



Scientific Journal of Immunology & Immunotherapy

Research Article

Assessment of Food Hygiene and Safety Practices among Street Food Vendors and its Associated Factors in Urban Areas of Shashemane, West Arsi Zone, Oromia Ethiopia, 2019 - 20

Adane Tesfaye^{1,2*} and Yadessa Tegene¹

¹Department of Public health, Paradise Valley College, Shashemane, Ethiopia

²Department of Public health, School of Public Health, College of Medicine and Health Science, Dilla University, Dilla, Ethiopia

***Address for Correspondence:** Adane Tesfaye, Department of Public health, Paradise Valley College, Shashemane, Ethiopia, Tel: +091-685-7437/+092-336-8574; ORCID: <https://orcid.org/0000-0001-9860-7764>; E-mail: Adanetesfaye2006@gmail.com

Submitted: 04 February 2020; Approved: 25 February 2020; Published: 28 February 2020

Cite this article: Tesfaye A, Tegene Y. Assessment of Food Hygiene and Safety Practices among Street Food Vendors and its Associated Factors in Urban Areas of Shashemane, West Arsi Zone, Oromia Ethiopia, 2019. Sci J Immunol Immunother. 2020;4(1): 001-005.

Copyright: © 2020 Tesfaye A, et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Due to consumption of unhygienic and unsafe food, foodborne diseases are a major public health concern causing a significant morbidity and mortality rate globally. In our time, street foods are thriving in many towns of Ethiopia including urban areas in Shashemane. It becomes common to see street vendors around schools, hospitals, bus stations where numerous people are congested. Since street vended food is operated under poor sanitary conditions near the street, it can be contaminated with many pathogens that can expose consumers to various foodborne diseases. These situations require an evaluation of safety and hygiene of street foods being served in urban areas in order to prevent them from developing into health risks among consumers.

Objectives: To assess the practice of food hygiene and safety, and its associated factors among street food vendors in urban areas of Shashemane, West Arsi Zone, Oromia Ethiopia, 2019.

Methods: Cross-sectional study design was applied from December 28, 2019 to January 27, 2020. Data was collected from 120 food handlers, which were selected by purposive sampling techniques. Information was gathered from interview and field observation by conducting food safety survey and using questionnaires via face to face interview. The collected data was entered using EpiData 3.1 and finally, it was analyzed using SPSS VERSION 20.

Results: The magnitude of good food handling practice among street food vendors and food handlers in food establishments in this study is 27.5% - 49.2% of food handlers had good Knowledge of food handling practice. Average monthly income > 1500 Ethiopian Birr; Primary school level of education; good Knowledge of Food handling and Receiving Food handling training are independent predictors of Good food handling practice.

Conclusion: Good food handling practice among street food vendors and food handlers in food establishments in this study is very low; monthly income > 1500 Ethiopian Birr; Primary school level of education; good Knowledge of Food handling and Receiving Food handling training are independent predictors of Good food handling practice

Keywords: Street foods; Food safety; Food hygiene practices

ABBREVIATIONS

AOR: Adjusted Odds Ratio; COR: Crude Odds Ratio; EU: European Commission; FAO: Food and Agricultural Organization; FBDs: Food Borne Diseases; FERG: Foodborne Epidemiology Reference Group; SFVs: Street Food Vendors; SVFs: Street Vended Foods; WHO: World Health Organization

INTRODUCTION

In both developed and developing world, foodborne diseases are a public health concern. Billions of people are at risk and millions fall ill every year; thousands die as a result of consuming unsafe food [1-3]. However, the extent of health problem is not the same; it varies among regions and within sub regions [4]. The global burden of FBDs/foodborne diseases is considerable, and affects individuals of all ages, particularly children < 5 years of age and persons living in low-income regions of the world [1].

Using unsafe water for cleaning and processing of food, poor food-production processes and food-handling, absence of adequate food storage infrastructure and inadequate or poorly enforced regulatory standards aggravate the burden of FBDs [1,5,6]. This may be the characteristics of environmental conditions of street food vendors in low-income countries like Ethiopia [1,7,8].

As reported in the scientific literature during the years of 2006 and 2007, 3 out of 10 people in the world suffered from Foodborne Diseases/FBDs [9-13]. Even though this figure is reduced to 10% since 2010 [5,11], it is still a critical public health problem of our globe.

Research forms the backbone for addressing food safety and hygiene practices on the reduction of foodborne diseases [1]. WHO and EU recommend the community measures (such as food safety, food hygiene and water safety) to be reassessed in the light of scientific knowledge which is therefore crucial in addressing foodborne prevention [1,9-11]. Hence, looking into the presence of knowledge

gap on food hygiene and safety practices among street food vendors are a prime footstep for proper planning and performing requisite interventions in low income regions and sub-regions like Ethiopia.

Moreover, in urban areas of Ethiopia like Shashemane, dining out in street shops is common among numerous consumers [14]. However, to the best of our awareness, no study has been undertaken on the level of food hygiene and safety among street food vendors particularly in Shashemane. In the absence of such data, planning successful intervention methods for improving food hygiene and safety among food handlers is impossible. This may limit the preventive strategies of food-borne diseases to improve public health status in the zones. Therefore, this study aimed to investigate the hygiene practices of street food vendors and safety of street foods in Shashemane, West Arsi Zone, Oromia, Ethiopia.

METHODS

Study area and period

This study was conducted in Shashemene town located at 250 km from Addis Ababa in South of Oromia region. Shashemene town is the capital city of West Arsi zone; located in Oromia national regional state.

Study design and period

A cross-sectional study design was used and this study was conducted from December 28, 2019 to January 27, 2020.

Source population

All food handlers working in street food vendors in the Gedeo zone were used as source of population.

Study population

The study subjects are those food handlers who were selected or the study using random sampling techniques



Sample size determination and sampling technique

Due to the nature of the issue convenient sampling technique was used to take data from 120 street food vendors.

Inclusion criteria

All street food vendors, who gave their consents, in the town, were included in this study. Food handlers who were working in street food vendors during the study period were included.

Exclusion criteria

Street food vendors who were absent on data of data collection were excluded.

Data collection tools and procedure

A structured questionnaire composed of socio-demographic factors, food safety knowledge, working environment characteristics and food hygiene practices were employed to collect the data via face to face interview and observation. The questionnaire was designed from standardized food and drink establishments’ inspection checklist by reviewing different literatures. To maintain its consistency, the questionnaire was originally prepared in English, then translated to local language, and finally retranslated back to English.

Public health and environmental health professionals were recruited as data collectors and field supervisors. One day training regarding the objective of the study, interview and inspection techniques, and confidentiality of information was given to data collectors and supervisors.

The questionnaire was pre-tested on 5% of the total sample out of the study area. To maintain the quality of data, the investigators and supervisors carried out regular supervision, spot-checking, and reviewing the completeness of the questionnaire on daily basis.

Data handling and analysis

The data entry was done using EpiData version 3.1; data analysis were done using the SPSS VERSION 20. Level of significance was set at 95% confidence interval. Descriptive analysis was done. Pearson correlation was used to test relationships of variables within the study areas. Results were summarized and presented by tables.

Operational definitions

The level of food hygiene practice was determined by using 17 food hygiene practice questions complemented with direct observation based on Derso, et al. [7,14]. The food hygiene practice was computed with a maximum score of seventeen. By considering the mean score as twelve, 12; the food hygiene practice of food handlers was categorized as poor if their score was below twelve, otherwise good practice if their score was greater or equal to twelve.

Regarding to food safety knowledge, ten questions were used to determine the food handler’s knowledge about food safety [7]. Finally, by considering the mean score as 6, the food handlers’ knowledge was categorized as poor if their score was less than six, otherwise good knowledge if they score greater than or equal to six.

Ethical consideration

Ethical approval and clearance was obtained from Paradize Valley College, Shashemene, Ethiopia. Verbal consent was obtained from owners/managers and study subjects. Interview was carried out only with full consent of the person being interviewed. Each

respondent was assured that the information provided by her/him are kept confidential and used only for the purpose of this research.

RESULT

Socio-Demographic Characteristics of the study participants

The great majority of food handlers in street food shops (90.8%; 109/120) were women. About 31% (38/120) of the study participants just attended up to Primary school. The mean age of street food vendors was 27 ± 6.3 years, respectively (Table 1).

Environmental hygiene parameters of the study participants

83% of Food vendors had unclean Surrounding Environment on Observation. The majority of Food shops/vending sites have washing basin (80%) (Table 2).

Observed food handling/vending practices of Participants

Only 10% of the Street food handlers among participants had hair covering. Greater than half of food vending sites (86.7%) had foods in uncovered container (Table 3).

Factors associated with food handling practice

In bivariate logistic regression analyses; socio demographic and economic characteristics such as Educational Status of the study participant; having the level of education of Primary school [Crude Odds Ratio/COR = 4.63, 95% Confidence Interval/ CI (2.14 - 10.01)] having the level of education of secondary school and above [COR = 0.11, 95% CI (0.08 - 0.58)], and Average monthly income (having monthly income > 1500 ETB) were found to be associated with food handling practice [COR = 1.6, 95% CI (1.08 - 7.82)]. *p* < 0.05. Moreover; knowledge of food handling [COR = 7.4, 95% CI (4.8 - 8.53) and Food handling training [(COR = 23, 95% CI (19.38 - 26.59) were the other factors found to be associated at bivariate level.

Table 1: Socio-economic and demographic characteristics of Street Food Vendors in Urban Areas of Shashemane, West Arsi Zone, Oromia Ethiopia, 2019 (n = 120).

Variable	Frequency	Percent	
Age in years	18-26	28	23.3
	27-35	71	59.2
	36-44	19	15.8
	> 45	2	1.6
Sex	Male	11	9.2
	Female	109	90.8
Marital status	Married	39	32.5
	Single	78	65
	Widowed	2	1.6
	Separated	1	0.8
Family size	< 4	73	60.8
	≥ 4	47	39.2
Educational status	No formal education	9	7.5
	Can read and write	33	27.5
	Primary school	38	31.6
	Secondary school	25	20.8
	Above secondary school	15	12.5
Average Household Income per month in Ethiopian birr	< 800	74	61.6
	801-1500	24	20
	> 1500	22	18.3



Table 2: Environmental hygiene parameters and food vending parameters of Street Food Vendors in Urban Areas of Shashemane, West Arsi Zone, Oromia Ethiopia, 2019 (n = 120).

Variable		Frequency	Percent
Clean environment	Yes	63	52.5
	No	57	47.5
Waste bin present	Yes	91	38.6
	No	29	12.3
Refuse site present	Yes	98	81.7
	No	22	18.3
Wash basin present	Yes	96	80
	No	24	20
Presence of hand towel	Yes	19	15.8
	No	101	84.2
Soap present	Yes	97	80.8
	No	23	19.2
Presence of flies	Yes	14	11.7
	No	106	88.3
Presence of rats/ cockroaches	Yes	22	18.3
	No	98	81.7

Table 3: Observed food handling/vending practices of Street Food Vendors in Urban Areas of Shashemane, West Arsi Zone, Oromia Ethiopia, 2019 (n = 120).

Variable		Frequency	Percent
Food in covered container	Yes	54	45
	No	66	55
Food in uncovered container	Yes	16	13.3
	No	104	86.7
Food exposed to flies	Yes	19	15.8
	No	101	84.2
Food reheated before sale	Yes	10	8.3
	No	110	91.7
Vendor wore hand jewelry	Yes	30	25
	No	90	75
Vendor had long nails	Yes	15	12.5
	No	105	87.5
Vendor had hair covering	Yes	12	10
	No	108	90
Vendor had cut on the hand	Yes	13	10.8
	No	107	89.2

In multivariable logistic regression analyses level, the odds of good food handling practice in those who are at primary school is three times higher compared with those who are unable to read and write [(Adjusted odds ratio/AOR = 3, 95 CI = (1.36 - 7.67)]. Regarding average monthly income food handlers who earn greater than 1500 Ethiopian Birr per month were two times more likely to have good food handling practice as compared to those who earn less than 800. [AOR = 2.2, 95% CI = (1.9 - 5.87)]. The odds of good food handling practice in those who had good knowledge of food handling was three times more compared with those who has poor knowledge of food handling; [AOR = 3, 95% CI = (1.87 - 9.36)]. Moreover, the odds of good food handling practice in those whose received food handling training was four times higher; [AOR = 4.5, 95% CI = (2.56 - 9.26)] (Table 4).

DISCUSSION

We conducted a community-based cross-sectional study among

street food vendors and food handlers in food establishments in Shashemane, town, Ethiopia. Our main findings showed that; only 27.5% had good food handling practice and almost half (49.2%) had good Knowledge of food handling practice. Average monthly income (having monthly income > 1500 Ethiopian birr); having primary school level of education; good knowledge of food handling and receiving food handling training are independent predictors of food handling practice.

Our findings showed low level of good food hygiene and safety practices (27.5%) than previous studies conducted in other Ethiopian towns, i.e. (49.0%) of food handlers had good food handling practice in a facility-based cross-sectional study conducted in Gondar city [15]. In addition 72% and 49.6% of food handlers had good food handling practice in study conducted at Desse and Debark town, Ethiopia respectively [7,16]. These variations might be due to the difference in socioeconomic characteristics of the study population, variation in training, and the provision of food hygiene/safety materials and education from government bodies.

The odds of good food handling practice in those having primary school level of education was three times more compared with those who are unable to read and write; Cross-sectional studies in Amhara region, Northwest Ethiopia, Dangila town [6] and Bahir Dar town [7] also showed that educational status is an independent predictor of good food handling practice. This could be due to the marvellous multipurpose impact of education that improves our daily practice, as body hygiene is thought in schools across Ethiopia.

The odds of good food handling practice in those who had good knowledge of food handling is three times more compared with those who has poor knowledge of food handling; Studies conducted on knowledge attitude and practice about food safety in Hanoi, Veitnam [17] and in Taif, Saudi Arabia [18] suggested that efforts to prevent foodborne illnesses in food facilities require sufficient knowledge on hygiene and safety standards from both food processors and customers. Although good Knowledge is not a guarantee for good practice, it is one of the key enabling factors to have a better food handling practice.

The odds of good food handling practice in those whose received Food handling training was four times higher; A cross-sectional study conducted on factors associated with food safety practices among food handlers in Gonder town reveled similar finding [15]. Training is one of the best interventions to improve human practice as it significantly increase knowledge which is a key factor to improve practice.

Average monthly income of food handlers who earn greater than 1500 ETB per month per two times more likely to have good food handling practice as compared to those who earn less than 800 ETB; This could be due to the fact that ;those who have better economic status can buy all the necessary materials for keeping food hygiene.

CONCLUSIONS

The magnitude of good food handling practice among street food vendors and food handlers in food establishments in this study was 27.5% - 49.2% of food handlers had good Knowledge of food handling practice. Average monthly income > 1500 ETB; having Primary school level of education; good knowledge of food handling and receiving food handling training were independent predictors of good food handling practice.



Table 4: Factors associated with Food Handling practice of Street Food Vendors in Urban Areas of Shashemane, West Arsi Zone, Oromia Ethiopia, 2019 (n = 120).

Variables		Practice of		COR	AOR
		Food handling		(95% CI)	(95%CI)
		Good	Poor		
Knowledge of Food handling	Good	31 (34.4%)	59 (65.6%)	1	1
	Poor	2 (6.6%)	28 (93.4%)	7.4 (4.8-8.53)	3.4 (1.87-9.36)*
Average monthly income	≤ 800	11 (28.9%)	27 (71.1%)	1	1
	8001-1500	12 (37.5%)	20 (62.5%)	0.67 (0.24-5.67)	0.4 (0.17-4.87)
	> 1500	10 (25%)	40 (75%)	1.6 (1.08-7.82)	2.2 (1.9 -5.87)**
Educational status	No formal education	4 (10.3%)	35 (89.7%)	1	1
	Read & write	2 (8%)	23 (92%)	1.3 (1.25-14.27)	0.83 (0.46-1.49)
	Primary	12 (46%)	14 (54%)	4.63 (2.14-10.01)	3 (1.36-7.67)***
	Secondary & Above	15 (50%)	15 (50%)	0.11 (0.085-0.58)	16 (13.56-22.94)
Food handling training	Yes	26 (68.4%)	12 (31.6%)	1	1
	No	7 (8.5%)	75 (91.5%)	23 (19.38-26.59)	4.5 (2.56-9.26)**

*Significant at $p < 0.05$, ** Significant at $p \leq 0.002$, *** Significant at $p < 0.001$, OR = Odd Ratio, AOR = Adjusted Odd Ratio, CI = Confidence interval.

RECOMMENDATIONS

Based on the findings of this study the following recommendations are forwarded:

Shashemane town health office should support and facilitate inspection, education and intensive trainings to food handlers.

Health facilities should support with provision of necessary materials to keep environmental hygiene

Health extension worker should work hard on teaching food handlers to increase awareness.

Finally, we recommend for further community based Interventional/follow up study.

REFERENCES

1. WHO. WHO estimates of the global burden of foodborne diseases, 2007-2015: Foodborne Epidemiology Reference Group (FERG). 2015. <https://bit.ly/2uxlUnG>
2. A M Shonhiwa, G Ntshoe, V Essel, J Thomas, K McCarthy. A review of foodborne disease outbreaks reported to the outbreak response unit, South Africa, 2013-2017. 2018. <https://bit.ly/2w0eaen>
3. Akabanda F, Hlortsi EH, Owusu Kwarteng J. Food safety knowledge, attitudes and practices of institutional food-handlers in Ghana. BMC Public Health. 2017; 17: 40. **PubMed:** <https://www.ncbi.nlm.nih.gov/pubmed/28061850>
4. Havelaar AH. The public health burden of unsafe foods: a need for global commitment. The First FAO/WHO/AU International Food Safety Conference. February 2019; Addis Ababa, Ethiopia: FAO/WHO/WTO/AU; 2019. WHO. Food safety. 2010; p.148-57. <https://bit.ly/2HVL3LG>
5. WHO. Food safety. 2010. p.148-157.
6. Ayehu Gashe Tessema, Kassahun Alemu Gelaye, Daniel Haile Chercos. Factors affecting food handling Practices among food handlers of Dangila town food and drink establishments, North West Ethiopia. BMC Public Health. 2014; 14: 1-5. <https://bit.ly/2w0eNEL>
7. Metadel Adane, Brhanu Tekla, Yirga Gismu, Goitom Halefom, Ademe M. Food hygiene and safety measures among food handlers in street food shops and food establishments of Dessie town, Ethiopia: A community-based cross-sectional study. PLoS One. 2018; 13: 1-13. **PubMed:** <https://www.ncbi.nlm.nih.gov/pubmed/29723288>
8. Chigozie O Ifeadike, Okechukwu C Ironkwe, Prosper O U Adogu, Chinomso C Nnebue. Assessment of the food hygiene practices of food handlers in the Federal Capital Territory of Nigeria. Tropical Journal of Medical Research. 2014; 17: 10-15. <https://bit.ly/2TffyBK>
9. Nora A Moreb, Anushree Priyadarshini, Amit K Jaiswala. Knowledge of food safety and food handling practices amongst food handlers in the Republic of Ireland. Food Control. 2017; 80: 341-349. <https://bit.ly/3a4ygCG>
10. European-commission. Food contaminants factsheet. Brussels: Directorate-general for health and consumer protection, 2008. <https://bit.ly/37VIWn2>
11. FAO/WHO. Risk communication applied to food safety handbook. Geneva. 2016. <https://bit.ly/32pYr47>
12. Mama M, Alemu G. Prevalence, antimicrobial susceptibility patterns and associated risk factors of Shigella and Salmonella among food handlers in Arba Minch University, South Ethiopia. BMC Infectious Diseases. 2016; 16. **PubMed:** <https://www.ncbi.nlm.nih.gov/pubmed/27871241>
13. Saurabh R. Kubde, Jayashree Pattankar, Prashant R Kokiwar. Knowledge and food hygiene practices among food handlers in food establishments, India. Int J Community Med Public Health. 2016; 3: 251-256. <https://bit.ly/2wLPxCT>
14. Derso T, Tariku A, Ambaw F, Alemenhew M, Biks G A, Nega A. Socio-demographic factors and availability of piped fountains affect food hygiene practice of food handlers in Bahir Dar Town, northwest Ethiopia: a cross-sectional study. BMC Res Notes. 2017; 10: 628. **PubMed:** <https://www.ncbi.nlm.nih.gov/pubmed/29183394>
15. Azanaw J, Gebrehiwot M, Dagne H. Factors associated with food safety practices among food handlers in Gondar city : facility-based cross-sectional study. BMC Res Notes. 2019; 12: 683. **PubMed:** <https://www.ncbi.nlm.nih.gov/pubmed/31640793>
16. Henok Dagne, R P Raju, Zewudu Andualem, Tesfaye Hagos, Kidstemariam Addis. Food safety practice and its associated factors among mothers in Debarq town, Northwest Ethiopia: community-based cross-sectional study. BioMed Research International. 2019; 8. <https://bit.ly/32qxUDM>
17. Nguyen ATL, Tran BX, Le HT, Le XTT, Do KN, Do HT, et al. Customers knowledge, attitude, and practices towards food hygiene and safety standards of handlers in food facilities in hanoi, Vietnam. Int J Environ Res Public Health. 2018; 15: 1-9. **PubMed:** <https://www.ncbi.nlm.nih.gov/pubmed/30257446>
18. Ahmed Mahmoud Khalifa, Khadiga Ahmed Ismail, Farah Anjum Ansari, Hasnaa A Abouseif. Assessment of the knowledge, attitude and practice about food safety among Saudi population in taif. Biomed J Sci & Tech Res. 2018; 8: 6413-6419. <https://bit.ly/2w3C5cR>