



Consumer Perspective towards Safety of Street Food

Parveen Pannu, Deepshikha Kataria, Sunita Aggarwal

Institute of Home Economics, University of Delhi, F-4, Hauz Khas Enclave. 110016

parveen.pannu@yahoo.com

ABSTRACT

In India, food vending on streets pertains to unorganized sector of food processing. The street food mainly comprises of unorganized food processing sector where cooked food may be served on the streets without any formal establishment. The palatability, affordability and easy accessibility of street food make it highly popular across all age groups of the society. The incidence of poor hygiene and sanitation can cause contamination of food products with grave health consequences. The objective of the study was to assess the knowledge, attitude and practice of food safety among the students of higher educational institutions based in Delhi as consumers of street food. A survey of 500 consumers indicated variations in their knowledge, attitude and practices related to safety aspects of street food. The findings are significant and expose the risk associated with safety aspects of street food. The importance of carrying out food safety education programmes for all the stakeholders in establishing an overall knowledge base in collaboration with the food industry and regulatory agencies is emphasized.

Keywords: Attitude, food safety, knowledge, practices, street food.

INTRODUCTION

The 'Street-vended foods' or 'street foods' are foods and beverages prepared and/or sold by vendors in streets and other public places for immediate consumption or consumption at a later time without further processing or preparation. This definition includes fresh fruits and vegetables which are sold outside authorized market areas for immediate consumption (1). The street-vended foods are usually inexpensive, convenient and often nutritious besides being a major source of income for a vast number of vendors; thus provide a chance for self-employment and grant an opportunity to develop business skills and sustain a business with low capital investment (1). Despite having many benefits, street vended foods often pose risk to health of consumers if not prepared or served hygienically.

In India, food vending on streets pertains to unorganized sector of food processing where sometimes poor hygiene and inappropriate sanitation measures may cause contamination of food products. People become sick if they eat street food contaminated with physical, chemical or biological hazards. Some of the life threatening food borne diseases which cause great losses to people and nation are *Salmonellosis*, *Botulism*, etc. Most of the vendors are uneducated and lack awareness on hygiene and sanitation while preparing foods on streets.

The hygiene and sanitation of vending sites have always been a matter of concern for public health. The unavailability of potable and running water; inappropriate space for cooking and washing of food supplies and utensils; washing hands and dishes in buckets and bowls; are some of the commonly observed practices of street food vendors. Leftovers if not handled properly may attract rodents and insects which increases the chances of food contamination thereby multiplying the risk of food borne hazards (2). Consumers are frequently unaware of their role in the prevention of foodborne diseases and underestimate the incidence of foodborne diseases and the frequency of serious consequences (3).

The study premises that consumers can be potential educators who can inculcate knowledge and good practices related to food safety among vendors and peers. Particularly, improving students' knowledge about food safety is an issue that needs to be considered. Food vendors, on the other hand can be motivated through consumers. The school and university setting can be an effective place to reach and teach the young students with food safety concepts (4). There is a need for developing food safety educational programs that cover key food safety concepts for promoting public health.

The Food Safety and Standards Act of 2006, has become operational in the entire country, initiating a new era of food safety in India. The Act is expected to ensure improved quality of food for the consumers by laying down science based standards for articles of food and to regulate their manufacture, storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption. Several other first-time changes the new law is expected to incorporate are: registration of street food vendors with the state health departments; authority given to the individual citizens to get the food testing done as per the guidelines laid down by the Food Safety and Standards Authority of India (FSSAI) (5).

The Delhi Government has notified the Street Vendors' (Protection of Livelihood and Regulation of Street Vending) Act, 2014. It has made the provision of "Town Vending Committees (TVC)", a decision-making body. Five TVCs are proposed in Delhi - one each under the East, South and North corporations, the New Delhi Municipal Council (NDMC) and the Delhi Cantonment Board (DCB). The new Act will streamline the entire street vending system in Delhi as there will be a concrete list of registered vendors (6).

METHODOLOGY

The study, exploratory and empirical in design, assessed the awareness levels of the consumers regarding the safety of street food. The knowledge, attitude and practices (KAP) of the students of higher educational institutions as consumers were studied. The study brings to notice the importance of raising the awareness levels of consumers of street foods for the prevention of incidence of food borne diseases.

A sample of 500 students aged between 18 to 23 years studying in 50 higher educational institutions in Delhi, both private and affiliated to government, was taken. Given the focus of the study on the microenterprise of street food vendors in the city of Delhi, the city was divided into five zones: North, East, West, South and Central zones to ensure that the sample is geographically representative of the street food consumer's population in Delhi. The consumers were selected purposively based on accessibility, availability and willingness to participate in the study.

A questionnaire comprising questions based on AKP format (Attitude, Knowledge and Practices) was prepared to elicit information with respect to consumer's (students of higher education) street food consumption pattern. The questionnaire was pilot tested with 10 consumers, reviewed and revised and utilized for seeking information on socio- and demographic profile; knowledge and attitude about safety of street food; street food consumption related practices; observations regarding hygiene related behavior. The tools for data collection were a structured interview schedule for conducting the survey, in-depth interviews, observations and discussions.

RESULTS

A. Knowledge of the Consumers about Food Safety: There were 14 items to assess the knowledge of consumers about food safety. The questions assessed the knowledge about meaning of safe food, food borne diseases, washing hands before eating, using clean utensils, keeping raw and cooked food separately, clean water, thorough cooking, food labels, food safety laws and personal hygiene. The consumers' knowledge of safety of street foods was tested using a questionnaire. A scoring pattern was devised to rate their responses about the knowledge levels with respect to food safety. Every correct answer was given a score of 1 and for every wrong answer a score of zero was given. These scores were then summed up to make a knowledge index. The three knowledge categories were considered: 0-6: Poor knowledge; 7-11: Average knowledge; and 12-16: Good knowledge.

Around two third consumers (65.4%) had awareness about safe food and 58% were aware about the food-borne diseases. Majority of the consumers (80.4%) were able to tell importance of washing hands before eating and the need for using clean utensils (77%), yet discrepancies were observed amongst the zones. The knowledge about these issues were poor in north and east zones as compared to rest of the zones ($p < 0.05$). About 38 % consumers had the knowledge that the raw and cooked foods should be kept separately and importance of keeping vegetarian and non- vegetarian foods separately (30.8 %). Zonal differences were significant ($p < 0.05$) in these respect as consumers from south and west zones showcased better knowledge in this regard (Table I).

On rating the responses of all the consumers, 26% exhibited a good knowledge about issues related to food safety. Out of 500 consumers, 45.8% were categorized in average knowledge category and about 28% had poor knowledge about food safety (Table II).

B. Attitude of the consumers about food safety: The main items included for studying the attitude of the consumers about food safety were: observations about street food vendor doing brisk business, whether using safe water and their own reasons/preferences for influencing their decision to consume street food, which ranged from convenience offered, taste preferences, variety available, economic pricing of the food, safety perspectives, cultural factors.

Consumers choose food vendors who seems to do more business, zone wise differences were evident as consumers from central and east zone were more conscious in this respect than from other zones ($p < 0.05$). Taste emerged as the most important factor for choosing the street food. Most consumers (81%) consumed street food because of its likeable taste, whereas variety and reasonable price were almost equal in preference (31% and 28% consumers respectively). Unfortunately with regard to safety aspects, only about 10 % consumers expressed concerns about safety of street food (Table III).

Table 1: Knowledge of the Consumers about Food Safety

S. No.	Queries related to knowledge	Consumers in Five Zones of Delhi					
		North (%)	South (%)	Central (%)	West (%)	East (%)	Total (%)
1.	What is “safe food”?	46	78	61	82	60	65.4
2.	What are foodborne diseases?	46	77	45	73	49	58.0
3.	Name some food borne diseases.	81	81	70	89	58	75.8
4.	Why is it important to wash the hands before eating the food?	68	87	88	88	71	80.4
5.	Why there is a need to eat food in clean utensils?	66	86	84	81	68	77.0
6.	Why should you separate the following? Raw and cooked food	37	53	22	56	22	38.0
a.	Non vegetarian and vegetarian food	45	42	11	51	5	30.8
b.	Utensils used for cooking and storing different food?	28	33	11	41	13	25.2
c.							
7.	Why eating thoroughly cooked food is essential?	53	79	37	82	35	57.2
8.	Why it is important to keep the hot food hot and cold food cold?	35	55	23	64	22	39.8
9.	Why safe water should be used in cooking food?	47	85	79	93	64	73.6
10.	Why there is a need to carefully select the raw material for safe food preparation?	39	65	55	79	47	57.0
11.	Why there is a need to check expiry date in a packaged food?	47	86	58	81	61	66.6
12.	Are you aware of laws related to food safety?	38	44	34	53	35	40.8
13.	Name a food safety related law.	30	35	13	46	17	28.2
14.	Why there is need to observe the personal hygiene of street food vendors?	31	65	49	76	43	52.8

Table II: Consumers in different Knowledge Categories

S. No.	Knowledge Scores of Consumers	Consumers in Five Zones of Delhi					
		North (%)	South (%)	Central (%)	West (%)	East (%)	Total (%)
1.	Poor (Score 0-6)	43	9	34	9	46	28.2
2.	Average (Score 7-11)	41	49	59	35	45	45.8
3.	Good (Score 12 and more)	16	42	7	56	9	26

Table III: Consumer Attitudes about Food Safety

S. No.	Questions Reflecting Attitudes of the Consumers	Consumers in Five Zones of Delhi					
		North (%)	South (%)	Central (%)	West (%)	East (%)	Total (%)
1.	Choosing a street food vendor who is doing more business	48	69	35	54	39	49.0
2.	Looking for street food vendor who is using safe water	67	85	73	70	83	75.6
3	Different reasons for consuming street food:						
a.	Convenience	46	28	25	39	20	31.6
b.	Taste	82	89	78	85	71	81.0
c.	Variety	20	32	34	47	20	30.6
d.	Cheap food	17	35	27	53	7	27.8
e.	Safe food	6	9	15	11	8	9.8
f.	Cultural factors	8	4	9	8	5	6.8
g.	Any other	0	4	0	10	1	3.0

The rating of their responses about the attitude levels with respect to food safety was undertaken and a scoring pattern was devised. Every correct answer was given a score of 1 and for every wrong answer a score of zero was given. These scores were then summed up to make an attitude index. The two attitude categories chosen were: 0-3 scores: Negative attitude and scores 4-9: positive attitude. The findings are revealed in table IV.

Table IV. Consumers with Positive and Negative Attitude Scores

S. No	Attitude Category	Consumers in Five Zones of Delhi					Total (%)
		North (%)	South (%)	Central (%)	West (%)	East (%)	
1	Negative (Score 0-3)	69	55	66	41	87	63.6%
2	Positive (Score 4-9)	31	45	34	59	13	36.4%

36.4% consumers revealed their positive attitude for street foods whereas 63.6% had negative attitude. The consumers from different zones exhibited variance in their attitude categories. From the west zone (59%) followed by south zone (45%) had more positive attitude towards street food safety than other zones (Table 4). The consumers from east zone (87%) demonstrated maximum negative attitude for street food.

C. Consumer Practices related to Street Food: The practices of the consumers were studied on the aspects mentioned here: practices related to consumption; their keen observations about the food safety related practices followed by vendors and at their own level. The practices related to their consumption pattern consisted of 5 items: packed lunch from home, consumption of street food if bring or not bring lunch and money spent on outside food and street food. Of the 500 consumers interviewed, 68.4 % were carrying lunch with them and 54.6 % consumers were in a habit of consuming street foods in addition to the packed lunch. This practice was higher in the south zone (76%) as compared to the other four zones. In case the consumers did not bring packed lunch to the college, 72.6 % were consuming street foods, the maximum (90%) being from south zone (Table V).

Table V: Practices of the Consumers related to Consumption of Street Food

S. No.	Consumers' practices	Consumers in Five Zones of Delhi					
		North (%)	South (%)	Central (%)	West (%)	East (%)	Total (%)
1.	Do you carry packed lunch?	72	72	69	63	66	68.4
2.	Do you also consume street food in addition to the home cooked packed lunch?	45	76	56	56	40	54.6
3.	If you do not bring packed lunch to college, do you consume street food?	67	90	67	74	65	72.6
4.	Money spent on consuming food outside home						
	Rs. 0-99	36	29.9	29.4	10	31.2	26.9
	Rs. 100-499	43	46	42.4	52	29.9	43.2
	Rs. 500 and more	21	24.1	28.2	38	39	29.8
5.	Money spent on consuming street food per day						
	Rs. 0-24	46.9	28	32.2	48	46.4	40.4
	Rs. 25-50	15.3	17.2	16.7	20	11.9	16.3
	Rs. 50 and more	37.8	54.8	51.1	32	41.7	43.2

Information collected on the money spent on street foods per day reflected that 40.4% consumers were spending up to rupees 24 daily, 16.3% were spending 25- 50 rupees and 43.2% were spending rupees 50 or more on a daily basis. More than 50% of the consumers from south and central zone were spending rupees 50 or more on street food on a daily basis (Table V).

The study of practices with regard to the consumers' observations about the vendor and the vending practices consisted of eight items. These consisted of personal hygiene of vendors, clean vending cart, serving food in clean utensils, freshly prepared food, using clean water, keeping food covered, separating raw and cooked food and appropriate waste disposal. The observations of the consumers are mentioned in table VI.

Table 6: Observation Practices of Consumers about the Vendor and the Vending Practices

S. No.	Questions about Observation Practices of Consumers	Consumers in Five Zones of Delhi					
		North (%)	South (%)	Central (%)	West (%)	East (%)	Total (%)
1.	Clean utensils and hygienically served food.	78	80	74	72	82	77.2
2.	Ensure that the street food that you buy is cooked and served	69	85	67	76	81	75.6
3.	use safe and portable water	71	80	76	68	76	74.2
4.	Hand washing before eating	89	88	92	98	94	92.2
5.	Observe personal hygiene of food vendors	55	84	72	68	71	70
6.	Observe that vending cart and surroundings kept clean	60	80	67	64	71	68.4
7.	Vendor keep the raw food and cooked food separate	74	86	67	63	64	70.8
8.	Vendor Keep the food covered.	64	78	77	79	66	72.8
9.	Vendor make arrangement for waste disposal	70	86	71	78	68	74.6

The findings of these consumer's practices were heartening as 77% consumers insisted on food being served in clean utensils and hygienic foods while eating street food. 75.6 % ensured that the street food that they bought was cooked and served immediately and no left over was served and it was not stale. About 74.2 % consumers expressed concern about the quality of water being used for cooking and drinking purposes. The study of observance of consumer's own food safety related practice of washing hands before eating revealed that 92.2 % washed their hands before eating food. With respect to these practices no significant differences were noted between the zones ($p>0.05$) (Table VI).

A scoring pattern based on the consumers' concern about vendors and vending practices was devised for two practice categories namely, poor and good. The table number VII exhibits the responses of the consumers in the two mentioned categories.

A large number of consumers (60.6%) from all the five zones were following good food safety related practices. The maximum number of consumers (76%) falling in the good practice category were from the south zone (Table VII). The data is illustrated in figure I for comparing the findings on the consumers' concern about vendors and vending practices.

Table VII: Consumers Displaying Concern about Vendors and Vending Practices (Poor and Good Practices)

S. No	Practice Category	Consumers in Five Zones of Delhi					Total (%)
		North (%)	South (%)	Central (%)	West (%)	East (%)	
1	Poor Practice	53	24	43	37	40	39.4
2	Good Practice	47	76	57	63	60	60.6

Further, the consumers from all the zones were grouped according to their KAP scores obtained under different categories, good and poor knowledge and practices along with positive and negative attitude, are shown in table VIII.

Even though a large number of consumers (71.8%) had good knowledge about food safety, only 36% were following the good practices related to street food safety. 60.6% consumers had a positive attitude towards food safety issues. 28 % of consumers were having poor knowledge about food safety, 63.6% were not following good practices and 39% had a negative attitude towards food safety related issues. Among the 5 zones, maximum number of consumers from west and north had poor knowledge and practice. Poor practices (55%) and negative attitude (24%) were evident in south zone while only 9% of them had poor knowledge (Table VIII).

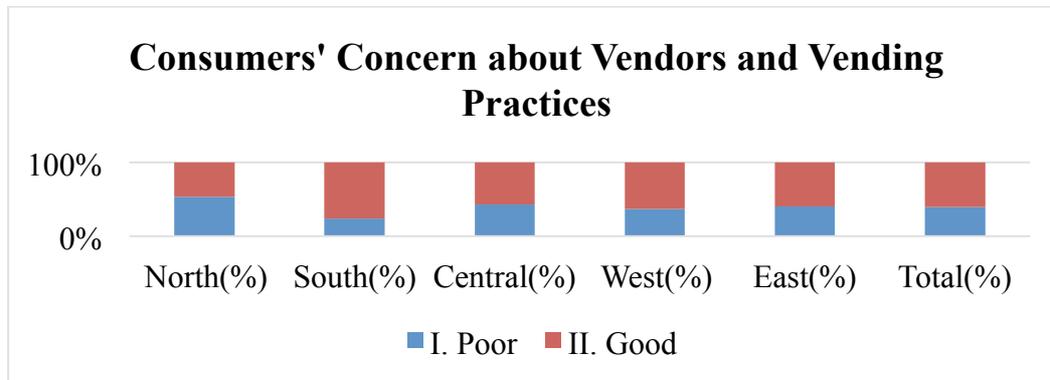


Figure I: Consumers' Concern about Vendors and Vending Practices in the Five Zones of Delhi

Table VIII: Zone-Wise Grouping of Consumers under Knowledge, Practices and Attitude Categories

S. No	Zones of Delhi	Knowledge		Practices		Attitude	
		Good (%)	Poor (%)	Good (%)	Poor (%)	Positive (%)	Negative (%)
1	North	57	43	31	69	47	53
2	South	91	9	45	55	76	24
3	Central	66	34	34	66	57	43
4	West	91	9	59	41	63	37
5	East	54	46	13	87	60	40
Overall Scores		71.8	28.2	36.4	63.6	60.6	39.4

The zone-wise grouping of the consumers as per their KAP scores obtained for good and poor knowledge; good and poor practices and positive and negative attitude of the consumers from all the five zones of Delhi is illustrated in figure II. The figure II sums gives a clear idea about the KAP levels of consumers and highlights the disparities seen in the scores obtained by them.

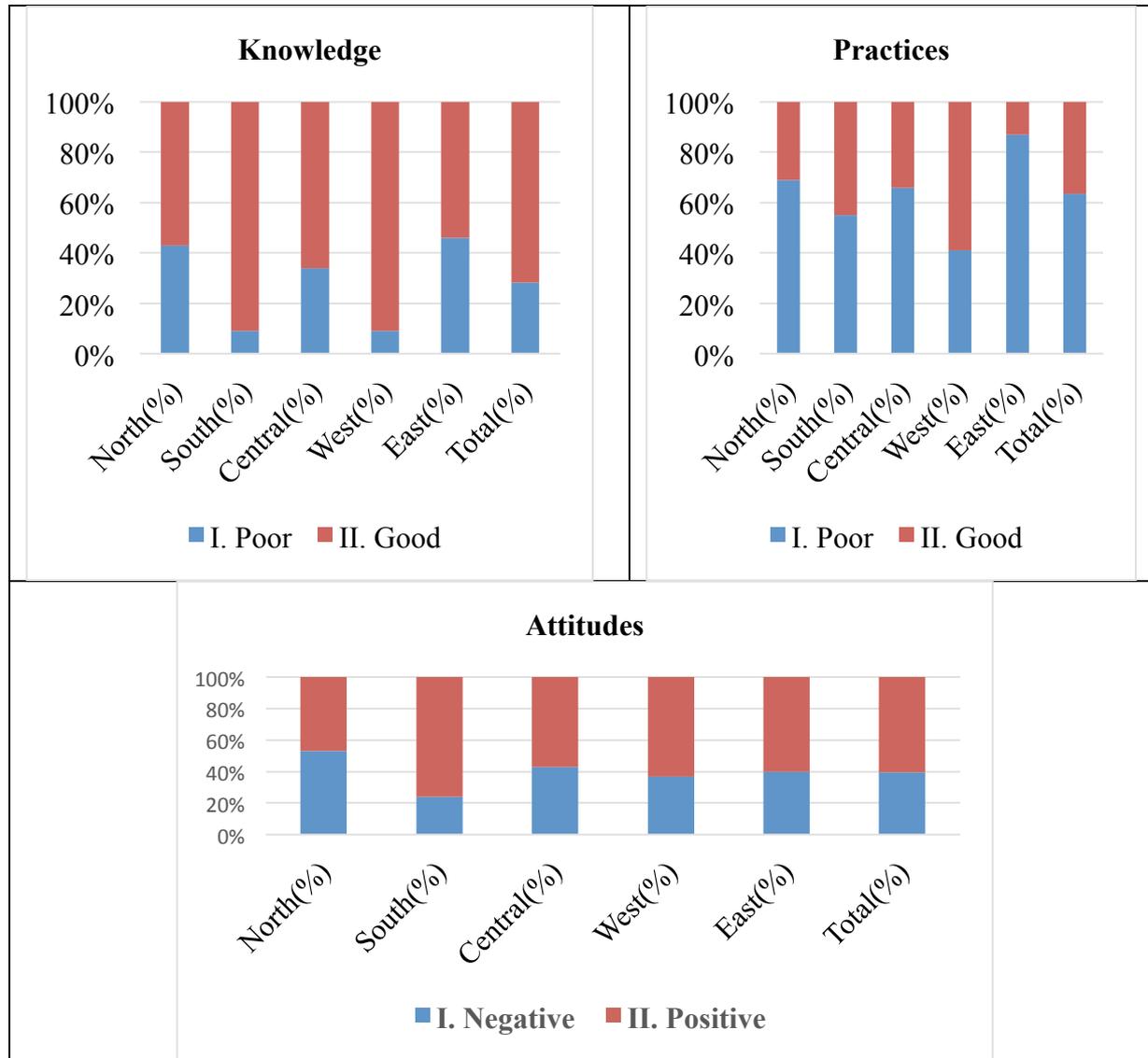


Figure II: Comparing the Consumer's Knowledge, Attitude and Practices in all the Five Zones of Delhi

DISCUSSION

The study documents the consumer perspectives in terms of the knowledge, attitude and practices and upholds that consumers can be potential educators who can inculcate knowledge and good practices related to food safety among vendors and peers.

The examination of knowledge of consumers brought out that only 26% had good knowledge related to safety of street foods. The consumers from South and West Delhi had a knowledge score of 42% and 56 % respectively (Table II). The positive attitude score emerged as 45% and 59% for South and West Delhi consumers respectively (Table IV) and they were following good practices since the good practice scores of south and west zones reached 76%

and 63% respectively (Table VII). Most of the consumers (75%) had some knowledge about food borne diseases (Table I) and 92.2% reported that they washed hands before eating (Table VI), a definite good food-safety practice. 77% of the consumers exhibited awareness about cooking and serving food in clean utensils (Table I). 60.6 % consumers were following good food safety related practices. Among the five zones, South zone had maximum number of consumers (76%) in the good practice category. Many consumers knew the importance of using safe and potable water and were conscious that any negligence may cause health risks. 73% consumers had knowledge about importance of using safe water (Table I) and 75.6% consumers had positive attitude towards ensuring the use of safe water for street food related purposes (Table III). In practice, 74.2% consumers were observing whether the food vendor was using safe and potable water (Table VI).

The hygiene and sanitation of vending sites have always been a matter of concern for public health. Moreover, the street food vendors work against many challenges and limitations. But it is the consumers who are frequently unaware of their role in the prevention of foodborne diseases and underestimate the incidence of foodborne diseases and the frequency of serious consequences. There is a need for developing food safety educational programs that cover key food safety concepts for reducing the incidence of food borne diseases and promotion of public health. To increase the knowledge and promote the safe attitude and practices of students of higher education in Delhi as consumers of street food, mass scale awareness enhancing campaigns need to be undertaken.

CONCLUSIONS

The study was undertaken to contribute to the understanding of the knowledge, attitude and practices of consumers related to safety of street food, an issue linked with food borne diseases which is a serious problem to public health. Knowledge, attitude and practices scores of consumers were found to be positively correlated with each other indicating that consumers with better knowledge and positive attitude follow more food safety related practices. There is need to spread awareness related to food safety to ensure that good practices are inculcated in the consumers.

The consumers need to be more aware about the consequences of health hazards which occur due to poor hygiene and negligence towards food safety. The study has exposed that knowledge about a good practice does not automatically leads to adoption of the improved behaviour. The study recommends that for promotion of good attitudes and practices as well as to understand the reasons behind the zonal differences an in-depth study needs to be undertaken at a large scale to contribute towards measures to be adopted for safe street foods. The findings of the study would help in planning health intervention programs for food handlers for their improvement of knowledge, attitude and practice towards food-borne diseases and food safety. It will be a step towards reduction in food-borne diseases. The study premises that there is an urgent need to supervise quality and safety of street foods for healthy population and a strong nation.

ACKNOWLEDGMENTS

The study was a part of Delhi University Innovation Project Scheme (2012) funded by University of Delhi. We acknowledge the efforts of 10 undergraduate students of Institute of Home Economics who worked whole heartedly on the project titled “Ensuring Access to Safe Street Food”. We are grateful to Dr Ranjana Mahna, Director of Institute of Home Economics

for supporting the project in all ways. We also extend our thanks to the participants of the study including all students and 250 street food vendors of Delhi

REFERENCES

1. World Health Organization (1996). Essential safety requirements for street-vended foods. <http://www.who.int/foodsafety/publications/street-vended-food/en/>. Retrieved on March 25, 2016.
2. Mensah, P., Yeboah D., Darko, O. and Ablorde, A. (2002). Street foods in Accra, Ghana: how safe are they? *Bulletin of the World Health Organization*, 80: (546-554).
3. Byrd-Bredbenner, C., Maurer, J., Wheatley, V., Schaffner, D., Bruhn, C., and Blalock, L. (2007). Food safety self-reported behaviors and cognitions of young adults: results of a national study. *Journal of Food Protection*, 70: (1917-1926).
4. Osaili, T. M. (2011). Food safety knowledge and practices among college female students in north of Jordan. *Food Control*, 22: (269-276).
5. FSSAI (2016). Food Safety and Standards Authority of India, Project clean street food. http://www.fssai.gov.in/Portals/0/Pdf/IEC_Awareness_Materials/Leaflets/Clean_Street_Food_Brochure.pdf Retrieved on August 29, 2016.
6. NASVI (2016). National Association of Street Vendors of India. <http://nasvinet.org/newsite/amended-street-vendors-act-notified> Retrieved on January 14, 2016.