was selected from Enam Medical College, Savar, Dhaka and the study was conducted in a short period of time with a small sample size. So, the results of the study may not reflect the exact picture of the whole country.
2. It is an institution-based cross-sectional study; so, the results of this study do not apply to the community.
3. Recall and non-response bias could have occurred from the students while filling the questionnaire, which warrants further research.

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