



FOOD HYGIENE PERCEPTIONS AND SAFETY PRACTICES AMONG STREET FOOD VENDORS IN SOUTH DELHI: A CROSS-SECTIONAL STUDY.

Medical science

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ABSTRACT

Background: Food hygiene is an important concept to prevent food-borne illnesses and outbreaks. Perceptions, beliefs and practices of food handlers regarding food hygiene play an important role. But they are usually deprived of awareness related to basic principles of food handling due to lack of Government policies on mandatory training of vendors. So, there is a need to study street food vendors' perceptions to formulate guidelines and policies on food safety and hygiene.

Methodology: Face-to-face interviews were conducted among 130 street food vendors by using semi-structured, interviewer-administered questionnaire. Informed consent was obtained from each participant.

Results: Out of 130 street food vendors, majority (88.5%) were males. Importance of food hygiene was known to 97.7% vendors. Only 16.2% vendors were wearing gloves while handling food. None of the vendors had ever attended any food safety training.

Conclusion: Although majority of vendors knew the concept of food hygiene, yet it was not translated into practice. There is a need to bridge this gap between perceptions and practices by providing adequate facilities and training.

KEYWORDS:

Food hygiene, awareness, gloves, food safety.

Introduction

Food is a basic necessity of life. Zero hunger has been identified as one of the sustainable development goals to transform our world. Availability of food is not enough, but the available food must be safe and free from pathogens so that it can serve its purpose of growth and development. Considering this crucial point, in 2015, WHO has kept their theme on food safety i.e. from farm to plate-make food safe. WHO has also given five keys for safer food - keep clean, separate raw and cooked food, cook food thoroughly, keep food at safe temperatures, use safe water and raw materials.⁽¹⁾ It is a practical guide for all the food handlers including vendors and consumers.

FAO gives definition of street food as wide range of ready-to-eat foods and beverages sold and sometimes prepared in public places, notably streets.⁽²⁾ In India, due to rapid urbanization and population explosion, the demand for informal service oriented activities, including street food vending, has increased rapidly. Street food not only serves as a source of livelihood for vendors but also fulfills nutritional needs of a significant proportion of population. But at the same time, it is a major public health hazard as it lacks basic infrastructure and services. A major role is played by food handlers to ensure food safety.⁽³⁾ There are a number of diseases caused by food-borne pathogens and they cost an estimated 2 million lives annually,⁽¹⁾ especially in the developing countries.

In the current era, India is in a phase of rapid growing economy. There is a huge rural – urban migration for employment opportunity. Due to this transition, eating habits of people are getting affected. Nowadays, street food is becoming very popular among a large population. These are in high demand because there are cheap, instant and easily available. In India, there are numerous varieties of ready to eat foods. This generally includes Chinese fast food, paranthas, puri-bhaji, bhature and kulche apart from lighter snacks like tea, biscuits, mathi, fan etc. This is the major source of income for the vendors.

According to National Policy on Urban Street Vendors, 2004, a Street Vendor is broadly defined as a person who offers goods for sale to the

public without having a permanent built up structure but with a temporary static structure or mobile stall (or head load).⁽⁴⁾ Street vendors may be stationary by occupying space on the pavements or other public/private areas, or may be mobile in the sense that they move from place to place carrying their wares on push carts or in cycles or baskets on their heads, or may sell their wares in moving trains, bus etc. Street food vendors are deprived of awareness regarding food safety and hygiene practices. FAO stated that approximately 2.5million people eat street food daily.⁽⁶⁾

According to WHO (1989), food handling personnel play important role in ensuring food safety throughout the chain of food production and storage. Mishandling and disregard of hygienic measures on the part of the street vendors may enable pathogenic bacteria to come into contact with and in some cases survive and multiply in sufficient numbers to cause illness in the consumer. Food borne outbreaks can be reduced to a substantial minimum level by understanding the interaction between prevailing food safety beliefs, knowledge and practices of the food handlers (WHO 2000). In a recent study conducted in east Delhi in 2009 by Bhasin SK et al, 90% of food vendors had poor food hygiene practices.⁽⁵⁾ There is still a paucity of literature on assessment of food hygiene knowledge and practices among food handlers in India as majority of the studies have been done in other parts of world. Therefore, the present study was conducted with primary objective to assess the acquaintance of street food vendors with food safety and hygiene practices.

Aim & Objectives-

To assess the perception and practices of street food vendors regarding food safety and hygiene practices.

Material & methods- Study design & duration-

This was a cross-sectional study, conducted among street food vendors of South Delhi. It was conducted during 1st March to 1st June, 2016 (3 months).

Sample size estimation-

Sample size calculation was calculated on the basis of previous study done in East Delhi in which prevalence was found to be 9%.(3) Then applying the formula $4PQ/d^2$, sample size came as 130.

Sampling technique-

Non-probability convenient sampling

Study participants-

Street food vendors who were available at time of study were explained about the purpose of study. They were assured of confidentiality of data and were told they are free to withdraw from study at any time.

Inclusion criteria-

Any vendor selling ready-to-eat food or drinks on a temporary static structure/mobile stall or head load.

Exclusion criteria-

Those serving food in a permanent establishment were excluded.

Study tool-

Face-to-face interview technique was used to collect the data with the help of pre-designed, semi-structured, interviewer administered questionnaire. The questionnaire was made in English, translated to Hindi also to eliminate bias. Information about socio-demographic profile, perceptions regarding food safety and hygiene and related practices was collected. A pilot study was done among 13 street food vendors in a similar setting to validate the questionnaire and necessary modifications were made in questionnaire based on findings of pilot study.

Data analyses –

All collected data was entered in MS excel and analysed by SPSS software version 16.0. Simple tables were used for data representation. Univariate analysis using descriptive statistics was used.

Ethical consideration –

Written informed consent was taken from each participant and all information was kept confidential and used for study purpose only.

Results-A total of 130 street food vendors had participated in the present study.

Table 01. Socio-demographic profile of study participants (N=130)

Serial number	Variable	Frequency (Percentage)
1.	Sex Distribution	
	Female	15 (11.5)
	Male	115 (88.5)
2.	Marital status	
	Unmarried	39 (30.0)
	Married	91 (70.0)
3.	Native place	
	Delhi	19 (14.6)
	Bihar	24 (18.4)
	Uttar Pradesh	53 (40.8)
	Others*	34 (26.2)
4.	Age groups (in completed years)	
	10-19	8 (6.2)
	20-29	48 (36.9)
	30-39	53 (40.8)
	40-49	16 (12.3)
	50 and above	5 (3.8%)
5.	Educational status	
	Illiterate	30 (23.1)
	Primary school	35 (26.9)
	Middle school	34 (26.2)
	Senior secondary school	7 (5.3)
6.	Daily wages (in Rs.)	
	<200	1 (0.8)
	200-399	54 (41.6)
	400-599	57 (43.8)

	600-799	15 (11.5)
	>800	3 (2.3)
7.	Time since in food vending profession (in completed years)	
	<5	45 (34.6)
	5-10	30 (23.2)
	11-15	25 (19.2)
	16-20	15 (11.5)
	>20	15 (11.5)
8.	Structure used for vending	
	Cart	69 (53.1)
	Portable table	26 (20.0)
	Static table	26 (20.0)
	Van	4 (3.1)
	Cycle	3 (2.3)
	Ground	2 (1.5)
9.	Type of food sold	
	Cooked	117 (90)
	Uncooked	13 (10)

*Others include Haryana, Himachal Pradesh, Rajasthan, Gujarat, Mizoram, Nepal and Bangladesh.

From the above table, out of 130 study subjects, 88.5% were males while females were only 11.55%. Most (40.8%) of the participants were in the age group of 30-39 years. Majority (76.9%) of them were literate but significant percentage, i.e., 23.1% participants were illiterate. Most (70%) of them were married and rest 30% were unmarried. Maximum of the study subjects (85.5%) were originally belonged to states other than Delhi. Most (43.8%) of the study subjects were earning Rs. 400-599 per day. About 34.6% of the study subjects employed in vending profession for less than 5 years. Most common structure used for vending the food was cart, used by 53.1% vendors.

Table 02. Perceptions about food hygiene and safety among study participants (N=130).

S.no.	Question	Yes Frequency (%)	No Frequency (%)	Don't Know Frequency (%)
1.	Food hygiene is important	127 (97.7)	1 (0.8)	2 (1.5)
2.	Knives and cutting boards needs to be properly cleaned	114 (87.7)	12 (9.2)	4 (3.1)
3.	Clean utensils are necessary before, during and after use	130 (100)	0	0
4.	Dish towel can be a source of contamination	84 (64.6)	33 (25.4)	13 (10)
5.	Washing hands reduces food contamination	127 (97.7)	1(0.8)	2 (1.5)
6.	Raw food materials should be washed before using	127 (97.7)	2 (1.5)	1 (0.8)
7.	Raw and cooked food should be stored separately	100 (76.9)	20 (15.4)	10 (7.7)
8.	Well cooked foods are free of contamination	112 (86.2)	12 (9.2)	6 (4.6)
9.	Prepared food material should be kept covered	118 (90.8)	9 (96.9)	3 (2.3)
10.	Wearing gloves is important during food handling	90 (69.2)	34 (26.2)	6 (4.6)
11.	Food handlers having abrasions in hands should not touch food without gloves	91 (70.0)	29 (22.3)	10 (7.7)
12.	Covering head is important during food handling	57 (43.8)	56 (43.1)	17 (13.1)
13.	During illness*, food handler should take leave	105 (80.8)	22 (16.9)	3 (2.3)

14.	Unhygienic food can transmit diseases	121 (93.1)	4 (3.1)	5 (3.8)
15.	Diarrhoea can be transmitted by food	109 (83.9)	9 (6.9)	12 (9.2)

*Illness includes fever, cough, skin infections and loose stools.

Above table reveals that 97.7% study subjects knew the importance of food hygiene and raw food materials should be washed before processing or preparing them. Most of the vendors (86.2%) knew that well cooked foods are free of contamination. Awareness regarding food borne diseases was present in majority (93.1%) of the study participants and 83.9% were aware that diarrhoea is one such food borne illness. Importance of wearing gloves and covering their head while handling food was known to 69.2% and 43.8% vendors respectively. Dish towel was known as a potential source of infection to 64.6% vendors. All the vendors (100%) knew that clean utensils are necessary for food handling. Only 70% study participants knew that food handlers having cut or abrasions in hands should not touch food without gloves. None of the study participant had received any kind of formal or informal training related to food hygiene and safety.

Table 03. Practices regarding food hygiene and safety among study population.

S. no.	Practice	Yes Frequency (%)	No Frequency (%)
For both uncooked and cooked food vendors (N=130)			
1.	Usage of clean storage utensils	123 (94.6)	7 (5.4)
2.	Food kept in covered containers	104 (80)	26 (20)
3.	Fruits/vegetables washed before cutting	125 (96.2)	5 (3.8)
4.	Fruits/vegetables washed after cutting	48 (36.9)	82 (63.1)
5.	Utensils washed with soap and water before using	115 (88.5)	15 (11.5)
6.	Kept water for washing hands	123 (94.6)	7 (5.4)
7.	Kept water for drinking	88 (67.7)	42 (22.3)
8.	Cover head during food handling	4 (3.1)	126 (96.9)
9.	Wear gloves during food handling	21 (16.2)	109 (83.8)
10.	Wash hands regularly	121 (93.1)	9 (6.9)
11.	Adequate hand washing facilities available	72 (55.4)	58 (44.6)
For vendors selling cooked food only (n=117)			
12.	Food cooked on morning of sale only	45 (38.5)	72 (61.5)
13.	Food cooked during sale only	35 (29.9)	82 (70.1)
14.	Food reheated before serving	81 (69.2)	36 (30.8)
15. Hand washing practices (N=130)			
15.a	Hands washed after touching money	8 (6.2)	122 (93.8)
15.b	Hands washed after handling garbage	122 (93.8)	8 (6.2)
15.c	Hands washed after eating meal	115 (88.5)	15 (11.5)
15.d	Hands washed after using toilet	128 (98.5)	2 (1.5)
15.e	Hands washed after continuous food handling	39 (30)	91 (70)

Above table reveals that clean storage utensils were used by 94.6% study subjects and 80% subjects used to store food in covered utensils. Clean water and soap were used by 88.5% study subjects to clean utensils. Majority (96%) of them used to wash fruits/vegetables before cutting. But only about 63% of them washed fruits/vegetables after cutting. About 38.5% of them used to cook food on morning of sale only and nearly 29.9% of them used cook food during sale of their food items. About 69.2% of them had the practice of reheating their food items. Nearly 95% of study subjects kept water for washing hands but only 68% were having water for drinking. Majority (97%) of them were not covering their heads during food handling. Only 16.2% of them wear gloves during food handling.

Regarding practices related to food hygiene, majority (93.1%) of the subjects washed their hands regularly. Hand-washing facilities were available to only 55.4% vendors. Hands were washed before preparation of food, after handling garbage and after using the toilet by 92.3%, 93.8% and 98.5% respectively. Only 6.2% vendors washed

their hands after touching money.

Discussion-

It is well known fact that street food vending in urban areas especially in large metropolitan cities has become an integral part of the urban lives and culture. It is also recognized that despite of good taste and easily availability, street food vendors are often poor, uneducated and lack hygiene practices. So, street foods are perceived to be a major public health risk (WHO, 2013).

Regarding socio-demographic status of street food vendors, it was revealed that street food vending is a male predominant sector (88.5%) which was true in earlier studies as well.^(3,7,12,18) Although many other studies conducted globally have shown that majority participants were females in their studies.^(13,14,15,17) Majority (85.48%) of the study subjects were migrants from other states but in other studies majority of the subjects were permanent residents of the places where they were vending the food,^(3,5) except the study by Thakur CP et al in which 64% of the vendors were migrants.⁽⁷⁾ This could be explained by the fact that many people migrate to places like Delhi in search of gainful employments due to lack of such opportunities and poverty in their native villages. Majority (84%) vendors were of age group less than 40 years as was true in earlier studies.^(3,7,8) In our study, nearly 23% vendors were illiterate as compared to study by Bhasin SK et al which showed 58% illiterate,⁽³⁾ but it was comparable to the finding of study by Thakur C P et al which showed 24% were illiterate.⁽⁷⁾ Most (65%) of the vendors are in this profession for less than 5 years suggesting that it is a temporary profession. Movable cart was the most common structure (53.1%) on which food was sold.

Food hygiene was considered important by majority vendors in present study (97.7%) and other studies also.⁽¹⁶⁾ Wearing gloves during food handling was considered to be important by two-thirds of the vendors but on the other hand, to cover head while handling food was considered important by less than half of the participants.

In present study, none of the participants underwent food hygiene and safety training. This shows glaring deficiencies in government policies related to food safety. In studies conducted globally, at least some of the participants had received such trainings.^(10,11,16,17)

While comparing with other studies done in India, it was found that much lower hygiene practices were found in those studies. The present study revealed that majority (94.6%) of them stored food in clean utensils which was much better than earlier studies where 82% stored food in dirty utensils.⁽³⁾ 38.5% vendors used to cook their food item in morning of sale only. It was higher as observed in other studies where only 16.6% and 19% vendors cooked food in morning,^(6,7) but lower compared to study in Atbara city.⁽⁹⁾ In our study, reheated food was served by 69.2% vendors while in other studies it was only 46%, 23.3%, 38% and 14.7%.^(3,5,9,13) Most of the vendors (69.8%) served prepared food within 4 hours of preparation, similar to other study.⁽³⁾ Utensils cleaned with soap and water by 92% vendors in our study while it was only 36% in previous study.⁽⁷⁾ A higher proportion of vendors were found to wash hands after going to toilet and after handling garbage in our study which was 98.5% and 93.8% respectively comparable to other studies also,^(11,16,18) while it was only 33.4% and 30% in study by Gadi C et al.⁽⁶⁾ During food handling, gloves were worn by higher percentage of vendors in our study, as compared to another study.⁽¹¹⁾ But still this practice is sub-optimal.

Limitations - A microbiological analysis of the food couldn't be done. Larger sample size couldn't be covered due to paucity of time. Also, water used for food preparation and drinking purpose could not be quality tested. Consumers' perspective could not be considered.

Conclusion -

The study showed several glaring deficiencies and areas of concern regarding the health status, health related practices and potential for infections. With the changing time, street food vendors are having adequate knowledge regarding food hygiene and safety but they are not practicing these measures in their trade. Therefore, there is a wide gap in knowledge and practice. As this occupation having become a necessity of modern urban life, there is a need for the trade to be regulated and monitored by the health authorities. Therefore, there is felt need of generating government's initiatives for wider dissemination of information, education and communication to these street food vendors regarding food hygiene and safety.

REFERENCES

1. World Health Day 2015: Food Safety. WHO global health days. WHO. Available from <http://www.who.int/campaigns/world-health-day/2015/event/en/> [Last accessed on March 14, 2016].
2. Winamo FG, Allain A. Street food in developing countries: lessons from Asia. FAO corporate document repository. Agriculture & consumer protection. Available from <http://www.fao.org/docrep/u3550t/u3550t08.htm> [Last accessed on March 14, 2016].
3. Bhasin SK, Grover S, Sharma R, Singh NP. Hygiene status and food handling practices among street food vendors in East Delhi: an observational study. *J Commun Dis* 2009;41(4):229-37.
4. Bhowmik S K. Street vendors in Asia: A review. *Economical and Political Weekly* 2005 May 28-Jun 10;40(22/23):2256-64.
5. Choudhury M, Mahanta L, Goswami J, Mazumder M, Pegoo B. Socio-economic profile and food safety knowledge and practice of street food vendors in the city of Guwahati, Assam, India. *Food control* 2011 Feb;22(2):196-203.
6. Gadi C, Bala K L, Kumar A. 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 Vol. LXVIII, January - 2013 No. 2*, pg 1-10.
7. Thakur C P, Mehra R, Narula C, Mahapatra S, Kalita T J. Food safety and hygiene practices among street food vendors in Delhi, India. *Int J Current Researh* 2013 Nov;5(11):3531-4.
8. Gawande H A, Mishra A A, Shukla R N, Jain J. Socio-economic Profile of Street Food Vendors and Quality Evaluation of Samosa and Panipuri in Allahabad City, (UP) India. *Int J Agriculture and Food science Technology* 2013;4(3):275-80.
9. Abdalla MA, Suliman SE, Bakhiet AO. Food Safety knowledge and practices of street food vendors in Atbara City. *African Journal of biotech* 2009 Dec;8(24):6967-71.
10. Clayton DA, Griffith CJ, Price P, Peters AC. Food handlers' beliefs and self-reported practices. *Int J Environmental Health Research* 2002;12(1):25-39.
11. Bas M, Ersun AS, Kivanc G. The evaluation of food hygiene knowledge, attitudes, and practices of food handlers' in food businesses in Turkey. *Food Control* 2006 Apr;17(4):317-22.
12. Abdullahi A, Hassan A, Kadarman N, Saleh A, Baraya YS, Lua PL. Food safety knowledge, attitude, and practice toward compliance with abattoir laws among the abattoir workers in Malaysia. *Int J Gen Med* 2016 Apr;9:79-87.
13. Okojie OH, Wabatsoma VA, Ighoroge AD. An assessment of food hygiene among food handlers in a Nigerian university campus. *Niger Postgrad Med J* 2005 Jun;12(2):93-6.
14. Zain MM, Naing NN. Sociodemographic characteristics of food handlers and their knowledge, attitude and practice towards food sanitation: a preliminary report. *Southeast Asian J Trop Med Public Health* 2002 Jun;33(2):410-7.
15. Isara AR, Isah EC. Knowledge and practice of food hygiene and safety among food handlers in fast food restaurants in Benin City, Edo State. *Niger Postgrad Med J* 2009 Sep;16(3):207-12.
16. Bamidele JO, Adebimpe WO, Oladele EA, Adeoye OA. Hygiene Practices among Workers in Local Eateries of Orolu Community in South Western Nigeria. *Ann Med Health Sci Res* 2015 Jul-Aug;5(4):235-40.
17. Kibret M, Abera B. The Sanitary Conditions of Food Service Establishments and Food Safety Knowledge and Practices of Food Handlers in Bahir Dar Town. *Ethiop J Health Sci* 2012 Mar;22(1):27-35.
18. Nee SO, Sani NA. Assessment of Knowledge, Attitudes and Practices (KAP) Among Food Handlers at Residential Colleges and Canteen Regarding Food Safety. *Sains Malaysiana* 2011;40(4):403-10.