

## Evaluation of body mass index among undergraduate medical students

Saira Jamshed, Farah Khan, Adnan Bashir, Khadijah Abid, Nabeel Naeem Baig

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### Abstract:

**Objective:** To determine frequency of BMI among undergraduate medical students of Karachi.

**Study design:** Cross-sectional study

**Place and duration of study:** Hamdard College of Medical and Dentistry Karachi, from January 2017 to August 2017.

**Methodology:** A total of 175 students were included. A pre-tested questionnaire was used to collect and record information. Measurement were carried out for BMI. The subjects responses were coded, calculated and analyzed by using SPSS version 21.

**Results:** Among total of 175 undergraduate medical students which were assessed for their weight status on the basis of BMI, 63% of them were overweight, while 60% of them were normal weight, 15.4% were obese and only 14.3% were underweight.

**Conclusion:** Our study highlights the fact that obesity is not a major problem among the medical students but being over-weight is coming up as a significant problem. Most of the students did not consider having a balanced diet or nutritional value of foods so they just took what was available thus indicating poor dietary and nutritional practices. Improvement in dietary habits, if made in early years of medical schooling, would produce physicians practicing and promoting healthy dietary habits. Nutrition education is required including counseling on skipping meals and consumption of snacks.

**Keywords:** Body mass index (BMI), Obesity, Medical students, healthy dietary habits

### Introduction:

Obesity is a chronic disease where a person has accumulated so much body fat that it might have a negative effect on their health. Obesity has arrived epidemic proportion globally. Comprehensively in 2014 more than 1.9 million adults of age  $\geq 18$  years were studied out of them 600 million were categorized as obese.<sup>1</sup>

A nationally representative survey conducted among Pakistani population in 2016 which confirms obesity as a major public health problem. The overall prevalence of overweight and obesity was 25.0%. The prevalence was highest, 42.8%, among women aged 35–54 years but was also high among those aged 15–24 years, at 12.4% for men and 13.8% for women shows the

weighted prevalence of overweight and obesity according to various BMI cut-off values. However, the overall weighted prevalence of obesity was 10.3%.<sup>2</sup>

Usually a university student's diet is high in fat and low in fruits and vegetables. Students often select fast food due to its availability and convenience. As a result of their erratic eating pattern contribute these young people to obesity.<sup>5</sup> Various studies among university students in developing countries showed high prevalence of overweight and obesity ranging from 10% to 59.4%.<sup>3</sup>

Universities can affect the health behavior of young adults through academic programmes

**Hamdard College of  
Medicine & Dentistry,  
Hamdard University  
Hospital, Karachi**  
S Jamshed  
F Khan  
A Bsahir  
K Abid  
NN Baig

**Correspondence:**  
Dr Saira Jamshed,  
House No. A-204, Block-H,  
North Nazimabad, Karachi.  
Cell: + 92-333-2307062  
Email:  
doctorsairajamshed@  
yahoo.com

Table-1: Characteristics of study variables

Variables	Frequency (%)
Age in years (Mean±SD)	21.87±1.48
BMI (Mean±SD)	23.37±4.63
Gender	
Male	91(52%)
Female	84(48%)
Living Status	
Hostel	103(58.9%)
With Family	72(41.1%)
Medical Year	
3rd Year	70(40%)
4th Year	105(60%)
Diabetic	
Yes	26(14.9%)
No	149(85.1%)

Table-2: Stratification of BMI w.r.t effect modifiers

Variables	BMI Categories				P-value
	Underweight	Normal	Overweight	Obese	
Gender					
Male	7(7.7%)	24(26.4%)	43(47.3%)	17(18.7%)	0.001
Female	18(21.4%)	36(42.9%)	20(23.8%)	10(11.9%)	
Living Status					
Hostel	13(12.6%)	30(29.1%)	43(47.3%)	17(18.7%)	0.178
With Family	12(16.7%)	30(41.7%)	20(23.8%)	10(11.9%)	
Medical Year					
3rd year	11(15.7%)	18(25.7%)	27(38.6%)	14(20%)	0.216
4th year	14(13.3%)	42(40%)	36(34.3%)	13(12.4%)	
Diabetes Mellitus					
Yes	6(23.1%)	5(19.2%)	11(42.3%)	4(15.4%)	0.261
No	19(12.8)	55(36.9%)	52(34.9%)	23(15.4%)	

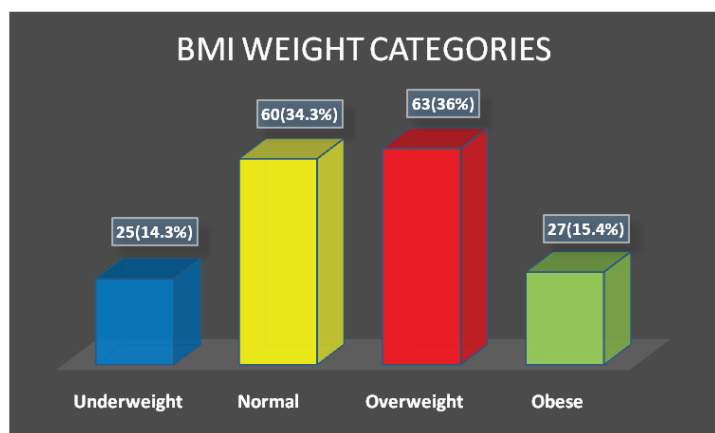


Figure-1: Frequency distribution of BMI weight categories

on nutrition and health. Most of the universities have health services and campus recreation centers which are the main setting for nutrition education. However, due to the numerous reasons,

these programs have not played an efficient role and it is suggested that the health education centers/departments should be established for students.<sup>4</sup>

Not with-standing these concerns regarding a higher body weight, there is a serious lack of data on the prevalence of obesity in Pakistan, particularly among undergraduate medical students. Therefore, the present investigation was undertaken to assess the prevalence of obesity among undergraduate medical students.

### Material and Method:

It was a cross-sectional study conducted at Hamdard College of Medical and Dentistry Karachi from Jan 2017 to Aug 2017. A total of 175 students of either gender aged 18 to 26 years from third and fourth year were included in the study by using non-probability consecutive sampling. Students who did not give consent were excluded. A pre-tested questionnaire was used to collect and record information on age, sex, residence, medical year, height in meters, weight in kilograms and comorbid like diabetes of each subject. Body mass index (BMI) values were calculated by dividing weight in kg with height in m<sup>2</sup>. BMI was stratified as <18.5 kg/m<sup>2</sup> underweight, 18.5–22.9 kg/m<sup>2</sup> normal weight, 23.0–26.9 kg/m<sup>2</sup> overweight and ≥27 kg/m<sup>2</sup> obese. This classification was adapted from WHO expert panel recommendation potential BMI categories for public health action in people of Asian ethnicity.<sup>6</sup> The subjects responses were coded, calculated and analyzed using SPSS (statistical package for social sciences version 21). Frequency and percentages were calculated for qualitative variables. Mean and standard deviation were computed for qualitative variables.

### Results:

Among total of 175 undergraduate medical students which were assessed for their weight status on the basis of BMI, 84(48%) were females and 91(52%) were males. The mean age was calculated as 21.87 years ± 1.48 SD. The mean BMI of the students was 23.37±4.63 kg/m<sup>2</sup>. Out of 175, 58.9% students were living in hostel and 41.1% students were living with their fam-

ily. About 40% of students were belonging from 3rd year and 60% were belonging from 4th year. Diabetes were observed in 26(14.9%) of them. (table-1)

As depicted in figure-1, most (63%) of them were overweight, while 60% of them were normal weight, 15.4% obese, and only 14.3% underweight. (figure-1)

Stratification with respect to gender showed statistical significance ( $P < 0.05$ ) while living status, medical year and diabetes mellitus showed no significance. (table-2)

#### **Discussion:**

In this study BMI of 175 undergraduate medical students was evaluated to check the prevalence of obesity among them. In the present study about 34.3% students had normal BMI. A similar study at Lahore Medical & Dental College showed that 60% of students had normal BMI.<sup>8</sup> A study conducted at Dow Medical College showed about 59% having normal BMI.<sup>4</sup> A study among Omani Medical students showed similar results with 59% had normal BMI.<sup>10</sup> In another study conducted Sarawathi Institute of Medical Sciences, India reported that 73.1% had normal BMI.<sup>11</sup> Reporting from a Malaysian Medical college, Boo et al. reported that 69% of students had a normal BMI.<sup>9</sup>

The prevalence of underweight was observed as 14.3% in the present study, contrary to the report obtained by Mani G as 10%<sup>7</sup> and Kumar et al. as 20.1%.<sup>11</sup> Boo et al. showed about 15% of medical students were underweight.<sup>9</sup> In another study by Hamid S et al. showed very low prevalence of underweight students as 3%.<sup>13</sup> However a study conducted at Dow Medical college reported overall prevalence of underweight students as 29.9%. The reason of being underweight is due to the current trend for slimness rather than malnutrition and it was highlighted by Minhas et al. On the other hand being underweight could lead to psychological and physical disorders including infertility.<sup>8</sup>

In our study prevalence of overweight and obe-

sity was 36% and 15.4% as per WHO criteria for Asian population. In the present study males were more overweight (47.3%) as compared to females (23.8%), in the same manner proportion of obesity among males (18.7%) were high as compared to females (11.9%). Similar results were showed in the study by Peltzer et al. which was conducted among students of 22 countries that men (24.7%) were significantly more overweight or obese as compared to women (20%).<sup>3</sup> The low frequency of students 2.7% were observed in overweight category at Dow Medical College, however very low frequency of obese as 0.6% was observed.<sup>4</sup> Gupta et al. reported 3% obesity and 17.5% over weight among medical students of Kolkata<sup>15</sup> while Chhabra et al. reported obesity to be 2% and overweight to be 12% among medical students of Delhi.<sup>16</sup> Nisar et al. at Baqai Medical University, Karachi reported the combined prevalence of obesity and overweight as 42%;<sup>17</sup> Mahmood et al<sup>18</sup> at Civil Hospital of Karachi demonstrated it was 60% and Allam et al at Saudi Arab showed that the combined prevalence was 44.8%.<sup>19</sup> Overweight and obesity also adversely affect the quality of life, it threatens to overtake the nation like a tsunami, wreaking havoc on medical, social, and economic health. Overweight and obesity carry a social stigma that may contribute to higher rates of anxiety, depression, and low self-esteem. Researchers have consistently found associations between overweight and obesity and increased morbidity and mortality involving nine body systems, many of which are interdependent. Overweight and obesity have been linked to cardiovascular disease, hypertension, diabetes, dyslipidemia, metabolic syndrome, gallstones, osteoarthritis, sleep apnea, and certain forms of cancer. The risk of these comorbid conditions is positively correlated with the BMI.<sup>20</sup>

In the present study gender showed significance association with BMI, while there was no significant role of living status, medical year and diabetes mellitus.

#### **Conclusion:**

Our study highlights the fact that obesity is not a major problem among the medical students but

being over-weight is coming up as a significant problem. Most of the students did not consider having a balanced diet or nutritional value of foods so they just took what was available thus indicating poor dietary and nutritional practices. Improvement in dietary habits, if made in early years of medical schooling, would produce physicians practicing and promoting healthy dietary habits. Nutrition education is required including counseling on skipping meals and consumption of snacks.

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**Role and contribution of authors:**

Dr Saira Jamsahed, collected the data and wrote the initial write-up.

Dr Farah Khan, collected references and wrote the introduction and discussion

Dr Adnan Bashir, helped in data analysis and collected the references

Dr Nabeel Naeem Baig, helped in discussion writing

Khadijah Abid, collected the data and did statistical analysis, critically review the article.

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