ORIGINAL ARTICLE

Overweight & Obesity and its Associated Factors Among Medical Students of SMS Medical College, Jaipur: An Observational Descriptive Study

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ABSTRACT

Introduction : Students undergo transition phase when they leave home for education. This emerging adulthood period is associated with important life events like relocation, newer relationships, stress, irregular sleep and eating habits etc. Students are particularly at high risk for abnormal weight gain during the transition period.

Objectives : To estimate the proportion of overweight & obesity and its associated factors among recently enrolled students of SMS Medical College, Jaipur.

Methods : 497 recently enrolled MBBS students were assessed for height, weight, BMI, socio-demographic factors. WHO's International classification for BMI was used for labeling overweight or obesity.

Results : Around 17% were overweight and 1% was frankly obese. There were around 18% underweight students also. Increasing age, caste, socioeconomic class, residential background, family history of obesity and food habits were significantly associated with overweight & obesity. Sex, religion, current residential status and type of family were not associated with obesity or overweight.

Conclusions : Every fifth (17.9%) MBBS student begins their adulthood with overweight or obesity. Underweight was also equally (18.3%) prevalent in students. Increasing age, caste, socioeconomic class, residential background, family history of obesity and food habits were significant associated factors.

Key words : overweight, obesity, MBBS, student, Jaipur

INTRODUCTION

Obesity is the most neglected global public health epidemic. It is associated with an increased risk of hypertension, coronary artery disease, type 2 diabetes, obstructive sleep apnea, depression, stroke & malignancies[1]. Prevalence of obesity and overweight with female preponderance has increased globally in last 40 years from 1975 to 2016 (obesity from 5% to 13%, overweight from 21 to 39%). Similarly, children and adolescents have also shown a dramatic rise in obesity from 1% to 7% and overweight from 4% to 18%[2]. India, in sync with

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global trends shows almost double the proportion of obesity & overweight in last 10 years i.e. 9.3% males and 12.6% females (NFHS-3, 2005-06) to 18.9% males and 20.7% females (NFHS-4, 2015-16). In Rajasthan overweight & obese population increases from 6.2% to 13.2% in case of males while from 8.9% to 14.1% in case of females from NFHS-3 to NFHS-4. Currently, district Jaipur has 14.6% of males and 17.4% of females obese & overweight[3]. Recent Indian studies shows wide range of prevalence of obesity and overweight in young adults and students in different cities i.e. Hyderabad (3.5% & 31.9%)[4] and Vishakapatnam (10.7% & 26.8%)[5]. It is a transition period for students when they leave home for education. This emerging adulthood period is associated with important life events like relocation, newer relationships, stress, irregular sleep and eating habits etc. Students are particularly at high risk for abnormal weight gain during this transition period[6,7]. Hence it is important to know the magnitude of overweight and obesity among medical students who are responsible for provision of health care in society in future.

OBJECTIVES : The aim of the study is to estimate the proportion of overweight & obesity and its associated factors among recently enrolled students of SMS Medical College, Jaipur.

METHODOLOGY

A descriptive observational study was conducted in the month of October 2018 at SMS medical college, Jaipur. All 500 students who have either entered or just passed first year of MBBS were considered recently admitted in the college. Data were collected from 497 students during their pre-scheduled practical classes. Three students could not be contacted despite of three visits. Socio-demographic & anthropometric information collected on a pre-structured performa. Weight was measured using digital weighing machine (Smart Care SCS-0180A) with graduation up to 0.05 Kg & height was measured using stadiometre (Easy Care No. 26 SM) with graduation up to 1 mm. BMI is calculated using Quetelet's index {W (in Kg) / H^2 (in m)}. Students were classified using "International Classification of adult underweight, overweight and obesity according to BMI".[2,8] Data obtained were compiled & analyzed using Microsoft Excel and Primer software. Approval for study was taken from research review board & ethics committee of SMS medical college. Written informed consent was taken from each student.

RESULTS

Total 497 MBBS students participated. Most were in the age group of 17 to 22 years, only five were above 22 years. There were around 36.4% of female students. Majority (97.4%) were Hindu. Maximum (39.8%) were from General caste followed by OBC (34.4%), SC (15.5%) and ST (10.3%). Majority (68.2%) were from Socio-economic class-I followed by class-II (16.1%), class-III & IV (14.9%). Only four students were from class-V. Half of students were from urban background (53%) and almost equal proportion (47%) was from rural background. Majority (82.7%) were currently living in hostel, only 17.3% were staying at home. Most (61%) were from nuclear family background and rests were from joint families. Around 15% students had a family history of obesity. Non-vegetarians (68.4%) are more than twice the vegetarians (31.6%). On assessment, around 17% were overweight and 1% was frankly obese, indicating that every fifth student begins their adulthood with overweight or obesity. There were

around 18% underweight students also (Chart-1). On further analysis of associated factors it was found that relatively older students were more obese/over weight, two out of five students (40%) from the age group of 23-24 years were either overweight or obese followed by age group of 21-22 years (27.8%), 17-18 years (20%), 19-20 years (13.7%). This difference is statistically significant (Table-1). There is no significant difference in proportion of overweight/ obesity in both sexes (female 18.2% v/s male 17.4%) (Table-1). Muslims (33.3%) and students from other religion (28.6%) were found to be more overweight/ obese than Hindu (17.6%) but this difference was not significant (Table-1). Overweight/obesity was seen significantly more in General caste (24.2%) followed by OBC (15.8%), SC (11.7%). Only 9.8% of ST students were overweight or obese (Table-1). Maximum overweight/obese students from Socio-economic class-I (21.5%), least were in Socio-economic class-IV (7.3%). This difference was significant. However, one out of all four students from Socio-economic class-V was overweight/obese (Table-1). Students from urban background were significantly more (23.5%) overweight/obese than rural background (11.6%) (Table-1). Day-scholars were more (23.3%) overweight/obese than hostellers (16.8%) but the difference is not significant. Students from nuclear families were more (18.9%) overweight/obese than from joint families (16.4%) but the difference is not significant. Overweight/ obesity was significantly more in students who has positive family history (42.3% v/s 13.8%) (Table-1). Vegetarians were significantly more (23.6%) overweight/obese than non-vegetarians (15.3%). On subgroup analysis the BMI profile of first year entered and passed students was comparable (Table-2).

DISCUSSION

Our study observed that 16.7% recently enrolled MBBS students were overweight and 1.2% was obese, that is comparable to Hamid S et. al[9]. observation of 15% & 1% respectively at SKIMS medical college, Bemina, J&K in 2015 & by Sarkar P et. al.[10] (15.2% & 0.9%) at MIMS, Mandya, Karnataka in 2015. However, Tiwari R et. al.[11] observed slightly less prevalence of overweight (9.93%) but little higher prevalence of obesity (1.5%) in MBBS students at GR medical college, Gwalior in 2014. Yadav SS et. al.[12] observed higher overweight (22.3%) and obesity (3.1%) at MMIMSR, Mullana, Ambala in 2016. A very high proportion of overweight & obesity (53.7%) was observed by Pandey AK et. al.[13] in recently entered MBBS students of Kasturba medical college, Manipal in 2018 and by Doley P et. al.[14] (47%) at VM medical college, Delhi in 2019. Mehta DP et. al.[15] observed more of obese (11.53%) than overweight (8.45%) students in GMC, Bhavnagar in 2016. Chabra et. al.[16] observed 11.7% overweight and 2% obesity in male MBBS students of UCMS, Delhi in 2006. Lakshmi Y et. al.[17] observed little low overweight (10%) but higher obesity (11%) in students of SV medical college, Tirupati in 2015.

In present study we observed that overweight and obesity is almost equally prevalent in males (17.4%) and females (18.2%). This finding was supported by Lakshmi Y et. al. study (males 20.8% and females 21.2%) and Kumar CA et. al.[18] (males 9.5% and females 9.5%). Hamid S et. al. observed higher overweight and obesity in females (22%) than males (10%). Many studies observed low prevalence of overweight and obesity in females i.e. Tiwari R et. al. (9.76% vs 12.22%), Mehta DP et. al. (14.1% vs 25.8%) and Yadav SS et. al. (14.3% vs 32.1%). Our study observed that overweight and obesity is significantly more in the age group of 17-18 years

(20%) in comparison to 19-20 years age group (13.7%) but it increased after 20 years of age (27.8%). Kumar CA et. al. observed almost equal prevalence of overweight & obesity in all age groups from 17 to 25 years but much higher (25%) in older students of more than 25 years at PESIMSR, Kuppam, Chittoor in 2014. Our study observed 17.6 % overweight & obesity in Hindus and much higher (> 28%) in Muslims and others. However the number of students of Muslim and other religion were very less. Tiwari R et. al. reported 12.5% overweight and obesity in Hindus and none in other religion. Overweight and obesity was more in general caste (24.2%) followed by OBC (15.8%), SC (11.7%) and least was found in ST (9.8%). It was comparable to Tiwari R et. al. where 19.1% in general caste followed by SC (9.1%), OBC (7.7%) and ST (4.3%). Overweight and obesity is observed higher (21.5%) in socioeconomic class-I in present study, however it was found highest (25%) in socioeconomic class-V but there were only four students in this class hence results may be ambiguous. Similarly, Kumar CA et. al. also observed higher (11.2%) in class-I, though highest (12.9%) was observed in class-IV. We observed more overweight & obesity in urban (23.5%) than rural (11.6%), that was similar to Tiwari R et. al. (12.2% vs 10.2%). Our study also observed that students living with family were more overweight and obese (23.3%) than hostellers (16.8%). We also observed that students from nuclear family were more overweight and obese (18.9%) than from joint family (16.4%). We observed higher (42.3%) overweight and obesity in students with positive family history than negative one (13.8%). Similarly, Mehta DP et. al. observed higher (8.5%) obesity in positive family history than negative family history (3.1%). Overweight & obesity is more in vegetarians than non-vegetarian (23.6% vs 15.3%) in our study. Tiwari R et. al. also shows similar results i.e. 14.1% vs 8.3% in vegetarian vs non-vegetarians but reverse results were shown by Gupta S et. al.[19] i.e. 17.6% vs 21.6% in vegetarians vs non-vegetarians at Midnapore medical college, Paschim Medinipur in 2008.

CONCLUSIONS

Every fifth (17.9%) MBBS student begins their adulthood with overweight or obesity. Underweight was also equally (18.3%) prevalent in students. Increasing age, caste, socio-economic class, residential background, family history of obesity and food habits were significant associated factors. Sex, religion, current residential status and type of family were not associated with obesity or overweight.

RECOMMENDATIONS

Government of India has already started 'Fit India Movement' hence similar fitness campaign could be initiated for medical students with emphasis on healthy food habits, regular physical activities and good sleep habits.

Chart 1 : Overweight and obesity profile in recently enrolled MBBS students

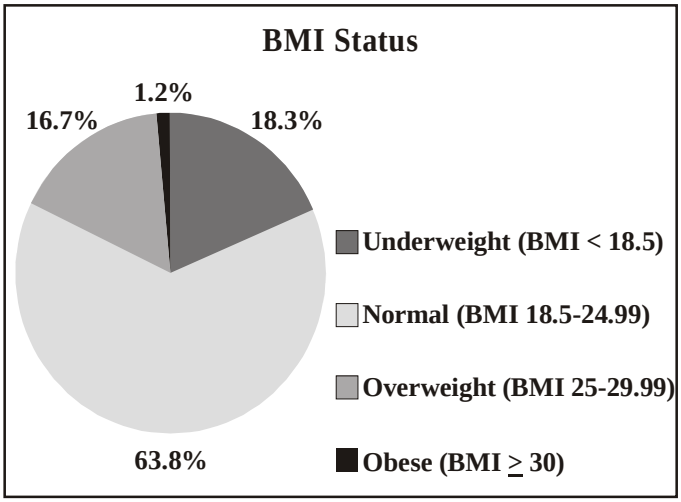

Table 1 : Socio-demographic factors associated with overweight & obesity

Socio-demographic factors	Overweight/Obesity (BMI > 25)		Total n=497 (%)	Chi-square (X^2) test p-value
	Present n=89 (%)	Absent n=408 (%)		
Age (yrs)				
17 to < 19	30 (20)	120 (80)	150 (30.2)	$X^2 = 10.124$
19 to < 21	37 (13.7)	233 (86.3)	270 (54.3)	df = 3
21 to < 23	20 (27.8)	52 (72.2)	72 (14.5)	p = 0.022
23 to < 25	2 (40)	3 (60)	5 (1)	
Sex				$X^2 = 0.070$
Male	55 (17.4)	261 (82.6)	316 (63.6)	df = 1
Female	34 (18.2)	147 (81.2)	181 (36.4)	p = 0.791
Religion				
Hindu	85 (17.6)	399 (82.4)	484 (97.4)	$X^2 = 1.552$
Muslim	2 (33.3)	4 (66.7)	6 (1.2)	df = 2
Other	2 (28.6)	5 (71.4)	7 (1.4)	p = 0.460
Cast				
General	48 (24.2)	150 (75.8)	198 (39.8)	$X^2 = 10.231$
OBC	27 (15.8)	144 (84.2)	171 (34.4)	df = 3
SC	9 (11.7)	68 (88.3)	77 (15.5))	p = 0.021
ST	5 (9.8)	46 (90.2)	51 (10.3)	
SE status *				
1	73 (21.5)	266 (78.5)	339 (68.2)	$X^2 = 10.452$
2	8 (10)	72 (90)	80 (16.1)	df = 4
3	4 (12.1)	29 (87.9)	33 (6.6)	p = 0.033
4	3 (7.3)	38 (92.7)	41 (8.3)	
5	1 (25)	3 (75)	4 (0.8)	
Residential background				$X^2 = 11.120$
Rural	27 (11.6)	206 (88.4)	233 (46.9)	df = 1
Urban	62 (23.5)	202 (76.5)	264 (53.1)	p = 0.000
Current residential status				$X^2 = 1.608$
Hostel	69 (16.8)	342 (83.2)	411 (82.7)	df = 1
Home	20 (23.3)	66 (76.7)	86 (17.3)	p = 0.205
Family type				$X^2 = 0.336$
Joint	32 (16.4)	163 (83.6)	195 (39.2)	df = 1
Nuclear	57 (18.9)	245 (81.1)	302 (60.8)	p = 0.562
Family H/o obesity				$X^2 = 31.494$
Yes	30 (42.3)	41 (57.7)	71 (14.3)	df = 1
No	59 (13.8)	367 (86.2)	426 (85.7)	p = 0.000
Food habits				$X^2 = 4.453$
Veg	37 (23.6)	120 (76.4)	157 (31.6)	df = 1
Non-Veg	52 (15.3)	288 (84.7)	340 (68.4)	p = 0.035

* Modified B G Prasad's social classification Jan 2018

Table 2: Comparison of BMI profile of first year entry and first year passed students

BMI Profile	Recently enrolled MBBS students			Chi-square ($\chi 2$) test p-value
	I[st] year n (%)	II[nd] year n (%)	Total n (%)	
Underweight (BMI < 18.5)	49 (19.8)	42 (16.8)	91 (18.3)	
Normal (BMI 18.50 - 24.99)	154 (62.4)	163 (65.2)	317 (63.8)	$X^2 = 1.551$
Overweight (BMI 25.00-29.99)	40 (16.2)	43 (17.2)	83 (16.7)	df = 3
Obese (BMI $\geq$ 30.00)	4 (1.6)	2 (0.8)	6 (1.2)	p = 0.918
Total	247 (100)	250 (100)	497 (100)	

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