Original Research Article

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20184813

Prevalence of overweight/obesity among medical students at Suraram, India

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Received: 23 September 2018 **Revised:** 15 November 2018 Accepted: 16 November 2018

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ABSTRACT

Background: Overweight/obesity is a critical public health problem in both developed and developing nations, has nearly tripled since 1975. In 2016, more than 1.9 B were overweight and 650 M obese. Studies from different parts of India have reported a rise in prevalence of obesity (11 to 37.5%). To date, there are not many studies on the prevalence of obesity among medical students in India. Hence this study was conducted with an objective to assess the prevalence of overweight/obesity and its associated factors among young medical students.

Methods: VI Semester MBBS students of the year 2013 batch of Malla Reddy Medical College for Women were interviewed in March and April 2016.

Results: Out of 150 participants, 125 responded (83%). Overall prevalence of obesity/overweight was 45%. Mean age of the sample was 20 years (±0.75); more belonged to upper than lower strata (61.6% vs. 38.4%); 86.4% were from nuclear family, means better food and care. Chi-squared test revealed significant differences for age, higher socio-economic status, diet, physical inactivity and co-morbidities associated with obesity/overweight (p<0.05). There was significant positive correlation values between BMI and waist circumference at p<0.01 level. The correlation of BMI with waist circumference is (r=0.675).

Conclusions: It is crucial to establish cost-effective strategies like promotion of healthy foods, introducing extracurricular activities at institutional level, avoiding junk food are likely to have a major effect in reducing obesity among these young medicos. This would also enable them to maintain normal weights, avoid immediate and longterm complications associated with overweight/obesity.

Keywords: Overweight, Obesity, Physical activity

INTRODUCTION

Obesity is defined as excess of fat in the body. It tripled worldwide since 1975. Globally, an estimated 1.9 billion adults above the age of 18yrs are overweight, that means 39% of the world's adult population are overweight (39% of men and 40% of women) and 13% obese (11% men and 15% women) in 2016 as per World Health Organization. By 2030, it is expected to increase to >3 billion people.² The prevalence of overweight increased with rising income level of countries across all income

groups over the last thirty years. In high-income and upper-middle-income countries, it was more than double of low- and lower-middle-income countries. More than 50% of adults in high-income and upper-middle-income countries were overweight. Over one fifth of them were obese in high income countries against a quarter in uppermiddle-income countries. In lower-middle and lowincome countries the increase in prevalence of overweight and obesity increased over three decades than in upper-middle and high-income countries, with rates of obesity doubling between 1980 and 2008.3 Currently,

India, with 1.2 billion people is the second most populous country in the world experiencing rapid epidemiological transition. Under-nutrition which dominated in the past due to poverty is rapidly replaced by obesity. Industrialization and urbanization also contributes to increased prevalence of obesity. Studies from different parts of India have provided evidence of the rising prevalence of obesity. 4-7 A survey was conducted in India during 2014-2015 which found that 11 percent of men and 15 percent of women (aged 18-69) were obese. 8 The main cause of overweight and obesity is an imbalance of energy between calories consumed and expended.^{9,10} Increased intake of energy-dense foods, lack of physical activity due to the increasingly sedentary life style, Dietary changes are often due to environmental and societal changes. Overweight and Obesity are major risk factors non-communicable diseases for cardiovascular diseases: diabetes; musculoskeletal disorders (especially osteoarthritis-a highly disabling degenerative disease of the joints); some cancers (endometrial, breast, ovarian, prostate, liver, gallbladder, kidney, and colon) which contribute to 5% of mortality globally. 11 To date, there have not been many studies on the prevalence of obesity among medical students in India. Hence this study was conducted with an objective to assess the prevalence of overweight/obesity and its associated factors among young medical students.

METHODS

It is a cross-sectional study conducted among VI Semester MBBS students of the year 2013 admission batch of Mallareddy Medical College for Women which is situated in Telangana state, Southern part of India. It is a private Medical College started in the year 2013, with an intake of 150 students per year only for women. Institutional Ethical clearance was obtained to conduct the study. It was conducted in March and April 2016. The study subjects were briefed about the study, trained them to take the height and weight accurately. A pre-tested Structured Questionnaire was administered to those who volunteered and gave the consent to participate in the study. Socioeconomic and Demographic parameters pertaining to age, religion, socio-economic status as per modified Kuppuswamy social class classification, type of family, self-reported health problems, food habits (whether vegetarian, consumption of junk food, snacks, red meat, fish, ghee, dietary fiber, aerated drinks, sweets/chocolates, fruits and vegetables and how frequently they consume was obtained). A total score of 10 was given based on what they eat. A score of <5 was considered poor practice and >5 as good practice. Physical activity (total sitting time in a day, brisk walking, cycling, swimming, dancing, any other aerobic or anaerobic type of exercise) were collected. Anyone who does 150 minutes of physical activity in a given week was considered as doing exercise and others were labeled as not doing any physical activity. The sample size was calculated using a formula $(Z_{1-\alpha/z}^2 p(1-p)/d_2)$. Prevalence of obesity was taken as 11% as there was a wide variation in the figures (11 to 37.5%).³ A precision of 5% was considered and thus the sample size was 150.

Non-response rate of 10% was not considered in calculating sample size as the capacity of intake of medical students was limited to 150 per batch/academic year. This was the first batch of intake of students at this college. All students were included in the study (purposive sampling). Those individuals who were absent from college on the day of study were excluded. Standard techniques were used to measure the anthropometric parameters.¹² Height and weights were measured in centimeter (cm) and kilogram (kg). A floor type weighing scale was used with due respect to the standardization of the equipment and procedure. The measurements are taken to the nearest 0.5 kg. A Stadiometer was used to measure the height. The study subjects were asked to stand upright, barefooted with their back of heels, buttocks and head touching the vertical back board. Readings were taken to the nearest 0.5 cm. Definition of overweight and obesity was having too much body fat which is a risk to health. ^{13,14} A reliable way to determine the body fat is to calculate a ratio of their weight in kg to their height in meter squared. This ratio is called the Body Mass Index (BMI). The recommended cut-offs for Asia as per the World Health Organization (WHO), normal weight with BMI of 18.5–22.9 kg/m², \geq 23 kg/m² to <24.9 kg/m² as overweight and \geq 25 kg/m² as Generalized obesity (GO) with or without abdominal obesity (AO) was considered in the present study. 15 Location of fat in the body is also important and could be a better indicator of a risk factor. Fat which accumulates around the waist may be more dangerous in long-term. 15 A non-stretchable tape was used to measure waist circumference (WC) in centimeters. It was measured at a level mid-way between the lower rib margin and the iliac crest at the end of expiration in a standing position. WC based cut-offs: normal weight <80 cm, overweight 80 to 87.99 cm and obese >88 cm for women was considered. 16 The same tape was used to measure the hip circumference which was measured as the maximal circumference over the buttocks at the level of greater trochanter. Waist to Hip ratio (WHR) was calculated and cut-offs of normal weight <0.80, overweight 0.80 to 0.84 and obese >0.85was considered for women.¹⁶ All analyses were performed with SPSS software.¹⁷ Descriptive statistics (frequencies, means) was used to characterize the study subjects. Primary outcome overweight/obesity was measured in numbers, percentages. The prevalence of the outcome was estimated with 95% confidence interval. Association between demographic variables, diet, physical activity, co-morbidities and overweight/obesity was assessed with Chi-square test that used a significance level of 0.05. Further evaluated whether measurements of BMI and the waist circumference were correlated among study group.

RESULTS

Out of 150 participants, 125 responded, response rate was 83%. Overall prevalence of obesity/overweight was 45% (SD±3.50). The mean age of the sample was 20 years (SD±0.75), minimum and maximum age was 18 yrs and 22 yrs. Coming to health problems, 25 (20%) had reported medical, gynecological or others like asthma,

migraine, sinusitis; 27 (21.6%) of them reported a family history of overweight, thyroid, diabetes, hypertension, chronic kidney disease, tuberculosis or others like asthma, cancer; minimum and maximum BMI was 15.22 and 31.11, mean was 22.19 (SD±3.50); Minimum and maximum waist circumference was 53 cms and 90 cms, mean was 71.38 (SD±7.60).

Table 1: Socio-demographic characteristics of study subjects.

	N (%)
Age (yrs)	
<20	104 (83.2)
>20	21 (16.8)
Religion	
Hindus	113 (90.4)
Muslims	7 (5.6)
Christians	5 (4.0)
Socio-economic class	
Upper class	39 (31.2)
Upper middle class	38 (30.4)
Lower middle class	36 (28.8)
Upper lower class	12 (09.6)
Type of family	
Joint family	17 (13.6)
Nuclear family	108 (86.4)

Table 1 shows the demographic characteristics of study subjects. Age distribution showed 83% of the students were below 20 yrs of age. Distribution across religion showed an increase in percentage of Hindus compared to Non-Hindus (90.4% vs. 9.6%). The distribution by socioeconomic class showed more of the students belonged to upper strata than lower strata (61.6% vs. 38.4%). Distribution by type of family showed that 86.4% were from nuclear family, which means better food and care.

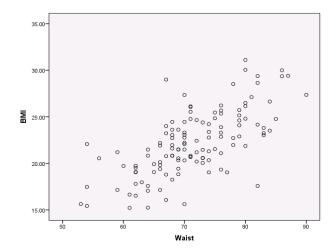


Figure 1: Correlation between body mass index and waist circumference.

Table 2: Prevalence of obesity and associated risk factors.

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	Overweight	Obesity	Normal	
	N (%)	N (%)	N (%)	
	25 (20)	31 (25)	69 (55)	
Age (yrs)				
<20	15 (12)	26 (21)	63 (50)	
>20	10 (08)	05 (04)	06 (05)	0.002*
SES				
Upper	18 (14)	26 (21)	33 (26)	0.001*
Lower	07 (06)	05 (04)	36 (29)	
Diet				
Good Practices	09 (07)	11 (09)	42 (34)	0.02*
Poor practices	16 (13)	20 (16)	27 (21)	
Physical activity				
No	20 (16	22 (18)	20 (16)	<0.0001*
Yes	05 (04	09 (07)	49 (39)	
Co-morbidities				
Yes	19 (15)	24 (19)	15 (12)	<0.0001*
No	06 (05)	07 (06)	54 (43)	

Table 2 Chi-squared test revealed significant differences for age, higher socio-economic status, diet, physical inactivity and co-morbidities associated with obesity/overweight (p <0.05).

Figure 1 presents the correlation between Body Mass Index and Waist Circumference. There was significant

positive correlation values between BMI and waist circumference at p<0.01 level. The correlation of BMI with waist circumference is (r=0.675)

DISCUSSION

The study population was unique as the study subjects were all women, as the study area was a women's

medical college. The proportion (45%) of them who were overweight/ obese is relatively high and perhaps higher than expected. The prevalence rates are consistent with the findings of the fourth round of National Family Health Survey (NFHS-4), released by the ministry of health and family welfare, Government of India for adults aged 18 yrs and above. ¹⁸

The prevalence rates reported are similar to those reported elsewhere like in urban Delhi (46.7%), Chennai (45.9%). 19,20 Thus the study findings are consistent with those of other studies. Age group between 18-22 yrs was similar to studies conducted at Melaka Manipal Medical College, Manipal, Karnataka in India, and also at teaching hospital, Pune in a study conducted by Fernandez.^{21,3} With an increase in income levels, more food choices in developing countries, there is a shift from traditional diets to Western food ways with a rise in obesity rates as observed in the present study. 23 NFHS-4 reported that the obesity was more in the urban areas, in higher socioeconomic groups and especially among women, which is consistent with results of the present study. 18 Kotian et al reported that the obesity was two times higher among high socioeconomic class.²⁴ Goyal et al revealed the prevalence of obesity to be higher in high socioeconomic group.²⁵ Poor dietary practices are linked with obesity which is similar to study conducted in U.S.A on dietary patterns - more red meat or processed meat, sugared drinks, sweets, refined carbohydrates, or potatoes linked to obesity. 26,27 Though the contribution of any one diet change to weight control may be small, together, the changes could add up to a considerable effect, over time and across the whole society.²⁸ Mehan et al reported that 45% of study population showed physical inactivity which is on slightly on higher side when compared to the present study (34%).²⁹ BMI is simple, universally applicable, inexpensive, non-invasive, easier to measure and screen those who are at greater risk due to their weight.^{30,31} It is a useful determinant of adiposity in early and middle-aged adults.³² It is used since long time and does an excellent job of predicting disease risk. It can be calculated on our own by using the formula. For most people, it is a good gauge of measuring fat. Research has shown that BMI is strongly correlated with the goldstandard method for measuring body fat. 10 Measuring both BMI and waist circumference may actually be a better way to predict someone's weight-related risk in adults.30 In the present study BMI and WC were positively correlated, which was reported in the studies conducted by Schreiner et al compared with BMI, WC and WHR are good indicators for body fatness in adults at the population level and provide additional information about central fat distribution.³²

CONCLUSION

It will be crucial to establish cost-effective strategies like promotion of healthy foods and physical activity by introducing extra-curricular activities at institutional level, participating in more physical activities, avoiding junk food are likely to have a major effect in reducing obesity among young medicos. This would enable them to maintain normal weights and also avoids immediate and long-term complications associated with overweight and obesity.

ACKNOWLEDGEMENTS

The Department of Community Medicine, Malla Reddy Medical College for Women sincerely thanks the VI Semester medical students who have given their time and participated in this study.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

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Cite this article as: Dumpala S, Chadaram B, Berad A. Prevalence of overweight/obesity among medical students at Suraram, India. Int J Community Med Public Health 2018;5:5338-42.