

Junk food consumption and malnutrition among Medical and Dental college students, Bangalore

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ABSTRACT

INTRODUCTION: Junk foods are energy dense foods; poor in micronutrients and regular consumption of them can adversely affect our health. Assuming medical and dental college students have adequate knowledge regarding ill-effects of junk food consumption, we have still seen few of them consuming it. Current study was designed to assess the pattern of junk food consumption among medical & dental college students and reasons for the same.

OBJECTIVE: Assess the pattern of junk food consumption among medical & dental college students and reasons for the same. To correlate junk food consumption between body mass index and waist circumference.

METHODS: Cross-sectional study was conducted among 163 medical and dental college students. Pre-tested semi-structured questionnaire was administered to assess the pattern of junk food consumption, reasons for the same. Height, weight & waist circumference were measured.

RESULTS: In present study, 80.4% started consuming junk foods from primary school level and 71.2% consumed more than twice a week in past 3 months. Reasons for same were; 83.4% found tasty and 56.4% easy availability. Out of 163; 11.7% were under-weight & 15.3% obese & 16.6% had waist circumference above cut-off values. Pearson correlation co-efficient was significant for consumption of puff, aerated drinks/week for waist circumference; ice cream cone/week for BMI & also for waist circumference.

CONCLUSION: junk food consumption initiation started from primary school level in 80.4%. In the past 3 months 71.2% consumed more than twice a week; most common reason was finding it tasty and easy availability. In our study 46% were overweight / obese. Consumption of puff, aerated drinks and ice cream significantly correlated with increased waist circumference and BMI.

KEY WORDS: junk food, malnutrition, body mass index, waist circumference

Introduction

Junk foods are foods or beverages that have low nutrient density, that is they provide calories primarily through fats or added sugars and have minimal amounts of vitamins and minerals (1). In short they are energy dense foods and poor in micronutrients (2). It includes potato chips, namkeen, chats, pizza, burger, aerated soft drinks etc. Junk food is generally a fast food [typically the term fast food refers to food sold in a restaurant or stored with preheated or precooked ingredients, and served to the customer in a packaged form for take-out/take-away (2)] which is devoid of nutritional value. Regular and consistent consumption of such foods over a long period of time may therefore be deleterious to health. Foods like burger and cola are nutritionally only refined carbohydrates containing empty calories and hardly any vitamins, minerals or proteins (3). They are also deficient in iron, calcium and other trace elements. But their sodium content is very high. Some may contain chemicals, artificial colours, flavours and preservatives which are not good for health. The fat content of some of these meals may be as high as 50% of the total daily calories consumed. The ratio of saturated to unsaturated fatty acids may be unfavourable (4). Consumption of these foods in an un-controlled manner and over a prolonged period of time may result in obesity their by increasing the risk of other non-communicable diseases like Diabetes Mellitus, hypertension, coronary artery disease etc., (5). Despite the general assumption that medical and dental

college students have relatively better knowledge with regards to nutritional aspect of junk food there are considerable proportions of them still consuming junk food.

The current study was designed among the medical & dental college students to assess the pattern of junk food consumption and the reasons for the same. Additionally the study also attempted to compute the correlation between the consumption of junk food with the basic anthropometric measurements (body mass index & waist circumference).

Material and Methods

A cross-sectional study design was conducted during the month of January 2012. The medical and dental students belonging to 4th & 5th term of private medical college in Bengaluru were included. Among them those who were not willing to participate were excluded. In the absence of any literature available among the medical college students regarding prevalence of junk food consumption, for estimating the sample size a study conducted in general population in Allahabad, Uttar Pradesh in the age group of 15- 18 yrs (4) was utilised, with prevalence value of 73.2%, relative precision of 10% and at desired confidence level of 95% it was estimated that 141 persons need to be included in the study. However there were 187 students of both medical and dental belonging to 4th & 5th term were available, so it was proposed to include as many students as possible. Out of 187 students 163 students were willing to participate.

The students were administered with pre-tested semi-structured questionnaire. Questions pertaining to general demographic details, when were the first time they consumed junk food, how

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frequently they consumed & the reasons for same were asked to maintain uniformity among the students while quantifying the amount of junk foods consumed images of junk foods were shown and were asked to quantify as how much they consumed each of those items per week. For example images of aerated drinks in different containers were displayed and informed how much millilitre (mL) of aerated drinks each of these contained. Height in centimetre was measured with the help of measuring tape which was fixed to the wall. Weight in kilograms was measured with minimal clothing (not wearing apron, additional jackets, shoes etc.) with a bathroom scale after calibration. Body mass index was computed with the help of height and weight recorded. Waist circumference was measured at the level of midpoint between the lower margin of the last palpable rib and the top of the iliac crest at the end of expiration, in a standing position as per the standard procedure (5). Height, weight and waist circumference were measured as per the standard procedure by trained students.

Statistical methods- data was analysed in SPSS version 16.0 software. Qualitative variables were expressed in frequency and percentages. The quantitative data were summarized through mean with standard deviation. Pearson correlation co-efficient was computed to assess the correlation between various junk foods consumed per week with body mass index and waist circumference.

Results

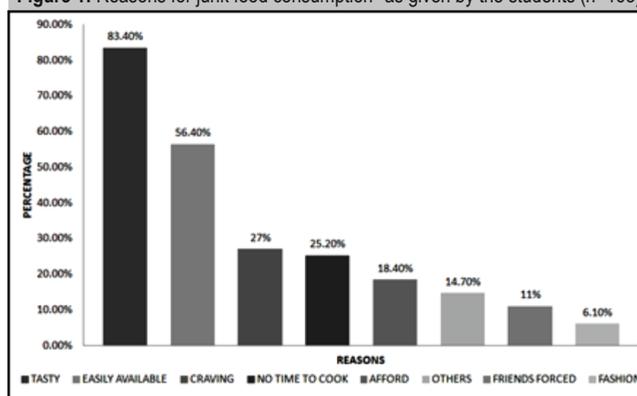
A total of 163 students participated in the study. Mean age was 19.82 yrs (SD=1.37). In the study group 97(59.5%) were females and 133(81.6%) were medical students. Out of 163 students 87 (53.4%) of them stayed in Hostel/Paying Guest/independently in an apartment. Demographic characteristics of the students are given in Table-1.

Table1- Characteristics of the study population	
Age (yrs)	n (%)
18-20	128 (78.53)
21-23	32(19.63)
24-26	3(1.84)
Sex	n (%)
Male	66 (40.5)
Female	97 (59.5)
Faculty	n (%)
Medical	133 (81.6)
Dental	30 (18.4)
Residence	n (%)
With parents	70 (42.9)
Relatives/ guardian's house	6 (3.7)
Hostel/PG/independently in an apartment	87 (53.4)
Total	163 (100)

Table 2 Pattern of junk food consumption in the past three months	
Pattern of junk food consumption	n (%)
Every day	17 (10.4)
More than 4 days in a week	50 (30.7)
Twice a week	49 (30.1)
Once a week	23(14.1)
Once in 15 days	14(8.6)
Once a month	8(4.9)
Once in 3 months	2(1.2)
Total	163(100)

Majority of them 131 (80.4%) started consuming junk food as early as they started going to primary school (i.e. from 1st to 7th standard class). In the past 3 months 100% of them were consuming some kind of junk food. Among them 17 (10.4%) consumed junk food every day while 50 (30.7%) consumed more than 4 days in a week (Table 2). Totally 71.2% of them consumed at least twice in a week.

Figure 1: Reasons for junk food consumption* as given by the students (n=163)



* Multiple responses

Reasons as given by students for consuming junk food over a period of long time were due to, 136(83.4%) found tasty, 92 (56.4%) said as easily available, 44 (27%) had craving for junk foods & 41 (25.2%) dint have time to cook food at home. (Figure 1) Other reasons given by students included just for change, hostel food not tasty, on birthdays and party etc.

In the study group 19 (11.7%) were under-weight & 25(15.3%) were obese according to BMI classification for Asian population (3)& 27 (16.6%) had waist circumference above the cut-off values (> 90 cm for males > 80 cm for female (3)). (Table 3)

Table 3: Frequency distribution of Body Mass Index (BMI) & waist circumference of the study population

BMI(kg/m²)	n (%)
Under-weight (<18.5)	19 (11.7)
Normal (18.5 – 23.00)	69(42.3)
Pre-obese (23.01 - 27.5)	50(30.7)
Obese (>27.5)	25(15.3)
Waist circumference	n (%)
Normal (< 90cm for males and <80cms for females)	136 (83.4)
Abnormal (> 90cm for males and >80cms for females)	27 (16.6)
Total	163 (100)

Table 4: Correlation of each junk food items with Body Mass Index & waist circumference [n = 163]

Items consumed per week (quantity)	Body Mass Index Pearson Correlation (p value)	Waist circumference Pearson Correlation (p value)
Samosa (number of pieces)	-0.053 (0.505)	0.075 (0.34)
Chats (number of plates)	-0.047 (0.551)	-0.068 (0.388)
Potato chips (g)	-0.108 (0.172)	0.038 (0.632)
White bread (number of slices)	-0.035 (0.655)	0.019 (0.814)
Puff (number of pieces)	0.097 (0.216)	0.228** (0.003)
Cake piece (number of pieces)	-0.076 (0.333)	-0.115 (0.142)
Pastries (number of pieces)	-0.021 (0.792)	-0.097 (0.218)
Butter or coconut biscuit (numbers)	-0.013 (0.873)	-0.036 (0.644)
Aerated drinks (mL)	0.099 (0.206)	0.203** (0.009)
Ice cream cone (number of cones each measuring 50 mL)	0.166* (0.035)	0.172* (0.028)
Ice cream cup (mL)	-0.047 (0.548)	-0.021 (0.791)
Pizza small size per piece	0.026 (0.738)	0.143 (0.069)
Pizza medium size per piece	-0.033 (0.674)	0.048 (0.542)
Pizza large size per piece	-0.097 (0.22)	-0.089 (0.257)

*. Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed)

Pearson correlation co-efficient was computed for some of the most commonly consumed junk food items by the students with Body Mass Index (BMI) & waist circumference. It was found to be statistically significant for consumption of puff per week ($p=0.003$) for waist circumference; aerated drinks per week ($p=0.009$) for waist circumference; ice cream cone per week ($p=.035$) for BMI & also for ice cream cone per week ($p=0.028$) for waist circumference (Table 4).

Discussion

In the present study information was collected regarding when was the first time they started consuming junk food(when they were studying in primary school/high school/ college/ M.B.B.S) as far as the students remember which could have resulted in certain amount recall bias. In order to minimise this recall bias information regarding pattern of junk foods consumption in the previous 3 months was collected i.e., they consumed once in a week or twice or daily.

In general it is difficult to quantify the amount of junk food consumed by any person. But still efforts have been taken to reduce the information bias by showing the images of each of the food items and quantifying each of them. Students were asked to quantify as to how much they were consuming these food items in the past one day and also in the past one week. Correlating the junk food consumption for one day with the anthropometric measurements will not be ideal since mere consumption of junk foods for one day will not alter the BMI or waist circumference. Similarly asking the students to quantify their junk food consumption in the past 3 to 6 months or even at least one month would lead to recall bias. Hence Pearson's correlation was computed for consumption of junk food items in the past one week with the anthropometric measurements.

While collecting details of consumption of aerated drinks information regarding consumption of diet coke and alcohol were

excluded. Diet coke contains fewer amounts of calories. Alcohol consumption itself is a different kind of substance abuse and hence has been excluded in the current study. While collecting information of pizza; non-vegetarian pizzas were excluded assuming that they do contain some amount of protein and hence no longer meet the definition of junk food.

Adequate care was taken to reduce the measurement errors of height, weight and waist circumference; which otherwise would alter the point estimates of BMI and waist circumference. Anthropometric measurements were measured as per the standard protocol by the trained students. Data regarding the regular consumption of cereals, pulses, milk etc were not collected. Data regarding certain medical conditions such as polycystic ovarian disorder, familial obesity etc and prolonged intake of obesitogenic drugs were not collected. Information regarding regular physical exercise was not collected. These can be considered as one of the limitations in our study since junk food consumption over a long period of time alone may not result in obesity.

Obesity was identified based on body mass index and waist circumference. Abdominal obesity can be due to either visceral fat deposition or sub cutaneous fat deposition. Waist circumference measurement is a surrogate indicator for visceral adipose tissue and measures the abdominal obesity. The cut off for BMI and waist circumference applied here are that of the Asian population since the Indians have higher visceral fat deposition while among the African-American people the subcutaneous fat predominates. Relative increase in visceral versus subcutaneous adipose tissue with increasing waist circumference in Asians and Asian Indians explains the greater prevalence of metabolic syndrome (6).

In our study 19 (11.7%) were under-weight in spite of consuming junk foods. Probable reasons may be replacing regular meals; skipping the regular meals or reducing the consumption of total food intake following junk food consumption. For example few

students instead of having healthy breakfast used to eat 2 samosas in the morning daily.

In our study, the study population included medical & dental college students in age group ranging from 18 to 26 yrs. There was no literature available among the medical college students however a study conducted in Allahabad in Uttar Pradesh in the year 2003 showed that most of the fast food consumers belonged to age group of 15 to 18 yrs. Samosa and chats were the most preferred fast food item among the respondents. Majority of the respondents were occasional consumers of the fast food. Most common reason for consuming fast food was need for change from routine (4).

A similar study conducted in South Africa among adults aged 19 to 30 yrs., showed that 21% of all the participants had fast food at least once a week, while 27.6% had it two to three times a week. Males consumed fast food more frequently than females. The most popular fast foods consumed were burgers (69.5%), pizza (56.6%) and fried chicken (38.4%). Soft drinks were the most popular beverage consumed (56%). The main reasons for choosing fast food were time limitations (58.9%), convenience (58.2%) and taste (52.5%) (2) and similar results were also observed in our study too.

A study was conducted by CSE (Centre for Science and Environment) in Delhi in the year 2012 where a few of the junk food samples (i.e. potato chips, Indian snacks, Instant noodles, burgers, pizzas, French fries and carbonated drinks) were collected from Delhi Outlets and analysed for salt, total carbohydrates, total fat and trans fat content with a widely and internationally used methodology of Association of Official Analytical Chemists (AOAC). They found that for 100g of potato chips contained total fats 33 g., carbohydrates 57.5 g., Trans fats of 0.6 g. (private company potato chips) & 3.7 g. of trans fat (another private company potato chips). Amount of salt present were 1.2 g. & 3.5 g in the two different private company potato chips. So consuming a standard-sized packet (65-75g) would finish about half of the daily fats quota. Munching a packet of private company potato chips would exceed trans-fat quota and similarly a packet of private company potato chips will meet 60-70% of a person's daily salt quota (7,8). For aerated drinks they found that for every 100 mL; carbohydrates content was 14 g. (private company aerated drinks). A 300 ml bottle will have over 40 g sugar; so consuming a single bottle would exhaust our added sugar quota almost twice over (8).

According to the Dietary Guidelines for Indians (National Institute for Nutrition, 2011) a balanced diet should provide 50-60% of calories from carbohydrates, 10-12% from proteins and 20-25% from fats. Though NIN recommends a maximum of two per cent of total calories to come from trans-fats, the recommendations of WHO is one per cent. Balanced diet should provide other non-nutrients such as dietary fibre, antioxidants and phytochemicals (9). But regular and prolonged consumption of these junk foods which are rich in carbohydrates and high salt level at younger age can predispose an individual to obesity and cardiovascular disorders.

Conclusion: In our study we have observed that medical & dental college students in the age of 18 -26 yrs. started consuming junk food right from their childhood i.e. from primary school itself & almost 71.2% consumed junk food more than twice in a week, most common reasons for consumption being tasty (83.4%) and easy availability (56.4%). In the study population only 42.3% had normal BMI according to WHO guide lines for Asian population & rest were under-nourished 11.7% or over weight/ obese 46%. Consumption of puff, aerated drinks and ice cream significantly correlated with increased waist circumference and BMI.

Recommendation: Since obesity is associated with various non communicable diseases like hypertension, diabetes mellitus there is a need to stress on healthy diet & life style modifications among these students. Since some of these students have already developed the risk factors (undernourished or obese) health education regarding healthy diet & life style modifications is the need of the hour.

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