DOI: https://doi.org/10.67203/gjhrr.2025.fs3wejhp

THE FOOD HYGIENE PRACTICES IN PREVENTING FOOD HAZARDS AMONG FOOD HANDLERS IN UNIVERSITY OF ILORIN.

Badmus Yakub Kolade, Olu Gbemi Moses and Oluwaponle Oluwatosin Stephen

University of Ilorin, Ilorin, Nigeria

Abstract

Food hygiene encompasses several principles and procedures to ensure food safety. Poor food hygiene practices put everyone at risk, and food handlers play a key role in ensuring food safety. Improper hand washing, allowing customers to have direct contact with food, talking while handling food, fixing and polishing nails and using phones during food handling by the food handlers are some factors contributing to food hazards and contamination, which can lead to food poisoning. This study assessed food hygiene practices in preventing food hazards among food handlers in University of Ilorin. The objective was to examine food hygiene practices, specifically hand washing and proper food handling. A descriptive cross-sectional research design was used for this study. The participants were food handlers at the University of Ilorin. A total sampling technique was employed to select all 117 food handlers working at 18 food vending establishments that sell cooked food on campus. A researcher-designed questionnaire and structured observation checklist were used for data collection, both of which were validated by three experts in the Department of Health Promotion and Environmental Health Education. A reliability coefficient (r) of 0.76 was obtained through test-retest reliability using Pearson's Product-Moment Correlation (PPMC). Two research questions were formulated and answered, while two hypotheses were tested at a 0.05 level of significance. The data collected were analyzed using percentage, frequency and chi-square. The results of the findings revealed that there is significant practice of proper hand washing, with the calculated chi-square value of 215.084 greater than the table value of 21.03 at 18 df. Also, there is significant practice of proper food handling, with a calculated chi-square value of 215.588 greater than the table value of 14.03 at 7 df. The study concluded that food handlers demonstrated proper hygiene practices in hand washing and food handling. It recommended that food handlers undergo continuous training to reinforce good hygiene practices. Additionally, the Campus Eatery Regulatory Board should ensure continuous monitoring to maintain compliance with proper food handling practices among food vendors on campus.

Keywords: Food hygiene, Food handlers, Food hazards

Introduction

Food hygiene involves several principles and procedures designed to ensure food safety and reduce the risk of food poisoning and food-borne diseases. Food safety practice is crucial and essential because food is an essential and basic need of every individual. No one can survive for a long time without taking food. It is a fuel that powers and drives the body system. World Health Organization (2015) explained that the body needs the nutrients, vitamins and minerals deposited in food for survival. Meanwhile, the way food saves lives is the same way it endangers it if contaminated. Everyone is potentially exposed to foodborne diseases with every bite one takes from food (WHO, 2015).

Food poses great threats to human beings if not well prepared, kept or eaten. It can be said to be hygienic or unhygienic, safe or unsafe for consumption based on the way it is handled and prepared. Unsafe foods pose a threat that can be endangering to whoever takes it, but the most vulnerable ones are infants, young children, pregnant women, elderly ones and those with underlying illnesses (Dajaan, Addo, Luke, Eugenia, Amshawu & Kwasi, 2018). Contamination of food can occur at different stages of production involving storage, preparation, cooking or serving to consumption. Therefore, food safety is very important because it entails proper hygienic practices by food handlers (Umar, Shehu, Akorede, Sa'ad, Suleiman & Umaru, 2024).

Nowadays, people work or study in a place far from their homes and families, they are occupied with work. There is little or no time to prepare food and eating is inevitable for every living soul. This prompts many of them to resort to eating at various food establishments or vendors to function well in their various daily activities and lives (Akintaro, 2012). Food and Agriculture Organization & Pan American Health Organization (2017) explained that every food establishment or vendor has people known as food handlers who prepare food for proper running of buying and selling foods to customers. A food handler is anyone who works in a food or drink establishment and handles packaged or unpackaged food or has contact with foods or any food equipment or utensils that has contact with foods (Food and Agriculture Organization & Pan American Health Organization, 2017). Their work involves food and their actions or inactions could compromise food safety.

Food handlers could play a major role in contaminating food; they could transmit pathogens passively from contaminated sources such as transmitting pathogens from raw meat to ready and eatable-food (Odo & Onoh, 2018). Therefore, knowledge

of hygiene either formally or informally is important for the handlers and anyone who sets up a food business, where food is processed, prepared, stored and distributed or exposed for sale. Food hygiene is all practical measures to ensure keeping food safe and healthy through the stages of production to the point of sale or consumption (White, 2006; Food and Agriculture Organization & World Health Organization, 2009). A food handler is saddled with the moral and legal responsibility of providing safe food and ensuring that he or she does not contaminate food. They should maintain the principle of personal hygiene which is maintaining cleanliness and grooming of the external body, food hygiene and proper disposal of sewage and refuse to prevent harborage of organisms that could contaminate foods (Akorede & Toyin, 2020).

Food hazards are physical, biological and chemical agents that can contaminate foods leading to foodborne disease. Failure to adhere to food hygiene principles during the stages of food production may cause food hazards which could result in various degrees of health problems. Food hazards could be introduced intentionally, accidentally or criminally (FAO & PAHO, 2017). Food handlers can contribute to food-borne disease by serving as channels for the transmission of harmful microbes, they may carry some human-specific food-borne pathogens such as Hepatitis A, Typhoidal salmonella, Staphylococcus aureus and Shigella species in their hands, cuts or sores, nails, mouths, skins and hairs in their failure to maintain proper hygiene (Adams & Moss, 2008). Pokhrel and Sharma (2016) directed the use of personal protective equipment such as aprons, gloves, and hairnets while serving food among food handlers to mitigate food contamination.

Oghenekohwo (2015) identified proper food and environmental hygiene as putting on clean aprons and hair covering to be worn at all times when handling foods, food handlers who have symptoms of having any food-borne disease should not be handling food, handlers must have clean habits and have an elementary knowledge of hygiene. Afolaranmi, Hassan, Bello and Misari (2015) carried out a study on food vendors in primary schools in Jos, Plateau State of North Central Nigeria and revealed that vendors had knowledge of food safety and hygiene but were poor in not practising proper hand washing, cleaning and sanitizing of cutting surfaces. Another study by Faremi, Olalubi and Nnabuife (2018) on food vendors in tertiary educational institutions in South Western Nigeria, found that the majority of the respondents had adequate knowledge of the transmission of food-borne disease but had unsafe hygiene practices. Kubde, Pattankar and Kokiwar, (2016) found out that knowledge, attitude and practice of food handlers were average and satisfactory.

Kok and Balkaran (2014) did a study on street food vending and hygiene practices and observed that the majority of the food handlers did not wear gloves, hairnets or aprons, also garbage was left open. Prepared foods were displayed with no covers in very humid weather thus encouraging the proliferation of insects and rodents linked to enter disease. Washing of utensils was carried out in bowls or pots which were also used for cooking and water was not being changed, as it was not easily accessible. Pepple (2017) also reported proper hand-washing practices among food vendors in Garki, Abuja. Nurudeen, Lawal and Ajayi (2014) conducted a study on the hygiene and sanitary practices of food vendors in the North-central state of Nigeria. The findings revealed poor food handling practices among the handlers of serving food with bare hands, handling money while handling foods, and chewing and talking while serving food. It was also revealed that 60% of the vendors prepared their food in an unclean environment with the presence of flies all over the places and some stalls were located very close to dumpsites in an attempt to avoid obstruction within vending sites. Pokhrel and Sharma (2016) observed poor hygiene practices such as sneezing, coughing and keeping long dirty nails while handling food among the handlers. Mulugeta and Bayeh (2012) also found poor food handling practices by the food handlers.

Statements of the Problem

Food vending is a thriving business on campus due to the high population of students and staff who often purchase meals from vendors. However, it appears that the food and environmental hygiene practices of the food vendor fall short of the basic requirements of food and environmental hygiene practices due to some of the unhygienic practices observed among the handlers. Some years back, there was an outbreak of cholera in Kwara State with 1558 cases claiming 11 lives; whereas Ilorin South Local Government Area where the University of Ilorin is located had 215 cases (WHO, 2017). Similarly, the researcher through interaction with some students got a report of several cases of food illness such as typhoid fever, dysentery, and diarrhoea among others that were treated unreported. Many of them attributed the cause to eating outside with campus food vendors. This was making some of them discriminate among the vendors on campus. And noting some unhygienic practices observed among the vendors of allowing customers to have contact with food and food items, talking among the waitresses at some of these eateries when serving food, wearing jewellery, fixing and polishing nails and using phones while at work among others into consideration, they are tantamount to causing food hazards because they could aid in contamination of food and results to foodborne disease (FAO, 2014). Sesan (2017) reported that Nigeria's Health Minister, Isaac Adewole claimed that food-borne diseases alone are responsible for 5160 deaths every year in the country. The University has many food vendors and there have been many cases of health complaints which are related to food-borne infections among the students engaged by the researcher. The researcher perceives that the food hygiene practice of the vendors on campus might have a connection to the cases of food-borne infection reported by the students. Hence, the researcher intends to carry out this study on food hygiene practices in preventing food hazards among the food vendors in University of Ilorin to mitigate the incidence of food-borne diseases and their health implications on the entire residents of the school community.

Research Questions

The research answered the following questions:

1. Do food handlers in University of Ilorin practice proper handwashing to prevent food hazards?
2. Do food handlers in University of Ilorin practice proper food handling to prevent food hazards?

Hypotheses

The following research hypotheses were formulated to guide the study

1. There will be no significant practice of proper hand washing in preventing food hazards among food handlers in University of Ilorin.
2. There will be no significant practice of proper food handling in preventing food hazards among food handlers in University of Ilorin.

Methodology

This study adopted a descriptive cross-sectional research design. The target population comprised all food vendors operating within the University of Ilorin community. The study was delimited to 117 food handlers who work in 18 registered food vendors that sell cooked food on campus. A total sampling technique was used to select all the 117 food handlers working in 18 registered food vendors because the population was small and could be accessible. A researcher's designed questionnaire and structured observation checklist were used to gather responses from the handlers. The information in the observation checklist and the questionnaire were adopted from FAO's "Guidance on Hygiene and Safety in the Food Retail Sector". The questionnaire collected information on the demographic data and hand washing practices of the handlers while food handling practices of the handlers were recorded in the structured observation checklist. The instruments were given to three experts in the Department of Health Promotion and Environmental Health Education for content, construct and face validation. Their comments and suggestions were used to improve the quality of the research instruments. The reliability of the instruments was carried out using a test-retest method of reliability in which 30 copies of the instrument were administered two times on food handlers in Kwara State University KWASU at an interval of two weeks. The results were scored and correlated using Pearson's Product Moment of Correlation (PPMC) to get the co-efficient correlation of 0.76 at a .05 level of significance. Descriptive statistics of frequency and simple percentage was used to analyze the demographic data of the respondents while the research questions was presented in percentage and frequency and hypotheses were analyzed with inferential statistics of chi-square at 0.05alpha level of significance using Statistical Product and Service Solution (SPSS) version 20.

Table 1: Distribution of sample to be selected for the Study

S/N	**Name of vendors**	**No of handlers**
1	Relaxation centre	6
2	Sister Bigs	6
3	Kay Beez	8
4	Item 7Resturant(Coca cola village)	9
5	Crub Town	8
6	Buka 1-12	14
7	Eat more(Zamfara Hostel)	8
8	IyaYusuff	6
9	Law restaurant	8
10	Berbecue (Senate building)	7
11	Famous Kitchen (ASUU Hostel)	6
12	MBOResturant(Zamfara Compound)	6
13	Oyinda kitchen	6
14	Trustee hostel (Hawa Hostel)	6
15	ArafimsRestaurant	5
16	RabiatAjikeResturant	6
17	Buka Tay	7
18	ASSU Relaxation Centre	9
	Total	**117**

Source: Researchers developed, (2025)

Results and Discussions

Table 2: *Demographic Data of Respondents*

S/N	Variables	Frequency	Percentage (%)
1	**Gender**		
	Male	25	24.1
	Female	92	78.6
	Total	117	100
2	**Age Range**		
	21-30years	55	47.0
	31-40years	46	39.3
	41-50years	13	11.1
	51- 60years	3	2.6
	Total	**117**	**100**
3	**Marital status**		
	Single	54	46.2
	Married	63	53.8
	Widow	0	0
	Divorced	0	0
	Separated	0	0
	Total	**117**	**100**
4	**Years in business**		
	1-50	88	75.2
	6-10	24	20.5
	11-15	5	4.3
	16-20	0	0
	Total	**117**	**100**
5	**Educational level**		
	Primary school	6	5.1
	Secondary school	80	68.4
	Tertiary school	31	26.5
	Total	**117**	**100**

The table shows that the majority 92(78.6%) of the handlers were females and the rest 25(24.1%) were males. With regards to age, 55(47.0%) were between ages 21-30years, while 46(39.3%) were 31-40years of age and 13(11.1%) were between ages 41-50years and the rest 3(2.6%) were between ages 51-60years. The majority of the handlers representing 63(53.8%) were married while the rest 54(46.2%) were single. For years in business, the majority representing 54(75.2%) had between 1-5 years in business while 24(20.5%) had 6-10 years experience in the business and the remaining handlers 5(4.3%) had 11-15 years experience. The majority of the handlers 80(68.4%) attended secondary school, while 31(26.5%) had tertiary education and the rest 6(5.1%) had only primary school education.

Answers to the Research Questions

Research Question One: Do food handlers in University of Ilorin practice proper hand washing to prevent food hazards?

Table 3: *Percentage Analysis of Proper Hand Washing Practice in Preventing Food Hazard among Food Handlers in University of Ilorin*

S/N	Items	SA	A	PP	D	SD	GP
1.	How often do you wash your hands for at least 20 seconds?	0 (0.0%)	0 (0.0%)	0	69 (59.0%)	48 (41.0%)	117
2.	How often do you wash your hands with soap and water?	0 (0.0%)	0 (0.0%)	0	91 (77.8%)	26 (22.2%)	117
3.	Do you allow the soap to form foam with the water before washing hands with it, if yes, how often?	0 (0.0%)	0 (0.0%)	0	79 (67.5%)	38 (32.5%)	117
4.	How often do you wash the back of your hands between your fingers and under the nails?	0 (0.0%)	0 (0.0%)	0	60 (51.3%)	57 (48.7%)	117
5	Do you leave your hands to dry before handling any food or food item, if yes, how often?	0 (0.0%)	17 (14.5%)	17	80 (68.4%)	20 (17.1%)	100
6.	Do you use any cloth around to dry your hands after washing, if yes, how often?	0 (0.0%)	5 (4.3%)	5	22 (18.8%)	90 (76.9%)	112
7.	I wash my hands frequently after every procedure, if yes, how often	0 (0.0%)	0 (0.0%)	0	39 (33.3%)	78 (66.7%)	117
				22 (2.68%)			**797 (97.31%)**

***Note*: PP - Poor Practice. GP - Good Practice**

Table three shows the answer to research question one. The mean of good practice by the handlers to the items is 797(97.31%), which is greater than the mean of poor practice 22(2.68%). This indicates a high level of compliance with handwashing protocols among food handlers at the University of Ilorin

Research Question 2: Do food handlers in University of Ilorin practice proper food handling to prevent food hazards?

Table 4: *Percentage Analysis of Proper Food Handling Practice in Preventing Food Hazard among Food Handlers in University of Ilorin*

S/N	Items	Yes	No
1	Evidence of serving and collecting money concurrently	5 (4.3%)	112 (95.7%)
2	Evidence of exposing foods while serving	0 (0.0%)	117 (100.0%)
3	Evidence of serving food with bare hands	3 (2.6%)	114 (94.4%)
4	Evidence of picking nose or scratching body while handling foods	0 (0.0%)	117 (100.0%)
5	Evidence of talking or sneezing while handling food	19 (16.2%)	98 (83.8%)
6	Evidence of unpolished, long or dirty fingernails	53 (45.3%)	64 (54.7%)
7	Evidence of handling phones while handling foods	34 (29.1%)	83 (70.9%)
	Total	**114 (12.18)**	**822 (87.82)**

Table four shows the answer to research question two. The mean of positive observation is 822(87.82%), which is greater than the negative observation 114(12.18%). This implies that there was proper food handling practice in preventing food hazards among the food handlers in University of Ilorin.

Hypotheses Testing

Hypothesis One: There will be no significant practice of proper hand washing in preventing food hazards among food handlers in University of Ilorin.

Table 5: *Chi-square Analysis Showing Proper Hand Washing Practice in Preventing Food Hazard among Food Handlers in University of Ilorin*

S/N	Items	Never	Sometimes	Most times	All the times	df.	Cal. Val.	Tab. Val.	Decision
1.	How often do you wash your hands for at least 20 seconds?	0 (0.0%)	0 (0.0%)	69 (59.0%)	48 (41.0%)				
2.	How often do you wash your hands with soap and water?	0 (0.0%)	0 (0.0%)	91 (77.8%)	26 (22.2%)				
3.	Do you allow the soap to form foam with the water before washing hands with it, if yes, how often?	0 (0.0%)	0 (0.0%)	79 (67.5%)	38 (32.5%)	18	215.084	21.03	H_{01} rejected
4.	How often do you wash the back of your hands between your fingers and under the nails?	0 (0.0%)	0 (0.0%)	60 (51.3%)	57 (48.7%)				
5	Do you leave your hands to dry before handling any food or food item, if yes, how often?	0 (0.0%)	17 (14.5%)	80 (68.4%)	20 (17.1%)				
6.	Do you use any cloth around to dry your hands after washing, if yes, how often?	0 (0.0%)	5 (4.3%)	22 (18.8%)	90 (76.9%)				
7.	I wash my hands frequently after every procedure, if yes, how often.	0 (0.0%)	0 (0.0%)	39 (33.3%)	78 (66.7%)				
	Total	00	22	440	357				

α=0.05

Table five shows the result of research hypothesis one which states that there will be no significant practice of proper hand washing in preventing food hazards among food handlers in University of Ilorin. Chi-square analysis showed a calculated value of 215.084, which was greater than the table value of 21.03 at 18 degrees of freedom (df) (cal. X^2 val. > tab. X^2 Val.). Research hypothesis one was therefore rejected. This implies that there was significant practice of proper hand washing in preventing food hazards among food handlers in University of Ilorin.

Hypothesis Two: There will be no significant practice of proper food handling in preventing food hazards among food handlers in University of Ilorin.

Table 6: *Chi-square Analysis Showing Proper Food Handling Practice in Preventing Food Hazard among Food Handlers in University of Ilorin*

S/N	Items	Never	Sometimes	df.	Cal. Val.	Tab. Val.	Decision
1.	Evidence of serving and collecting money concurrently	5 (4.3%)	112 (95.7%)				
2.	Evidence of exposing foods while serving	0 (0.0%)	117 (100.0%)				
3.	Evidence of serving food with bare hands	3 (2.6%)	114 (94.4%)	7	215.588	14.03	H_{o3} rejected
4.	Evidence of picking nose or scratching body while handling foods	0 (0.0%)	117 (100.0%)				
5.	Evidence of talking or sneezing while handling food	19 (16.2%)	98 (83.8%)				
6.	Evidence of unpolished, long or dirty fingernails Evidence of putting on earrings, watches or other jewellery	53 (45.3%)	64 (54.7%)				
7.	Evidence of handling phones while handling foods	34 (29.1%)	83 (70.9%)				
	Total	114	822				

α=0.05

Table six shows the result of research hypothesis three which states that there will be no significant practice of proper food handling in preventing food hazards among food handlers in University of Ilorin. Chi-square analysis showed a calculated value of 215.588, which was greater than the table value of 14.03 at 7 degrees of freedom (df) (cal. X^2 val. > tab. X^2 Val.). Research hypothesis three was therefore rejected. This implies that there was significant practice of proper food handling in preventing food hazards among food handlers in University of Ilorin.

Discussion of Findings

From the result of the analysis of hypothesis one, the study found that food handlers in University of Ilorin demonstrated proper hand-washing practices. This is consistent with Pepple (2017), who reported that 84% of food vendors in Garki, Abuja, washed their hands regularly with soap and water before preparing food, 10% washed most of the time, and 6% washed sometimes and it was found out that hand washing habit of three groups used in the study were 100%, 92% and 60% respectively. Similarly, the finding concurs with the findings of Afolaranmi et al (2017); Oghenekohwo (2015); and Kubde et al (2016) that there was a proper hand-washing practice among the vendors. The findings are contrary to the observation made by Pokhrel and Shamna (2016) that most vendors were wiping hands with a towel after each preparation as opposed to their claim of washing hands after each preparation of food preparation during the interview. This implies that there is great compliance with proper hand washing as the majority of the handlers wash their hands with soap and water and wash them after every procedure.

From the result of the analysis of hypothesis two, the study found that food handlers in University of Ilorin demonstrated proper food handling in preventing food hazards. The finding is consistent with Oghenekehon's (2015) findings that there was regular use of aprons and gloves among handlers when handling food among the vendors. The finding contradicts Nurudeen et al (2014) findings that the majority of the street food vendors were serving food with bare hands, chewing and talking while serving and handling money while handling food. The findings also contradict Mulugeta and Bayeh's (2012) findings that revealed poor food handling practices by the food handlers This implies that there is proper food handling practice among the handlers as the majority of them were acting in compliance with food handling practice.

Conclusion

Based on the findings of this study, the following conclusions were drawn:

1. Food handlers in University of Ilorin practised proper hand hygiene to prevent food hazards.
2. Food handlers in University of Ilorin demonstrated proper food handling practices to prevent food hazards.

Recommendations

Based on the conclusion of this study, the following recommendations were made:

1. Food handlers should participate in regular training programs to reinforce proper hygiene and hand-washing practices.
2. The Campus Eatery Regulatory Board should implement continuous monitoring and enforcement to ensure total compliance with food handling regulations**.**

References

Adams, M. R., & Moss, M. O. (2008). *Food Microbiology*. (3rd ed.). The Royal Society of Chemistry, Cambridge, 463p.

Adebitan, E. O. (2011). *Assessing Compliance with Food Hygiene Requirements among Urban and Sub-Urban Classified Hotels in Bauchi State, Nigeria* (Master thesis, School of Hospitality and Tourism Management of Kenyatta). Kenyatta University.https://www.google.com/url?q=http://irlibrary.ku.ac.ke/bitstream/123456789/3920/3/esther%2520olaitan.pdf

Afolaranmi, T. O., Hassan, Z. I., Bello, D. A. & Misari, Z. (2015). Knowledge and Practice of Food Safety and Hygiene among Food Vendors in Primary Schools in Jos, Plateau State, North Central Nigeria. *Journal of Medical Research*, *4*(2), 16-22.

Akintaro, O. A. (2012). Food handling, hygiene and the role of food regulatory agencies in promoting good health and development in Nigeria. *International Journal of Health and Medical Information*, *1*(3), 1–8.

Akorede, S. N., & Toyin, A. (2020) Knowledge of Personal Hygiene among Undergraduates. *Journal of Health Education (JHE), 5*(2), 66-71.

Dajaan, D. S., Addo, H. O., Luke, O., Eugenia, A., Amshawu, A. & Kwasi, N. A. (2018). Food Hygiene Awareness and Environmental Practices among Food Vendors in Basic Schools at Kintampo Township, Ghana. *Food and Public Health*, *8*(1), 13-20 http://dx.doi.org/10.5923/j.fph.20180801.03

Faremi, F. A., Olatubi, M. I. &Nnabuife, G. C. (2018). Food Safety and Hygiene Practices among Food Vendors in a Tertiary Educational Institution in South Western Nigeria. *European Journal of Nutrition & Food Safety, 8*(2), 59-70. http://dx.doi.org/10.9734/EJNFS/2018/39368

Food and Agriculture Organization & Pan American Health Organisation. (2017). *Food Handlers Manual. Instructor.* http://www.fao.org/ or http://www.paho.org/

Kok, R. & Balkaran, R. (2014). Street Food Vending and Hygiene Practices and Implications for Consumers. *Journal of Economics and Behavioral Studies*, *6*(3), 188-193

Kubde, S. R., Pattankar, J., & Kokiwar, P. R. (2016). Knowledge and food hygiene practices among food handlers in food establishments. *Int J Community Med Public Health, 3*(1), 251-256. http://dx.doi.org/10.18203/2394-6040.ijcmph20151572

Mulugeta, K & Bayeh, A. (2012). The sanitary conditions of food service establishments and food safety knowledge and practices of food handlers in Bahir Dar town. *Ethiop J Health Sci, 22*(1), 27-35

Nurudeen, A. A., Lawal, A. O., & Ajayi, S. A. (2014). A survey of hygiene and sanitary practices of street food vendors in the Central State of Northern Nigeria. *Journal of Public Health and Epidemiology,6*(5), 174-181. https://doi.org/10.5897/JPHE2013.0607

Odo, A. N., & Onoh, A. N. (2018). Food Hygiene among Food Handlers in University of Nigeria, Nsukka Campus. *Mediterranean Journal of Social Sciences, 9*(6), 137-144. https://doi.org/10.2478/mjss-2018-0169

Oghenekohwo, J. E. (2015). Pattern of Food Hygiene and Environmental Health Practices among Food Vendors in Niger Delta University. *European Journal of Food Science and Technology*, *3*(1), 24-40.

Pepple, N. (2017) Environment and Food Poisoning: Food Safety Knowledge and Practice among Food Vendors in Garki, Abuja – Nigeria. *Journal of Health Education Research Development*, 5, 217. https://doi.org/10.4172/2380-5439.1000217

Pokhrel, P., & Sharma, D. (2016). A study on assessment of food safety knowledge and practices among the street food vendors of urban and semi-urban areas of Guwahati, Assam. *International Journal of Home Science, 2*(2), 85-89

Umar, I., Shehu, H., Akorede, S. N., Sa'ad, U., Suleiman, M. A., & Umaru, M. (2024). Effects of health education intervention on use of food labels among students of Federal University Dutse. *Global Journal of Health Related Researches*, *6*(1), 40-47.

Sesan, A. A. (2017). Foodborne diseases kill 5160 Nigerians yearly- Health Minister. The Punch Newspaper

White, R. (2006). Food Hygiene – Why Bother? http://www.safefood.eu/SafeFood/media/SafefoodLibrary/Education/safefood%20for%20life/NI/section1.pdf

WHO. (2015). *Estimates of the Global Burden of Foodborne Diseases: Foodborne Disease Burden Epidemiology Reference Group 2007-2015*. WHO Press. Geneva: Switzerland.