

# Relationships between dietary habits and the incidence of obesity in Indian medical students

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## Abstract

Dietary habits play a major role in the healthy wellbeing of and individual and may be the key intervention for treatment of overweight and obesity and the chronic disorders along with it. The study to know the incidents of obesity in medical students and its correlation with dietary habits is of great significance as students in general are highly inclined to irregular and unhealthy dietary habits. On the other hand medical students, with irregular and prolonged study schedules tend to be further inclined to such dietary habits. Obesity is well known disorder of the 21<sup>st</sup> century which is constantly on the rise, carrying with it the vast Variety of health related factors. The study included 200 medical students of the ages 18-24. The students were examined thoroughly, so as to exclude those suffering from major diseases, psychological problems and those on medication. Obesity was determined by calculating the BMI according to the American journal of clinical nutrition. And the grading of obesity into various grades between 18.5 to 24.9 kg/m, was done according to WHO. Dietary habits was determined by a self admitted questionnaire on dietary and exercise habits, (extracted from) "A Survey of Dietary and Exercise Habits and Perceived Barriers to Following a Healthy Lifestyle in a College Population by Kathryn Silliman, Kathleen Rodas-Fortier, Michelle Neyman California State University, Chico<sup>2</sup>. After appropriate statistical analysis and assessment it was observed that 47 (23.5%) students belonged to the overweight category with BMI ranging from 30.0 to 39.9. Maximum number of students i.e. 89 (44.5%) were found to be inclined to snacking while studying Majority of the students 85 (42.5%) snacked on food items such as chips, crackers and nuts. While 42 (21%) students snacked on ice cream, candy and cookies. There is significant concern about the regularity of consumption of fruits and vegetables, as Maximum number 80 (40%) of students consumed vegetables a mere 2-6 times a week, while only 33 (16.5%) students consumed vegetables daily. Fruits were consumed by majority of students 123 (63%) only once a week or less. while only 11 (5.50%) students consumed fruits on a daily basis.

**Keywords:** Obesity, dietary habits and Medical field.

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## INTRODUCTION

Dietary habits play a major role in the healthy wellbeing of and individual and may be the key intervention for treatment of overweight and obesity and the chronic disorders along with it. It has recently been noted that students tend to consume more sugar in stressful situations, and as medical students are inclined to nothing

but stressful situations, this is an important factor to be prevented. The habits of Snacking amongst young adults have seen a rise recently, with fast food and junk food being the majority consumed. Students are usually inclined to snack in a range of situations, but snacking while studying is the major situation seen, especially in medical students with long hours spent in studying. In this 21<sup>st</sup> century obesity is one of the major concerns of the general population. As the effects and risks of obesity on health are familiar with most people. Health related risk factors being the main aspects of the obesity are not always the reasons of concern of the general population. Obesity also has a lot to do with glamour and the aesthetic demands of the 21<sup>st</sup> century. Along with the major health risk factors obesity bring, such as hypertension, Type II diabetes mellitus, infertility, hyperlipidemia and increased risk for coronary disease<sup>3</sup>, it also has a negative effect on an individual's physical fitness and mental abilities, and as we know from a

number of studies the two are correlated. Medical students are at a higher risk of developing obesity because of the life style and the time consuming demands of medical studies. Psychological pressure, mental tension and inability to cope with stress may be one of the reasons for the irregularity in dietary habits as well as inclination to snacking as a coping strategy<sup>4</sup>. The average lifestyle of a medical student involves very little time for physical activities and also irregular dietary habits. Fatigue is a common complaint among medical students and is related to poor academic outcomes, impaired dietary habits such as irregularity of meals and poor diet has a major role in the prevalence of fatigue<sup>5</sup>. Recently it has been observed that medical students have an anti-obesity bias towards their patients. They often associate obese individuals with negative attributes and laziness. On average, medical students and physicians share the general population’s anti-obesity bias. When medical students and professionals can have such a bias, what’s to stop patients from having an anti-obesity bias towards their doctor, associating an obese doctor with negative attributes and laziness?

**MATERIALS AND METHOD**

The study included 200 medical students in the age groups of 18 to 24 years. All the subjects were thoroughly examined with particular emphasis on history of disease, psychological problems and drug history. Sampling was done by using contracting random allotment. Any student who has completed > 6 months in medical school was involved. Remaining students were randomly selected from the other batches. The inclusion criteria involved, all students having written consent to participate in the study and all students who were present on the days of study. While the exclusion criteria involved students who were suffering from major diseases like hypothyroidism and diabetes which could interfere with the study. Students suffering from any psychological related disorders, as well as those on any medications (steroids, sleep inducing, antihistaminic) were also excluded from the study. Obesity was determined by using the BMI formula according to the American journal of clinical nutrition<sup>1</sup>. Grading of BMI was done according to W.H.O grading<sup>6</sup>. In which individuals with BMI below 18.5 are underweight. Individuals with BMI ranging from 18.5-24.9 are considered normal, those with BMI ranging from 25-29.9 are overweight and those with BMI above 30 are labelled obese.

- Mean BMI was 22.74/kg/m<sup>2</sup>.and SD was 3.71

Dietary habits was determined by a self administered and internationally validated questionnaire. The questionnaire contained three groups of questions mainly concentrating on three aspects of dietary habits leading to obesity in a

college population, these were questions on snacking, soda and alcohol

- The questions on snacking covered aspects such as
- Situations one is inclined to snack
- Type of food normally snacked on
- The regularity of consumption of vegetables
- The regularity of consumption of meat
- The regularity of consumption of fruit
- The questions on soda consumption mainly included
- The regularity of soda consumption
- The regularity of alcohol consumption

**STATICAL ANALYSIS**

Proportion and percentage were obtained for qualitative data, whereas mean and standard deviation were obtained for quantitative data. Chi-square test was applied to check the association of BMI with different parameters included in the study. Spearman’s rank Correlation was obtained to check the relationship between BMI, sleep durations and PSQI. Analysis was done by using Microsoft excel and Statistical software SPSS for windows, version - 22.0, U.S.A. (Chicago) P value <0.05 was considered as significant and <0.01 was considered as highly significant.

**RESULTS**

**Table 1:** Charactersitics of participating students

Characteristics	# of participants	% of participants
<b>GENDER</b>		
male	98	49%
female	102	51%
<b>AGE (YEARS)</b>		
18-20	101	50.50%
20-24	70	35.00%
22-24	29	14.50%
<b>BODY MASS INDEX</b>		
<18.5	25	12.5%
18.5-24.9	119	59.5%
24.9-29.9	47	24.5%
>30.0	9	3.5%

Assessment of obesity showed that 47 students i.e., 23.5% were overweight with a BMI ranging from 25.0 to 29.9. The increasing trend of consumption of fast foods and other unhealthy snacks; as well as the pattern and situations which students are inclined to snack may have also contributed. While the majority of the students, adding up to 116 i.e., 58% were in the normal category with a BMI ranging from 18.5 to 24.9. A smaller group of students were found to be in the underweight category with a BMI less than 18.5. While a minimal but yet concerning number of students 10 i.e., 5% were found to be obese with a BMI ranging from 30 to 39.9. Shown in figure no.1

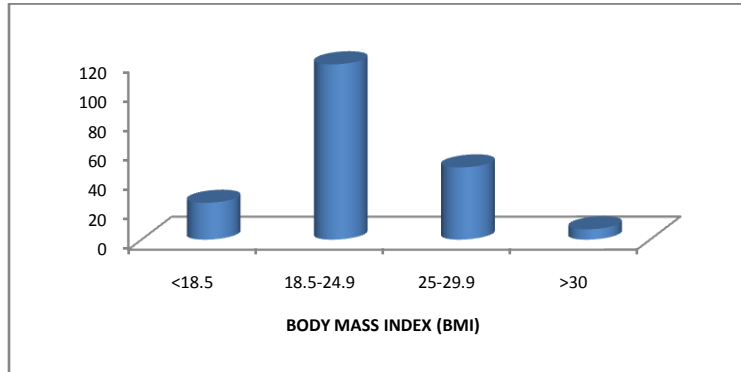


Figure 1: BMI Distribution of students

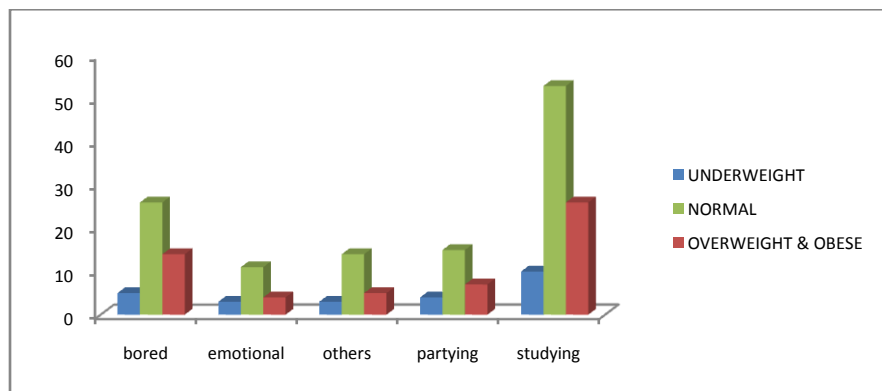
On assessment of different situations in which students are inclined to snack, it was observed that a majority of 89 student's. i.e. 44.5% were inclined to snack on while studying. While the next majority of 45 student's. i.e.

22.5 were inclined to snack in situations where one is bored. A small number of 18 students were inclined to snack in emotional situations. Shown in table 1 and figure no.2

Table 1: Showing the association between BMI and various inclined to snack

Situation Inclined To Snack	Bmi Of Participating Students			Total
	Underweight	Normal	Overweight and Obese	
bored	5	26	14	45
	11.11%	57.78%	31.11%	100.00%
emotional	3	11	4	18
	16.67%	61.11%	22.22%	100.00%
others	3	14	5	22
	13.64%	63.64%	22.73%	100.00%
partying	4	15	7	26
	15.38%	57.69%	26.92%	100.00%
studying	10	53	26	89
	11.24%	59.55%	29.21%	100.00%
Total	25	119	56	200
	12.50%	59.50%	28.00%	100.00%
studying	10	53	26	89
	11.24%	59.55%	29.21%	100.00%
<b>Total</b>	<b>25</b>	<b>119</b>	<b>56</b>	<b>200</b>
	<b>12.50%</b>	<b>59.50%</b>	<b>28.00%</b>	<b>100.00%</b>

Chi-square = 1.383 with 8 degrees of freedom; P = 0.847



It was also observed that a majority of students being 85 i.e., 42.5%, snacked on chips, crackers, or nuts. While the next majority of students 42 i.e. 21% normally snacked

on ice cream, cookies and candy. 38 students. i.e. 19% were also found to be snacking on fast food. (Table no. 2)

**Table 2:** Showing the association between BMI and various food items snacked on.

Food Items Snacked On	Bmi Of Participating Students			Total
	Underweight	Normal	Overweight and Obese	
Chips	7	46	32	85
	8.24%	54.12%	37.65%	100.00%
Fast Food	4	29	5	38
	10.53%	76.32%	13.16%	100.00%
Icecream	6	26	10	42
	14.29%	61.90%	23.81%	100.00%
Others	8	18	9	35
	22.86%	51.43%	25.71%	100.00%
	25	119	56	200
	12.50%	59.50%	28.00%	100.00%

Chi-square = 13.253 with 6 degrees of freedom; P = 0.010

**Table 3:** Questions about snacking, soda, and alcohol

Question	Number of students	Percent-age of students
Are you more inclined to snack in any of the following situations		
Studying	89	44.50%
Partying	26	13.00%
Bored	45	22.50%
Emotional	18	9.00%
Other	22	11.00%
What types of food do you normally snack on?		
Chips, crackers, or nuts	85	42.50%
Icecream, cookies, candy	42	21.00%
Fast foods (e.g. pizza, fries)	38	19.00%
Other	35	17.50%
How often do you drink regular soda or the sugared beverages (1 cup = 1 serving)?		
Never	30	15.00%
Occasionally	88	44.00%
A few times per week	55	27.50%
One to two times per day	27	13.50%
Two to three times per day	0	0.00%
More than 4 times per day	0	0.00%
What is the average number of alcoholic drinks (a drink is a can/bottle of beer, glass of wine, wine cooler, shot glass of liquor, or a mixed drink) you usually consume in a week?		
0-7	197	98.50%
8-14	3	1.50%
15-21	0	0.00%
22 or more	0	0.00%

Question	Number of students	Percentage of students
What type of milk/yogurt do you consume?		
I don't consume cow's milk/yogurt	68	34.00%
I consume only skim or 1% milk/yogurt	42	21.00%
I usually consume skim or 1% milk/yogurt but use others occasionally	31	15.50%
I usually consume 2% or whole milk/yogurt	59	29.50%
How often do you eat lean meat (lean beef, chicken, turkey, fish)?		
I never eat any of the meats	65	32.50%
I eat them about once per week or less	87	43.00%
I eat them about 2 to 4 times per week	46	23.00%
I eat them more than 4 times per week	2	1.00%

Question		
How often do you eat vegetables?(1/2cupcooked/1cup raw=1serving)		
eat vegetable onceperweekorless	46	23.00%
eat vegetables2to6timesperweek	80	40.00%
eat vegetables1time perday	40	20.00%
eat vegetables2to3timesperday	33	16.50%
eat vegetablesmorethan4timesperday	1	0.50%
How often do you eat whole or canned fruit?(1pieceOR½ cupcanned=1serving)		
eat fruit on ceperweekorless	126	63.00%
eat fruit2to6timesperweek	56	28.00%
eat fruit1timeperday	11	5.50%
eat fruit2to3timesperday	7	3.50%
eat fruitmorethan4timesperday	0	0.00%

## DISCUSSION

In this study 200 M.B.B.S. students of the Bharati Vidyapeeth Medical College, Sangli ranging from the age groups between 18 to 24 years were involved in the study. Majority of the students belonged to the first year and the age group 18-20 years. While the next majority of students were from the second year. Out of the 200 students 185 were Indians and 15 were Nigerians. There were a total of 102 female students and 98 male students that were included in the study. 47 students i.e., 24% were overweight with a BMI ranging from 25.0 to 29.9. The increasing trend of consumption of fast foods and other unhealthy snacks; as well as the pattern and situations which students are inclined to snack may have also contributed. While a minimal but yet concerning number of students 10 i.e., 5% were found to be obese with a BMI ranging from 30 to 39.9. The results were comparable to earlier studies done by Gopalkrishnan S, Ganeshkumar P on prevalence of obesity/overweight among medical students, Malaysia<sup>6</sup>. While considering the dietary habits of students based on the results obtained from the dietary questionnaire, it was observed that the majority 89 students i.e., 44.50% were inclined to snack while studying; out of which 26 students belonged to the overweight and obese category. Having short sleep durations due to more number of hours spent in studies could be a direct example of increased time for snacking with short sleep durations, given that majority of the students were inclined to snack while studying. And this could be one of the major reasons accounting for the development of obesity in medical students. 18 student's i.e. 9% were inclined to snack in emotional situations. When considering the type of food item usually snacked on with respect to the situation most inclined to snack, the majority of students being 85 i.e., 42.5%, snacked on chips, crackers, or nuts. While the next majority of students 42 i.e. 21% normally snacked on ice cream, cookies and candy. While a close number of students 38

i.e. 19% snacked on fast foods, the likely reason for this may be the convenience of snacking on food items like chips and crackers while studying, availability and cheap prizes of chips, crackers and fast food as compared to other healthy food items such as fruits may also be another reason. Results were comparable to those obtained by K Silliman, in the study, a survey of dietary and exercise habits and perceived barriers to following a healthy Lifestyle in college population<sup>2</sup>. Maximum number 80 (40%) of students consumed vegetables a mere 2-6 times a week, while only 33 (16.5%) students consumed vegetables daily. Fruits were consumed by majority of students 123 (63%) only once a week or less. while only 11 (5.50%) students consumed fruits on a daily basis. The results suggest of significant deficiency in consumption of fruits and vegetables, unlike Studies done by Ruka Sakamaki and Kenji Toyama on nutritional habits and knowledge among Chinese university students which showed that almost 80% students consumed fruits and vegetables twice per day, such eating habits ought to be encouraged<sup>7</sup>. Maximum number of students 68 (34%) were found not to be consuming milk and yogurt. While consideration of meat consumption, majority of students 87 (43%) consumed meat on weekly basis. The next majority of students 65 (32.50%) were found not to consume meat. Soft drinks and other sugared beverages were consumed at least a few times a week by 55 student's i.e.27.5%. While 27 students i.e. 13.5% consumed such beverages one to two times a day. This is a serious concern as such soft drinks and sweetened beverages contain alarmingly high quantities of sugar, which is a vital factor in the development of diabetes and eventually obesity. Sweetened beverages substantially contribute non-nutritive high calories. These results were comparable to studies done by Delia Smith West and Zoran Bursac on sugar-sweetened beverage intake among college students<sup>8</sup>.

## CONCLUSION

The students involved in the study had a significant overall number of incidences of obesity. Majority of these students showing signs of obesity were grade 1 overweight while a few were obese. Students also had poor or unhealthy dietary habits, maximum number of students were inclined to snack while studying on snacks such as chips, crackers or nuts and fast food such as pizza, burgers and fries were the main food items consumed. Majority of students only consumed vegetables a few times a week, while fruits were consumed on weekly basis. This shows a substantial lack in the intake of dietary fibers, vitamins and other nutrients. Maximum number of students consumed sweetened beverages occasionally; however a large number of students consumed these types of drinks on a daily basis. This contributes to non-nutritive high calories, which is a major factor in the development of obesity. Nutrition training for medical students has long been a low priority for most medical schools. Given the growing body of knowledge linking health promotion to proper dietary habits, there is a need to improve the quality and quantity of nutrition training for medical students<sup>9</sup>. Proper awareness and education at a very early stage of medical studies along with involvement of the institution and medical staff is very important in preventing the development of obesity amongst medical students and doctors. Similarly it is very important to impress the consequences of, unhealthy dietary habits, poor nutrition intake on a medical student's physical as well as mental health.

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