



IMPACT OF STREET FOOD CONSUMPTION PATTERN ON THE HEALTH OF COLLEGE GOING GIRLS IN MEERUT CITY U.P INDIA

¹Ms. Priyanka Agarwal, ²Dr. Shivani Verma

¹Ph.D Scholar, ²Professor,
¹Home Science,

¹Chaudhary Charan Singh University, Meerut, India

Abstract: Street food is food that is economical, can be prepared quickly and is readily available outside the colleges and hostel areas of the various college campuses in Meerut. But rich in calories and high fat and deficient in most nutrients. Due to increased globalization, urbanization, peer influence, changing lifestyle patterns of people, and commercial advertisements as well as great street food outlets, college-going girls are getting indulged in eating these types of food. In recent research, it is clear that street food is one of the reasons for metabolic disorders and various non – communicable diseases such as obesity, diabetes, and heart disease, etc. The present study was therefore conducted to check the consumption pattern of street food consumption by college-going girls in Meerut city and also to study the overall impact of street food consumption on their health. 198 college-going girls were randomly selected and assessed by self – administration of a structured questionnaire. The present study revealed that about 51% college going girls regularly consume fried/high-fat street food in the form of kachori, tikki, Pani puri, samosa, chole bhature, etc. and almost 31% of college girls regularly consumed high sugar–based food like cold drinks, sugarcane juice, shakes, etc with the street foods. Most of the college girls revealed that the taste of street food is the sole reason for the consumption of street foods. The present study also revealed that about 23% of college-going girls were having adequate knowledge about the effects of street food consumption on health whereas 42% of college-going girls had insufficient knowledge about the ill effects of street food consumption on health. It is, therefore, necessary to create awareness about the ill effects of fast food and the benefits of a balanced diet for college-going girls.

Index Terms - Street - Food, Nutritional Awareness, General Health, Non – Communicable Diseases, Unhealthy Food

Introduction:

The Food and Agricultural Organization defines street food as “ready-to-eat foods and beverages prepared and sold in streets and other similar public places.” The changes taking place in people’s lifestyles lead to the habit of eating outside. Because the college-going girls have no cooking facilities at hostels, the changes in consumption habits of the society, cultural interactions, fast living, peer influence, etc are influencing and changing the nutrition style in Meerut. In the current time span, college-going girls and young generations prefer to buy food sold on the streets to meet their requirements and needs and also like that food more than home-cooked food. Street foods are being prepared and sold at places like streets, schools, colleges, train stations, bus terminals, and entertainment and festival areas where people are crowded. Street foods generally found on the streets are integral to any country’s cuisine. Street foods commonly found in INDIA are Pani Puri, Aaloo Tikki, Chaat, Puri Sabji, Samosa, Momos, Chowmein, Sugarcane Juice, Soda Shakes, Milkshakes, etc. Indian street food differs from state to state, not in the food items themselves but due to the different spices used. Street foods are highly demanded and welcomed by consumers because they are economical, tasty, and easily available. The environment in the college influence the behavior of the college-going girls toward street food consumption. College-going girls are indulging in street foods to curb their hunger, social gathering with peers, and save time as well street food gives them a sense of pleasure. Due to their economical

price and easy availability, street foods are considered an alternative to home food. Street foods are rich in calories, fat, and salt, and therefore excessive consumption of street food is a major factor in the causing of non – communicable diseases such as obesity, high blood pressure, high cholesterol, and high glucose level in the blood. Microbial contamination can be caused due to the poor method of preparation of street foods thus resulting in gastrointestinal problems. The wholesomeness of this food in terms of sanitation is quite questionable. Lack of cleanliness or hygiene may be a question mark on the consumption of street food.

The present research study was therefore planned to know the consumption pattern and factors associated with high consumption of street foods and its overall impact on the health of the college-going girls in Meerut city U.P India and to study the preventive measures that can be taken to reduce the consumption of street foods.

Literature Review:

Garbin B. et al., (2002), described that tests on the street vended ready to eat foods like: sandwiches, ice creams etc.) and the vendors of such foods were carried out to assess the microbiological quality of these foods. The study shows that the poor microbiological quality of these street foods constitutes a potential hazard to public health, that the extent of this hazard varies between the cities studied, and that vendor's health education in food safety is a crucial factor in the prevention of food borne infections.¹

Ramesh V.B., and Kavita W. (2002), described in their research study the uses and retail of street foods in Asian countries. Aspects considered include a historical perspective on street food retailing in Asian countries, socio economic aspects of street food retailing, (employment, economics, consumer spending, street food franchises, costs of street foods, role of women in the street food industry) profile of street food retailers (age, migration, income, training, personal hygiene) profile of street food consumers in various Asian countries, types of street foods available Asian countries (range, street foods for special occasions, seasonal changes in street food retailing, preparation and processing methods, packaging, use of left over foods, water facilities, disposable of waste, location of vending vehicles) quality of street foods in Asia and legislations regarding street food retailing in Asian countries.²

Usha Chandrasekhar, kowsalya S., and Pramila Latha (2003), in their research study conducted in Kochi, mentioned the presence of non – permitted colour, artificial sweeteners, adulterant oils and the poor sanitary quality of the food. Hazard Analysis Critical Control Point (HACCP) analysis of Bengal gram curry showed high microbial counts in raw and soaked samples.³

Chakravarthy (2013) states that food is a biological product and supports many microorganisms such as aerobic bacteria, Ecocle bacteria and pathogens responsible for diseases such as diarrhoea. Chemical additives such as colourants and preservatives also routinely contaminate food.⁴

Gadi. C, Bala. K, Kumar.A., (2013), talked about the personal hygiene and food handling practices followed by street food vendors in Allahabad city, for the study 30 street food vendors have been chosen as the sample for the study. 52 food samples were also collected for safety and checking any contamination which will have any potential for the food poisoning or coli and salmonella bacteria particularly, after studying the samples carefully tested in laboratories it has found that most of the food has the risk of salmonella and coli, due to un – purified water has been used while cooking the food, most potential food which caused the risk of food poisoning was sugar cane juice and pani puri. Contamination reason was poor personal hygiene, poorly maintained premises and poorly cleaned pots and pans, it has been also found that they do preparation of food much before cooking and this unprepared food is exposed to pollution and dust which is more harmful to health. Researchers suggest that street food vendors need strong training towards following HACCP as well as personal hygiene so that it will minimize the risk of food poisoning and increase food quality.⁵

Sangwan.V & Boora.P (2015), in the research study talked about consumers' perception, preference, safety aspects and consumption of street foods. The research was conducted in Hisar city of Haryana. Findings were

¹ Garbin B. et al., "Food and Environmental Hygiene" Journal of Food Protection. Vol.65, No.1, 2002, pp. 146-152.

² Ramesh, V.B., and Kavita, W., "Profile of street foods sold in Asian countries", World – Review of Nutrition and Dietetics, ISBN 3–8055–6927–0, 2000, pp.53-99.

³ Usha Chandrasekhar, Kowsalya S., and Pramila Latha, "Proximate Composition, Microbial and Chemical Contamination of Street Vended from Versus Home Made and Restaurant Foods from Kochi," Journal of Food Science and Technology, Vol.40, No.1, 2003, pp. 58-62.

⁴ Chakravarthy, I. (2013) Street Food Vendors – Food Safety Requirements. Government of West Bengal, Public Health Engineering Department.

⁵ Gadi, C., Bala, K. L., & Kumar, A. (2013). Study of Hygienic practices of street food vendors in Allahabad city, India and Determination of Critical control points for safe street food. The Allahabad Farmer, 58(2), 134. <https://doi.org/10.13140/RG.2.2.22360.14080>

from the chosen sample most of the working men (64%) preferred street food as their just the once lunch. It was also founded that girl's student frequently consume street food over male students and their frequency to consume the street food was on alternative days. Most of the working men were not bothered about food hygiene and food quality of street food vendors. Working women were more bothered about food hygiene and the overall food quality. Students were more drawn to the street food for the taste and they were ignorant of the food hygiene followed by the street food vendors. The street food vendors were lacking a lot of personal hygiene standards and they were handling money with the identical hand from which they were serving food and their serving of food with bear hand might also be the most dominant reason for food contamination. Researcher suggests that there is a strong need for food safety and private hygiene for street food vendors.⁶ **Sabbithi. A, et al, (2017)**, explained the way to prioritize food safety practices by street food vendors which can deliver more safe food to eat and can avoid microbial contamination through street food. The research study was conducted in the city of Hyderabad in India. The conclusion of the study notes that food safety training programs must conduct on the regular basis.⁷

Objectives:

To assess the consumption pattern of street foods and its impact on health of the college going girls in Meerut city.

Research Methodology:

Research Problem: Impact of Street Food Consumption Pattern on the Health of College Going Girls in Meerut City U.P India

Research Design: Cross Sectional Survey design was used to conduct the research survey.

Sampling Design: Simple random sampling design has been used and every fifth college going girl from various colleges in Meerut was selected as sample for the study.

The particulars of sample design are:

- a) **Type of Universe:** Finite
- b) **Sampling Unit:** College going girls of various colleges of Meerut.
- c) **Sample Size:** The sampling population of the proposed research was 198 college going girl's respondents.

Data Collection/Data Analysis:

- a) **Primary Data:** The primary data was collected with the help of questionnaire with the permission of the ethical committee of the colleges and data was collected from the college girls during free periods in their classrooms.
- b) **Secondary Data:** List of college going girls were obtained from the faculty office of various colleges in Meerut.

Research Instrumentation: To assess the consumption pattern of street foods and its impact on health among the college going girl's self – structured questionnaire was constructed and sent to experts for opinion. Suggestions given by experts were incorporated and pilot study was conducted. On the basis of pilot study final questionnaire was finalized.

Statistical Tools: For data analysis arithmetic mean, standard deviation, percentage and Pearson Correlation was used using SPSS version 23.

Findings and Analysis:

Table 1: Distribution of College Going Girls According to Age

Age Group	Number (n= 198)	Percentage (%)
17 – 20 Years	108	55%
21 – 24 Years	74	37%
25 – 30 Years	16	8%

⁶ Sangwan, V., & Boora, P. (2015). A Study of the Safety Consumer Perception & Consumption of the Street Foods Sold in Hisar City, Haryana. *Indian Journal of Preventive & Social Medicine*, 46(1-2)6.

⁷ Sabbithi, A., Reddi, S.G.D.N.L., Naveen Kumar, R., Bhaskar, V., Subba Rao, G.M., Rao V, S. (2017). Identifying critical risk practices among street food handlers. *British Food Journal*, 119(2), 390-400. <https://doi.org/10.1108/BFJ-04-2016-0174>

The above table 1, shows that college-going girls were distributed into 3 groups, based on their age. 55% of college-going girls belong to the 17 – 20 age group, 37% of college-going girls belong to the 21 – 24 age group, and 8% of college-going girls belong to the 25 – 30 age group. Age plays an important role in the consumption of street foods as most college-going girls are in their late adolescence or in early adulthood. During this period, college gatherings among peers or classmates are on regular basis and also college girls receive more pocket money from their parents which they get influenced and spend on the consumption of street foods.

Table 2: Distribution of College Going Girls According to Education

Educational Status	Number (n= 198)	Percentage (%)
Under Graduate Students	100	51%
Post Graduate Students	98	49%

The above table 2, shows the educational status of the selected college-going girls, that out of 198 college-going girls, 100 (51%) were having their undergraduate degree, whereas 98 (49%) were post graduate students.

Table 3: Distribution of College Going Girls According to Physical Activity

Activity	Number (n= 198)	Percentage (%)
Sedentary	44	22%
Active	154	78%

The above table 3, shows that 78% of college girls were having active lifestyles whereas 22% of college-going girls were having sedentary lifestyles. Most of the college-going girls assessed were active as they were essentially engaged in some sort of physical activities per day such as running, jogging, playing sports/badminton, etc. with their peers after college time. Physical activity also impacts street food consumption as during or after playing with friends they mostly indulge in street foods consumption sold by street vendors increment in their consumption of street foods.

Table 4: Distribution of College Going Girls According to Weight

Weight	Number (n= 198)	Percentage (%)
Underweight	9	5%
Normal	79	40%
Overweight	69	35%
Obese	41	20%

As shown in above table 4, 40% of college-going girls were having normal body weight, 35% of college-going girls were overweight, 20% of college girls were obese and 5% of college girls were underweight. Street foods directly affect the weight of college girls due to high salt content and oil usage that led to water retention as well due to high-fat content that is not fully utilized by the body and is deposited in adipose tissues of the body causing a gain in weight.

Table 5: Distribution of College Going Girls According to Family History

Family History	Number (n= 198)	Percentage (%)
Yes	105	53%
No	93	47%

The above table 5 shows that 53% of college-going girls were having a family history of non – communicable diseases such as heart disease, diabetes, etc. whereas 47% of college-going girls responded “No” for any family history of non – communicable diseases. It was observed that college-going girls with a family history of non – communicable diseases were aware of the ill – effects of unhealthy eating, therefore, they keep a check on the amount of street foods consumption.

Table 6: Percentage Distribution of College Going Girls According to Consumption of High Fat/High Sugar Food

Consumption	Regularly (%)	Occasionally (%)	Never (%)
High Fat	51	48	1
High Sugar	31	60	9

The above table 6, shows that 51% college going girls regularly consume high-fat/fried food in form of chole bathure, samosa, kachori, poori, noodles, chowmein, goalgappe, etc. while 48% of college-going girls

occasionally consume high-fat foods. As shown in the table, 60% of college-going girls occasionally consume high-sugar-based food along with street foods. Whereas, 31% of college-going girls consume street foods regularly. Street foods are easily available outside and nearby the college area to be easily consumed in by college students. Students/college-going girls mostly consume street foods during college hours or at the get-together with their friends and peer group.

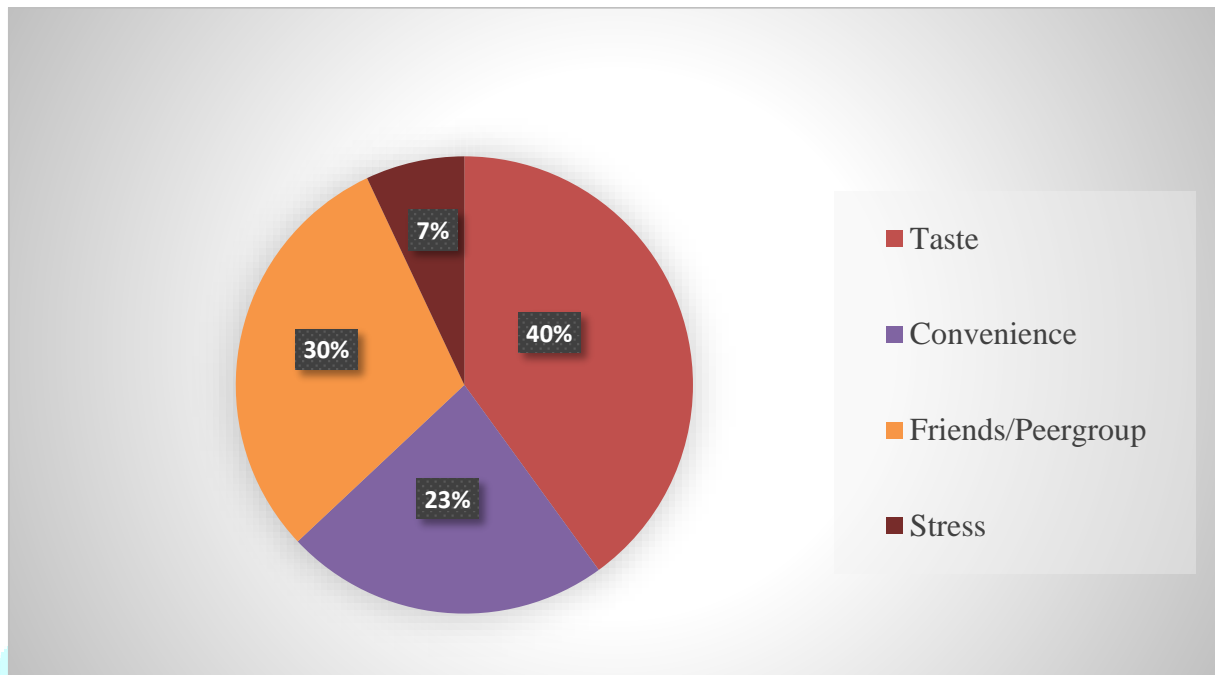


Figure 1: Percentage Distribution of College Going Girls According to Reason for Consumption of Street Foods

As shown in above figure 1, 40% of college-going girls consume street foods due to taste whereas 30% of college-going girls consume street food while going out with friends and peer groups. 23% of college-going girls responded that street foods are easily available everywhere outside and nearby college areas, thus freedom from carrying food from home whereas 7% of college-going girls responded that to relieve the stress they indulge in eating street foods of their choice.

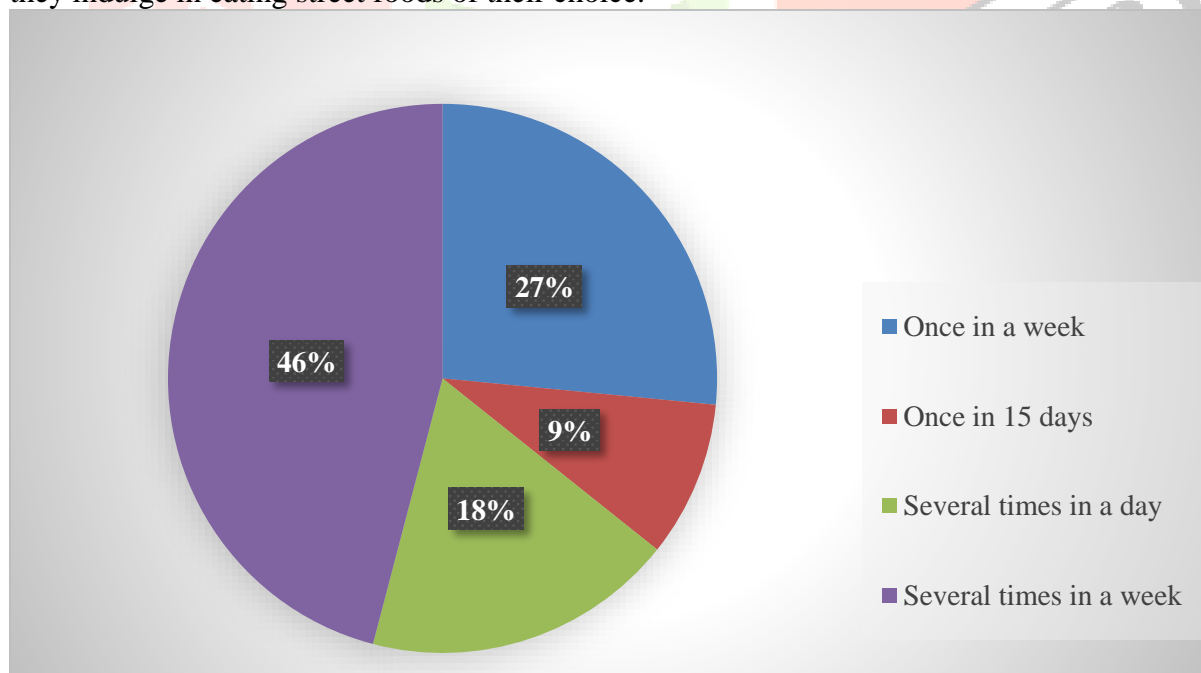


Figure 2: Percentage Distribution of College Going Girls According to Frequency of Consumption of Street Foods

As shown in above figure 2, 45% of college-going girls were consuming street foods several times a week whereas 26% of college-going girls were consuming once a week. 18% of college-going girls reported consumption of street foods several times a day whereas 9% of college-going girls reported consumption of street foods once in fifteen days.

Table 7: Awareness About Street Food in College Going Girls

Awareness Level (n= 198)				
	Additives	Calories	Metabolic Diseases	Freshness
Mean	1.6465	1.2677	1.4394	1.5657
Standard Deviations	.47928	.44387	.49757	.49693

As shown in table 7, college-going girls were highly aware of the addition of additives in street foods and least aware of the calories present in street foods. College girls were also aware of un – freshness of street foods, especially during the pandemic situations, and their linkage to metabolic diseases but because of taste, convenience, and easy availability of the street foods outside the college campus and in nearby areas to the college campus and hostel area or houses they consume in.

Table 8: Pearson Correlation Among Awareness About Calories, BMI of College Going Girls and Frequency of Street Foods Consumption

Correlations among awareness about calories, BMI of college going girls and frequency of street food consumption (n = 198)				
		Calories	BMI	Frequency
Calories	Pearson Correlation	1	.841**	.609**
BMI	Pearson Correlation	.841**	1	.778**
Frequency	Pearson Correlation	.609**	.778**	1
** Correlation is significant at the 0.01 level (2 – tailed)				

As shown in Table 8 above, there was a significant correlation obtained between the BMI of college-going girls and the frequency of consumption of street food and calories present in street foods. An increment in the frequency of high-calorie food that is not utilized by the body and ultimately gets deposited as fat in adipose tissues that led to an increment in BMI. Although other factors are also responsible for BMI of the college-going girls other than street foods consumption that is not covered in the present study due to limitations.

Table 9: Correlation Among Awareness About High Calories in Street Food, BMI and Physical Activity.

Correlations among awareness about high calories in street food, BMI and physical activity (n = 198)				
		Calories	BMI	Activity
Calories	Pearson Correlation	1	.841**	.167*
BMI	Pearson Correlation	.841**	1	.278**
Activity	Pearson Correlation	.167*	.278**	1
** Correlation is significant at the 0.01 level (2 – tailed)				
* Correlation is significant at the 0.05 level (2 – tailed)				

As shown in Table 9 above, there is a significant correlation between college-going girls' physical activity, BMI, and calories present in street foods. As per the National Institute of Nutrition, India “Calories In = Calories Out = Weight Management” and if “Calories In > Calorie Out = Weight Gain”, therefore physically active college-going girls showed weak correlation with BMI and calories.

Conclusion:

Malnourishment in terms of obesity is the current vital health problem of college-going girls that leads to increased medical expenses. Various types of research have shown that college-going girls or university students mostly consume foods with high calories in terms of fried, packaged, or high-sugar foods and are least concerned about consuming foods like vegetables and fruits. In the current research study, the college-going girls reported that taste, convenience, and easy availability outside the college premises was the primary factor for street food consumption. Other than taste another reason was frequent hangouts and parties with peer groups and friends. College-going girls who were aware of the calories and ill effects of street foods were having normal BMI in comparison to unaware students. Street food vendors mostly target the young generation and the overall environment of college, influencing the behavior of college-going girls/students to

make social interaction with peers and to satisfy taste buds and hunger. Street foods contain a high amount of fat, sugar, and salt, more than recommended by the National Institute of Nutrition (NIN) and the World Health Organisation (WHO). In the current research study, a significant correlation was obtained among BMI, Street foods frequency, physical activity, and awareness. It is thus, therefore very necessary and essential need to organize the nutrition education program in colleges to prevent the young generation from addiction to street food consumption and also to prevent the spreading of non – communicable diseases like Obesity, Diabetes, Cardiovascular disease, etc.

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