

Study of Fast Food Consumption Pattern in India in Children Aged 16-20 years

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Abstract

Fast food consumption pattern was studied on 51 children aged 16-20 years in India using a pre-tested and pre-designed performa to collect information about age, family type, dietary history, consumption of junk foods, food habits and food consumption pattern, food intake per day, nutritional status data, anthropometric measurement such as height, weight, etc. and body mass index (BMI). The study revealed that the respondents had reached the border line of BMI and approaching towards obesity. It was also observed from the results that the adolescents consume more calories, fats and carbohydrates and less proteins, vitamins, iron and dietary fiber than the recommended dietary allowances which is a serious concern and may be a predisposing factor for obesity. Also the contribution of carbohydrates to total energy intake is more, followed by fats and less contribution is provided by proteins which is again a serious concern.

Keywords: Fast food, obesity, body mass index, anthropometric measurements, high sugar, high salt

Food diversity is an implicit characteristic of India's diversified culture consisting of different regions and states within. Traditionally, most of the Indians like to have home-cooked meals— a concept supported religiously as well as individually. However, due to the influence of western culture and urbanization, there is a slight shift in food consumption patterns among urban Indian families. It started with eating outside and moved on to accepting a wide variety of delicacies from all over the world (Goyal and Singh, 2007).

Adolescence is a period of increased vulnerability to obesity. Lack of physical activity and outdoor sports, along with the consumption of fat-rich 'junk'

foods, is the major cause of obesity among the affluent population (Choudhury and Gogia, 2006). Consumption of diet high in sugar, saturated fat, salt and calorie content in children can lead to early development of obesity, hypertension, dyslipidaemia, and impaired glucose tolerance (Kotecha *et al.*, 2013). Some dietary patterns appear quite common among adolescents, to mention a few: snack eating, usually on energy-dense foods; meal skipping, particularly breakfast, or irregular meals; wide use of fast food; and low consumption of fruits and vegetables (Cavadini *et al.*, 1999; Dausch *et al.*, 1995). Among urban adolescents in India, some of these patterns are also likely to be common but very little information is available on this aspect.

Most of the young people are presumed to be healthy but, as per World Health Organization (WHO), an estimated 2.6 million young people aged 10 to 24 year die each year and a much greater number of young people suffer from illnesses behaviors which hinder their ability to grow and develop to their full potential. Nearly two-thirds of premature deaths and one-third of the total disease burden in adults are associated with conditions or behaviors initiated in their youth (e.g. tobacco use, physical inactivity, high risk sexual behaviors, injury and violence and others) (Young people: health risks and solutions, 2011). The behavioral patterns established during this developmental phase determine their current health status and the risk for developing some chronic diseases in later years (Sunitha and Gururaj, 2014). A significant reduction in the mortality and morbidity of communicable, maternal and neonatal disorders since 1990 due to concerted and integrated effort led to a shift in focus towards the health, safety and survival of the young people (Collins *et al.*, 2013; Gururaj, 2013).

It is crucial to understand the health problems of this population, processes and mechanisms that affect their health and to identify interventions and strategic approaches that may protect their health and develop and implement policies and programs (Sunitha and Gururaj, 2014).

The practice of high consumption of junk foods like *maggi* noodles, burgers, *pao-bhaji*, sandwiches, hot dogs, patties, pastries, popcorn, potato chips, carbonated drinks, biscuits, muffins, toast, *kulcha-channa*, *samosa*, chocolates etc. have become a common feature of adolescent's diet (Singh and Singh, 2008; Goel *et al.*, 2013). Adolescent's eating behaviors are strongly influenced by their social environments, which include family, peer networks, schools, advertising, religion and knowledge (Gomathy and John, 2008). Ill effects of regular intake of junk foods are mainly lack of energy, poor concentration and obesity leading to inferiority complex, depression, heart diseases, high cholesterol, stunted growth, premature ageing and tooth decay (Chhibber, 2010). According to a study on adolescents, with excessive

consumption of processed foods and high fat diets obesity is on the rise (Augustine and Poojara, 2003).

Dietary quality declines from childhood to adolescence (Lytle *et al.*, 2000) with dietary habits likely to promote fatness being actively adopted. For example, the consumption of fruit, vegetables and milk decreases from childhood to adolescence (Lytle *et al.*, 2000), while soft-drink consumption increases (Nielsen and Popkin, 2004; Goel *et al.*, 2013). Due to an increasing allurements of adolescents towards junk food and increasing prevalence of overweight/obesity among adolescents, the present study was conducted to examine and understand the eating behavior of children aged 16-20 years in India.

MATERIALS AND METHODS

Selection of subjects

A sample of 51 children (school and college students) of age 16-20 years were selected by purposive sampling method.

Data collection

The age of children was ascertained by questioning them and age in completed years was taken for analysis. A pre-tested and pre-designed performa was used to collect the following information- age, family type, dietary history, consumption of junk food, food habit and food consumption pattern (collection of information regarding food habits, number of meals per day, amount of food and type of food consumed by the respondents per day), nutritional status data (anthropometric measurement-physical dimensions such as height, weight, etc. and gross composition of human body, dietary survey) and body mass index (BMI).

In the present study, BMI of the subjects was calculated to categorize them into underweight, normal weight and obese according to the classification given by Garrow (1981) (Table 1).

Dietary intake

The dietary intake of the subjects was adjudged by "Diet Survey method". 24 hours recall method using

standardized containers was employed to record the dietary intake of the subjects (Goel *et al.*, 2013). The different food items consumed were converted into their raw equivalents; categorized into their respective food groups and average daily intake of energy, protein, fat, calcium, iron, β -carotene and vitamin C were calculated from the values per 100g of edible portion using Michigan State University (MSU) nutriguide (Song *et al.*, 1992). The nutritive value of some of the foods like *maggi*, noodles, potato chips, biscuits etc. were taken from the information provided on the package of a product. The calculated nutrient intake was compared with the recommended dietary allowances (RDA) for the respective age group (16-20 years) (Gopalan *et al.*, 2004).

Table 1: Garrow's classification of body mass index (BMI), Kg/m²

BMI (kg/m ²)	Classification
18-20.0	Underweight
20.0-25.0	Normal
25.0-29.0	Obesity Class I
> 30.0	Obesity Class II

Anthropometric measurements

Height and weight were measured by using the methods of Indian Council of Medical Research (ICMR) (Brahmam *et al.*, 2005). Weight was measured using an electronic balance (ATCO) with 100g of accuracy and was recorded in kilograms, to the nearest 100g. The body mass index (BMI) was calculated as the weight in kilogram/height (Kg/m²) and it was classified according to the Garrow's classification given by American National Institute of Health and National Heart, Lung and Blood Institute (NHLBI) (Bethesda, 1998).

Data analysis

The data collected were subjected to qualitative and quantitative analysis. The anthropometric data relating to height and weight of the children were used to calculate BMI. After 24 hours of dietary record, the nutritive value of these diets in terms of

energy, protein, carbohydrate and fat were calculated by using values given (Gopalan, 2004). The average nutrient intake per day per child was calculated and then compared with Recommended Dietary Allowances (RDA) as given by ICMR (2002). A code design was prepared in context to response of various questionnaires. The responses of each child were separately transferred into master sheet for easy interpretation. Data was compiled, analyzed and presented in proportions and percentages. Statistical analysis was carried out using the Statistical Package for Social Sciences (SPSS) version 16.0.

Table 2: General profile of the respondents (n=51)

Variables	Percentage
Gender	
Male	43.13
Female	56.86
Age	
16-18 years	56.86
19-20 years	43.13
Education	
Pre-university	49.01
College	50.98
Religion	
Hindu	92.15
Muslim	5.88
Christian	1.96
Food habit	
Vegetarian	39.21
Non-vegetarian	50.98
Eggetarian	9.80
Family type	
Nuclear	78.43
Joint	21.56

RESULTS AND DISCUSSION

General Profile

The general profile of children is presented in Table 2. It was found that 56.86% were in the age group of 16-18 years while 43.13% were in the age group of 19-20 years. Out of the respondents, 49.01% were pre-

university children and 50.98% were college-going students. The subjects were 92.15% Hindu where as 5.88% were Muslims and 1.96% were Christians. Among the subjects, 78.43% had nuclear family while as 21.56% had joint family. About 39.21% of the respondents were vegetarian, 50.98% were non-vegetarian while as 9.80% were eggeterian.

Table 3: Eating habits among respondents

Variables	Percentage
Regular Meals	
Yes	50.98
No	49.01
Daily Breakfast	
Yes	50.98
No	49.01
Frequency of daily meals	
Less than three times	58.82
Three or more times	41.17
Frequency of having snacks (per week)	
Less than three times	56.86
Three or more times	43.13
Weekly consumption of vegetables & legumes	
Less than three times	31.37
Three or more times	68.62
Weekly consumption of fruits	
Less than three times	27.45
Three or more times	72.54
Meals with friends & family	
Daily	80.39
Not daily	19.60

Out of the total respondents, 43.13% were males and 56.86% were females. Gender may be considered as one of the major predictors of junk food consumption. Males are more likely to have diets higher in total saturated fat compared to females (Story *et al.*, 2002; French *et al.*, 2001). There is also some evidence that females are influenced by social environment to a greater extent than males. Driskell and colleagues (2006) reported that bigger percentage of women (34%) than men (13%) indicated that one of the two

primary reasons for choosing to eat at fast food restaurants was to eat with friends and family. Nevertheless, some studies did not find significant associations between eating fast food and gender (Satia *et al.*, 2004).

Table 4: Pattern of fast food consumption among respondents

Pattern of fast food consumption	Percentage
Frequency of consumption per week	
Once	3.92
Twice	54.90
Thrice	15.68
Four times	15.68
Occasionally	9.80
Everyday	—
Favorite type of fast food	
Flour products	76.47
Flour products and carbonated drinks	82.35
Carbonated drinks	94.11
Preference of fast foods to homemade meal	
Yes	25.49
No	74.50

Dietary habits and life-style pattern

Self-reported food preferences have been found to be one of the strongest predictors of food choices (Woodward *et al.*, 1996). The study shows that eating junk foods was associated with pleasure, being with friends, independence, affordability and convenience. The perceived characteristics of healthy foods were in direct contrast to those of junk foods. Eating healthful food was linked with family meals and being at home. Eating and liking junk food was seen as a normal behavior among adolescents, whereas liking healthful food was viewed as an oddity. Our results are in agreement with the results shown by Chapman and Maclean (1993).

As can be seen from Table 3, 50.98% eat meals regularly while as 49.01% do not eat meals regularly among which 58.82% eat daily meals less than three times and 41.17% eat daily meals three or more times.

About 50.98% eat breakfast daily while as 49.01% do not eat breakfast daily. 56.86% of the respondents eat snacks less than three times a week while as 43.13% eat snacks three or more times a week. 31.37% of the respondents consume vegetables and legumes less than three times a week and 68.62% consume vegetables and legumes three times or more per week. 27.45% of the respondents consume fruits less than three times a week while as 72.54% consume three or more times a week. Eating meals with friends and family plays an important role. About 80.39% of the respondents eat with friends and family daily while as 19.60% do not eat daily with their friends and family.

Table 5: Respondents’ perception of how fast foods can lead to non-communicable diseases (NCDs)

Perception of how fast food consumption can lead to NCDs	Percentage
Fast foods contain cholesterol, sugar, salt, fats etc. and their accumulation in the body	31.37
Fast foods are not cooked under healthy condition and environment	29.41
Increases the risk of developing non-communicable diseases (NCDs)	3.92
Excessive consumption of fast foods	25.49
Intake of chemicals/toxins contained in the preservatives and their accumulation	9.80

Table 4 shows the fast food consumption pattern of the respondents. About 3.92% of the respondents consume fast foods about once a week, 54.90% consume twice a week, 15.68% consume thrice a week, 15.68% consume four times a week and 9.80% occasionally consume fast foods a week. However, none of the respondents consume fast foods everyday per week.

From Table 5, it can be observed that about 45% of the respondents take carbonated drinks which contain carbon dioxide and is high in calories which could be a reason of obesity. Only 4% of the respondents purchase mineral water which is good for health. 22% of the respondents purchase and consume fruit juices and about 10% of the respondents consume milk and shakes along with fast foods. Juice and

shakes are rich in various nutrients like vitamin C, folic acid, potassium and are an excellent source of bioavailable antioxidant phytochemicals and significantly improves blood lipid profiles in people suffering from hypercholesterolemia. About 15% of the respondents consume tea/coffee along with fast foods and only 4% of the respondents were not consuming any type of drink along with fast foods.

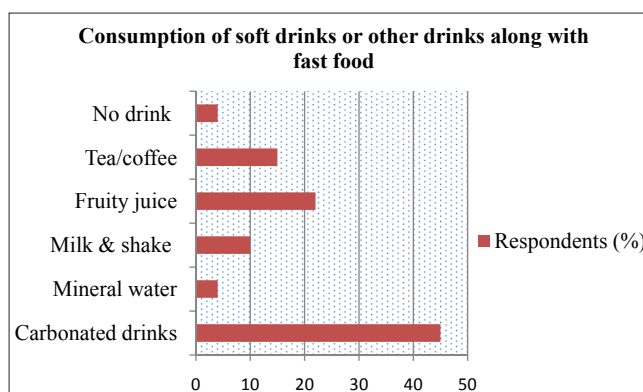


Fig. 1: Consumption of soft drink or other drinks along with fast food

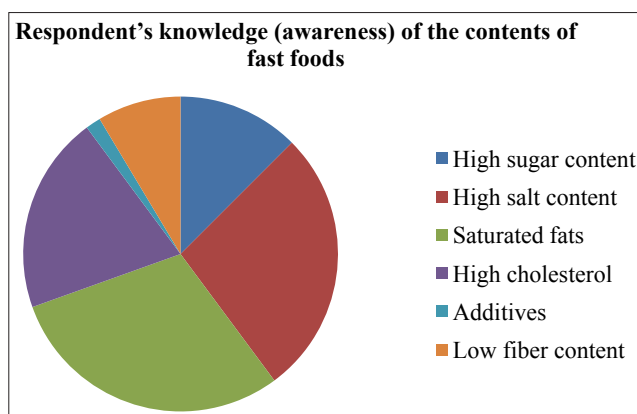


Fig. 2: Respondent's knowledge (awareness) of the contents of fast foods

Knowledge related to fast food

Fig. 2 shows an awareness of fast food among the respondents. The respondents know various names like burger, pizza, hamburgers, cake, French fries, ice-creams, hot dogs, chips as examples of fast food. 31.9% of the respondents are aware about high sugar content of fast foods, 68.8% of the respondents

Table 6: Comparison of mean body weight and mean height with standard

Age (Years)	Standard (Kg)		Mean Weight (Kg)		Weight Difference (Kg)		Standard (cm)		Mean height (cm)		Height Difference (cm)	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
16-18	57.1	49.9	55.5	52.3	-1.6	+2.4	162.2	162.1	165.4	163.6	+3.2	+1.5
19-20	62.1	52.2	70.2	50.8	+8.1	-1.4	167.1	165.1	168.8	159.8	+1.7	-5.3

know about the high salt content of fast foods, 74% of the respondents know that fast foods have high saturated fat content and 51.5% respondents have knowledge about the high cholesterol level in fast foods. However, only 3.92% know that fast foods contain additives and 21.56% know about the low fiber content even then they do not stop themselves from consumption.

Table 5 shows the perception of respondents how fast foods consumption can lead to non-communicable diseases (NCDs). More than half of the respondents disagreed with the view that fast food consumption predisposes one to developing NCDs such as diabetes and only 1% of the respondents agreed with the risk factors for non-communicable diseases (NCDs) associated with consumption of fast food which is consistent with the earlier research works which found that fast foods are a contributing factor in the etiology of NCDs such as hypertension and cardiovascular diseases (CVDs). One possible explanation for this could be their disagreement about the role of fast food consumption in causing NCDs while as another possible reason could be that they are not enlightened about how fast food consumption can possibly lead to NCDs. However, some respondents explained that fast foods contain cholesterol, salt, sugar and fats which may accumulate in the body leading to obesity, hypertension and/or heart diseases. This corroborates the World Health Organization (WHO) stating that fast foods are high in fat, sugar and sodium (as salt) which contribute additional calories, excess body fat and increased body weight. It further stated that being overweight or obese increases the likelihood of suffering from coronary heart diseases (CHDs), diabetes and hypertension.

Anthropometric measurements of the respondents

Table 6 shows the standard weight and mean weight of the respondents. According to National Center for Health Statistics (NCHS) standards, weight for age group 16-18 years should be 57.1 Kg for boys and 49.9 Kg weight for girls. The data shows that in this age group (16-18 years) boys deviated by -1.6 Kg and girls by +2.4 Kg from the standard. In age group of 19-20 years, the body weight should be 62.1 Kg for boys and 52.2 Kg for girls however, the data shows that boys deviated by +8.1 Kg and girls by -1.4 Kg from their respective standards. Table 6 also shows the difference between mean height and standard height. The data shows boys of age group 16-18 years showed a deviation of +3.2 cm from standard and girls of +1.5 cm from the standard and in the age group of 19-20 years; boys deviated by +1.7 cm and girls by -5.3 cm from the standard values.

Table 7: Mean BMI of respondents

Age group (Years)	Mean BMI	
	Boys	Girls
16-18	18.8	19.6
19-20	22.5	20.05

<18.5-underweight; 18.5-22.5-Normal; >22.5-Obese

Table 7 shows body mass index (BMI) of the respondents. As observed from the table, girls in the age group of 16-18 years and 19-20 years came under normal range of BMI (18.5-22.5). Also the boys in the age group of 16-18 years have normal BMI but boys in the age group of 19-20 years had BMI of 22.5 i.e. they were at the border line of normal and overweight.

Table 8: Nutrient intake of respondents

Nutrient	RDA	Mean \pm SD	Difference from RDA	Percent consumption of RDA
Energy (kcal)	2350	2527.58 \pm 42.71	+177.58	107.5
Protein (g)	70.5	65.3 \pm 9.6	-5.2	92.6
Fat (g)	22	78.2 \pm 8.1	+56.2	355.45
Carbohydrate (g)	352.5	440.2 \pm 95.21	+87.7	0.012
Vitamin A (β -carotene); mg	2400	890 \pm 26.9	-1510	37
Iron (mg)	40	14.8 \pm 4.0	-25.2	37
Dietary fiber (g)	25	14.3 \pm 3.7	-10.7	43

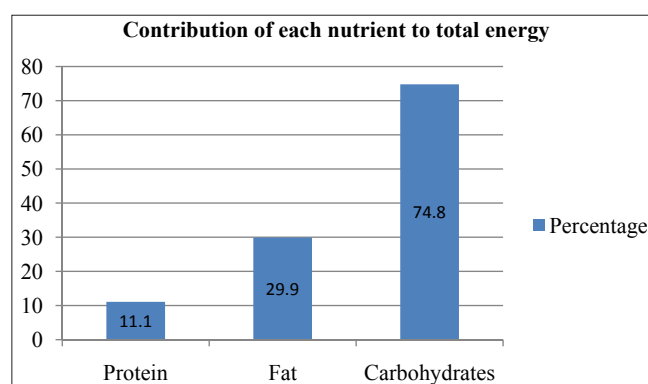
The results are expressed as Mean \pm SD, n=3

But as the age increases, the BMI increases which is an alarming sign, therefore, it could be inferred that the respondents (adolescents) were approaching towards obesity.

Nutritional intake of the respondents

Table 8 shows the overall consumption of various nutrients consumed by the respondents. The data in the table 8 showed that, the total energy consumed was 107.5% of the recommended daily allowances (RDA) most of which is obtained through fat and carbohydrates which may lead to obesity. Data also shows that the consumption of micronutrients and fiber was less than RDA.

Fig. 3 shows that most of the energy is being provided by carbohydrates followed by fat and less from proteins which is an alarming sign and if followed the same way may lead to obesity.


Fig. 3: Contribution of each nutrient to total energy

As these children have started disturbing their dietary pattern, therefore in the long run this will lead to various health complications among the adolescents.

CONCLUSION

Most of the respondents do not take meals on their regular time which may be one of the predisposing factors for obesity among the adolescents. Also a good proportion of respondents were found eating snacks about 3 times a week. The results of the present study indicate that the children falling in the age group of 19-20 years have reached the border line of basal mass index and approaching towards obesity. It was revealed that the adolescents consume more calories, fats and carbohydrates and less proteins, vitamins, iron and dietary fiber than the RDA requirements which is a serious concern and may also be another predisposing factor for obesity. Also, the contribution of carbohydrates to total energy intake is more followed by fats and less contribution is provided by proteins which is again serious concern.

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