Knowledge, Attitude and Practice of Food Hygiene among Food Handlers in Port Harcourt Local Government Area of Rivers State

Elechi, C. E. (PhD) & Allison Gladys
Department of Human Kinetics,
Health and Safety Education.
Ignatius Ajuru University of Education
Port Harcourt, Nigeria
gladysallison76@gmail.com, ndameruimmanuel@gmail.com

Abstract
This study investigates the knowledge, attitude and practice of food hygiene among food handlers in Port Harcourt Local Government Area of Rivers State. A descriptive survey design was adopted as the research design for this study. The study population comprised of all the food handlers in Port Harcourt Local Government Area of Rivers State. A multi-stage sampling technique was adopted to select 400 respondents for the study. The instrument for data collection was structured questionnaire with a reliability coefficient of 0.76. Data collected was analyzed using Statistical Package for Social Science (SPSS) version 20.0. Statistical tools such as frequency and percentage were used for relevant variables. The result showed that (63.5%) were within the age range of 21-30 years, more than half (56.0%) had secondary education, and more than half (53.8%) were cooks. The type of food establishments operated include restaurant (32.0%), fast food/snacks bar (22.3%), hotel (15.8%), canteen (11.5%), bakery (11.3%), and mobile food services (7.3%). The findings of this study showed that 80.5% of the respondents had good knowledge of food hygiene. The grand mean for attitude was = 3.16 which is greater than the criterion mean = 2.5 indicating that respondents had a positive attitude towards food hygiene. The most frequent food hygiene practice was proper disposal of waste which 64.0% do always; 60.7% always trim and clean their finger nails. It was concluded that knowledge, attitude and practice of food hygiene among food handlers was good. Though knowledge of food hygiene was good, a small proportion still lack food hygiene knowledge hence, it was recommended that, food hygienists and environmental health professionals should make concerted effort to promote or increase awareness of food hygiene through enforcement of public health laws, mass media and social media.

Keywords: *Food, Food hygiene, Practice, Knowledge, Attitude, Port Harcourt.*

Introduction

Food handlers are key players in the prevention and control of food contamination hence, any knowledge deficiency on food hygiene by the food handlers poses a stern challenge to food safety. Proper food hygiene is an important practice needed to ensure that food is safe for consumption, According to Etim (2017), food hygiene is a practice of proper preparation, washing, cooking, storing and preservation of food in ways that prevent cross contamination and spread of bacteria which could lead to food poisoning. The activities involved in food hygiene include the inspection of food preparation, inspection of premises prior to commencement of operation, licensing of the food premises after satisfaction of the minimum requirement for such a license, ensuring that the food handlers are medically fit to handle food meant for public consumption amongst others (Omodu, 2012).

The importance of knowledge in the practice of food hygiene cannot be overemphasized. According to Zulkifly, Salleh, Hanafiah and Jamaluddin (2016), food hygiene knowledge is important to prevent food borne illness. In the same vein, Coleman and Roberts (2005) noted that, knowledge on the importance of food hygiene should be given to all food handlers so as to bring behavioral changes besides adopting of positive attitudes. Researchers have reported that knowledge alone is not sufficient to promote the practice of food hygiene and safe behaviors among food handlers. Attitude was found to be a strong variable for the practice of food hygiene. This was reflected in the finding of Zulkify et al (2016) which showed that, there is a significant positive correlation between attitude and practice of food hygiene among food handlers ($p < 0.05$). However, identifying both knowledge and attitudes are essential to ensure the practice of food hygiene and to prevent the occurrence of food borne diseases, which is a public health problem.

Food borne diseases have caused a significant morbidity and mortality around the world. The United States of America reports that around 76 million food borne diseases occur annually with 325,000 people hospitalized and 5200 cases of mortality (Buzby& Roberts, 2009). In Nigeria, a case of food poisoning at a restaurant was reported in Calabar in the Tide Newspaper on the 27th of March 2017. Similarly, NAFDAC (2018) reported from a nationwide investigation in Port Harcourt, Abuja and Lagos that, a total of 3,300kg of vegetables were contaminated. Research has shown that food handlers are the main cause of food contamination (Pokhrel, Pokhrel, Chhetri, Awate & Sah, 2015). The hands of food handlers can be the vector to spread harmful microorganism through cross contamination. This can occur if they ignore the importance of food hygiene practices during food preparation. Food handlers can also spread harmful microorganism during and after they experience gastrointestinal infection.

Food handlers should have excellent hygiene practice to reduce cross contamination, thus protecting the consumers from food borne diseases. According to Martins, Hogg and Otero (2012), to ensure that food handlers practice proper food hygiene, knowledge and positive attitude are indispensible. The study of Zulkify, Salleh, Hanafiah and Jamaluddin (2016) revealed that, there is a significant positive correlation between knowledge, attitude and practice of food hygiene among food handlers. However, there is paucity of studies found on this subject matter in Nigeria, particularly Rivers State. Hence, this study is aimed at investigating the knowledge, attitude and practice of food hygiene among food handlers in Port Harcourt Local Government Area of Rivers State.

Methodology

Research Design

The research design adopted for this study is a descriptive cross-sectional survey design. According to Elendu (2010), the descriptive cross-sectional design is one that generates data from a selected population, studying and describing events as they occur in their natural setting at a particular time.

Study Population

The study population comprised of all the food handlers in Port Harcourt Local Government Area of Rivers State.

Sample Size Estimation

The minimum sample size required was estimated using Fisher's formula:

$n = z^2pq/d^2$

Where, n = the desired sample size z = the standard normal deviate set at 1.96 [95% confidence level (CI)]

P = the proportion in the target population estimated to practice food hygiene (37%) Iwu et al (2017).

q = 1-p (1-0.37 = 0.63)

d = desired level of accuracy, set at 0.05

$n = 1.96^2 \times 0.37 \times 0.63/0.05^2$

n = 358. This was increased to 400 to improve the power of the study.

A multi-stage sampling technique was adopted for the study. The technique involved three stages. At the first stage, the simple random sampling technique was used to select five communities in the L.G.A; at the second stage some food establishments were taken from the selected communities through a simple random sampling technique; and at the third stage, the purposive sampling were used to select the food handlers.

Instrument for Data Collection

The instrument for data collection in this study was a structured questionnaire with a reliability coefficient of 0.76. The instrument consisted of four sections A – D. Section A addressed the personal data of the respondents, section B illicited responses on knowledge of food hygiene, section C addressed the attitude toward food hygiene and section D addressed food hygiene practices.

Methods of Data Collection and Analysis

Data collection was done by a face to face delivery of the questionnaire to the respondents. The data collected were analyzed using the statistical package for social sciences (SPSS) version 20.0. Data analysis was done using some statistical tools such as frequency and simple percentage.

Research questions: This study provides answer to the following research questions:

1. What is the level of knowledge of food hygiene among food handlers in Port Harcourt Local Government Area, Rivers State?
2. What is the attitude of food handlers towards food hygiene in Port Harcourt Local Government Area, Rivers State?
3. What are the practices of food hygiene among food handlers in Port Harcourt Local Government Area, Rivers State?

Results

Table 1: Frequency distribution showing the personal data of respondents

Items	Frequency (F)	Percentage (%)
Age		
11-20	55	13.8
21-30	254	63.5
31-40	69	17.3
41-50	22	5.5
Total	**400**	**100.0**
Educational status		
None	19	4.8
Primary	17	4.2
Secondary	224	56.0
Tertiary	140	35.0
Total	**400**	**100.0**
Job specification		
Proprietor	13	3.3
Manager	109	27.3
Cook	215	53.8
Waiter	63	15.8
Total	**400**	**100.0**
Years of working experience		
<1	82	20.5
1-3	104	26.0
4-6	87	21.8
7-9	58	14.5
10 years above	69	17.3
Total	**400**	**100.0**
Type of food establishment		
Hotel	63	15.8
Bakery	45	11.3
Restaurant	128	32.0
Fast food/snacks bar	89	22.3
Mobile food services	29	7.3
Canteens	46	11.5
Total	**400**	**100.0**

Table 1 revealed that more of the respondents (63.5%) were within the age range of 21-30 years, 17.3% 31-40 years, 13.8% 11-20 years and 5.5% 41-50 years. More than half (56.0%) had secondary education, 35.0% had tertiary, 4.8% had no formal education while 4.2% had primary education. More than half (53.8%) of the respondents were cooks, 27.3% were managers, 15.8% were waiters while 3.3% were proprietors. The type of food premises or establishments operated were: restaurant (32.0%), fast food/snacks bar (22.3%), hotel (15.8%), canteen (11.5%), bakery (11.3%), and mobile food services (7.3%).

Research question 1: What is the level of knowledge of food hygiene among food handlers in Port Harcourt Local Government Area, Rivers State?

Table 2: Level of knowledge of food hygiene

Knowledge	Score	Frequency	Percentage	Mean score
Good	7-14	322	80.5	8.69
Poor	1-6	78	19.5	
Total	**14**	**400**	**100**	

Table 2 revealed the knowledge score of respondents. The total knowledge score is 14. The finding of the study shows that 322(80.5%) of the respondents scored above the average (7) and were assumed to have good level of knowledge on food hygiene and 78(619.5%) scored less

Research question 2: What is the attitude of food handlers towards food hygiene in Port Harcourt Local Government Area, Rivers State?

Table 3: Attitude towards food hygiene

Items	SA	A	D	SD	Mean
Food handlers must wear apron while preparing and serving food	153(38.2)	164(41.0)	75(18.8)	8(2.0)	3.15
Food handlers must cover their hair while cooking and serving food	166(41.5)	138(34.5)	80(20.2)	16(4.0)	3.17
Food handlers must clean their finger nails frequently	178(44.5)	159(39.8)	0(0.0)	63(15.8	3.29
Hand washing is mandatory before and after handling food	177(44.3)	167(41.8)	48(12.0)	8(2.0)	3.28
Food handlers with an open wound should not prepare food	126(31.5)	170(42.5)	80(20.0)	24(6.0)	2.99
Water used for washing utensils must be changed frequently	95(24.2)	229(58.4)	62(15.5)	6(1.5)	3.05
Grand mean					**3.16**

Criterion mean = 2.5.

Table 3 revealed the attitude of respondents towards food hygiene. The table shows that the grand mean = 3.16 is greater than the criterion mean = 2.5 which indicates that respondents had a positive attitude towards food hygiene.

Research question 3: What are the practices of food hygiene among food handlers in Port Harcourt Local Government Area, Rivers State?

Table 4: Food hygiene practices

SN	Items*	Always	Occ.	Rarely	Never	Mean	Decision
1	Washing of hand with soap and water before and after handling of food	197(51.3)	138(35.9)	35(9.1)	14(3.5)	3.35	Good
2	Wearing of apron and cap while preparing and serving food	86(22.4)	159(41.4)	38(9.9)	101(26.3)	2.59	Good
3	Embarked on medical examination before handling food	33(8.8)	48(12.8)	41(10.9)	254(67.6)	1.63	Poor
4	Water treatment	95(25.3)	74(19.7)	0(0.0)	206(54.9)	2.15	Poor
5	Washing of kitchen utensils before and after use	197(51.3)	156(40.6)	6(4.6)	25(6.5)	3.37	Good
6	Covering of hair while preparing food	144(37.5)	147(38.3)	29(7.6)	64(16.7)	2.97	Good
7	Changing of water used for washing kitchen utensils	173(45.1)	179(46.6)	24(6.3)	8(2.0)	3.35	Good
8	Handle food with polished finger nails	47(12.5)	126(33.4)	22(5.8)	182(48.3)	2.10	Poor
9	Trim and clean finger nails	233(60.7)	138(34.5)	6(1.6)	7(1.8)	3.55	Good
10	Proper disposal of waste	256(64.0)	106(27.6)	14(3.6)	8(2.0)	3.59	Good
11	Carryout cleaning operation like sweeping and dusting during food preparation	150(40.8)	135(33.8)	6(1.6)	77(20.9)	2.97	Good
12	Use of separate chopping boards for meats and vegetables	83(21.6)	112(29.2)	29(7.6)	160(41.7)	2.31	Poor
13	Tasting of food with separate spoon	161(42.7)	69(17.3)	25(6.6)	122(32.4)	2.71	Good
	Grand mean					**2.82**	**Good**

*Non responses excluded

The most frequent food hygiene practice was proper disposal of waste which 64.0% do always; 60.7% always trim and clean their finger nails; 51.3% of the respondents always wash their hands with soap and water before and after handling of food; 51.3% always wash their kitchen utensils before and after use; 45.1% always change water used for washing kitchen utensils;

42.7% taste their food with separate spoon;.; 37.5% always cover their hair while preparing food; about one quarter (25.3%) always treat their water; 22.4% always wear apron and cap while preparing and serving food; 21.6% always used separate chopping boards for meats and vegetables; and only few (8.8%) embarked on medical examination before handling food. Overall, the grand mean = 2.82 is greater than the criterion mean = 2.5 which indicates that the respondents had good practice of food hygiene however, 40.8% always carryout cleaning operation like sweeping and dusting during food preparation and 12.5% always handle food with polished nails which are bad food hygiene practices.

Discussion of Findings

The finding of the study shows that majority (80.5%) of the respondents have good level of knowledge on food hygiene. This finding is not surprising because, there is the likelihood that modern information and communication channels such as the mass media and social media are helping to fill the gap in knowledge of healthy practices including food hygiene, this might be responsible for the good knowledge found in this study. The finding of this study is similar to that of Pokhrel et al (2015) and Iwu et al (2017) were majority of the respondents were found to have good knowledge. The similarity between the previous study and the present one might be due to the similarity in the population studied. However, the finding of this study differs from that of Galgamuwa, Iddawela and Dharmaratne (2016) where a lesser (59.6%) proportion of the food handlers were found to have good knowledge of food hygiene. The reason implicated for this difference that the previous study used a very small sample size compared to the present study and was focused on handlers in plantation sector only whereas the presents study was conducted among food handlers in different food establishments. The finding of this study is at variance with that of Kubde, Pattankar and Kokiwar (2016) where 27.9% of the respondents were found to have good knowledge of food hygiene. The smaller sample used in the previous study might be implicated for this variation. Also, the finding of this study varies from that of Shehbaz (2016) where only 14.8% participants have proper knowledge of food hygiene. This variation found in the previous study and the present one can be due to the fact that the sources of primary data in the two studies were different. The previous study used a checklist for collection of primary data whereas the present study used a structured questionnaire. This might be implicated for the variation seen in the two studies.

The finding of this study showed in table 4.3 that the study respondents had a positive attitude towards food hygiene. Specifically, 98% were found to have positive attitude towards food hygiene. It can be deduced from this result that the attitude of respondents is in corroboration with their knowledge of food hygiene. The finding of this study is support of that of Lin (2010) whose result showed a positive attitude of respondents towards food hygiene. The finding of this study is also in line with that of Pokhrel et al (2015) where majority of the respondents had positive attitude towards food hygiene. The finding of this study is also similar to that of Kubde, Pattankar and Kokiwar (2016) where 96.5% of the respondents were found to have proper attitude towards food hygiene. This similarity might be due to the fact that study population in the both studies covered the food handlers working in different type of food establishments. There is a slight difference found in the present study and that of Iwu et al (2017), where a bit lesser proportion (71%) of the respondents had positive attitude towards food hygiene. This slight difference might be due to the difference in the location. The finding of this study is at variance with that of Aluh and Aluh (2017) where less than half (43.5%) of the respondents had an appropriate attitude towards Food hygiene. The smaller sample size (200) in the previous study, which is half of the sample used in the present study might be the reason for the variation found in the two studies.

The finding of this study showed in table 4.4 that overall, majority of the study respondents had good food hygiene practice. This finding had shown that the good knowledge and positive attitude respondents have towards food hygiene was translated to practice. The finding of this study is similar to that of Pokhrel et al (2015) where the result showed that, majority had good practice of food hygiene. The finding of this study differs from that of Chukuezi (2010) where the study respondents were found to prepare their food under unhygienic conditions. This difference is due to the difference in the location of the two studies. The finding of this study also showed that 51.3% of the respondents always wash their hands with soap and water before and after handling of food; 51.3% always wash their kitchen utensils before and after use. This finding is at variance with that of Galgamuwa, Iddawela and Dharmaratne (2016) where the result showed that, 59.5% of studied food handlers were found to have good practice of food safety and hygiene. 54.4% always clean and sanitize food preparing equipment and tools before and after use, More than 50.0% of respondents never used proper hand washing techniques with soap and water during the time of food preparation. The finding of this study is also different from Kubde, Pattankar and Kokiwar (2016) where a greater percentage (83.3%) of the respondents wash their hands before serving food. The finding of this study is also different from that of Aluh and Aluh (2017) where a greater proportion of respondents were found to wear aprons and covered their hair while handling food. The difference found in the previous studies and the present one might be due to the difference in the study locations or sample size used.

Conclusion

Based on the data and the findings, it was concluded that; knowledge, attitude and practice of food hygiene was good and contrary to the findings from other studies, the good knowledge and attitude toward food hygiene found in this study was expressed or translated to practice by the respondents.

Recommendations

Based on the findings of this study the following recommendations were made:

1. Employers of labour in the food establishments should employ the services of food hygienists to train the food handlers on food hygiene and be monitored closely to ensure they inculcate food hygiene practices.
2. Though knowledge of food hygiene was good, a small proportion still lack food hygiene knowledge hence, food hygienists and environmental health professionals should make concerted effort to promote or increase awareness of food hygiene through the mass media and social media.
3. Governments should enforce quality food hygiene assessment parameters for food establishments.

Contribution to Knowledge

This study contributes to knowledge as it has broken new grounds on the food hygiene practices of food handlers in Port Harcourt and as such provides an additional insight to the knowledge, attitude and practice of food hygiene.

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