

## Assessment of Level of Knowledge on Food Hygiene among Street Food Vendors in Urban Chidambaram: A Cross Sectional Study

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**Abstract:** Food borne diseases are the major health problems in developing countries like India. The problem is more noticeable due to prevailing poor food handling and sanitation practices. Street food vending has been increasing for several years but this growth presents public health challenge with evidence of diarrheal diseases. Emerging needs for understanding the food hygiene knowledge of street food vendors to ensure hygienic preparation of street foods is essential. The purpose of this study is to assess the level of knowledge on food hygiene among street food vendors in urban Chidambaram. The study conducted using a descriptive cross-sectional survey. A total of 50 street food vendors were selected using purposive sampling technique. Data were collected by conducting face to face interview using a semistructured questionnaire. The questionnaire were structured into three distinctive parts to collect information on demographic characteristics, personal hygiene and knowledge on food safety. Among the study participants majority were of the age group 20 to 29 yrs ie 25[50%] majority of the participants were males 35[70%] and 33[66%] were married. With regards to cooking process 44[88%] of participants had moderate knowledge with mean score of 59.66±12.63. Knowledge about diseases was also adequate among 46[92%] participants with mean score of 97.33±9.13. The study shows the overall knowledge level on food hygiene among street food vendors were adequate with 82.63±6.40. The factors like age, gender, education, type of shop or years of experience had no significant association with the knowledge levels of the participants. To conclude, Food vendors should be adequately educated on the role of food in disease transmission as well as on rules of personal hygiene and approved practices in handling street food.

**Keywords:** street food vendor, food safety, personal hygiene, knowledge

## INTRODUCTION

The term "street food" refers to a wide variety of ready-to-eat foods and beverages sold and sometimes prepared, in public places. Street food may be consumed where it was purchased or can be taken away and eaten elsewhere [1]. Street foods reflect traditional cultures based on local products, as well as new dishes adapted to urban living conditions and the low incomes of many city dwellers [2].

The street vendors provide a source of inexpensive, convenient and comparatively nutritious food. They are conveniently situated, either in the living areas, near the workplaces or en route for thousands of commuters [2]. Street food vendors [SFVs] are characterized into two groups; mobile vendors and stationary vendors. Mobile vendors travel from place to place with prepared and packaged food intended for

sale on their heads, carts, bicycles, motorcycles or tricycles. Stationary vendors have fixed stalls where food is prepared, stored and served to consumers [3].

As street vending has proved to be a good source of income, requiring low capital investment, their numbers continue to increase.[2] The street food vending sector of the economy has expanded in low and middle-income countries and provides access to a diversity of inexpensive food for variety of customers [3].

One of the frequent problems in the sale of street foods is their actual and potential hazard caused by bacterial contamination [4]. Street foods reflect traditional cultures based on local products, as well as new dishes adapted to urban living conditions and the low incomes of many city dwellers [2].

The conditions under which street vendors operate are often undesirable for both the preparation and the selling of food [2]. They are prepared at very dirty surroundings with waste water and garbage disposed nearby, providing nutrient and breeding ground for rodents and vermin [9].

What people eat depends not only on individual and cultural factors but also on their surrounding food environment. The food environment is one of the major domains in which policies can intervene to improve the availability, affordability, and acceptability of healthier food.[5]Food-borne related illnesses have increased over the years, and negatively affected the health and economic well-being of many developing nations [6].

Mishandling and disregard of hygienic measures on the part of the food handlers may enable pathogenic bacteria to come into contact with food and in some cases survive and multiply in sufficient numbers to cause illness in the consumer [7].

Most of the vendors who sold both raw and cooked food items were not regulated; they operated haphazardly without any monitoring of what they prepared and how they prepared it [1]. There is inadequate supervision and proper monitoring by food safety officers and the enforcement of food hygiene regulation is weak [7]; lack of training in food safety and good hygiene practices is also rife among food handlers [8].

Food handlers may also carry some human specific food-borne pathogens such as Hepatitis A, Salmonella, Staphylococcus aureus and Shigella sp in their hands, cuts or sores, mouth, skin and hair. Food handlers may also shed foodborne pathogens, such as E. coli O157:H7 and non-typhoid Salmonella during the infectiousness period or less important during recovery period of a gastrointestinal sickness [9].

Investigations of outbreaks of food-borne disease throughout the world show that, in nearly all instances, they are caused by the failure to observe satisfactory standards in the preparation, processing, cooking, storing or retailing of food [10]. The established food safety know-how among the surveyed street food vendors regarding food contamination, types and symptoms of food diseases was significant since several pathogenic micro-organisms had also been isolated from many street vended foods [1].

Consumers often use their senses in their descriptions of safe food, and feel that food that looks or smells bad should not be eaten. They cannot tell the risk of incurring a food-borne illness at the time of purchase or consumption of a food item, because the extent of microbial contamination or the level of chemical

This study was conducted with the purpose to shed light on knowledge on food hygiene among street food vendors in Urban Chidambaram, Tamilnadu.

## **METHODS**

### **Study design**

This study was a Cross-sectional quantitative study.

### **Study area and period**

The study was conducted in Chidambaram town from July 2016 to December 2016. Chidambaram, a municipality located in Cuddalore district of Tamilnadu. According to census 2011, Chidambaram comprised of 33 wards and 146 streets with a population of 85458. Raja Muthiah medical college and hospital [RMMCH] under Annamalai university located in this scenic place. This particular study carried out in urban Chidambaram.

### **Study population**

Street food vendors located in Chidambaram town were included in this study. Vendors mainly operate around busstand, near temple and markets. These locations had the highest concentrations.

### **Inclusion and exclusion criteria**

#### ***Inclusion criteria***

Street food vendors who were willing to participate in this study were included.

#### ***Exclusion criteria***

Food handlers who were not willing to participate were excluded from this study.

### **Sample size**

All the streets in Chidambaram town were surveyed and all street food vendors were interviewed. Among them 50 food vendors were randomly selected for this particular study.

### **Study tool**

A semi structured questionnaire was peer-reviewed and pilot tested on 20 street food vendors operating around Natarajar temple in Chidambaram. The questionnaire was adjusted accordingly to make it clear and include the most relevant aspects of food vending in Chidambaram. The final questionnaire had 41 questions and was divided into 3 sections including demographic characteristics, personal hygiene and knowledge about food hygiene. The questionnaire was administered through face to face interviews.

Section one of questionnaire was to collect information on respondents socio-demographic characteristics such as age, sex, marital status, income, educational qualification, type of shop and years of experience.

Section two pertaining to personal hygiene of respondents included 22 questions which includes hand washing, wearing of head cap, gloves and aprons, usage of slippers, jewellery, smoking, wiping after sweating etc.

The section of questionnaire dealing with food safety knowledge comprised 19 close-ended questions with three possible answers; “yes”, “no” and “do not know”. These questions specifically dealt with respondents’ knowledge on food hygiene, cross contamination, food borne diseases, hygienic practices. A scale ranging between and [representing the total number of questions on food safety knowledge] was used to evaluate the overall knowledge of respondents. Food vendors who obtained total score points were considered to have “insufficient” knowledge and those who had scores points were considered to have “good” knowledge of food safety.

#### Ethical issues

Ethical approval and clearance was obtained from Rajamuthiah medical college and hospital [RMMCH] Institutional Human Ethics Committee [IHEC].

Verbal informed consent was obtained from prospective respondents by explaining the purpose of

the study and giving assurances about the confidentiality of the data.

#### Statistical analysis

The data were captured in Microsoft excel spread sheets and imported into the statistical package for social sciences [SPSS], Version 16 programme. To compare whether knowledge level on four dimensions are similar, Friedman’s test has been applied. If it is significant, Post hoc test for Friedman’s test has been applied. To find out the association between the demographic values and overall knowledge level, Kruskal-Wallis test has been applied.

#### RESULTS

The study population consisted of 50 food vendors in Chidambaram. Among the study participants majority were of the age group 20 to 29 yrs i.e. 25[50%]. Majority of the participants were males 35[70%] and 33[66%] were married. Among the participants 31[62%] had education upto higher secondary and only 5[10%] were graduates. Thetype of shops included in the study were meals 58% and chats 42%.Total years of experience was <5yrs for 20 vendors and more than 10yrs for 11 participants [table 1].

**Table 1: Distribution of study population based on the socio-demographic factors:**

Variable	Frequency [%]
Age [yrs]	
20-29	25[50]
30-39	15[30]
>40	10[20]
Sex	
Male	35[70]
Female	15[30]
Marital status	
Married	33[66]
Single	17[34]
Education qualifications	
Illiterate	14[28]
Higher secondary	31[62]
Graduate	5 [10]
Type of shop	
Meals	29[58]
Chat	21[42]
Years of experience	
<5yrs	20[40]
5-10 yrs	19[38]
>10yrs	11[22]

Table 2 represents the levels of knowledge among study population. With regards to cooking process 44 [88%] of participants had moderate knowledge with mean score of 59.66±12.63. Both kitchen area care and personal hygiene knowledge

among the participants were high with majority having adequate score of 78% and 60% respectively. Knowledge about diseases was also adequate among 46[92%] participants with mean score of 97.33±9.13.

**Table 2: Levels of knowledge among study population**

variable	Inadequate; n[%]	Moderate; n[%]	Adequate; n[%]	mean	sd
Cooking process	3[6]	44[88]	3[6]	59.66	12.63
Kitchen area	-	11[22]	39[78]	94.00	12.28
Personal hygiene	1[2]	19[38]	30[60]	90.00	14.14
disease	-	4[8]	46[92]	97.33	9.13
overall	-	17[34]	33[66]	82.63	6.40

Table 3 represents Mean and standard deviation of the knowledge score of the four dimensions. The significant p-value of the Friedman's test infers that street vendors' knowledge level has been different for

the four dimensions. To understand which of the dimensions are different, Post hoc test has been applied. The result indicates that the knowledge on cooking process has been lesser than all other dimensions.

**Table 3: Ranking of knowledge score among study population using friedman test**

variable	mean	sd	Friedman test	P value
Cooking process	59.66	12.63	1.22	<0.001
Kitchen area	94.00	12.28	2.90	
Personal hygiene	90.00	14.14	2.71	
disease	97.33	9.13	3.17	

Table 4 represents association of knowledge level with socio-demographic factors. The factors like age, gender, education, type of shop and years of experience had no significant association with the

knowledge levels of the participants. The knowledge level has been similar for all the street vendors and not influenced by the above selected demographic variables.

**Table 4: Association of knowledge level with socio-demographic factors of study population**

Variable	category	No.	Mean	Sd	K.W.test	P value
Age[yrs]	20-29	25	82.31	5.86	0.267	0.875
	30-39	15	82.80	7.82		
	>40	10	83.15	5.95		
Gender	Male	35	82.40	6.62	0.405	0.524
	Female	15	83.15	6.03		
Education	Illiterate	14	85.83	4.98	3.523	0.172
	Higher sec.	31	81.74	6.40		
	Graduate	5	80.00	7.80		
Type of shop	Meals	29	81.57	6.23	0.939	0.332
	Chats	21	83.45	6.57		
Years of experience	1-5	20	81.05	6.25	3.010	0.222
	5-10	19	82.82	5.77		
	>10	11	85.16	7.37		

## DISCUSSION

This cross sectional study was conducted among street food vendors of urban Chidambaram town located in Tamilnadu. The study included 50 participants with majority [70%] of them males and about 62% having education levels upto higher secondary. This is similar to the study by Y.M. Sun *et al* which had higher male participants with majority 52% studied upto high school [11]. But this study is in contrast to the study by K. Soares *et al* which had female predominance and lower education levels [12]. The majority of participants were of age group 20-29yrs similar to that of Rahman *et al* [13].

Street food satisfies a vital need of the urban population by being reasonably priced and conveniently available, and some segments of the population depend entirely on it [14]. The shops studied included meals and chat stations which constituted 52% and 48% respectively. These were major street vending areas in the region where the owners were assessed for their knowledge of food hygiene. The knowledge assessed based on the aspects of cooking process, kitchen cleanliness, personal hygiene and diseases. The study population reported a higher level of knowledge overall in food hygiene which is similar to K. Soares *et al*. But the studies by Y. M. Sun *et al* and M.bas *et al* reported poor knowledge among participants [15].

The knowledge levels of participants in the present study states that the knowledge about the diseases caused through food contamination is the higher and adequate with a mean score of  $97.33 \pm 9.13$ . The participants were aware of the unhygienic practices leading to disease and pathogens involved. They also had good knowledge common contaminants and symptoms of food poisoning. Also the participants had adequate knowledge of personal hygiene and kitchen area cleanliness. This is in supportive of the study by Siow Oi nee et al which states that the participants had good knowledge of food hygiene especially with regards to the personal hygiene but the knowledge of kitchen area was lacking drastically unlike this study [15]. The study by Y.M.Sun et al reported poor knowledge levels among street vendors in aspects of personal hygiene and kitchen area though they had fair knowledge of the diseases and symptoms. Thus it indicates that the knowledge level of the present study participants were good and higher than previous studies.

The knowledge level of the participants were neither associated with their socio- demographic profiles such as age, gender, marital status nor with the type of shop or the years of experiences the owner had in this field. This is similar to the results of study by K. Soares *et al* which also found no significant association between socio-demographic factors and the level of knowledge. Thus the present study highlights the level of knowledge among street food handlers assess their knowledge in various aspects of food handling and personal hygienes despite their demographical factors.

### LIMITATIONS AND STRENGTHS

Important limitation of this study is that food safety practices are more difficult to evaluate because of self-reported bias. Further exploration is needed on food safety practices and cognition among the street food vendors. Thus the attitude and practices also needs to be assessed with knowledge. The major strengths of the study are the adequate sample and single observer that excludes observer bias.

### RECOMMENDATIONS

Along with administrative support, Promotion of awareness and increasing understanding of food safety issues among the general public would pave path for better food handling techniques. This also should be promoted with health education and training programmes.

### CONCLUSION

Making safe food a top priority to prevent foodborne diseases, protect the health of your family and community, and be confident about the safety of the food you eat. Food vendors should be adequately educated on the role of food in disease transmission as well as on rules of personal hygiene and approved practices in handling street food.

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