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Prevalence Of Obesity Among Medical Students Of Bangladesh Medical College

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Abstract

Introduction: *Obesity is a growing public health concern worldwide, and it has become a significant risk factor for various non-communicable diseases. Medical students, as future healthcare providers, play a critical role in preventing and managing obesity. However, limited research has been conducted on the prevalence of obesity among medical students in Bangladesh. Understanding the prevalence and associated factors of obesity among medical students can help develop effective interventions to prevent and manage obesity among medical students and the general population. Therefore, this study aims to assess the prevalence of obesity among medical students of Bangladesh Medical College and explore its associated factors.*

Methods: *This cross-sectional descriptive study was conducted at the Bangladesh Medical College, Dhanmondi, Bangladesh. The study duration was 6 months, from March 2019 to October 2020. During this period, a total of 124 3rd year MBBS students available during the data collection were included as the study population*

Result: *39.0% of students had obesity, with 23.4% being overweight and 37.9% being normal weight. The prevalence of obesity/overweight was higher among the younger population. The mean age of participants was 21.4 ± 0.82 years, and the majority were female, Muslim, and unmarried. Household characteristics indicated that most participants had a nuclear family with more than four members, and over a third earned one lac & more monthly. Family history of obesity and diabetes were significantly associated with BMI. Eating behavior, consumption of soft drinks, chocolate, and junk food were not significantly associated with BMI. Watching TV was not significantly associated with BMI, but smoking habit was significantly associated. Alcohol/drug habit and physical activities were not significantly associated with BMI.*

Conclusion: *The anthropometric measurement results indicate that a significant percentage of the young student population surveyed had obesity or overweight. The study also found several associations between socioeconomic factors, food habits, lifestyle, and BMI categories. The results suggest that interventions are needed to address the high prevalence of obesity and overweight among young students, particularly those with a family history of obesity or diabetes. Strategies that promote healthy eating habits, physical activity, and discourage smoking and other unhealthy lifestyle practices should be implemented to improve the health outcomes of this population.*

Keywords: *Obesity, Weight, Overweight, Medical, Junk-Food*

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I. INTRODUCTION

Obesity may be defined as an abnormal growth of the adipose tissue due to an enlargement of fat cell size (hypertrophic obesity) or an increase in fat cell number (hyper plastic obesity) or a combination of both. However, obese individuals differ not only in the amount of excess fat that they store but also in the regional distribution of fat within the body.(1) Overweight and obesity are the fifth leading cause for global deaths. At least 2.8 million adults die each year as a result of being overweight or obese.(2) Obesity is not a problem of a certain part of the world any longer; obesity has now become a global pandemic. Genetic predisposition cannot

be neglected as a contributing factor to obesity, and dietary habits, physical activities, and behavioral factors are also crucial risk factors.(3) In Bangladesh, there is a nutritional transition going on from typical carbohydrate diet to fast food dietary habits, and it is more prominent among young adults like medical students.(4) During the recent years, the rate of obesity in children and adolescents is progressively being noted with influencing factors such as the altered lifestyle of families with enhanced purchasing power, elevated hours of inactivity because of television, video games, and computers, lack of outdoor games and other social activities.(5) Overweight and obesity are major risk factors for non-communicable diseases like cardiovascular diseases, diabetes disorders, and even some forms of cancers which contribute to 5% of mortality globally.(6) Childhood obesity is associated with high level blood pressure, LDL Cholesterol, insulin resistance, lower level of HDL-C, increased heart rate and increased cardiac output.(7) Medical students are more prone to obesity due to their lifestyle involving less physical activity and disordered eating habits. Due to such factors, they are prone to obesity related health hazards. The target for the present study was the medical students who are the future physicians of this country, and them being overweight and obese can generate a wrong impression among the general populace.(8) In 2014, nearly 1.9 billion adults were overweight and 600 million were obese globally. That means a total of 39% of the adult population(38% male and 40% female) worldwide were overweight and 13% were obese (11% men and 15% women), which in total was almost half of the world's population.(9) Being overweight or obese is one of the major contributing factors to a plethora of health problems. Almost 2.8 million adults die of obesity each year. In addition, 44% of the diabetes cases, 23% of ischemic heart diseases and 7%-41% of certain cancer burdens are attributed to being overweight or obese.(10) Globally, the highest number of obese and overweight people are form the Americas, where nearly half the population is overweight and 19% are obese.(11) China has the following highest prevalence, where the prevalence of being overweight among men has increases from 9.6% to 20.0% and among females this has increased from 14.5% to 26.5%, while the prevalence of obese individuals has also increased from 0.6% to 3.0% in males and 1.8% to 5.2% in females.(12) The third highest prevalence of obesity and overweight is in India, where 1 in 5 men and women is either overweight or obese.(9) The situation is similar in various other countries where there has been a significant rise in the overweight and obese population.(2,13,14) According to WHO, 30%-80% of adults and 20% of children in Europe are overweight.(12) The aim of this study was to determine the prevalence of obesity among medical students of Bangladesh Medical College, and its relationship with their regular lifestyle activities.

II. OBJECTIVE

General Objective

- To estimate the prevalence of obesity among the students of a tertiary Medical College Hospital.

Specific Objectives

- To describe the socio-demographic characteristics of the students of Medical College Hospital.
- To identify the factors relating to overweight/obesity among the medical students.

III. METHODS

This cross-sectional descriptive study was conducted at the Bangladesh Medical College, Dhanmondi, Bangladesh. The study duration was 6 months, from March 2019 to October 2020. During this period, a total of 124 3rd year MBBS students available during the data collection were included as the study population. Purposive sampling technique was used to select the study population from the students of Bangladesh Medical College, Dhaka. Based on the study objectives- variables were identified and operationalized. A questionnaire was then developed and pre-tested on a separate group of students. After pretesting the questionnaire was slightly modified and finalized for data collection. The purpose of the study was explained in a rational manner to the respondents. On completion of data collection, the students BMI were calculated from the height and weight. Data capturing format was developed using SPSS software considering the entry program procedures. Data from the questionnaires were entered into developed data entry software. Data editing was included checking of range, structure and a selected set of checks for internal consistency. The whole system for data entry/data processing and management was directly managed by the researcher. Once the data are being entered and cleaned, data was then analyzed as per analysis plan. For the data analysis, descriptive analyses of all main variables and appropriate test analyses using independent predictor variables in the data sets to determine their relative contributions to the dependent variable was done. The tabulation plan for this study was of various tables included by segregated in the respective chapter of the study report.

Inclusion Criteria

- 3rd year MBBS students attending Bangladesh Medical College, Dhaka
- Patients who had given consent to participate in the study.

Exclusion Criteria

- Students not available during the deployment of questionnaire
- Unable to answer the criteria question.

IV. RESULTS

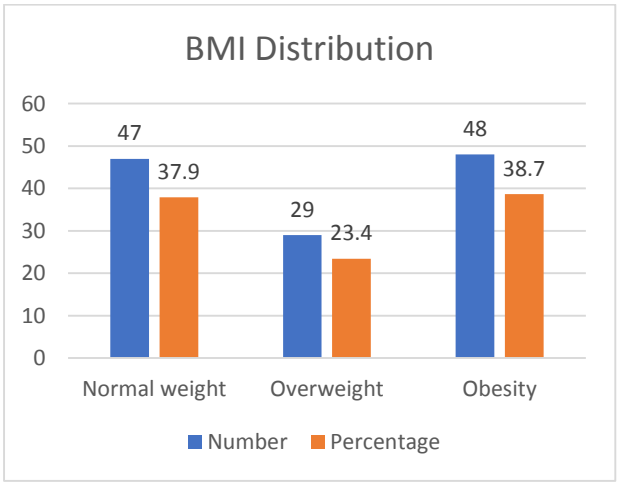

Figure 1: Distribution of study population Based on Anthropometric Measurement

Respondent's Anthropometric measurement results showed in Figure 1 where about 39.0% students had obesity, followed by 23.4% overweight students and 37.9% normal weight students. The results indicated that that the prevalence of obesity/overweight was more pronounced among the young study population.

Table 1: Distribution of study population Based on sociodemographic and household Characteristics

Characteristics	Number	Percentage
Respondent's Age		
< 21 years	71	57.3
≥22 years	53	42.7
Mean age	21.4 ± 0.82	
Gender		
Male	47	37.9
Female	77	62.1
Religion		
Muslim	112	90.3
Non-Muslim	12	9.7
Marital Status		
Unmarried	121	97.6
Married	3	2.4
Permanent Residence		
Dhaka	22	17.7
Outside Dhaka	50	40.3
Abroad	52	41.9
Place of living		
Home	31	25
Hostel	93	75
Monthly Family Income		
Not Disclosed	23	18.5
< 50000 BDT	17	13.7
50000-99000 BDT	37	29.8
BDT One lac & above	47	37.9

Type of family		
Nuclear	107	86.3
Joint	17	13.7
Family size		
< 4 members	18	14.5
4+ members	106	85.5
Number of siblings		
1	70	56.5
2	29	23.4
3 or more	13	10.5
No sibling	12	9.7
History of obesity in the family		
Yes	49	39.5
No	74	60.5
History of diabetes in the family		
Yes	49	39.5
No	75	60.5

Among the participants, the mean age was 21.4 ± 0.82 years. 57.3% of participants were under 21 years of age, 62.1% of the participants were female, 90.3% of participants were Muslim, and 97.6% of participants were Unmarried. Regarding permanent residence, 41.9% of participants were from abroad, and 40.3% were from outside Dhaka. 75.0% of participants were living in Hostel, and 25.0% of participants were living in Home. Regarding student's monthly family income, 37.9% earned were one lac & more. Based on household characteristics, 86.3% had a nuclear family, and 85.5% had more than four family members. In addition, the majority of families had one or two siblings, 56.5% and 23.4%, respectively, 60.5% of participants had no family history of obesity, and 39.5% of participants had a family history of diabetes.

Table 2: Frequency of Food Intake/Consumption Habit among the Respondents

Characteristics	Number	Percentage
Non-vegetable		
Daily	109	87.9
Weekly	10	8.1
Twice a month	1	.8
Once a month	2	1.6
Never	2	1.6
Eating fruits		
Daily	61	49.2
Weekly	46	37.1
Twice a month	8	6.5
Once a month	9	7.3
Skipping breakfast		
Daily	49	39.5
2-3 times a week	47	37.9
Never	28	22.6
Skipping lunch		
Daily	4	3.2
Once a week	33	26.6
Twice a week	20	16.1
Thrice a week	16	12.9
Never	51	41.1
Taking junk food		

Daily	39	31.5
Sometimes	81	65.3
Never	4	3.2
Taking soft drink		
Daily	18	14.5
Sometimes	99	79.8
Never	7	5.6
Taking Tea/Coffee		
< 2cups/day	67	54.0
2-4 cups/day	35	28.2
>4 cups/day	4	3.2
Never drink	18	14.5
Taking meal while watching TV		
Daily	50	40.3
Occasionally	60	48.4
Never	14	11.3
Taking plain water		
< 6 glasses/day	71	57.3
> 6 glasses/day	53	42.7
Taking chocolate after food		
Daily	16	12.9
Occasionally	89	71.8
Never	19	15.3
Munching between meal		
Daily	41	33.1
Occasionally	65	52.4
Never	18	14.5
Taking midnight snacks		
Daily	17	13.7
Occasionally	72	58.1
Never	35	28.2
Total	**124**	**100.0**

The majority of respondents (87.9%) had eaten non-vegetable foods daily, 49.2% had eaten fruits every day, 57.4% of participants had the habit of eating in the canteen weekly, and about two-fifths of people had 37.9% skipped breakfast. 26.6% of the participants skipped lunch once a week, 65.5% of participants had a habit of taking junk food sometimes, 31.5% had a daily habit of taking junk food, 79.8% had a habit of drinking beverages sometimes, 54.0% people took about one and a half cups of tea or coffee every day. 48.4% had participants watched tv occasionally while eating, and 40.3% of participants watched tv every day. 57.3% of participants had consumed less than six glasses of normal water per day, and 42.7% drank more than six glasses. 71.7% of participants had occasionally eaten chocolate after a meal. 52.4% of participants had a habit of occasionally munching between meals, while 33.1% had a daily habit of taking snacks between meals. 58.1% of participants had a habit of sometimes taking midnight snacks, and 13.7% had a daily routine of midnight snacks.

Table 3: Respondent's Life Style and Personal Behavior

Characteristics	Number	Percentage
Hours of sleeping (Night)		
< 6 hours	48	38.7
6-7 hours	50	40.3

7-8 hours	17	13.7
> 8 hours	9	7.3
Napping time (day Time)		
10-20 mints	9	7.3
30 mints	24	19.4
An hour	37	29.8
> an hour	41	33.1
Does not take nap	13	10.5
Watching TV daily		
Yes	24	19.4
No	100	80.6
Time spent watching TV		
< 2 hours	18	14.5
2-4 hours	8	6.5
4-6 hours	4	3.2
> 6 hours	10	8.1
Never	84	67.7
Time spent using Phone/Laptop/tablet/game		
< 2 hours	15	12.1
2-4 hours	60	48.4
4-6 hours	30	24.2
> 6 hours	19	15.3
Tendency to study overnight		
Everyday	25	20.2
Sometimes	87	70.2
Never	12	9.7
Smoking habit		
Yes	7	5.6
No	117	94.4
Participation in outdoor activities		
Yes	36	29.0
No	88	71.0
Active Workout (Gym)		
Daily	6	4.8
Weekly	1	.8
Sometimes	13	10.5
Never	104	83.9
Yoga		
30 mints/day	4	3.2
30-60 mints/day	2	1.6
Never	118	95.2
Total	**124**	**100.0**

40.3% of participants had a habit of 6-7 hrs sleep every night, 33.1% slept more than 1 hour during the day, and 10.5% didn't take naps during the day. 80.6% of participants had not watched tv every day. 67.7% of the participant had never wasted time watching TV, while 14.5% watched tv below 2 hours and 8.1% watched TV over 6 hours. 48.4% of participants spent 2-4 hours on phone/laptop/tablet/game, 12.1% had spent below 2 hours, and 15.3% had spent over 6 hours watching phone/tablet/tablet/game. 9.7% of participants had never studied overnight, 70.2% had studied overnight sometimes, and 20.2% had learned overnight every day. 94.4% of participants had no smoking habit, while 5.6% had a smoking habit. 71.0% of participants had not participated in outdoor activities, and 29.0% had participated in outdoor activities. 83.9% of participants had never gone to gyms, 10.5% had used gyms sometimes, and 4.8% had used gyms daily. 95.2% had never done yoga, and 3.2% had a habit of practicing yoga for 30 minutes daily.

Table 4: Association between Body Mass Index and Respondents' Socioeconomic Factor

Demographic & SES	BMI Category				Significant Level (Chi-Square Value)
	Normal weight	Overweight	Obesity	Total	
Respondent's Age					
< 21 years	57.40%	62.10%	54.20%	57.30%	p=0.79
22+ years	42.60%	37.90%	45.80%	42.70%	
Gender					
Male	36.20%	37.90%	39.60%	37.90%	p=0.94
Female	63.80%	62.10%	60.40%	62.10%	
Place of Living					
Home	21.30%	10.30%	37.50%	25.00%	P<0.05
Hostel	78.70%	89.70%	62.50%	75.00%	
Monthly Family Income					
Not Disclosed	23.40%	24.10%	10.40%	18.50%	p=0.17
< 50000 BDT	6.40%	24.10%	14.60%	13.70%	
50000-99000 BDT	34.00%	20.70%	31.30%	29.80%	
BDT One lac & above	36.20%	31.00%	43.80%	37.90%	
Family History of Obesity					
Yes	23.40%	55.20%	45.80%	39.50%	p<0.05
No	76.60%	44.80%	54.20%	60.50%	
Family History of Diabetes					
Yes	36.20%	65.50%	66.70%	54.80%	p<0.05
No	63.80%	34.50%	33.30%	45.20%	

Regarding Association between socioeconomic factors and BMI category, respondents' age was non-significantly associated with BMI (p=0.79). Gender was non-significantly associated with BMI (p=0.94), the place of living was highly statistically significantly associated with BMI (p<0.05), and monthly family income was non-significantly associated with BMI (p=0.17). A family history of obesity was statistically significantly associated with BMI (p<0.05). A family history of diabetes was statistically significantly associated with BMI (p<0.05).

Table 5: Body Mass Index and Respondents' Food Habit Factor

Food Habit	BMI Category				Significant Level (Chi-Square Value)
	Normal weight (48)	Overweight (29)	Obesity (48)	Total	
Eating Behavior					
Non-vegetable	100.0%	93.1%	100.0%	98.4%	p=0.36
Vegetable	0.0%	6.9%	0.0%	1.6%	
Taking Soft Drink					
Daily	17.0%	13.8%	12.5%	14.5%	p=0.46
Sometimes	80.9%	82.8%	77.1%	79.8%	
Never	2.1%	3.4%	10.4%	5.6%	
Chocolate					
Eating	89.4%	75.9%	85.4%	84.7%	p=0.28
Not Eating	10.6%	24.1%	14.6%	15.3%	
Fatty and Junk Food					
Taken	72.3%	79.3%	85.4%	79.0%	p=0.23
Not taken	27.7%	20.7%	14.6%	21.0%	

Regarding Association between food habit factor and BMI category, eating behavior was non-significantly associated with BMI (p=0.36). In addition, taking soft drinks was non-significantly associated with BMI (p=0.46), chocolate was non-significantly associated with (p=0.28), and Fatty and junk food were non-significantly associated with BMI (p=0.23).

Table 6: Body Mass Index and Respondent's Life Style

Life Style & Physical Activities	BMI Category				Significant Level (Chi-Square Value)
	Normal weight	Overweight	Obesity	Total	
Watching TV					
Yes	19.1%	13.8%	22.9%	19.4%	p=0.67
No	80.9%	86.2%	77.1%	80.6%	
Smoking Habit					
Yes	6.4%	0.0%	2.1%	3.2%	p<0.10
No	93.6%	100.0%	97.9%	96.8%	
Alcohol/Drug Habit					
Yes	0.0%	6.9%	10.4%	5.6%	p=0.23
No	100.0%	93.1%	89.6%	94.4%	
Physical Activities					
Yes	27.7%	20.7%	35.4%	29.0%	p=0.37
No	72.3%	79.3%	64.6%	71.0%	

Regarding Association between lifestyle and BMI category, watching tv was non-significantly associated with BMI (p=0.67). Smoking habit was statistically significantly associated with BMI (p<0.010). Alcohol/ drug habit was non-significantly associated with BMI (p=0.23). Physical activities were non-significantly associated with BMI (p=0.37).

V. DISCUSSION

The aim of this study was to provide baseline data on the prevalence of overweight and obesity, as well as eating habits, among Bangladeshi medical college students. The unique study population consisted of only students, and the study area was limited to a medical college. Results showed that 23.4% of respondents were overweight and 39.0% were obese, which was not much higher than expected. Body mass index was used to assess weight status, and more than one-third of the students were of normal weight. Normal weight was more prevalent among female students (63.8%) compared to male students (33.2%), despite the lower prevalence of overweight and obesity among male students. Obesity was more common among female students than males in the studied population. This was in line with the findings of a 2014 study, but contradictory finding with a significantly higher male prevalence was also observed in some studies.(15,16) The study results showed that approximately one-third of respondents favored foods that were high in carbohydrates and animal protein, including animal fat. These are foods that young people tend to consume and that contribute to overweight and obesity.(17-19) Another factor that contributed to overweight and obesity was the frequent use of oil/fat during cooking. The study found a lower percentage of its use, which supported the lower prevalence of overweight. The study results also indicated that the majority of respondents had a habit of consuming non-vegetarian food items frequently, which was alarming. Unhealthy eating habits were also indicated by the fact that many students reported frequently skipping breakfast. However, some bad habits among respondents were not pronounced, such as frequent consumption of drinks, soft drinks, and tea. Physical exercise was found to help people maintain normal weight and avoid overweight and obesity. The study found that a high proportion of students engaged in regular walking and other forms of exercise. However, the study respondents reported some adverse lifestyle and personal behaviors that contributed to overweight and obesity. Many of the respondents slept less than 6 hours and did not take any naps during the day, which could contribute to overweight and obesity.(20,21) The study also found that respondents spent several hours using phones, laptops, tablets, and playing games. Respondents tended to study overnight in regular basis. As the alcohol consumption is not acceptable in our country context, resulting in a very few cases of alcohol consumption, the study did not find any relationship between alcohol consumption and obesity among medical college students in Bangladesh, probably due to the restriction of smoking on medical college premises. The study found that the proportion of overweight and obesity was higher among those who consumed junk food more frequently, but there was no significant relationship. This was contradictory to the general understandings and common findings among other studies, where junk food had been significantly associated with overweight and obesity.(22) However, respondents who were younger, female, and from families with higher income had a tendency towards overweight and obesity. The place of living was found to be a significant factor associated with

overweight and obesity. Students living in hostels had more freedom to avail adverse circumstances than students living with their families, where restrictions were more. The study results also found a significant relationship between BMI index and family history of obesity and diabetes, indicating that heredity is one of the public health determinants.

Limitations of The Study

The study was conducted in a single medical college with a small sample size. So, the results may not represent the whole community.

VI. CONCLUSION

The anthropometric measurement results indicate that a significant percentage of the young student population surveyed had obesity or overweight. The study also found several associations between socioeconomic factors, food habits, lifestyle, and BMI categories. The results suggest that interventions are needed to address the high prevalence of obesity and overweight among young students, particularly those with a family history of obesity or diabetes. Strategies that promote healthy eating habits, physical activity, and discourage smoking and other unhealthy lifestyle practices should be implemented to improve the health outcomes of this population.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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