

ORIGINAL ARTICLE

BODY MASS INDEX IN MEDICAL STUDENTS AND ITS ASSOCIATION WITH GENDER AND ACADEMIC YEAR

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Background: Students are generally prone to weight related problems due to sedentary lifestyle and disordered eating habits. The objective of current study was to evaluate the body mass index among MBBS and Physiotherapy students of Peshawar and to see its association with gender and academic year. **Methods:** This was a cross-sectional study conducted among MBBS and Physiotherapy students in Peshawar, from Sep 2016 to Sep 2017. A self-administered questionnaire was distributed among 250 students of different institutes, 213 filled questionnaires were returned. Body mass index (BMI) was used to classify underweight, overweight, and obesity grade I and grade II. Data was analyzed using SPSS-20. **Results:** Mean age of participants was 21.77 ± 1.45 . Females were 137 (64.3%) while males were 76 (35.7%). Unmarried participants were 192 (90.1%), while 21 (9.9%) were married. Mean height, weight and BMI of the participants were 1.654 meter, 61.1 Kg, and 22.8 respectively. One hundred and thirty (61.0%) were MBBS, and 83 (39.0%) were Physiotherapy students. Out of 213 respondents, 109 (51.2%) had normal BMI, 21 (9.9%) were underweight, 41 (19.2%) were overweight, 31 (14.6%) were grade I obese and 11 (5.2%) were grade II obese. Majority of 1st year (68.0%) and 4th year (72.7%) students had normal BMI. BMI was not associated with gender or academic year ($p > 0.05$). Mean BMI in MBBS students was higher than the physiotherapy students (23.3 vs 22.1 Kg/m², $p = 0.03$). **Conclusion:** The prevalence of obesity appears higher in our students.

Keywords: BMI, Obesity, Overweight, Students

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INTRODUCTION

Obesity and overweight is an excessive accumulation of fats in the body that may deteriorate health.¹ Obesity is the major public health problem worldwide.² It is considered as a serious risk factor for major diseases such as type 2 diabetes, hypertension, stroke and cardiovascular diseases.³ Obesity is the 5th leading cause of death.⁴ Each year, approximately 2.8 million adults die due to obesity.^{5,6} WHO had announced overweight and obesity as a global epidemic.⁷

Medical students are more prone to obesity due to their lifestyle with less physical activity and disordered eating habits and.⁵ Lack of physical activity among medical students causes less energy expenditure than food intake leading to obesity.⁸ Less time available for breakfast/launch in college hour due to busy schedule contributes to frequent habit of drinking tea/coffee/juices which exacerbate the condition.⁹ Other contributing factors include increased junk food consumption and family history of obesity.¹⁰ In a study among medical students in India, the prevalence of overweight and obesity according to Asia Pacific Guidelines was 9.67% and 17.66% respectively.⁵ Another study reported that prevalence of underweight, overweight and obesity was 19.08%, 9.93% and 1.53% respectively.¹¹ Similarly, abnormal weight is prevalent in Malaysian and Greek medical students.^{12,13}

Prevalence of obesity and overweight in general population of Pakistan ranges from 9 to 46%.¹⁴⁻¹⁶ The results from Pakistani students on obesity and overweight are different. A study conducted at Baqai Medical University reported 41.7% overweight/obesity in students.¹⁷ A study conducted in Lahore reported the prevalence of overweight, obesity, and underweight as 20.9%, 10.2% and 10.7% respectively.¹⁸ A study from Peshawar which included 1st year MBBS students reported prevalence of obesity and overweight as 16.2%, and 15% respectively.¹⁹ Yet another study from Peshawar among female medical students showed that prevalence of overweight, obesity and underweight was 32.5%, 17%, and 2.9% respectively.²⁰ A similar cross-sectional study conducted among MBBS and BDS students of Peshawar district showed that the prevalence of overweight and obesity were 18.6% and 15.7% respectively.²¹

This study was designed to evaluate the BMI among MBBS and Physiotherapy students of Peshawar and to see its association with gender and academic year.

SUBJECTS AND METHODS

This was a cross-sectional analytical study conducted on MBBS and Physiotherapy students in Peshawar, from Sep 2016 to Sep 2017. Participants were included through convenience sampling. Self-administered

questionnaires were distributed among 250 students of different institutes. BMI was used to classify underweight, overweight, and obesity grade I and II.²² Body mass index was calculated according to formula:

$$\text{BMI} = \frac{\text{Weight in Kg}}{(\text{Height in meter})^2}$$

The WHO definitions for BMI for Asians²³⁻²⁵ (Normal 18.5–22 Kg/m², overweight 23–24.9 Kg/m², grade I obesity 25–29.9 Kg/m² and grade II obesity ≥ 30 Kg/m²) were used in this study. Data were analysed using SPSS-20. Mean and standard deviation were calculated for numerical variables whereas frequency and percentage for categorical variables. Association of BMI categories with age and academic year was determined using Chi-square test. Mean difference between MBBS and Physiotherapy students was calculated using independent sample *t*-test, and $p \leq 0.05$ was considered significant.

RESULTS

Mean age of participants was 21.77±1.45 years. Majority (137, 64.3%) of participants were female, while 76 (35.7%) participants were male. Mean height, weight and BMI of participants were 61.1 Kg, 1.65 m, and 22.8±3.9 respectively.

Out of 213 respondents, 109 (51.2%) had normal BMI, 21 (9.9%) were underweight, and 41 (19.2%) were overweight. Moreover, 31 (14.6%) respondents were obese grade I, and 11 (5.2%) had grade II obesity (Table-1). Majority (68.0%) of 1st year and 4th year (72.7%) students had normal BMI (Table-2).

The data were further analysed on the basis of gender within the degree programmes. BMI was not statistically different between male and female students of MBBS and Physiotherapy ($p=0.20$ and 0.42 respectively) (Table-3).

Further analysis according to year of study in both degree programmes was done. No significant difference in prevalence of obesity based on the year of study was observed ($p=0.23$ and 0.41 respectively) (Table-4).

When BMI of the participants from both degree programmes were compared through independent sample *t*-test, the participants in the Physiotherapy programme had significantly lower BMI than MBBS students (Mean BMI 22.1±3.4 vs 23.3±4, $p=0.035$) (Table-1).

Table-1: Prevalence of underweight, overweight and obesity in MBBS and Physiotherapy students [n (%)]

Degree Program	Normal BMI	Underweight	Overweight	Obesity Grade I	Obesity Grade II	Total	BMI (Mean±SD)	<i>p</i>
MBBS	62 (47.7)	12 (9.2)	26 (20.0)	21 (16.2)	9 (6.9)	130	23.3±4.2	0.03
Physiotherapy	47 (56.6)	9 (10.8)	15 (18.1)	10 (12.0)	2 (2.4)	83	22.1±3.4	
Total	109	21	41	31	11	213		

Table-2: Prevalence of underweight, overweight and obesity in students studying in different academic years [n (%)]

Year of Study	Normal BMI	Underweight	Overweight	Obesity Grade I	Obesity Grade II	Total
1 st year	17 (68.0)	0 (0.0)	2 (8.0)	5 (20.0)	1 (4.0)	25 (11.7)
2 nd year	37 (59.7)	6 (9.7)	11 (17.7)	5 (8.1)	3 (4.8)	62 (29.1)
3 rd year	23 (42.6)	5 (9.3)	14 (25.9)	10 (18.5%)	2 (3.7)	54 (25.4)
4 th year	8 (72.7)	1 (9.1)	2 (18.2)	0 (0.0)	0 (0.0)	11 (5.2)
5 th year	24 (39.3)	9 (14.8)	12 (19.7)	11 (18.0)	5 (8.2)	61 (28.6)
Total	109	21	41	31	11	213

Table-3: Frequency comparison of BMI categories between male and female respondents among MBBS and Physiotherapy students [n (%)]

Degree program	Gender	Underweight	Normal	Overweight	Obesity	Total	<i>p</i>
Physiotherapy	Male	2 (5.3)	22 (57.9)	7 (18.4)	7 (18.4)	38 (100)	0.42
	Female	7 (15.6)	25 (55.6)	8 (17.8)	5 (11.1)	45 (100)	
MBBS	Male	2 (5.3)	15 (39.5)	8 (21.1)	13 (34.2)	38 (100)	0.20
	Female	10 (10.9)	47 (51.1)	18 (19.6)	17 (18.5)	92 (100)	

Table-4: Frequency comparison of BMI categories among different academic years of MBBS and Physiotherapy students [n (%)]

Degree programme	Year	Underweight	Normal	Overweight	Obese	Total	<i>p</i>
Physiotherapy	1	0 (0)	2 (100)	0 (0)	0 (0)	2 (100)	0.41
	2	4 (12.1)	19 (57.6)	6 (18.2)	4 (12.1)	33 (100)	
	3	1 (4.5)	11 (50)	4 (18.2)	6 (27.3)	22 (100)	
	4	0 (0)	2 (100)	0 (0)	0 (0)	2 (100)	
	5	4 (16.7)	13 (54.2)	5 (20.8)	2 (8.3)	24 (100)	
MBBS	1	0 (0)	15 (65.2)	2 (8.7)	6 (26.1)	23 (100)	0.23
	2	2 (6.9)	18 (62.1)	5 (17.2)	4 (13.8)	29 (100)	
	3	4 (12.5)	12 (37.5)	10 (31.3)	6 (18.8)	32 (100)	
	4	1 (11.1)	6 (66.7)	2 (22.2)	0 (0)	9 (100)	
	5	5 (13.5)	11 (29.7)	7 (18.9)	14 (37.8)	37 (100)	

DISCUSSION

Obesity, overweight and underweight has emerged as a global epidemic during the last few decades and that's why it is one of the key research area globally. The consequences associated with weight related problems are enormous and a plethora of high-quality research has reported the morbidity and mortality associated with obesity. Besides general population, MBBS and Physiotherapy students are at high risk of these problems because of their lifestyle with less physical activity and disordered eating habits.^{5,25}

BMI is one of the most commonly used tool to identify underweight, overweight and obesity. WHO generally defines overweight as a BMI equal to or more than 25 Kg/m², and obesity as BMI \geq 30 Kg/m².¹⁹ We used Western Pacific Regional Office of WHO Guidelines to categorise abnormal weight²³⁻²⁵ for the current study.

Previous studies conducted regarding prevalence of weight among medical and physiotherapy students reported higher prevalence of abnormal weight. The higher risk of developing abnormal weight in nursing students was found in those who were having their lunch at canteen.²¹ The prevalence of overweight and obesity in Kelantan at the University Sains Malaysia was 21.3% and 4.5%.²⁶ Another study conducted in medical students in Malaysia showed that obesity was prevalent in 30.1% students based on BMI recommended by WHO for Asian population.¹² The current study is fairly in agreement with the previous studies from abroad.

Different studies conducted in Pakistan reported different statistics regarding abnormal weight among medical students. In a cross-sectional study, conducted at Peshawar the prevalence of overweight was 32.5%, obesity was 17%, underweight was 2.9% and normal BMI was 47.5%. Students were mostly eating junk food instead of balanced diet. Due to use of online social media the degree of physical activity has further declined in students.²⁰ The prevalence of obesity found in medical students at Karachi was 34%, underweight 15%, normal weight 30%, obesity grade I 25.4% and obesity grade II was 8.8%.²⁴ The results of current study were in accordance with the results of previous studies conducted in Pakistan.

The comprehensive analytical results yielded no significant differences when the data was compared based on the gender and programme of study and year of study. The results may not have significant differences due to the fact that students at this level of study are more actively involved in physical activities along with the academic activities as the age gap between the students in different years of the study is small and their leisure activities almost remain the same in such age group. This warrants further research to

check for the physical activity behaviour of such students.

The BMI of the students in MBBS and physiotherapy was analysed using independent sample *t*-test which revealed that BMI of physiotherapy students is significantly lower BMI than MBBS students. The mean BMI of MBBS students (23.3 Kg/m²) is in the overweight category. This could be due to the fact that students in physiotherapy have less academic burden compared to MBBS students (Semester vs Annual system). A further study with more extensive questionnaires to identify the physical activity behaviour and academic burden of the student would yield far-reaching results.

CONCLUSION

The prevalence of obesity appears higher in our population. It is not associated with gender or academic year of medical students. MBBS students are in the overweight category range. Longitudinal studies are required to investigate obesity related problems in MBBS and Physiotherapy students.

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