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Research Article

IMPACT OF LIFESTYLE ON OBESITY AMONG MEDICAL STUDENTS OF J. J. M. MEDICAL COLLEGE, DAVANGERE

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Abstract

Introduction: Obesity has become one of the most upcoming health problems in India. We are in the midst of an obesity epidemic. It is percolating even to the remote sectors of the society. Youths particularly college students getting obese is a serious problem which needs to be addressed at appropriate time. Though obesity is a major lifestyle disease it leads to many other diseases. A better understanding of lifestyle factors on obesity is essential to develop effective intervention strategies early. Objectives: 1. To know the magnitude of overweight and obesity among medical students 2. To know their lifestyle and its impact on overweight and obesity. Methodology: By interview method, height and weight measurement. Information was collected using a predesigned, pretested, semistructured questionnaire. Study design - cross sectional study. Study setting -J.J.M.Medical College, Davangere. Study period – 1 month from 1st September to 30th September 2013 Sample size – all the M.B.B.S. students of JJMMC. Data is described as proportions, categorical data analysed using chi square test. Results and discussion: Of the total 647 students studied, 48.4% were males and 51.6% were females. Of these 12.4% were overweight (61.3% males + 38.7% females) and 1.1% were obese (71% males + 29% females). There is significant association between obesity and binge eating (p = 0.007), tobacco (p = 0.018), alcohol (p=0.026) and sweet consumption (p=0.03). Conclusion: Obesity and overweight was 2 times higher in males when compared to females. 12.4% of students who are overweight need to be addressed timely to prevent them from becoming obese. This necessitates the need for proper awareness regarding active lifestyles and healthy diets continuously.

Key words: Binge eating, impact, lifestyle, obesity, overweight.

INTRODUCTION

Obesity is defined as a body weight that exceeds the normal or standard weight for a particular person based on height and weight. BMI 30 kg/m² is obese ¹. Overweight and obesity are recognized as an "escalating epidemic" affecting both developed and developing countries^{2,3}. In the past 20 years, the prevalence rates of obesity have tripled in developing countries that have been adopting a western life style⁴. In India, there is a nutritional transition from typical carbohydrate diet to fast food dietary habits, particularly young adults like medical students have been affected⁵. The tendency toward obesity is fostered by our environment: lack of physical activity combined with high-calorie, low-cost foods⁶.



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Prevalence of obesity in India is up to 50% in women and 32.2% among men in the upper strata of the society⁵. In India available data on prevalence of obesity from different published studies suggest that prevalence ranged from 10 to 20 percent⁷. The obese, do less well academically, have poorer job prospects and lower self-esteem⁸.

Obesity has become one of the most urgent public health problems and poses a major threat to human health worldwide^{9, 10}. Obesity has reached epidemic proportions globally. The rising epidemic reflects the profound changes in society and in behavioral patterns of communities over recent decades. There is an alarming increase in prevalence of obesity worldwide with globalization. It is believed that the rise of obesity in developing countries is likely to create a tremendous public health burden¹¹, because obesity in children and adolescents is strongly associated with many comorbidities¹²⁻¹⁴. Moreover, obesity in adolescence was shown to track to adulthood^{15, 16}. Current evidence indicates that obesity is a multifactorial condition influenced by many variables, including genetic, demographic and lifestyle factors^{12, 17}. Most of the obesity-associated lifestyle factors are modifiable. Obesity increases the likelihood of various diseases, particularly heart disease, hypertension, type 2 diabetes, obstructive sleep apnoea, certain types of cancer, and osteoarthritis leading to reduced life expectancy and reduced productivity¹⁸. Although obesity should be considered as a disease in its own right, it is also one of the key risk factor for other non-communicable diseases¹⁹.

Obesity can be seen as the first wave of a defined cluster of non communicable disease called "New World Syndrome" creating an enormous socioeconomic and public health burden in developing countries²⁰. Throughout most of the human history, weight gain and fat storage have been viewed as signs of health and prosperity. The World Health Organization has described obesity as one of today's most neglected public health problems. Following the increase in adult obesity, the proportions of children and adolescents who are overweight and obese have also been increasing. If the underlying causes of the obesity epidemic are not addressed, it has the potential to overwhelm health systems throughout the world²⁰.

Studies on medical students in many countries, however, suggest that obesity is a problem among these population groups²¹. Medical education is stressful throughout the whole course of training. The amount of material to be absorbed, social isolation, pressure of examination, discrepancies between expectation and reality all can be anticipated to bring psychological stress²².

The present study aimed to determine the influence of certain factors on overweight and obesity among undergraduate medical students. An attempt was made to find out the significance of presence or absence of factors influencing body weight. a better understanding of the relationships between obesity and lifestyle factors is necessary for effective prevention and management of the increasing trend of obesity in youth.

OBJECTIVES:

1. To know the magnitude of overweight and obesity among medical students

2. To know their lifestyle and its impact on overweight and obesity

METHODOLOGY:

By interview method, height and weight measurement. Information was collected using a predesigned, pretested, semi-structured questionnaire.





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MATERIAL AND METHODS:

Subjects: A total of 647 undergraduate medical students (313 males and 334 females) studying in JJM Medical College, Davangere, Karnataka state in India participated in this study. It was a

descriptive cross sectional study conducted over a period of 1 month between 1st September to 30th September 2013.

Inclusion criteria: all students present on the day of study

Exclusion criteria: students absent on the day of study

Methods: Study participants were given a questionnaire, which consisted of year of study,

information regarding factors related to obesity such as age, sex, regular physical activity, type of diet (vegetarian/non-vegetarian), restaurant visits, eating junk food. Data collection was done for each semester separately. A brief introduction was given and the objective of the project was explained. After getting written informed consent from the students, a pretested questionnaire was administered. The physical activity was assessed by using International physical activity questionnaire (IPAQ) short form which includes the following domains like walking, moderate activity and vigorous activity. Scores were given for each domain which was converted into MET minutes/ week. Finally the candidates were categorized into low, moderate and high physical activity groups based on their MET values. Height and weight of each subject were recorded. The bathroom weighing scale graduated in kilogram (kg) was used for weight measurements. The body weight with an accuracy of ± 100 g was recorded. Subjects were weighed without shoes. Height was measured by asking the subject to stand erect without foot wear with gaze horizontal, the heels, the buttocks and the shoulders touching the wall on which the scale was marked with the measuring tape. It was recorded in centimeters and then converted to meter for calculating Body Mass Index (BMI). Body Mass Index (BMI)) was calculated using the formula weight (in kg)/height (in m).BMI values are age-independent and the same for both genders. Based on the World Health Organization (WHO) BMI cut-offs for the international classification of body weight, a BMI $< 18.5 \text{ kg/m}^2$ is categorized as underweight, $18.5-24.9 \text{ kg/m}^2$ as normal, and 25.0 kg/m^2 as overweight, which is further classified as pre-obese (25.0–29.9 kg/m²), obese Class I (30.0–35.9 kg/m²), obese Class II (36.0–39.9 kg/m²), and obese Class III (40 kg/m^2).

Statistical analysis: Statistical analysis was performed using the Statistical Package for Social Science (SPSS) version 17.0. Continuous variables (Age in years, body weight, height, BMI,) with normal distribution were expressed as mean±standard deviation (SD). Significance of factors influencing body weight was done by chi square test.



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RESULTS:

Table 1: Distribution of the study subjects according to sociodemographic factors

Age	Number	Percentage
17 – 22 years	549	84.9
23 – 28 years	98	15.1
Total	647	
Sex		
Male	313	48.4
Female	334	51.6
Total	647	
Residence		
Rural	100	15.5
Urban	547	84.5
Total	647	
BMI		
Underweight	82	12.7
Normal	478	73.9
Overweight	80	12.4
Obese	7	1.1
Total	647	

84.9% were in the age group of 17 to 22 yrs, 51.6% were females. 12.4% were overweight, 1.1% were obese and 12.7% were underweight. Mean age was 20.58yrs±1.89, mean weight was 60.07 kgs \pm 11.16, mean height was 1.65mts \pm 0.09 and mean BMI was 21.87kg/m² \pm 3.06.



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Tobacco consumption	Number	Percentage
Yes	27	4.2
No	620	95.8
Total	647	
Alcohol consumption		
Yes	54	8.3
No	593	91.7
Total	647	
Diet		
Mixed	423	65.4
Veg	224	34.6
Total	647	
Family history of obesity		
Yes	106	16.4
No	541	83.6
Total	647	
Physical activity		
Nil	136	21
Mild	326	50.4
Moderate	185	28.6
Total	647	

Table 2: Distribution of the study subjects according to their lifestyle.

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No. of meals / day		
2 meals or less	54	8.3
3 meals	512	79.1
4 or more meals	81	12.5
Total	647	
Fast food (min 3times/wk)		
Yes	359	55.5
No	288	44.5
Total	647	
Bakery items(min 3times/wk)		
Yes	351	54.3
No	296	45.7
Total	647	
Aerateddrinks(min3times/wk)		
Yes	189	29.2
No	458	70.8
Total	647	
Fried snacks(min 3times/wk)		
Yes	397	61.4



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No	250	38.6
Total	647	
Sweets		
Daily	59	9.1
3-4 days/ wk	109	16.8
1-2 days/ wk	239	36.9
Rarely	221	34.2
Nil	19	2.9
Total	647	
Dine out per week		
Daily	28	4.3
3 – 4 days/ wk	59	9.1
1-2 days/ wk	232	35.9
Rarely	285	44
Nil	43	6.7
Total	647	
Eating in between meals [*]		
While Watching TV / Computer	169	26.1
Reading books	105	16.2
Leisure time	212	32.8
No	201	31.1



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Binge eating		
Yes	99	15.3
No	548	84.7
Total	647	
Care about weight		
Conscious	413	63.8
Negligent	234	36.2
Total	647	
Fasting		
Regularly	68	10.5
Rarely	272	42
No	307	47.5
Total	647	
Stress		
Yes	263	40.6
No	384	59.4
Total	647	

* Multiple response

Table 2 shows 16.4% were having family history of obesity, 21% were not doing any physical activity, 79.1% had 3 meals per day,55.5% had fast foods (min 3 times/ wk), 61.4% had fried snacks (min 3 times/ wk), 15.3% had binge eating, 63.8% were conscious about weight and 10.5% were fasting regularly.



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Age	Underv	weight		Norma	l		Overw	eight		Obesity	y		Total		
	(< 18.5	kg/m ²)		(18.5–2	24.9 kg/m	n ²)	(25.0–2	29.9 kg/m	n ²)	(30 k	g/m ²)				
	Μ	F	Т	М	F	Т	Μ	F	Т	Μ	F	Т	М	F	Т
	(%)	(%)		(%)	(%)		(%)	(%)		(%)	(%)		(%)	(%)	
17–	33	41	74	185	220	405	41	25	66	4	0	4	263	286	549
22	(44.6)	(55.4)		(45.7)	(54.3)		(62.1)	(37.9)		(100)			(47.9)	(52.1)	
23 -	1	7	8	40	33	73	8	6	14	1	2	3	50	48	98
28	(12.5)	(87.5)		(54.8)	(45.2)		(57.1)	(42.9)		(33)	(67)		(51)	(49)	
Total	34	48	82	225	253	478	49	31	80	5	2	7	313	334	647
	(41.5)	(58.5)		(47)	(53)		(61.3)	(38.7)		(71.4)	(28.6)		(48.4)	(51.6)	

Table 3: Distribution of students according to BMI with respect to age and sex

Table 4: Association between various factors and overweight and obesity

Variables	Overweight and	d obesity		
Age	Yes	No	Total	
17 - 22	70 (12.8%)	479 (87.2%)	549	
23 - 28	17 (17.3%)	81 (82.7%)	98	
Total	87 (13.4%)	560 (86.6%)	647	
$\chi^2 = 1.51$, df = 1, p	= 0.2, not significant	it		
Sex				
Male	54 (17.3%)	259 (82.7%)	313	
Female	33 (9.9%)	301 (90.1%)	334	
Total	87	560	647	
$\chi^2 = 7.545, df = 1, p$	p = 0.006, significan	t]	



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Residence			
Rural	17 (17%)	83(83%)	100
Urban	70 (12.8%)	477 (87.2%)	547
Total	87	560	647
$\chi^2 = 1.283, df = 1, p =$	0.257, not signifi	cant	
Tobacco consumption			
Yes	9 (33.3%)	18 (66.7%)	27
No	78 (12.6%)	542 (87.4%)	620
Total	87	560	647
Alcohol consumption			
Yes	12 (22.2%)	42 (77.8%)	54
No	75 (12.6%)	518 (87.4%)	593
Total	87	560	647
$\chi^2 = 3.898, df = 1, p =$	=0.048, significant		
Mixed	56 (13.2%)	367 (86.8%)	423
Vegetarian	31 (13.8%)	193 (86.2%)	224
Total	87	560	647
$\chi^2 = 0.045, df = 1, p =$	= 0.831, not signif	icant	
Family history of			



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obesity			
Yes	28 (26.4%)	78 (73.6%)	106
No	59 (10.9%)	482 (89.1%)	541
Total	87	560	647
$\chi^2 = 18.31, df = 1, p$	p = 0.000, significar	nt	
Physical activity			
Nil	17 (12.5)	119 (87.5)	136
Mild	64 (19.6)	262 (80.4)	326
Moderate	6 (3.2)	179 (96.8)	185
		560	647
Total	87	500	
Total $\chi^2 = 27.36, df = 2, J$	87 0 = 0.000, significar	nt	
Total $\chi^2 = 27.36, df = 2, I$	87 p = 0.000, significar	nt	
Total $\chi^2 = 27.36, df = 2, g$ No. of meals / day	87 0 = 0.000, significar	nt	
Total $\chi^2 = 27.36$, df = 2, 1 No. of meals / day 2 meals or less	87 p = 0.000, significar y 11 (20.4)	100 nt 43 (79.6)	54
Total $\chi^2 = 27.36$, df = 2, p No. of meals / day 2 meals or less 3 meals	87 p = 0.000, significan y 11 (20.4) 60 (11.7)	10 11 43 (79.6) 452 (88.3)	54 512
Total $\chi^2 = 27.36$, df = 2, I No. of meals / day 2 meals or less 3 meals 4 or more meals	87 p = 0.000, significan y 11 (20.4) 60 (11.7) 16 (19.8)	300 nt 43 (79.6) 452 (88.3) 65 (80.2)	54 512 81
Total $\chi^2 = 27.36$, df = 2, p No. of meals / day 2 meals or less 3 meals 4 or more meals Total	87 p = 0.000, significan y 11 (20.4) 60 (11.7) 16 (19.8) 87	300 nt 43 (79.6) 452 (88.3) 65 (80.2) 560	54 512 81 647
Total $\chi^2 = 27.36$, df = 2, p No. of meals / day 2 meals or less 3 meals 4 or more meals Total $\chi^2 = 6.306$, df = 2, p	87 p = 0.000, significar y 11 (20.4) 60 (11.7) 16 (19.8) 87 p = 0.043, significar	300 nt 43 (79.6) 452 (88.3) 65 (80.2) 560 nt	54 512 81 647
Total $\chi^2 = 27.36$, df = 2, 1 No. of meals / day 2 meals or less 3 meals 4 or more meals Total $\chi^2 = 6.306$, df = 2, 1	87 p = 0.000, significar y 11 (20.4) 60 (11.7) 16 (19.8) 87 p = 0.043, significar	300 nt 43 (79.6) 452 (88.3) 65 (80.2) 560 nt	54 512 81 647
Total $\chi^2 = 27.36$, df = 2, p No. of meals / day 2 meals or less 3 meals 4 or more meals Total $\chi^2 = 6.306$, df = 2, p Fast food	87 p = 0.000, significan y 11 (20.4) 60 (11.7) 16 (19.8) 87 p = 0.043, significan	300 nt 43 (79.6) 452 (88.3) 65 (80.2) 560	54 512 81 647
Total $\chi^2 = 27.36$, df = 2, 1 No. of meals / day 2 meals or less 3 meals 4 or more meals Total $\chi^2 = 6.306$, df = 2, 1 Fast food Yes	87 p = 0.000, significar y 11 (20.4) 60 (11.7) 16 (19.8) 87 p = 0.043, significar 48 (13.4)	300 nt 43 (79.6) 452 (88.3) 65 (80.2) 560 nt 311 (86.6))	54 512 81 647 359
Total $\chi^2 = 27.36$, df = 2, p No. of meals / day 2 meals or less 3 meals 4 or more meals Total $\chi^2 = 6.306$, df = 2, p Fast food Yes No	87 $p = 0.000, significant (y) 11 (20.4) 60 (11.7) 16 (19.8) 87 p = 0.043, significant 48 (13.4) 39 (13.5)$	$ \begin{array}{c c} 500 \\ 10 \\ \hline 43 (79.6) \\ 452 (88.3) \\ 65 (80.2) \\ 560 \\ 10 \\ \hline 311 (86.6)) \\ 249 (86.5) \\ \end{array} $	54 512 81 647 359 288



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Bakery items			
Yes	39 (11.1)	312 (88.9)	351
No	48 (16.2)	248 (83.8)	296
Total	87	560	647
$\chi^2 = 3.59, df = 1, p = 0$	0.05, significant	l	
Aerated drinks			
Yes	30 (15.9)	159 (84.1)	189
No	57 (12.4)	401 (87.6)	458
Total	87	560	647
$\chi^2 = 1.351, df = 1, p =$	0.245, not signifi	cant	
Fried snacks			
Yes	51 (12.8)	346 (87.2)	397
No	36 (14.4)	214 (85.6)	250
Total	87	560	647
$\chi^2 = 0.318$, df = 1, p =	0.573, not signific	cant	
Sweets			
Daily	12(20.3%)	47(79.7%)	59
3-4 days/ wk	12(11.0%)	97(89.0%)	109
1-2 days/ wk	32(13.4%)	207(86.6%)	239
Rarely	30(13.6%)	191(86.4%)	221
Nil	1(5.3%)	18(94.7%)	19
Total	87	560	647
$\chi^2 = 20.3$, df = 4, p =	0.05, significant	l	1

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Ding out non wool		1	
Dine out per week			
Daily	8 (28.6)	20 (71.4)	28
3 - 4 days/ wk	6 (10.2)	53 (89.8)	59
1-2 days/ wk	41 (17.7)	191 (82.3)	232
Rarely	29 (10.2)	256 (89.8)	285
Nil	3 (7)	40 (93)	43
Total	87	560	647
$\chi^2 = 13.77, df = 4, p =$	0.008, significant		
-			
Eating in between			
meals			
While Watching TV / Computer	26 (17.4)	123 (82.6)	149
Reading books	11 (10.4)	95 (89.6)	106
Leisure time	26 (13.6)	165 (86.4)	191
No	24 (11.9)	177 (88.1)	201
$\chi^2 = 5.08, df = 3, p = 0$	0.6, not significant	_[
Binge eating			
Yes	22 (22.2)	77 (77.8)	99
No	65 (11.9)	483 (88.1)	548
Total	87	560	647
$\chi^2 = 7.73$, df = 1, p = 0	0.005, significant	1	I
Taking care about			
weight			

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100	10	6	•	
16		12	\sim	
100	105			

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Conscious	54(13.1)	359 (86.9)	413
negligient	33(14.1)	201(85.9)	234
Total	87	560	647
$\chi^2 = 0.135$, df = 1, p = 0.713, not significant			
Fasting			
Regularly	13 (19.1)	55 (80.9)	68
Rarely	32 (11.8)	240 (88.2)	272
No	42(13.7)	265(86.3)	307
Total	87	560	647
$\chi^2 = 2.55$, df = 2, p = 0.279, not significant			
Stress			
Yes	43(16.3)	220(83.7)	263
No	44(11.5)	340(88.5)	384
Total	87	560	647
$\chi^2 = 3.8$, df = 1, p = 0.05, significant			

Table 4 shows there is significant association between obesity and family history of obesity (0.000), physical activity (0.000), tobacco consumption (0.002), binge eating (0.005), gender (0.006), dining out per week (0.008), no. of meals per day (0.043), alcohol consumption (0.048), bakery items (0.05), sweet consumption (0.05), stress (0.05). There is no association between obesity and age, residence, type of diet consumed, fast food consumption. Aerated drink consumption, fried snacks consumption and eating inbetween meals.

DISCUSSION

The prevalence of overweight was 12.4% compared to 11.7% in a study done by Chhabra et al 32 , 17.5% by Gupta et al 23 , 21.3% by Mohamad et al 30 and obesity was 1.1% compared to 8.6% by Selvaraj K⁸, 2% by Chhabra et al 32 , 7% by Daud S 24 , 8% by Aziz J 25 , 3% 26 , 13% by Minhas HT 27 , 3% by Gupta et al 23 , 2% by Chhabra et al 32 . Abdalla and Mohamed in their study on medical students of Ribat University, Khartoum, reported obesity to be 9% 33 . 5.2% by Gopalakrishnan S 29 , 3.4% by Gupta et al 23 and 4.5% by Mohamad et al 30



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This is similar to other studies²³ which have observed that occurrence of overweight and obesity was more among male students. Boo NY et al²⁸ in their study observed that physical exercise and outdoor sports did not have a significant influence on body weight which is in contrast with the present study. Baker et al³¹ reported that the most important life style factors responsible for obesity were, long time spent using computer, eating more during time of stress and snacking between meals. The study suggests that regular exercise and taking care of stress precipitating factors could improve the health of the medical students.

CONCLUSION:

This study concludes that there was 12.4 % overweight and 1.1% obesity was in the representative sample. Obesity and overweight was 2 times higher in males when compared to females. 12.4% of students who are overweight need to be addressed timely to prevent them from becoming obese. This necessitates the need for proper awareness regarding active lifestyles and healthy diets continuously. Among all of the lifestyle factors assessed, overweight and obesity exhibited significant associations with less frequent vigorous physical activity. There is significant association between obesity and family history of obesity, physical activity, tobacco consumption, binge eating, gender, dining out per week, no. of meals per day, alcohol consumption, bakery items, sweet consumption, stress.

Limitation: We have to rely on the statements given by the students. Students might have adapted some of the lifestyle factors which may affect the results recently after joining medical course.

Recommendation:

Problem of 12.4% overweight among medical students warrants college and university authorities to create awareness regarding obesity and develop healthy lifestyle practices. Two priority interventions important in preventing the development of obesity are increasing levels of physical activity and improving the quality of diet. This can be applied, either to the whole population or to the high risk population. The prevention and management of obesity are not solely the responsibility of individuals, their families, health professional or health service organization; a commitment by all sectors of society is required.

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