ORIGINAL RESEARCH

A Cross-sectional Study of Obesity among Second-year MBBS Students of a Medical College in Mumbai

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ABSTRACT

Introduction: Obesity is defined as an abnormal and excessive deposition of adipose tissue to the extent that the health is adversely affected. In second year of the professional course, since the duration of the course being 1½ years (18 months), this is assumed and observed as well that students are more relaxed and tend to ignore their health profile to a greater extent. The general age of the students is 20 (±2) years in second Bachelor of Medicine and Bachelor of Surgery (MBBS) batch. Hence, by this study we will be able to assess the nutritional status of students and will suggest measures to improve their health profile.

Materials and methods: A target study group of 58 medical students of both the sexes was selected for the study. Any student not willing to give consent was excluded from the study. A predesigned and validated questionnaire was duly filled by participants with details, such as personal data, family history. Anthropometric measurements like body mass index (BMI) and waist hip ratio were also recorded. The collected data were analyzed using Statistical Package for the Social Sciences (SPSS) version 20.0, and Chi-square test was applied.

Results: About 40.54% of female population is noted with high waist hip ratio, whereas BMI showed only 5.4% of obese female participants. Of these participants, 23.8% male patients were preobese compared with 21.6% female patients who were preobese. Also, 14.3% male participants were obese compared with 5.4% of female participants as per their BMI.

Conclusion: Considerable amount of obesity among the female students of second year MBBS was observed. Also, we conclude that waist hip ratio is a better anthropometric indicator for obesity than BMI. The participants are advised to undergo further evaluation for obesity and undergo weight loss regimens so as to improve the quality of life.

Keywords: Bachelor of Medicine and Bachelor of Surgery students, Body mass index, Obesity, Waist hip ratio.

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INTRODUCTION

The transition from Junior College to Medical College can be a stressful lifestyle change for young adults. During this transition period, students can develop a variety of health attitudes and behavioral changes that may have a negative impact on their overall well-being.[1] There is a paucity of research on this transition of medical students.

Precisely, in second year of the professional course, since the duration of the course being 1½ years (18 months), students are more relaxed and tend to ignore their health profile to a greater extent. The general age of the students is 20 (±2) years and ignorance of nutritional status in period between the late adolescent and early adulthood can in turn result into obesity and provoke the risk for hypertension, type II diabetes mellitus, and other obesity-related diseases in future professional life, and thus affecting the quality of life.

Obesity is defined as an abnormal and excessive deposition of adipose tissue to the extent that the health is adversely affected.[2] Obesity is one of the most neglected and pervasive health problems worldwide affecting all ages, socioeconomic classes, and ethnicities. It is rightly referred as "Globesity," as it has emerged as a global non-communicable epidemic.[2] It is fifth cause of death in the world.[3,4] Irregularity in diet, lack of exercise, and stress are independent risk factors which are inadvertently present in the students, especially who live far away from their homes in the hostel.[5,6]

Aim

To find out the percentage of obesity among second-year MBBS students in a medical college in an urban area.

Objective

- To find out the BMI and waist hip ratio of second-year MBBS students.
- To find out the family history of (H/O) type II diabetes mellitus, hypertension, obesity, or any other concurrent diseases in the study group.

- To find out the H/O any disease in the past or present in the study group.
  Duration of the study: 3 months.

MATERIALS AND METHODS

Predesigned, validated questionnaire was developed to find out obesity among second-year MBBS students. It contained information on identification data, socioeconomic status, demographic data, current morbidity, anthropometric measures, and family H/O any disease. Permission was taken duly from Research Society and Institutional Ethics Committee before the study was started. It is a cross-sectional study. The observations and results are presented in a tabulated form subject to statistical analysis. Chi-square test is applied for the associated independent and dependent variables. Statistical Package for the Social Sciences package version 20.0 is used for the same. Inclusion criteria—all students of first- and second-year MBBS 2013 batch. Exclusion criteria—students not willing to give written consent.

DISCUSSION

The data collected from the participants were classified in various tables. The data are analyzed with the help of SPSS package version 20.0. Similarly, chi-square test is applied wherever applicable.

About 58 participants from second year MBBS participated in the study, out of which, 63.80% (37) were female participants and 36.20% (21) were male participants.

$\chi^2 = 6.065$, p-value = 0.108, p > 0.05.

Graph 1 shows BMI status of participants as per their sex. It shows that majority of the participants, i.e., 61.9% (19) of males and 51.4% (13) female participants, fall in normal category; 21.62% (8) female participants and none of the male participant were underweight. Out of 37 female participants, 27% (10) were preobese and obese and out of 21 male participants, 38.1% (8) were preobese and obese.

Though not statistically significant, it shows sizable number of students fall in preobese and obese categories. Compared with female participants, more of male participants fall in preobese and obese category pertaining to BMI. It is the precursor for future noncommunicable diseases in late adulthood. Similar results were found by Sperrin et al[7] and Deurenberg et al.[8]

Table 1 shows correlation of BMI status with waist hip ratio of participants. We found that out of 15 participants with high waist hip ratio, maximum, i.e., 40% (6) participants had normal BMI. About 26.7% participants with high waist hip ratio were underweight and preobese. Only 6.6% participants with high waist hip ratio were obese. Though it is not statistically significant, the total number of participants with high waist hip ratio is 15, which account for 25.9% (hidden data) of the total sample size, which is alarming. Similar results were found by Kaur and Walia[9] and Daniel et al.[10]

Table 2 and Graph 2 depict waist hip ratio as per the sex of the participants. It shows that out of total 37 female

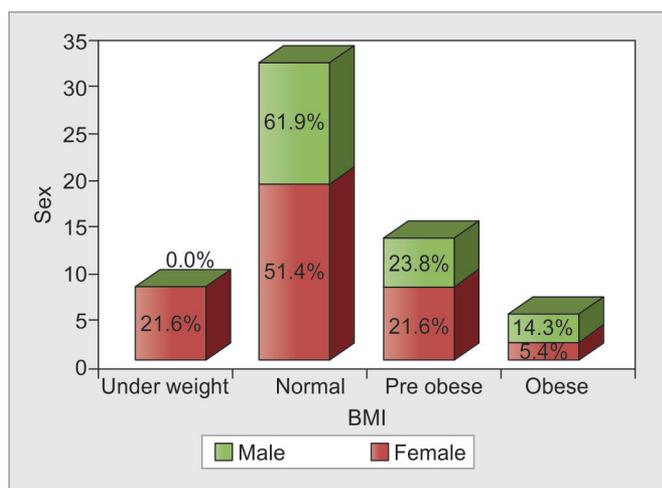**Table 1:** Body mass index status *vs* waist hip ratio

| Body mass index	Waist hip ratio				Total	
	High	%	Normal	%	Number	%
Underweight	4	26.7	4	9.30	8	13.8
Normal	6	40	26	60.5	32	55.2
Preobese	4	26.7	9	20.9	13	22.4
Obese	1	6.6	4	9.30	5	8.6
Total	15	100	43	100	58	100

$\chi^2 = 3.528$, p-value = 0.317

Table 2: Correlation of sex with waist hip ratio

Sex	Waist hip ratio				Total	%
	High	%	Normal	%		
Female	15	40.54	22	59	37	100
Male	0	0	21	100	21	100
Total	15	25.9	43	74.1	58	100

$\chi^2 = 11.483$, p-value = 0.001, significant at 5% level since p < 0.05

Graph 1: Body mass index and sex-wise distribution of participants
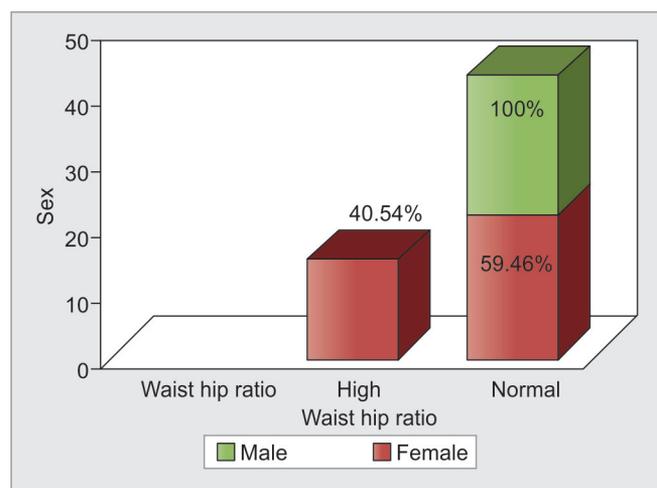
Graph 2: Correlation of sex with waist hip ratio

Table 3: Distribution of participants with respect to family history and waist hip ratio

Family H/O Illness	Waist hip ratio					
	High	%	Normal	%	Total	%
Diabetes	3	37.5	5	62.5	8	100
Hypertension	2	28.6	5	71.4	7	100
Diabetes and hypertension	2	28.6	5	71.4	7	100
Normal	8	22.2	28	77.8	36	100
Total	15	25.9	43	74.1	58	100

$\chi^2 = 0.867$, p-value = 0.833

participants, 40.54% (15) participants were in the high waist hip ratio category. None of the male participants has higher waist hip ratio. Our study shows alarming percentage of female participants (40.54%) with high waist hip ratio. The data are statistically highly significant. Similar results were found by Tichet et al.[11]

Table 3 classifies waist hip ratio with family H/O the participants. It shows that 37.5% (3) participants from the high waist hip ratio category had positive family H/O diabetes, 28.57% had family H/O hypertension, and 28.57% participants were with family H/O both diabetes and hypertension. Though the data are not statistically significant, participants with high waist hip ratio and positive family H/O diabetes, hypertension, or both are in high risk group of developing the lifestyle diseases in future life. Similar results were found by Gopalakrishnan et al[12] and Jayaraj et al.[13]

DISTRIBUTION OF PARTICIPATION WITH RESPECT TO FAMILY HISTORY AND BMI STATUS

We have collected the data about family history with BMI status of participants with one participant in obese category having H/O hypertension and one participant having a family H/O hypertension and diabetes in the obese category. There is no participant in obese category with exclusive family H/O diabetes. In the underweight category, there was one participant with family H/O diabetes and two participants with family H/O hypertension and no participants in the category of both diabetes and hypertension. Similar results were found by Villa-Caballero et al.[14]

DISTRIBUTION OF PARTICIPANTS WITH RESPECT TO PAST H/O DISEASE AND WAIST HIP RATIO

We have collected and analyzed the data of past H/O illness with one obese participant giving H/O bronchial asthma, one preobese participant with H/O of chicken pox, and one participant from the underweight category

giving H/O of typhoid in the past. We have collected the data about waist hip ratio with past H/O illness. One participant with high waist hip ratio gives H/O typhoid.

CONCLUSION

About 40.54% female participants show high waist hip ratio, whereas as per BMI calculations, only 5.4% of female participants fall in obese category. Waist hip ratio is better than BMI as per the study conducted by Rudolf E Noble,[7] and patients with high waist hip ratio have a high risk of cardiac diseases, like myocardial infarction. Also in the fourth decade of life, these subjects are prone to chronic illnesses like hypertension and type II diabetes mellitus. Newer studies have shown female participants with high waist hip ratio are at high risk for neoplasms like breast cancer.[10]

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