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Junk Food Eating Habits and Obesity among Medical College Students in Bangalore: A Cross-Sectional Study

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ABSTRACT

Introduction: Junk foods are empty calories. An empty calorie lacks in micro-nutrients such as vitamins, minerals or amino acids, and fibre but has high energy.

Objectives: To find out the extent of obesity among study subjects, to assess the junk food eating habits and to assess the factors influencing obesity.

Methods: A descriptive cross-sectional study was conducted among 237 medical college students in Bangalore for a period of 4 months. The data was collected using a pretested semi-structured questionnaire by interview technique. Obesity among study subjects was assessed using body mass index (BMI). The results were expressed in terms of descriptive statistics. Odds ratios (ORs) and corresponding 95% confidence intervals (CIs) were reported.

Results: In the present study, extent of Obesity was 20.7%. Ice creams & chocolates were the favourite junk food (47%) and KFC was the favourite junk food outlet (52%). Factor influencing the intake of junk food in majority was taste preferences (80.5%). Obesity was significantly associated with family history of obesity and increased junk food eating.

Conclusion: Increasing awareness about the risks of junk food consumption during adolescence is an important step for the prevention oflifestyle diseases like obesity.

Keywords: Obesity; Junk food; Medical students

INTRODUCTION

As per WHO, 39% of adults aged 18 years and over were overweight in 2014, and 13% were obese.[1] Increasing trend of obesity among adolescents is a worldwide phenomenon and considered as one of the major public health challenge of the 21st century.[2]Obesity in adolescence is a significant risk factor for a range of serious non-communicable diseases in adulthood such as cardiovascular diseases, diabetes mellitus, osteoarthritis, gall bladder diseases, cancers with an increased risk of mortality.[3]

Although prevalence of obesity is increasing worldwide, it is faster in developing countries due to declining levels of physical activity as well as nutrition transition characterized by a trend towards consumption of a diet high in fat, sugar and refined foods and low in fibre.[4] Dietary practice is a modifiable risk factor for obesity in childhood and adolescence. Any food that has poor nutritive value is considered unhealthy and may be called a "Junk Food". Junk foods are those containing little or no proteins, vitamins or minerals but are rich in salt, sugar, fats and are high in energy (calories).[5]

Medical students generally are expected to have adequate knowledge regarding the ill effects of unhealthy dietary habits and act as a role model to the public. Inspite of that, their busy curriculum, pressure of examinations, staying away from home makes them prone to intense stress which in turn leads to irregularity in diet, increased junk food consumption, increased intake of soft drinks, lack

of exercise and lack of outdoor games each being considered independent risk factors leading to obesity. With this background, the present study was conductedto assess the junk food eating habits and obesity among medical students and to identify various correlates associated with it.

MATERIALS AND METHODS

This descriptive cross-sectional study was conducted in the Department of Community Medicine, Bangalore for a period of four months from February 2015 to May 2015after obtaining Institutional Ethics Committee approval (BGS GIMS/287/2014-15). The study was conducted among a total of 237 medical students from 1st and 2nd year MBBS course selected by purposive sampling. Written informed consents were taken from all students and absentees were covered on subsequent dates, to ensure complete coverage. Data was collected from the study subjects using a self-administered, pre-tested, semi-structured questionnaire which included socio-demographic profile, questions on junk food eating habits, physical activity.

Junk foods are defined as those foods containing little or no proteins, vitamins or minerals but are rich in salt, sugar, fats and are high in energy (calories). Some examples are chocolates, artificially flavored aerated drinks, potato chips, ice creams, french fries etc.[5]

Physical activity was defined as any bodily movement produced by skeletal muscles that requires energy expenditure. It includes exercise as well as other activities which involve bodily movement and are done as part of playing, working, active transportation, house chores and recreational activities.[6]

Obesity among study subjects was assessed using body mass index (BMI). Measurement of height and weight of the study subjects was done by trained investigators by following standard procedures and guidelines. Height was determined using a vertical wooden bar calibrated in centimetres (0-200) with a movable horizontal bar which could be adjusted to touch the vertex of the participant's head. Height was recorded to the nearest 0.5 cms. Weight was measured by using a portable bathroom weighing scale, calibrated from 0-120 kg and it was recorded to the nearest 0.1 kg. The formula used for calculating body mass index (BMI) was Weight (kg) / [height (m)]^2. According to proposed WHO Asia-Pacific guidelines, the study subject was considered overweight if the BMI was ≥ 23 kg/m2 and obese if the BMI is ≥ 25 kg/m2.[7]

Statistical Analysis: The collected data was entered in Microsoft Excel, and analyzed using SPSS version 16.0. The results were expressed in terms of descriptive statistics (percentage, mean and standard deviation). We undertook logistic regression to assess the various factors associated with Obesity. The fit of the logistic model was assessed with the Hosmer and Lemeshow goodness-of-fit test. Odds ratios (ORs) and corresponding 95% confidence intervals (CIs) were reported. A probability level, p-value of < 0.05 was considered statistically significant.

RESULTS

In the present study, out of 237 study subjects, 131 (55.2%) were females and 106 (44.8%) were males. Majority i.e., 187 (79.0%) study subjects were in the age group of 17 - 19 years, followed by 50(21.0%) were in the age group of 20 - 22 years.The mean age was 18.8± 0.96years with a range from 17 to 22years. The mean age of males was 18.8 ± 0.98 years and of females 18.9 ± 0.95 years.

Majority ie., 213 (90.0%) of the study subjects were Hindu by religion, 194 (82.0%) were from a nuclear family, 185 (78.0%) had no family history of Obesity, 173 (73.0%) belonged to Upper middle socioeconomic status according to Modified Kuppuswamy's classification.[8]

Among 237 study subjects, majority i.e., 117(49.4%) were in normal range followed by 82 (34.6%) were overweight/obese I&II and 38 (16.0 %) were under weight.

Table 1: Distribution of study subjects according to BMI (WHO Asia-Pacific guidelines)[7]

BMI	Category	Male (n=106)	Female (n=131)	Total (n=237)
<18.5	Underweight	14 (13.3)	24 (18.4)	38 (16.0)
18.5 - 22.9	Normal range	55 (51.8)	62 (47.3)	117 (49.4)
23 - 24.9	Overweight	18 (16.9)	15 (11.4)	33 (13.9)
25 - 29.9	Obese – I	13 (12.3)	24 (18.4)	37 (15.7)
≥ 30	Obese – II	6 (5.7)	6 (4.5)	12 (5.0)

Figures in parenthesis indicate percentage

Table 2: Distribution of study subjects according to the type of junk food consumption

Type of Junk food	Number* (%)
Potato Chips	97 (40.9)
Soft drinks	89 (37.5)
Desserts	68 (28.6)
Pizza	85 (35.8)
Burger	83 (35)
Ice cream, Chocolates	111 (46.8)
Cakes	80 (33.7)
Noodles	74 (31.2)

* Multiple responses

Table 3: Univariate analysis showing various factors determining overweight/ obesity

Variable	Overweight/ Obese (n=82)	Non overweight/ Non obese (n=155)	Unadjusted OR	95% CI	P value
Age (years)					
17-19	61 (74.3)	126 (81.2)	1		0.014
20-22	21 (25.7)	29 (18.8)	3.665	1.300-10.331	
Sex					
Male	38 (46.3)	68 (64.2)	1		0.800
Female	44 (53.7)	87 (66.5)	0.901	0.401 – 2.022	
Type of family					
Nuclear	68 (82.9)	128 (82.6)	1		0.152
Three generation	11 (13.4)	11 (07.1)	4.159	0.748 – 23.114	
Joint	03 (03.7)	16 (10.3)	7.230	0.981 – 53.313	
Religion					
Hindus	71 (86.5)	139 (65.7)	1		0.670
Non-Hindus	11 (13.5)	13 (08.3)	1.284	0.407 – 4.049	
Socio-economic status*					
Upper	13 (15.8)	24 (15.5)	1		0.612
Upper Middle	63 (76.8)	110 (70.9)	0.778	0.080 – 7.554	
Lower Middle	03 (03.7)	18 (11.7)	0.976	0.111 – 8.549	
Upper Lower	03 (03.7)	03 (01.9)	0.276	0.018 – 4.134	
Family h/o of obesity					
Yes	32 (39.0)	20 (12.9)	1		<0.001
No	50 (61.0)	135 (87.1)	4.320	2.264 – 8.243	
Hostellite					
Yes	35 (42.6)	64 (41.3)	1		0.872
No	47 (57.4)	91 (58.7)	1.161	0.665 – 2.025	
Physical activity					
Yes	53 (64.6)	97 (62.5)	1		0.500
No	29 (35.4)	58 (37.5)	1.214	0.691 – 2.131	
Junk food eating frequency					
Never or <1/month	22 (26.8)	86 (55.5)	1		<0.001
1-3 times /month	20 (24.4)	32 (20.7)	0.241	0.034- 1.689	
Once a week	22 (26.8)	14 (09.0)	1.903	0.267 – 13.574	
>Once a week	15 (18.3)	17 (10.9)	2.576	0.346 – 19.173	
Everyday	03 (03.7)	06 (03.9)	14.052	1.790 – 110.28	

* Modified kuppuswamy's scale[8]

Table 4: Multivariate analysis for associated factors

Factors	Adjusted OR	95% CI	*P* value
Age (years)	2.290	0.993 – 5.283	0.052
Family History	4.453	2.173 – 9.123	<0.001
Junk food eating frequency	2.374	1.761 – 3.200	<0.001

Among males, 55 (51.8%) were in normal range followed by 37 (34.9%) were overweight/obese and 14 (13.3%) were under weight. Among females, 62 (47.3%) were in normal range followed by 45 (34.3%) were overweight/obese I&II and 24 (18.4%) were underweight. (Table 1)

The mean BMI among males was 22.58 ± 4.0 kg/m^{2}compared tofemales22.26 ± 4.18kg/m^{2}and this difference in mean was not statistically significant.

Eating habits

Majority of the study subjects i.e., 169 (71.3%) were having mixed diet (who consume both vegetarian and non-vegetarian), followed by 19.8% were vegetarians and 8.9% were ovo-vegetarians. 69% of study subjects had 3 meals/day and 76.4% of them had the habit of eating in between meals.

Out of 237 students, 135 (57.0%) students felt that junk food is a high calorie food that provides empty calories and is of no nutritional value and 84 (35.5%) students felt it is tasty, and the best food that is easily and quickly available in packaged forms. 225 (95%) students felt junk food is not healthy, among them 192 (85%) felt it makes person overweight.

Majority (78.0%) preferred eating junk food as an evening snack along with their friends 157 (66%), followed by 50% while watching TV. The amount spent/day on junk food was found to range from Rupees 10-1000/-.

Among the 237 study subjects, majority ie., 138 (58.0%) were hostellites. Out of them 102 (74.0%) felt their junk food eating habits had increased after joining the hostel. The reason given by majority (81.0%) was that food served in hostel was not

good followed by 16.0% who felt lack of time leads to skipping meals, thus junk food is easily available and hence the only option and 3.0% said junk food was served in hostel.

The favourite junk food was Ice cream and chocolates (46.8%) followed by potato chips (40.9%). (Table 2) whereas the favourite junk food outlets were KFC (52.3%) followed by McDonalds (33.7%), Bakery (32.0%), Pizza Hut (27.4%), Café coffee day (13.0%), Subway (12.6%) and hot chips (10.1%).

Factors influencing the intake of junk food were taste preferences (80.5%) followed by convenience (23.2%), lifestyle changes (18.9%), time constraint (13.5%) and influence of advertisements (13.0%).

Among the 237 study subjects, 150 (63.0%) were involved in physical activity for past one year. There was no significant association between physical activity and obesity.

Univariate analysis showed that there was a significant association between age group, family history of obesity, junk food eating frequency and Obesity (P<0.05) but there was no significant association found for factors likesex, type of family, religion, socio-economic status, being hostellite. (Table 3)

Multivariate analysis was done after entering the variables (significant on univariate analysis) in the logistic regression model, we found that family historyand junk food frequency were significantly associated with Obesity (P<0.05) which fits the model according to Hosmer-Lemeshow Goodness of fit (P>0.05).Family history is an important risk factor for Obesity with adjusted OR = 4.453, 95%C.I:2.173 – 9.123,P< 0.05which shows that odds of developing obesity is 4.45 times higher for those with positive family history of Obesity. Junk food frequency with adjusted OR = 2.374, 95%C.I:1.761 – 3.200,P< 0.05, shows that odds of developing obesity is 2.37 times higher for those with increased junk food eating frequency which means that family history and frequency of junk food eating both are independent risk factors for Obesity. (Table 4)

DISCUSSION

In India, 1.3 per cent males and 2.5 per cent females aged more than 20 years were obese in the year 2008. At least 3.4 million adults die each year as a result of being overweight or obese. In addition, 44 per cent of the diabetes burden, 23 per cent of ischaemic heart disease burden and between 7 to 41 per cent of certain cancer burdens are attributable to overweight and obesity. Overweight and obesity are linked to more deaths worldwide than underweight.[1]

The imbalance between the energy intake and energy out-put leads to excess accumulation of fat in various parts of the body leading to several health consequences of obesity. Considering the increasing trend in the prevalence of coronary artery disease, hypertension and diabetes in India, it is important to maintain desirable body weight for height and avoid obesity. As the future doctors, medical students should adopt healthy dietary and lifestyle practices from the very beginning of their youth for contributing more effectively and efficiently to the country's healthcare.

In the present study, the prevalence of overweight and obesity according to BMI (proposed WHO Asia-Pacific guidelines)was 13.9% and 20.7% respectively which is lower in regards to overweight and higher in regards to Obesity (WHO BMI classification)according to WHO[1].It is interesting to note that prevalence of obesity was higher compared to overweight. Most of the studies on obesity in the later part of adolescence in Indian scenario adopted WHO or IOTF classifications.[9,10] These classifications underestimate the prevalence of obesity among Indian adolescents because of higher cut-off adopted in these classifications.

In the present study, overweight/obesity prevalence was almost similar in both males (34.9%) and females (34.3%) as compared to NFHS – 4 survey[11]and non-communicable risk factor survey phase 2[12]where obesity was high among females. The prevalence of overweight/obesity was higher in the age group of 20-22 years compared to the subjects in 17-19 years which was statistically significant. This could be due to the fact that, in the later part of adolescence, the chance of obesity increases due to high burden of college work and academic competitiveness, which decreases the participation in sports and other forms of physical activities.[13]This trend shows that obesity in later part of adolescence may pass on to adulthood and can cause serious metabolic derangement and cardiovascular diseases leading to premature death.[14]

Majority 225 (95%) of the students felt junk food is not healthy, among them 192 (85%) felt it makes person overweight which is in contrast to the study done by Shah T et al[15]which reports 60% were unaware about the fact that fast food was unhealthy.

In the present study it was found that Ice creams & chocolates were the favourite junk food(47%) and KFC was the favourite junk food outlet(52%).Major factor influencing the intake of junk food was taste preferences(80.5%) which is similar to study done by Vaida N.[16]

Physical activity is a major determinant of health and when it exceeds the minimum recommended amount, it helps in improving physical fitness, reducing the risk of chronic diseases and disability

and in preventing unhealthy weight gain.[17]Low level of physical activity can be attributed to the lifestyle of a medical student, that requires long hours of sitting for his/her studies.[18]63.0% of the study subjects were involved in physical activity for past one year. 83.0% of study subjects said they performed physical activity for 4-7days/week. Type of exercise performed by majority (52.0%) was walking and jogging. Overweight/obesity was almost similar in those who were involved in physical activity and those who were not which was not statistically significant whereas according to Shah Tet al[15]highBMIwas associated with less physical activity.

The proportion of overweight/obesity was significantly associated with family history of obesity which is similar to the findings of Sanjay TV et al.[19]Ina study conducted by Goyal RK observed that family history of obesity was significantly associated with obesity among adolescents and this could be due to dominant genes involved in the development of obesity.[20] In this context, family is a critical window of opportunity to tackle obesity in adolescence which should start from early childhood by involving the family, school/college and local community in long term behavioural modification strategies and family history of obesity should be used as a screening tool for the identification of high risk adolescents for obesity.

Increased frequency of junk food eating was significantly associated with overweight/obesity which is similar to the findings of Shah T et al[15]andSinakio AR et al.[21]French SA et al., found that an increase of only one fast food meal in a week was associated with a daily energy intake increase of 234.4 KJ and a weight gain which was over and above the average weight gain of .72 kg.[22]Proportion of obesity was more among those who consumed soft drinks frequently which was not significantly associated as compared to Shah T et al[15]which reported high BMI was significantly associated with soft drink intake. Fruits and vegetables play an important role in improving general health. Fruit and vegetable consumption is inversely related to total and low density lipoprotein cholesterol and to risk of cardiovascular disease. Our study showed that proportion of obesity was more among those who ate fruits and vegetables less frequently which was significantly associated.

Limitations of the study: This study is cross-sectional in nature; hence it is difficult to extrapolate the results to general population. The current research observations need to be confirmed by undertaking large sample multicentric studies as junk food eating habits greatly differ from place to place.

CONCLUSIONS

In the current study, Overweight/Obesity among medical students was found to be 37.6%, the important factors associated with obesity were f**amily history of obesity** and **junk food consumption habits**. Ice creams & chocolates were the most common type of junk food consumed by the medical students with taste preference being the major factor which influenced the intake of junk food. From the findings, we can emphasize that predisposing genetic factors like family history of obesity along with unhealthy dietary habits predisposes a person to overweight/obesity. Lifestyle factors are becoming more and more important factors in predicting obesity.

RECOMMENDATIONS

Family history of obesity can be used as a screening tool for identification of high risk group for obesity and provide them preventive measures to avoid being overweight and eventually facing the health consequences. Healthier and tastier alternatives to junk food have to be identified and promoted to cut down the intake of junk food.

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