

PREVALENCE OF OVERWEIGHT AND OBESITY AMONG MEDICAL STUDENTS AT A TERTIARY CARE HOSPITAL IN KERALA

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Abstract

Background: The prevalence of overweight and obesity has increased to about three times since 1975. The worldwide prevalence of obesity has been reaching pandemic proportions. The WHO had estimated that in 2016, more than 1.9 billion adults worldwide (39%) were overweight, and approximately 650 million (13%) were obese. The medical students are future health-care providers who are more prone for obesity due to their sedentary lifestyle, stress, and disordered eating habits and spending more time with their books and gadgets. The objective is to assess the prevalence of overweight and obesity among medical students in Govt Medical College Thrissur. To study association between Obesity and factors like age, sex, year of MBBS, physical activity, type of diet, smoking, alcohol, sleep, screen time, frequency of consumption of non-vegetarian food, junk food, co-morbidities, frequency of skipping meals.

Materials and Methods: After obtaining the informed consent, the pre-designed questionnaire with 11 questions (mcqs) was sent to first, second and third year MBBS students in the age group 17-24 yrs Government Medical College, Thrissur (N=300) BMI was calculated with QUETELTS index (Body Mass Index: weight in kilo gram divided by height in meter square) and the participants were categorized on the basis of Asia-Pacific BMI CLASSIFICATION. Categorical data is presented as percentage. Tests of significance were performed using Chi-square test and fisher's exact test.

Result: 13.3% of MBBS students were found to have Grade 1 obesity and 20.7% were overweight according to Asian BMI classification. Among the variables analyzed for association with Obesity, Sex, type of accommodation and frequency of consumption of junk food were found to be statistically significant. **Conclusion:** Since, obesity is a prominent risk factor for several comorbidities it is necessary to take precautions to prevent and control it.

INTRODUCTION

The prevalence of overweight and obesity has increased to about three times since 1975 worldwide.^[1] Noncommunicable diseases (NCDs) are one of the leading causes of death and disability in developed and developing countries and include conditions such as cardiovascular diseases, cancer, chronic respiratory diseases, diabetes, obesity, and cognitive impairment.² While genetic and environmental risk factors for non-communicable diseases are well known, there is a strong emphasis on the modifiable elements related to lifestyle at the individual level.^[2-4] The worldwide prevalence of obesity has been reaching pandemic proportions. The WHO had estimated that in 2016, more than 1.9 billion adults worldwide (39%) were overweight, and

approximately 650 million (13%) were obese.^[5] The current trajectory of this prevalence acceleration would result in almost half of the world's population being overweight or obese by 2030.^[6] The main cause for obesity in Indians is a nutritional shift from the typical carbohydrate diet to high calorie fast food which is more common among college students.^[7] The medical students are future health-care providers. They are themselves more prone for obesity due to their sedentary lifestyle, stress, and disordered eating habits and spending more time with their books and gadgets. Hence this study aims to assess the prevalence of overweight and obesity among medical students at a tertiary care hospital in Kerala.

Objectives

- To assess the prevalence of overweight and obesity among first, second and third year MBBS students in Government Medical College, Thrissur in the age group 17-24 yrs
- To study association between Obesity and factors like age, gender, year of MBBS, physical activity, diet, smoking, alcohol, sleep, screen time, frequency of consumption of non-vegetarian food, junk food, co-morbidities, frequency of skipping meals among first, second and third year MBBS students in Government Medical College, Thrissur in the age group 17-24 yrs.

MATERIALS AND METHODS

A descriptive study was done among first, second and third year MBBS students in Government Medical College, Thrissur in the age group 17-24 yrs

Inclusion criteria:

MBBS students studying in first, second and third year at Govt medical college Thrissur who are willing to take part in the study.

Exclusion Criteria

1. Students on chronic medications.
2. Students with history of past or present pregnancy
3. Students not willing to participate in the study
4. Physically challenged students.

Sample Size- $n = 300$ (100 students each from first, second and third year MBBS) sample size calculated by the formula $n = 4pq/d^2$, $p = 25.7\%$ as calculated from least response rate obtained from the study conducted by Manojan KK et al in 2019 (Prevalence of Obesity and Overweight among Medical Students based on New Asia-Pacific BMI Guideline) $q = 1 - p$, $d = 14\%$ precision; Adjusted sample size $N = 375$ by using the formula $N = (n / (1 - d))$ where n is sample size and d is the anticipated dropout rate of 20%). Sampling technique used was Census sampling and the study period was 1 month after approval from IRC/IEC Study procedure: Questionnaire validation was done by sending the mcqs randomly to 10 mbbs students in the study population. Students who participated in the study received verbal and written explanation of the procedure involved and the expected benefits from the study. After obtaining the informed consent, the pre-designed questionnaire was sent to subjects and explained that results would only be expressed as a group data and confidentiality would be maintained throughout and after the study. Questionnaire: It contains participant's demographic and socioeconomic characteristics such as age, sex, income, smoking, alcohol, family history, diet pattern, and physical activity, comorbidities of obesity such as GERD, arthritis and OSAS, history of being bullied for obesity, and history of any efforts taken for weight reduction. The participants were categorized on the basis of BMI, according to Asia-Pacific BMI CLASSIFICATION (under weight (BMI < 18.5), normal (BMI = 18.5 to 22.9), over weight (BMI = 23 to 24.9), obese grade 1 (BMI = 25 to 29.9) and obesity grade 2 (BMI > 30)). To measure

weight, standardized weighing scales used. To measure height, portable anthropometry rod was used. Participants were asked to stand with back against rod, look straight, and heels touching the rod without any footwear. Sliding horizontal bar gently touches head compressing hair. BMI is calculated with QUETELTS index (weight in kilograms/height in square metre). The data will be entered in Microsoft excel and further analysis will be done using SPSS 16.0 version software.

RESULTS

A descriptive study was done among 300 students of first, second and third year MBBS students at Government Medical College, Thrissur in the age group 17-24 yrs. Categorical data is presented as percentage. Tests of significance were performed using Chi-square test and fishers exact test with statistical significance level set at $P < 0.05$.

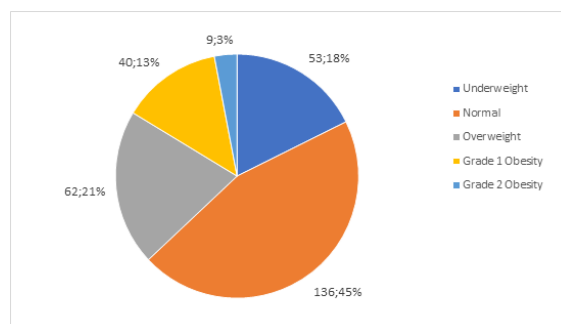


Figure 1: Distribution of study participants based on Asia Pacific BMI Classification

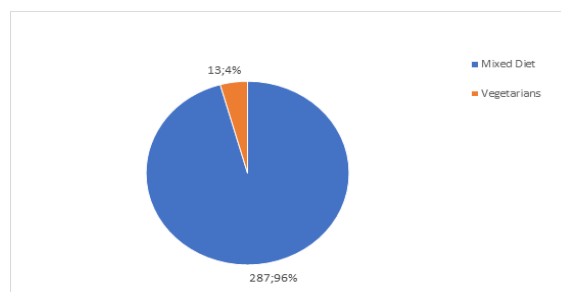


Figure 2: Distribution of study subjects based on diet

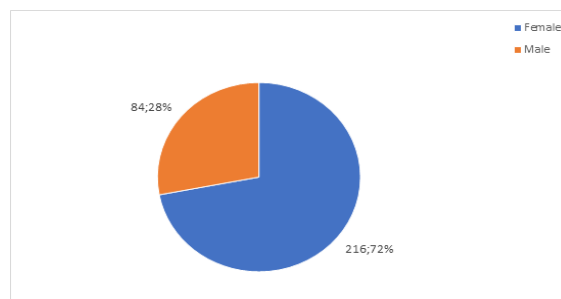


Figure 3: Distribution of study subjects based on gender

Highest proportion of the study participants (45.3%) had normal BMI. 37% of the study participants had high BMI, while 17.7% of the study subjects were underweight. [Figure 1]

Majority of the study participants (95.7%) were consuming a mixed diet, while only 4.3% were pure vegetarians. [Figure 2]

Majority of the study subjects (72%) were females. [Figure 3]

Table 1: Frequency table of MBBS Students according to year of study.

Year of MBBS	Frequency	Percentage
1	129	43 %
2	115	38.3 %
3	56	18.7 %

Among the study subjects, 43% were from 1st year, while 38% were from 2nd year and the least number of participants were from 3rd year.

Table 2: Descriptive statistics of Height, Weight and BMI of MBBS students

	Height in m	Weight in kg	BMI
Mean	1.62	57.7	21.9
Median	1.61	55.3	21.7
Standard deviation	0.101	12	3.37
Minimum	1.4	37	15.2
Maximum	1.93	99	31.9

The mean height of the study subjects was 1.62m. The median height was 1.61m (+/- 0.101m).

The mean weight of the study subjects was 57.7kg. The median weight was 55.3kg (+/- 12kg).

The average BMI of the study subjects was 21.9. The median BMI was 21.7 (+/- 3.37).

Table 3: Frequency of consumption of non-vegetarian food

How often do you consume non-vegetarian food?	Frequency	Percentage
Daily	171	59.2 %
Weekly	106	36.7 %
Monthly	12	4.2 %

Nearly 60% of the study participants consumed non-vegetarian food daily.

Table 4: Frequency of consumption of junk/fast food

How often do you eat junk food / fast food?	Frequency	Percentage
Never	3	1.0 %
Daily	30	10.0 %
Weekly	193	64.3 %
Monthly	74	24.7 %

Junk food was consumed daily by 10% of the study subjects, whereas majority of the study population reported only weekly consumption of junk food.

Table 5: Association between Obesity and various factors

Sl. No	Variable	Groups	Not Overweight/ Obese	Overweight/ Obese	P value (Chi-square Test)
1	Gender	Female	145(48.3%)	71(23.7%)	0.018#
		Male	44(14.7%)	40(13.3%)	
2	Year of MBBS	1st year	89 (29.7%)	40(13.3%)	0.174#
		2nd year	67(22.3%)	48(16%)	
		3rd year	33(11%)	23(7.7%)	
3	Accommodation	Day scholar	13(4.3%)	16(5.3%)	0.042#
		Hosteler	176(58.7%)	95(31.7%)	
4	Diet	Vegetarian	11(3.7%)	2(0.7%)	0.142*
		Non-Vegetarian	178(59.3%)	109(36.3%)	
5	Smoking	No	189(63%)	109(36.3%)	0.136*
		Yes	0(0%)	2(0.7%)	
6	Alcohol	No	189(63.0%)	110(36.7%)	0.370*
		Yes	0(0%)	1(0.3%)	
7	Sleep	<6hrs	3(1%)	1(0.3%)	0.216*
		6-8hrs	131(43.7%)	87(29%)	
		>8hrs	55(18.3%)	23(7.7%)	
8	Physical Activity	Never	28(9.3%)	17(5.7%)	0.703#
		Occasionally	80(26.7%)	47(15.7%)	
		Weekly	15(5%)	5(1.7%)	
		Daily	66(22%)	42(14%)	
9	Screen time	<2hrs	14(4.7%)	6(2%)	0.795#
		2-4hrs	86(28.7%)	51(17%)	
		>4hrs	89(29.7%)	54(18%)	
10		Daily	101(34.9%)	70(24.2%)	0.197*
		Weekly	69(23.9%)	37(12.8%)	

	Frequency of consumption of non-vegetarian food	Monthly	10(3.5%)	2(0.7%)	
11	Junk food	Never	3(1%)	0(0%)	0.012*
		Daily	12(4%)	18(6%)	
		Weekly	121(40.3%)	72(24%)	
		Monthly	53(17.7%)	21(7%)	
12	Co-morbidities (GERD)	Nil	183(61%)	111(37%)	0.088*
		Yes	6(2%)	0(0%)	
13	Frequency of skipping of meals	Never	67(22.3%)	26(8.7%)	0.177*
		Sometimes	93(31%)	64(21.3%)	
		Weekly	5(1.7%)	3(1%)	
		Daily	24(8%)	18(6%)	
14	Age	<= 20yrs	98(32.7%)	46(15.3%)	0.081#
		>20years	91(30.3%)	65(21.7%)	

*Fisher's-Exact Test #Chi-square Test

Among the variables analyzed for association with Obesity; Sex, Type of accommodation and Frequency of consumption of junk food were found to have association with statistical significance. (p value <0.05).

DISCUSSION

From this study, highest proportion of the study participants (45.3%) had normal BMI, 37% of the study participants had high BMI, while 17.7% of the study subjects were underweight. Among the variables analyzed for association with obesity: females (23.7%) were affected than males (13.3%), hostelers (31.7%) were found to be more obese than day scholars (5.3%) and those consuming junk food daily (6%) were mostly included in the obese category compared to others.

Obesity is a condition which is characterized by an increase in the size and amount of fat cells in the body. It is a chronic disorder that is officially classified as a disease by the World Health Organization (WHO), and also by several other national and international organizations.^[8] The definition of the term given by the Obesity Medicine Association captures both its complex etiology and diverse consequences: "a chronic, relapsing, multifactorial, neurobehavioral disease, wherein an increase in body fat promotes adipose tissue dysfunction and abnormal fat mass physical forces, resulting in adverse metabolic, biomechanical and psychosocial health consequences.^[9] The body mass index (weight/height²) is widely used in the adult populations, and a cutoff point of 30 kg/ m² is recognised internationally as a definition of adult obesity. The Western Pacific Regional Office of the World Health Organization (WHO) has recommended lowering the BMI cutoff levels for Asian people to 23.0 for overweight and 25.0 for obesity.^[10] The obesity related disorders occur at a much lower body mass index (BMI) in ethnic Asian populations than in ethnic Caucasian. Elevated body fat percentage and cardiovascular risks at low body mass index levels among Asian people, including Indians were well documented.^[11] According to studies conducted by Defronzo et al, an impaired appetite regulation in obese individuals is because of cerebral insulin resistance, leading to both an increased hepatic glucose production and a reduced muscle glucose intake, thus implicating the brain directly in the pathogenesis of the metabolic

syndrome.^[12] New evidence is emerging which indicates that obesity without type 2 diabetes results in a three-fold increase in the risk of developing Alzheimer's disease (AD).^[13] Furthermore, because of the strong correlation between Alzheimer's disease and impairments in insulin and insulin-like growth factor gene expression and its signaling in the brain, AD may represent a brain-specific form of diabetes, sometimes referred to as "type 3 diabetes."^[14]

Medical students are usually more prone to obesity due to their lifestyle with less physical activity and disordered eating habits. According to studies conducted by Parajuli K et al among medical allied science students in Karnataka, 28.7% were overweight among male students and 18.6% among female students.^[15] In another study conducted by Rekha et al in Chennai among medical students, the overall prevalence of overweight and obesity was 53.2% among which 30.3% were obese exclusively and also that 63% of obese individuals consume fast food once or more in a week whereas only 22.8 % of non-obese fall under the same category.^[16] The prevalence of Obesity in India has reached epidemic proportions in the 21st century, with morbid obesity affecting at least 5 % of the country's population.^[17] According to studies conducted by Gajewska et al in Poland, excessive body weight is perceived as one of the most grave public health problems. The university years also had a high influence on shaping adult habits, concerning everyday diet, physical activity, tobacco smoking, and alcohol consumption. Acquiring unhealthy lifestyle behaviours at very early stage of life may also result in a distorted body view.^[18] According to studies conducted by Moldakozhayev et al, ageing of the body is associated with a physiological slowdown of metabolism and, consequently, an increase in abdominal obesity.^[19] Both, early mitochondrial dysfunction and adipocyte hyperplasia, which also leads to metabolic dysregulation may be caused by an unhealthy lifestyle in students, support the physiological process of slowing down the metabolism. This may clarify higher BMI values in students in the second year of our study in comparison to the first year.

According to studies done by Alhashemi et al, long college days, combined with daily fatigue, can lead to fast food being a popular choice for medical students which also supports findings in our study.^[20]

CONCLUSION

Since, obesity is a prominent risk factor for several comorbidities it is necessary to take precautions to prevent and control it. This study can also create awareness among medical students to adopt a healthy lifestyle. There is also an increased psychosocial impact on these students due to obesity which can be looked upon.

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