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The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; 9(4): 96-102

www.thepharmajournal.com
Received: 14-02-2020
Accepted: 18-03-2020

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Quality aspects of fast foods and their consumption pattern among teenagers of rural-urban region of Sabour block in Bhagalpur district of India

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DOI: https://doi.org/10.22271/tpi.2020.v9.i4b.4575

Abstract
A comparative study of Indian Fast Food (IFF) and Western Fast Food (WFF) consumption among teenagers (girls and boys) was formulated to understand the quality aspects and trends of consumption of fast food among teenagers. For this 250 boys and 250 girls (12-18 years) were randomly selected and interviewed. It was found that girls (87.6%) and boys (86.8%) liked fast foods nearly equally i.e. and largely consumed both IFF and WFF (girls, 62.4% and boys, 60.4%). Among the IFF, girls (45.2%) and boys (54.4%) liked chat, pokora, samosa, patties, panipuri and while out of WFF, pizza was liked mostly (girls, 30% and boys, 45.2%). IFF was consumed for its taste (girls, 27.6% and boys, 53.6%) while WFF, it was largely as alternative food for girls (31.6%) and taste for boys (43.2%). IFF was taken occasionally by girls and boys, 29.6% and 33.2%, respectively, while WFF was taken occasionally, girls, 24.8% and boys, 52%. The satisfaction with IFF among girls and boys was 50.8% and 60%, respectively, and WFF (girls, 9.2% and boys, 5.2%). Reason for satisfaction with IFF was its deliciousness (girls, 64.4% and boys, 59.6%) followed by taste of food is indianized (girls, 20.4% and boys, 22%) in case of WFF, it was deliciousness (girls, 54% and boys, 59.6%), comparatively cheaper (girls, 7.6%; boys, 10.8%), and as a status symbol (girls, 2.4%; boys, 3.6%). This study would be helpful in formulating the strategies related to fast food consumption by teenagers.

Keywords: Fast food, teenagers, fast food consumption, BMI, obesity

1. Introduction
The importance of food for human health is known since the Hippocrates's days, when he said ''*Let food be thy medicine and medicine be thy food*" (let food be your medicine and medicine be your food). The consumer's standard of living, work culture, hectic schedule, liberal and global thoughts are changing rapidly. These impact our dietary pattern and routine food consumption. Out of various foods consumed across the world, "fast food" is one that is becoming popular among masses, especially young generations, thereby it is one of the fastest growing industries. Hence, it is pertinent to know about the fast food and its impact on consumers. Eating out in India has evolved from an occasion driven activity to an everyday activity and fast-food has become a significant symbol for the modern culture as it tends to satisfy customers in a relatively short time (Narayan and Prabhu, 2015) [5]. India also has long tradition foods with variety of recipes that still prevail in various part of country. Indian foods that includes in fast food lists are alloo-tikki, bhelpuri, panipuri, paav-bhaji, chat, pakora, samosa, Kachaudi, chole-bhature, idali, dosa, uttapam, etc. IFF depends on the cooking method. Indian fast foods (IFFs) are traditionally prepared by deep frying in fat (Keshari and Mishra, 2016) [3]. There are enough scientific evidence in India to substantiate that fast food have become an integral component of diet in all section of society. It was also found that the youngsters often visit fast food channels just for the sake of fun and some change from daily routine eating (Goyal and Singh, 2007).
Today, the fast food industry is adapted to Indian food requirement and is growing rapidly. As fast food is generally considered rich in calorie, fat, sugar, salt and poor in other nutrients, it has contributed to rise of many non- communicable diseases, metabolic diseases such as obesity and over-weight, diabetes mellitus, hypertension and cardiovascular diseases, among more common. In India fast food culture emerged after independence, however, over a period of time with a growth in the number of nuclear families as well working parents, increasing per capita income as well as globalization.

The fast food culture gained prominence with the liberalized Indian economy post 1990's, several multi-national companies (MNCs) forayed in Indian fast food market with their outlets in metro- and small cities largely functioning in shopping malls and other public areas. MNCs like Burger King, Pizza Hut, Domino's pizza, McDonald and KFC are serving several Western fast foods (WFFs) including Burger, French fries, Pizza, Hambergers, etc. to satisfy the Indian consumer's taste buds. Balanced diet has been replaced by fast or junk food, not only the younger generations but also people from all age-group, demand fast foods in their every-day eating habits. Also, rapid increase in disposable income and changing attitude towards food choices acting as major driving forces for fast food consumption instead of traditional foods. There are several myths or believes related to fast food consumptions that need to be addressed with scientific studies.

We conceived following hypotheses in relation to fast food consumption among teenagers: changing life style leading to increase in fast food consumption among teenagers; mushrooming of fast food outlets impacts teenager's food habits; advertisement of fast food products allures teenagers to fast food; and fast food, in general, is not healthy food; it may increases risk of metabolic diseases. To test the above hypotheses the comparative study of IFF and WFF consumption among teenagers was formulated with the following objectives (1) to understand the trends of consumption of fast food in teenagers, and (2) comparative analysis of fast food intake between teen boys and girls.

2. Methods

2.1 Data collection

The present study was conducted at Sabour Block of Bhagalpur district, Bihar, India. A convenient selection of ten schools/colleges was made for study purpose. Total 500 respondents, which include 250 each of boys and girls of age 12-18 years, were randomly selected from different schools and colleges residing in rural-urban areas. The permission to conduct study was obtained from the respective school principals. The questionnaire-cum- structured interview schedule/ in English and Hindi was prepared, and firstly tested in a pilot survey to check that the questions, that were asked providing us the relevant information regarding the main objectives of our survey or not. Also, the necessary information from secondary sources such as books, journals, newspapers, and internet were used.

2.2 Data analysis

Data were collected with the help of questionnaire-cum-structured interview schedule. Collected data from the field were properly analyzed and presented in the tables and graphic forms with the help of several statistics tools as per the need of study. On the basis of collected data to draw different conclusions and inference, the analysis procedure were adopted as follows: (1) tabulation of data by using frequency tables and cross tabulation; (2) graphical representation, and (3) Chi-square (χ^2) test of independence. P-value was calculated using online calculator (https://www.socscistatistics.com/pvalues/chidistribution.asp; https://www.graphpad.com/quickcalcs/pvalue1.cfm). If the p-value was found to be less than 0.05, it was considered that the variables are not independent of each other and that there is a statistical relationship between the categorical variables, and *vice-versa*.

3. Results and Discussion

The consumption of fast foods is increasingly growing across the world, because of the changes and transitions in the lifestyle and dietary habits, age groups particularly adolescents and young adults, are inclined toward consuming fast food (Majabadi *et al*. 2016) [4]. With increasing trend of fast food consumption, several health issues related to consumption of fast food had been reported (Wright *et al*., 2007; Bayol *et al*. 2008; Wiles *et al*., 2009; Keshari and Mishra, 2016; Corella *et al*., 2017) [7, 1, 6, 3, 2], hence awareness for the health hazards that come with eating fast food has become important.

3.1 Eating fast food

The students those liked IFF was nearly equal among girls (87.6%) and boys, (86.8%), and those students don't like comprised girls, 12.4% and boys, 13.2% (Fig. 1A; Table 1). Chi-square test showed the p-value 0.79, i.e. the result was not significant at $p< 0.05$, 1 d.f., hence the liking for fast food between girls and boys are not independent of each other and that there is a statistical relationship between these categorical variables.

3.2 Type of fast food consumption

The fast food consumption pattern was as follows, IFF (girls, 27.6%; boys, 32.8%), WFF (girls, 10%; boys, 7.6%), and the largest percentage consumed both of the fast food (girls, 62.4%; boys, 60.4%) (Fig.1B; Table 1). Chi-square test showed the p-value, 0.084 i.e. the result was not significant at $p< 0.05$, 2 d.f., hence the variables fast food consumption pattern (IFF, WFF and both) between girls and boys are not independent of each other and that there is a statistical relationship between these categorical variables.

3.3 Fast food that satisfies the most

The fast food that satisfies the most was as follows, IFF (girls, 50.8% and boys, 60%), WFF (girls, 9.2%; boys, 5.2%), and the largest percentage consumed both of the fast food (girls, 40%; boys, 32.4%) (Fig. 1C; Table 1). Chi-square test showed the p-value, 0.117. i.e. the result was not significant at $p< 0.05$, 2 d.f., hence the variables of fast foods (IFF, WFF and both) that satisfies the most to girls and boys, are not independent of each other and that there is a statistical relationship between these categorical variables.

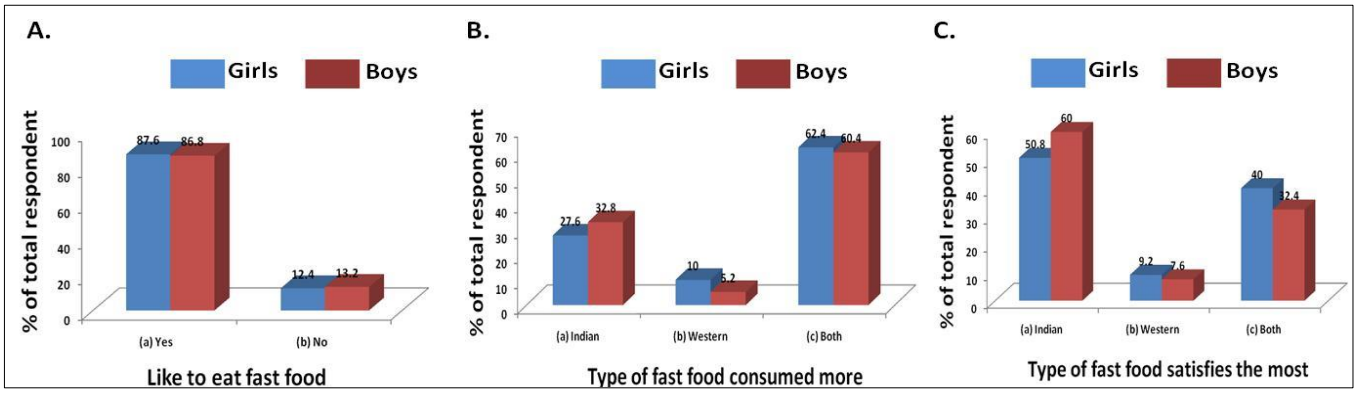

Fig 1: Graphical representation respondents who liked to eat fast food (A) type of fast food consumed more by respondents (B), and type of fast food that satisfied the respondents the most (C)

3.4 Fast food consumption

Among the IFF girls (45.2%) liked chat, pokora, samosa, patties, Panipuri and while boys (54.4%) followed by puri-Kachodi, Chhole-Bhature, stuffed paratha (girls, 21.2% and boys, 21.6%) (Fig.2A; Table 1). Chi-square test showed the P-value 0.021, i.e. the result was significant at $p< 0.05$, 6 d.f., hence variables items of IFF consumed between boys and girls are independent of each other and that there is no evidence of a statistical relationship between the categorical variables.. Among the WFF pizza was liked mostly (girls, 30%; boys, 45.2%) followed by noodles (girls, 42.4% and boys, 26.4%) and burger (girls, 14.4%; boys, 21.2%) (Fig.2B; Table 1). Chi-square test showed the P-value < .00001, i.e. the result was significant at $p< 0.05$, 6 d.f., hence variables items of WFF consumed between boys and girls are independent of each other and that there is no evidence of a statistical relationship between the categorical variables.

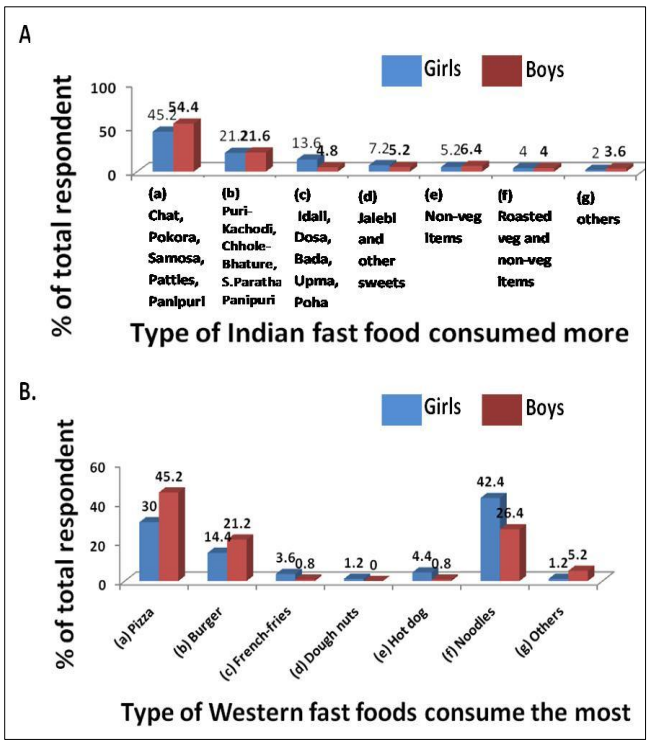

Fig 2: Graphical representation of type of IFF (A) and WFF (B) consumed more by respondents

3.5 Beverages preferred along with fast food

Among the beverages taken along with IFF, cold drink was liked mostly (girls, 26.4%; boys, 11.6%) followed by tea/coffee (girls, 26.4%; boys, 44%), and lassi (girls, 16.4%; boys, 7.6%) (Fig. 3A; Table 1). Among the beverages taken along with WFF, cold drink was liked mostly (girls, 26.8%; boys, 36.8%) followed by fruit juice (girls, 22.8%; boys, 12%) and tea/coffee (girls, 15.2%; boys, 16.4%), and lassi (girls, 21.6%; boys, 8%) (Fig. 3B; Table 1). Chi-square test showed the p-value < .00001, i.e. the result was significant at $p< 0.05$, 11 d.f., hence liking for beverages along with fast food (IFF and WFF) between girls and boys as shown in the contingency table are independent of each other and that there is no evidence of a statistical relationship between the categorical variables. As per National Health portal of India, Beverages like buttermilk, lassi, fruit juices, and coconut water are better options for beverages than synthetic drinks (https://www.nhp.gov.in/healthlyliving/healthy-diet).

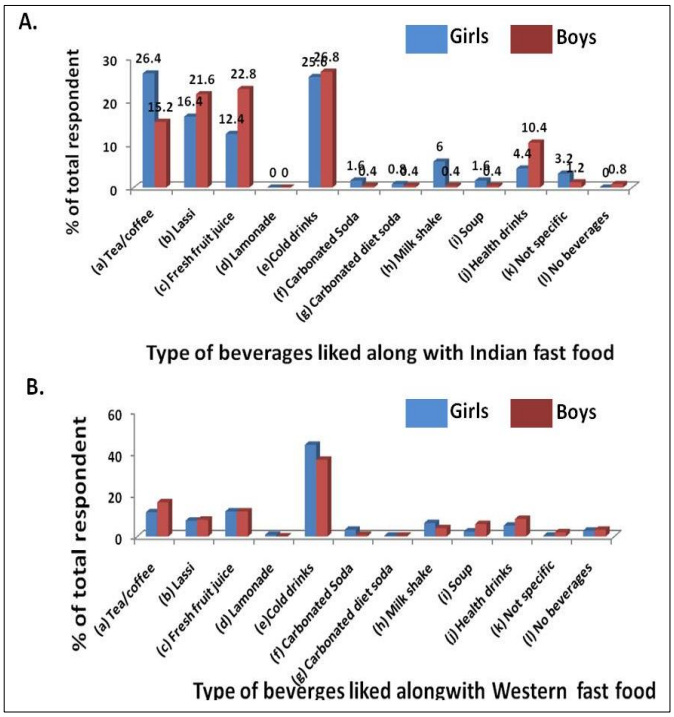

Fig 3: Graphical representation of type of beverages liked along with IFF (A) and WFF (B) by respondents

3.6 Reason for satisfaction with fast food consumption

Reason for satisfaction with fast food consumption in case of IFF, was its deliciousness (girls, 64.4% and boys, 59.6%), taste of food is indianized (girls, 20.4% and boys, 22%), comparatively cheaper (girls, 2.8% and boys, 18%) (Fig. 4A; Table 1). Chi-square test showed the P-value 0.000537, i.e.

the result was significant at $p< 0.05$, 5 d.f., hence for girls reason for satisfaction with fast food consumption was fond to be independent of each other and that there is no evidence of a statistical relationship between the categorical variables. While reason for satisfaction with fast food consumption in case of Western fast food, was its deliciousness (girls, 54% and boys, 59.6%), comparatively cheaper (girls, 7.6%; boys, 10.8%), and as a status symbol (show off of modernity) (girls, 2.4%; boys, 3.6%), (Fig. 4B; Table 1). In case of both fast foods, their deliciousness was the major factor, not the price and status symbol. But in contrast to girls, the chi-square test showed the p-value 0.19, i.e. the result was not significant at $p< 0.05$, 3 d.f., hence for boys reason for satisfaction with fast food consumption was fond to be not independent of each other and that there is a statistical relationship between the categorical variables.

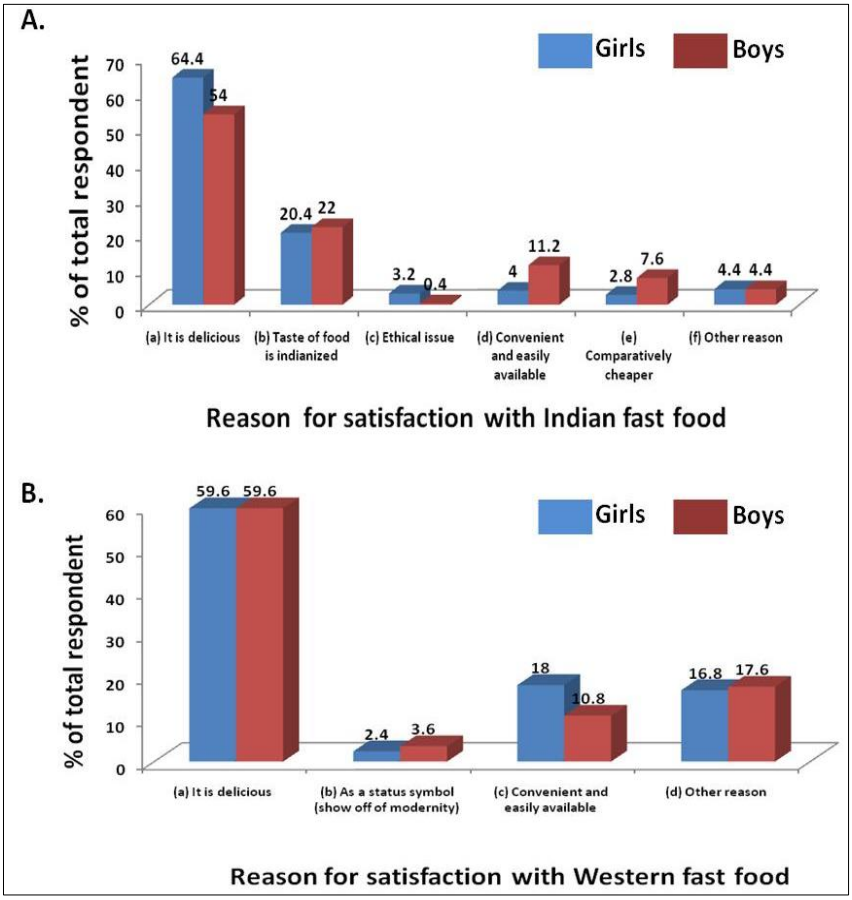

Fig 4: Graphical representation of reason for satisfaction with IFF (A) and WFF (B) consumed by respondents

Table 1: The consumption, satisfaction, beverages taken and reason for consumpt on of fast food by teenagers

Variables	Values#				Chi-square	P-value
	Girls (n=250)		Boys (n=250)			
	IFF	WFF	IFF	WFF		
1. Do you like to eat fast food?						
Yes	87.6		86.8		$\chi2=0.07$	The P-value is 0.789021, The result is not significant at $p< 0.05$, 1 df
No	12.4		13.2			
2. Type of fast food consumption						
Indian	27.6	10	32.8	5.2	Girls, $\chi2= 4.96$	The P-value is 0.083823. The result is not significant at $p< 0.05$, 2 df
Western						
Both	62.4		60.4			
3. Fast food that satisfies the most						
Indian	50.8		60		$\chi2=4.29$	The P-value is 0.117355. The result is not significant at $p< 0.05$, 2 df
Western		9.2		7.6		
Both	40		32.4			
4. IFF consumption						
Chat, Pokora, Samosa, Patties, Panipuri	45.2		54.4		$\chi2=14.88$	The P-value is 0.021186. The result is significant at $p< 0.05$, 6 df
Puri-Kachodi, Chhole-Bhature, Stuffed Paratha	21.2		21.6			
Idali, Dosa, Bada, Upma, Poha	13.6		4.8			
Jalebi and Sweets	7.2		5.2			
Non-veg items	5.2		6.4			
Roasted veg and non-veg items	4		4			
Others	2		3.6			
5. WFF consumption						

Pizza	30		45.2		$\chi2$=40.10	P value is < .00001 The result is significant, p< 0.05, 6 df
Burger	14.4		21.2			
French-fries	3.6		0.8			
Dough nuts	1.2		0			
Hot dog	4.4		0.8			
Noodles	42.4		26.4			
Others	1.2		5.2			
6. Like for beverages along with fast food						
Tea/coffee	26.4	11.6	15.2	16.4	Girls, $\chi2$=50.31 Boys, $\chi2$= 52.56	The P-value is < .00001. The result is significant at p< 0.05, 11 df P value is < .00001 The result is significant, p< 0.05, 11 df
Lassi	16.4	7.6	21.6	8		
Fresh fruit juice	12.4	12	22.8	12		
Lamonade	0	0.8	0	0		
Cold drinks	25.6	44	26.8	36.8		
Carbonated Soda	1.6	3.2	0.4	0.8		
Carbonated diet soda	0.8	0.4	0.4	0.4		
Milk shake	6	6.4	0.4	4		
Soup	1.6	2.4	0.4	6		
Health drinks (Horlicks/ Complain)	4.4	5.2	10.4	8.4		
Not specific	3.2	0.4	1.2	2		
No beverages	0	2.8	0.8	3.2		
7. Reason for satisfaction with fast food consumption						
It is delicious	64.4	59.6	54	59.6	IFF: $\chi2$=21.94 WFF: $\chi2$= 4.79	The P-value is 0.000537. The result is significant at p< 0.05, 5 df P value is 0.187733 The result is not significant, p< 0.05, 3df
Taste of food is indianized	20.4	22	--	--		
Ethical issue	3.2	0.4	--	--		
As a status symbol (show off of modernity)	--	--	2.4	3.6		
Convenient and easily available	4	11.2	--	--		
Comparatively cheaper	2.8	18	7.6	10.8		
Other reason	4.4	16.8	4.4	17.6		

#Data are presented as No. (%); df, degree of freedom

3.7 Reason for taking fast food

Reason for taking IFF was taste (girls, 27.6%; boys, 53.6%) followed by diverse variety (girls, 24%; boys, 11.6%), as alternative food (girls, 21.6%; boys, 10%), and ease of availability (girls, 20.4%; boys, 6.8%) (Fig. 5A; Table 2). While reason for satisfaction with fast food consumption in case of WFF, was its taste (girls, 12% and boys, 43.2%), diverse variety (girls, 16% and boys, 4.8%), and as alternative food (girls, 31.6% and boys, 13.2%), and ease of availability (girls, 18.8% and boys, 1.2%) (Fig. 5B; Table 2). Chi-square test showed the P-value < .00001, i.e. the result was significant at p< 0.05, 7 d.f., hence reason given above for taking IFF and WFF between girls and boys are independent of each other and that there is no evidence of a statistical relationship between the categorical variables. It was observed that irrespective of gender, when taste matters WFF were preferred more than IFF. So there is urgent need of educating teenagers or making them aware with the message like "*Nutrition is more important than the taste".*

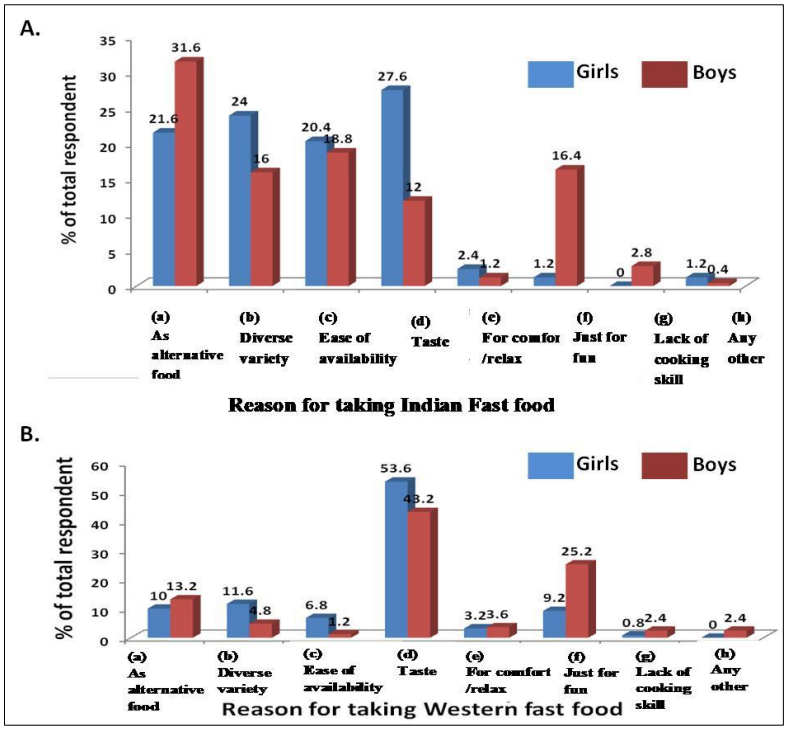

Fig 5 Graphical representation of reason for taking IFF (A) and WFF (B) by respondents

3.8 Frequency of consuming fast food

The frequency of taking IFF was occasionally (girls, 29.6%; boys, 33.2%) followed by once almost every day (girls, 24%; boys, 2.4%), and once in a week (girls, 14.8% and boys, 20%), (Fig. 6A; Table 2). The frequency of taking WFF was occasionally (girls, 24.8% and boys, 52%), once almost every day (girls, 24% and boys, 1.6%), once in a week (girls, 15.2% and boys, 18%), and ease of availability (girls, 18.8% and boys, 1.2%) (Fig. 6B; Table 2). Chi-square test showed the P-value < .00001, i.e. the result was significant at $p< 0.05$, 6 d.f., hence frequency of consuming IFF and WFF between girls and boys are independent of each other and that there is no evidence of a statistical relationship between the categorical variables. It was observed that irrespective of gender, once almost every day IFF was consumed equally and it was more than WFF for girls and boys.

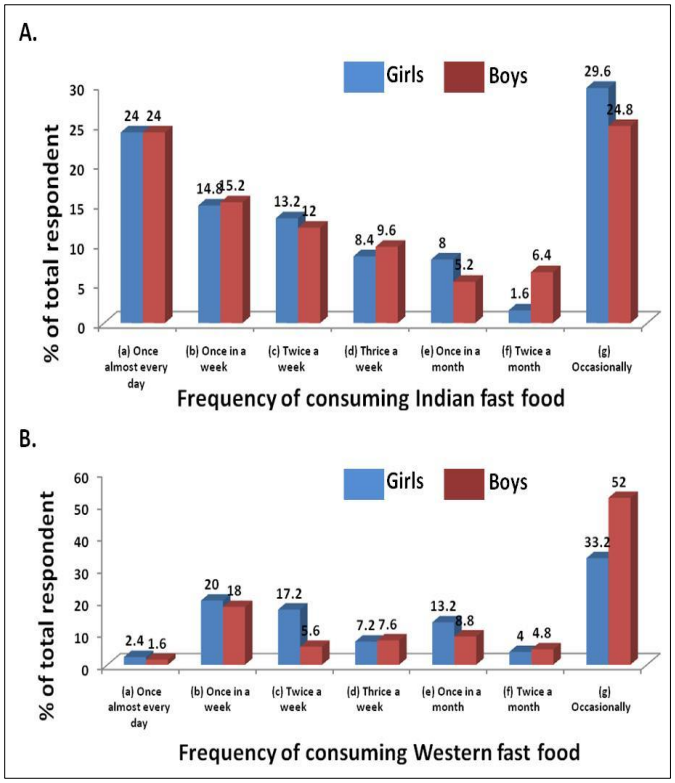

Fig 6 Graphical representation of frequency of IFF (A) and WFF (B) consumption by respondents

3.9 Size of fast food preferred

The size of IFF preferred was medium (girls, 52.4%; boys, 45.6%) followed by full (girls, 16.8%; boys, 9.6%), small (girls, 15.2%; boys, 21.6%), and double 3.2 11.2 (girls, 4.8%; boys, 8.4%) (Fig. 7A; Table 2). The size of WF preferred was medium (girls, 56.4%; boys, 41.2%), full (girls, 17.6 24%; boys, 13.6%), small (girls, 14.4%; boys, 24%), and double (girls, 3.2%; boys, 11.2%) (Fig. 7B; Table 2). Chi-square test showed the P-value < .00001 (girls) and 0.000056 (boys), i.e. the result was significant at $p< 0.05$, 4 d.f., hence the size of fast food preferred between girls and boys are independent of each other and that there is no evidence of a statistical relationship between the categorical variables.

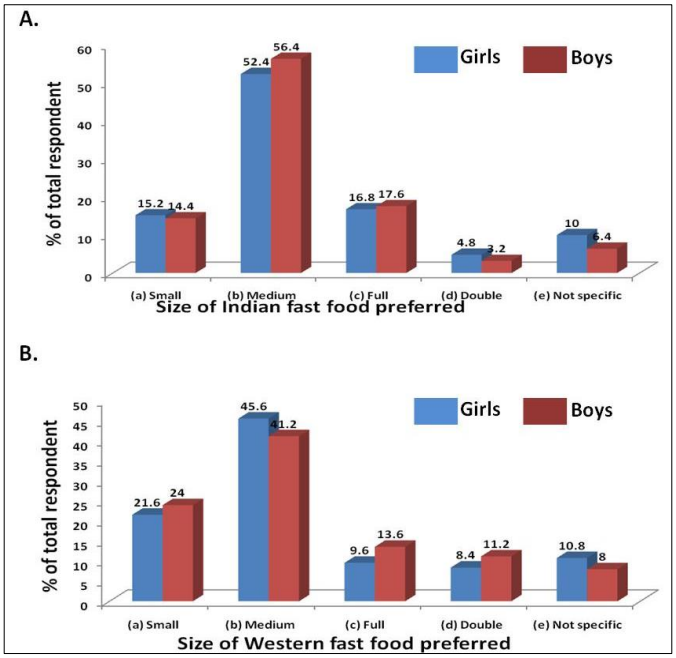

Fig 7 Graphical representation of size of IFF (A) and WFF (A) preferred by respondents

Reason for consuming both type of fast food as alternative was largely the taste, and convenience, nutritive value, and price comes only afterwards. It was observed that irrespective of gender, once almost every day IFF was consumed equally and it was more than WFF for girls and boys was 21.6 and 22.4%, respectively.

Table 2: Details on reason for taking fast food, frequency of consuming, and size of fast food preferred by teenagers

Variables	Values#				Chi-square	P -value
	Girls (n=250)		Boys (n=250)			
1. Reason for taking fast food						
	IFF	WFF	IFF	WFF		
As alternative food	21.6	10	31.6	13.2	Girls, $\chi2$=79.82 Boys, $\chi2$= 127.98	The P-value is < .00001, The result is significant at $p< 0.05$, 7 df The P-value is < .00001, The result is significant at $p< 0.05$, 7 df
Diverse variety	24.0	11.6	16	4.8		
Ease of availability	20.4	6.8	18.8	1.2		
Taste	27.6	53.6	12	43.2		
For comfort/relax	2.4	3.2	1.2	3.6		
Just for fun	1.2	9.2	16.4	25.2		
Lack of cooking skill	0	0.8	2.8	2.4		
Any other	1.2	0	0.4	2.4		
2. Frequency of consuming fast food						
Once almost every day	24	2.4	24	1.6	Girls, $\chi2$=53.88 Boys, $\chi2$= 82.94	The P-value is < .00001, The result is significant at $p< 0.05$,6 df The P-value is < .00001, The result is significant at $p< 0.05$,6 df
Once in a week	14.8	20	15.2	18		
Twice a week	13.2	17.2	12	5.6		
Thrice a week	8.4	7.2	9.6	7.6		
Once in a month	8	13.2	5.2	8.8		

Twice a month	1.6	4	6.4	4.8		
Occasionally	29.6	33.2	24.8	52		
3. Size of fast food preferred						
Small	15.2	21.6	14.4	24	Girls, $\chi 2=50.37$	The P-value is < .00001, The result is significant at $p< 0.05$, 4 df
Medium	52.4	45.6	56.4	41.2		
Full	16.8	9.6	17.6	13.6		
Double	4.8	8.4	3.2	11.2	Boys, $\chi 2= 24.76$	The P-value is .000056 The result is significant at $p< 0.05$, 4 df
Not specific	10	10.8	6.4	8		

The growing popularity of fast food chains in recent days is also due to increasing number of nuclear families, as working parents in such families have less time for meal preparation at home. While their children spend most of their time away from home by attending tuition classes after their school hours or engaged in recreational activity. In addition to the fact that fast foods contain a glycemic load and are generally served in excessive portions, additional risks to fast-food consumption include adverse dietary factors related to obesity; relatively high intake of calories, fat, saturated fat, and sugar-sweetened drinks; relatively high BMI; less successful weight-loss maintenance; decreased insulin sensitivity; and increased risk of diabetes owing to poor concentration of micronutrients (Majabadi *et al*., 2016) [4].

In conclusion, the findings of the present study reveal the relative data of fast food consumption and trends of consumption of teenagers. This study is possibly the first study which has documented the fast food consumption-related data in rural-urban areas of Bihar, India. The findings of this study would be helpful in formulating the strategies related to advantages and disadvantages of fast food consumption by teenagers.

3.10 Few recommendations related to fast food consumption for the teenagers

- Fast food should not be taken frequently as it could have negative impact on health
- Don't skip regular diets, teenagers need diet rich in nutrients for growth and development
- The fast food should be supplementary not alternative to normal meal as it Impact on health (BMI and obesity)
- Self-cooking is the best way, one can maintain the proper hygiene, calorific, and nutritional values of fast foods
- Avoid cold drinks/other beverages rich in sugar and caffeine along with fast foods
- Eat fast food in the evening not in the late night or in the morning as this affects the digestibility and assimilation in the body.
- Preference for fast food should be nutritive/calorific value, not on taste, convenience, price or as a status symbol. Check the nutritional/calorific label on fast food before consuming
- IFFs should be preferred over WFFs as these are comparatively healthier
- The frequency of taking fast food should be occasionally once in a week or a month
- The size of fast food should be small/medium, so lesser consumption of fast food
- Avoid spicy, oily, sugar and salt fast foods, as these have health implications
- Don't get attracted with promotional offers/advertisement of fast foods
- Favorite destination for having fast food should be branded or trusted restaurant or home cooked so that one gets the quality of fast food
- Listen to educational programme on fast foods through regular curriculum, internet, magazine, newspaper, TV/radio, and health awareness programme
- Consult the dietician/doctor on health issues related to fast food consumption

4. Acknowledgement

Authors thank the PG Department of Home Science-Food and Nutrion, Tilka Manjhi Bhagalpur University, for their all support during the study.

5. References

1. Bayol SA, Simbi BH, Bertrand JA, Stickland NC. Offspring from mothers fed a junk food diet in pregnancy and lactation exhibit exacerbated adiposity that is more pronounced in females. J Physiol. 2008; 586:3219-30.
2. Corella D, Coltell O, Mattingley G, Sorli JV, Ordovás JM. Utilizing nutritional genomics to tailor diets for the prevention of cardiovascular disease: A guide for upcoming studies and implementations. Expert Rev. Mol. Diagn. 2017; 17(5):495–513.
3. Keshari P, Mishra CP. Growing menace of fast food consumption in India: time to act. Int J Community Med Public Health. 2016; 3:1355-62.
4. Majabadi HA, Solhi M, Montazeri A, Shojaeizadeh D, Nejat S, Farahani FK *et al*. Factors Influencing Fast-Food Consumption Among Adolescents in Tehran: A Qualitative Study. Iran Red Crescent Med J. 2016; 18(3):e23890-9.
5. Narayan B, Prabhu M. Examining fast-food consumption behaviour of students in Manipal University, India. African J Hospit. Tour Leis. 2015; 4(2):1-9.
6. Wiles NJ, Northstone K, Emmett P, Lewis G. Junk food diet and childhood behavioural problems: results from the ALSPAC cohort. Eur. J. Clin. Nutr. 2009; 63:491-8.
7. Wright AJA. *et al*. Folic acid metabolism in human subjects revisited: potential implications for proposed mandatory folic acid fortification in the UK. Br. J Nutr. 2007; 98(4):667-675.