KNOWLEDGE, ATTITUDE AND PRACTICE OF FOOD HYGIENE AMONG FOOD VENDORS IN A SELECTED TERTIARY EDUCATIONAL INSTITUTION IN BENIN CITY, EDO STATE

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Abstract.
The study was designed to investigate knowledge, attitude and practice of Food Hygiene among Food Vendors in a selected tertiary educational institution in Benin City, Edo State using descriptive cross-sectional survey design. Snowball sampling technique was used to select 250 food vendors involved in the study. A validated and reliability tested structured questionnaire was utilised to collect data. The study was guided by four research questions and two hypotheses. Data analysis was done using SPSS version 21. Results showed that the majority of food vendors were females, of age 31 years and above, with tertiary education, Christians and Binis. The knowledge of food vendors was good with a mean value of 1.85(62%). However, a poor knowledge was observed in ´Maintenance of food hygiene which involves only the processes during food preparation with a mean value of 1.14. The attitude of the vendors was positive with a mean value of 1.73 (57.6%). It was observed also; that food hygiene practice was positive with a mean value of 2.06. However, poor attitude and practice were noted in some areas. Two hypotheses were tested and result observed tha´t there is significant relationship between the level of education of food vendors and their knowledge of food hygiene; (χ^2 = 18.75; df =2; p=0.000) and lastly, there is relationship between the sex of the food vendors and their practice of food hygiene (χ^2=51.4; df= 2; p= 0.000). Conclusively, the knowledge, attitude and practice of food hygiene were moderately satisfactory. However, periodic health education and medical examination are recommended for the food vendors.

Keywords; *Food hygiene, Food vendors, knowledge, Attitude, practice*

Introduction

The importance of food to life has been long established from the earliest time of human existence. The main functions of food include the provision of energy, growth and repair of tissues and cells, enhancement of immune and developmental functions, among others. Students, who have left their homes to various tertiary institutions, it is very important to meet the need from an adequate diet. Burrow, Whatnall, Patterson and Nutchesson (2017) explained that a proper diet is needed to enhance the academic performance of students. Although the importance of food cannot be

overemphasized, there have been recorded cases of death and illness related to consumption of food not properly handled. One of such was reported by Adedoyin, Ojuawo, Adesiyun, Mark & Anigilge (2018) which was a case of food poisoning due to consumption of yam flour. Investigation revealed that the flour contained lethal preservatives which almost claimed the lives of five families.

World Health Organization (WHO) also reported in 2009 that out of two million cases of food poisoning, there were about twenty thousand deaths. These reports and many others show the importance of food hygiene in maintaining public health. This is because most cases of food poisoning implicate harmful microorganisms which include species of *Salmonella, Shigella, Escherichia Coli and staphylococcus aureus* (Sujeet & Vipin 2015). Several studies have been carried out to assess food hygiene knowledge, attitude and practice among food vendors. Kubde, Pattankar & Kokiwar (2016) studied knowledge and food hygiene practice among food handlers in food establishments. It was stated that food handlers or vendors with poor personal hygiene and lack of awareness in preventing foodborne diseases could be potentially sourced from harmful microbes which cause a wide variety of gastrointestinal infections. Okojie, Wagbtsom and Ighoroge (2015) in assessing the level of food hygiene among food handlers in a Nigerian University campus revealed that the knowledge and practice of food hygiene were poor and massive health education was recommended. A food vendor has significant responsibility for ensuring food hygiene (Gabrehiwot Gizaw & Teka 2014). This study, therefore, aimed at investigating the knowledge, attitude and practice of food hygiene among food vendors in a selected tertiary educational institution in Benin City, Edo State.

Statement of the Problem

An adequate diet is necessary to maintain health and enhance learning. Long lecture hours and study periods have compared many students to eat from food vendors in the campus. Incidence of gastrointestinal disorders and food poisoning such as diarrhea and vomiting, severe indigestion, cramps, bloating, constipation and abdominal discomfort are common among student in the health facility in the campus. Kubde, Pattankar and Kokiwar (2016) studied the knowledge and food hygiene practice among food handlers in food establishments, concluded that food handlers or vendors had poor personal hygiene and lack awareness in the prevention OF foodborne diseases which might be a potential source of harmful microbes that caused a wide variety of gastrointestinal infections. Also, Okojie, Wagbtsom and Ighoroge (2015) assessed the level of food hygiene among food handlers in a Nigerian University campus, which revealed that the knowledge and practice of food hygiene were poor and, therefore, massive health education was recommended. These signs and symptoms associated with food poisoning on students are capable of hindering their normal activities and academic performance. The researchers best of knowledge, are aware that there is a dearth of empirical and literature information concerning the study area. Hence, the essence of this current study is to bridge the gap that exists empirically and in literature in the research setting.

Research Questions

1. What is the demography of the food vendors in the selected tertiary educational institution in Benin City?
2. What is the food vendors knowledge on the food hygiene in the selected tertiary educational institution in Benin City?
3. What is the attitude of the food vendors in the selected tertiary educational institution in Benin City towards activities promoting food hygiene?
4. To what extent do the food vendors practise food hygiene in the selected tertiary educational institution in Benin City?

Research Hypotheses

1. There is no significant relationship between the level of education and the knowledge of food hygiene among the food vendors in the selected tertiary educational institution in Benin City.

2. There is no significant association between the sex of food vendors and the practice of food hygiene among the food vendors in the selected tertiary educational institution in Benin City.

Methodology

The study design is a cross-sectional descriptive survey which is used to investigate the knowledge, attitude and practice of food hygiene among food vendors in a selected tertiary educational institution in Benin City. This design was preferred because it is appropriate for describing relationships among phenomena at a fixed point in time (Omorogiuwa, 2006).

The study was carried out in the University of Benin, Benin City Edo State, which has two campuses located in Ugbowo (Ovia North-East local government area) and Ekenwan campus (Egor local government area). The food vending sites were located in the various halls of residence for students, shopping complexes in the various faculties, and some other locations within the school.

The target population consist of food vendors in University of Benin found operating in various shopping complexes, halls of residence and at a general food vending point in the campus commonly called "Buka". Three hundred and one (301) vendors formed the target population. The sample size was calculated using the Taro Yamane formula, and a sample size of 250 vendors was involved in the study.

Snowball sampling technique was used to select the respondents because there is no record of food vendors in the student affairs office. The snowball sampling technique is non-probability sampling technique in which the existing study subjects recruit the future subjects from among their acquaintance. These research subjects (food vendors) are melt in their various locations in the school that are present at the time of the distribution of the questionnaires.

A close-ended questionnaire which was validated by two experts in Human Nutritionist, one Educationist and one seasoned researcher in the field of health care practice. The reliability of the instrument was established using split-half test from a pilot study conducted among 20 participants (which represent almost 10% of the sample size for the study) in a similar University environment outside Benin City was used to collect data.

Permission was obtained from the ethical committee with reference approval number CMS/REC/2019/088 dated 26th June 2019 to conduct the study in the school. Other ethical considerations such as confidentiality, anonymity and maleficent were strictly observed in the conduct of the study. Data were presented using frequency distribution tables, means and chi-square were used to test hypotheses at a significance value of 0.05.

RESULTS The results of the study are presented based on the research question and hypotheses in tables one to six.

Research Question One

What is the demography of the food vendors in the selected tertiary educational institution in Benin City?

Table 1: Demographic distribution of food vendors.

Gender	**Frequency**	**Percentage**
Male	37	14.8
Female	213	85.2
Age		
18 – 24yrs	34	13.6
25 - 31yrs	102	40.8

31 – Above	114	45.6
Level of Education		
Primary	5	2
Secondary	95	38.0
Tertiary	150	60.0
Others	0	0.0
Ethnic Group		
Igbo	85	34.0
Yoruba	22	8.8
Hausa	5	2.0
Bini	130	52.0
Others	8	3.2
Religion		
Christian	175	70.0
Islam	70	28.0
Traditional	5	2.0
Others	0	0

Table I shows that female recorded a higher frequency of 213 (85.2% than the male with a frequency of 37 (14.8). The age group of 31 and above recorded the highest frequency of 114 (45.6%) followed age 25-31 with a frequency of 102(40.8%) and the least being 18-24 with a frequency of 34 (13.6%). The tertiary education recorded the highest frequency of 150(60%) followed by secondary education with a frequency of 95 (38%) and the least being primary education with a frequency of 5(2%).
The Bini and Christian are the dominant groups with a frequency of 130(52%) and 175(70%) respectively.

Research Question Two

What are food vendors knowledge on the food hygiene in the selected tertiary educational institution in Benin City?

Table 2: Food vendors knowledge of the food hygiene.

Food hygiene knowledge	**Yes (%)**	**No (%)**	**Mean**	**Decisions**
1 Food hygiene involves proper handling, preparation and preservation of food to prevent foodborne illness.	250 (100)	0 (0.0)	2.00	Good
2 Maintenance of food hygiene involves only the processes during food preparation.	35 (14)	215 (86)	1.14	Poor
3 Personal hygiene is an important part of food hygiene.	242 (96.8)	8 (3.2)	1.96	Good

4 In maintaining food hygiene, a clean apron should be worn from home.	247 (98.8)	3 (1.3)	1.98	Good
5 A cap or head covering should be worn during food preparation.	240 (96)	10 (4)	1.96	Good
6 Dangling earrings, rings, bracelets and necklaces should not be used in the work area.	245 (98)	5 (2.0)	1.98	Good
7 Food items can safely be used at any time as long as there are no obvious signs of spoilage.	244 (97.6)	6 (2.4)	1.97	Good
8 To ensure food hygiene, hand washing should commence immediately after entering the facility before work begins.	247 (98.8)	3 (1.2)	1.98	Good
9 Refrigeration of defrosted foods promotes food hygiene.	150 (60)	100 (40)	1.61	Good
10 Proper waste disposals can promote food hygiene	244 (97.6)	6 (2.4)	1.97	Good
11 **Total Mean**	(85.5)	(14.5)	**1.85**	**Good**

Scale: Mean > 1.50 = Good (2 Point dichotomous Scale)
Mean < 1.50 = Poor *The values in Parenthesis are in Percentages.

The table 2 shows that the food vendors are moderately knowledgeable on food hygiene with a mean score of 1.85 (61.6%). In all items under the knowledge category, the food vendors score good except for item 2 with a score of poor knowledge. The item states ''Maintenance of food hygiene involves only the processes during food preparation''

Research Question Three
What is the attitude of the food vendors in the selected tertiary educational institution in Benin City towards activities promoting food hygiene?

Table 3: Attitude of the food vendors towards food hygiene.

Attitude of Vendors	**Agree %**	**Disagree %**	**Mean**	**decisions**
1. Hand washing several times during food preparation is not necessary.	18(7.2)	232(92.8)	1.07	Negative
2. An apron must be worn at all times during food handling.	245(98)	5(2)	1.98	Positive
3. Head covering must be worn by all those involved in the food handling process	220(88)	30(12)	1.88	Positive
4. Food handlers should go for regular medical examination to maintain food hygiene.	130(52)	120(48)	1.52	Positive
5. Food handlers need to take a break when they are ill.	235(94)	15(6)	1.94	Positive
6. Eating or drinking during food preparation is acceptable.	78(31.2)	172(68.8)	1.312	Negative
7. Waste bins with lids must be used during food preparation.	205(82)	45(18)	1.82	Positive
8. There is no need to wear gloves during food preparation.	234(93.6)	16(6.4)	1.936	Positive

9. Food handlers do not need to trim their nails.	240(96)	10(4)	1.96	Negative
10. There is no need to establish and enforce general standards of food hygiene.	211(84.4)	39(15.6)	1.844	Positive
Average			***1.73***	***Positive***

Scale: Mean > 1.50 = Positive (2 Point dichotomous Scale)
Mean < 1.50 = Negative *The values in Parenthesis are in Percentages.

The table 3 shows the food vendors had a moderately positive attitude towards food hygiene with a mean score of 1.73 (57.6%). Out of the ten items on the attitudinal assessment, the respondents had a positive attitude on seven items while negative attitudes on three items which are as follows: -

- 1: Hand washing several times during food preparation is not necessary.
- 6: Eating or drinking during food preparation is acceptable.
- 9: Food handlers do not need to trim their nails.

Research Question Four
To what extent do the food vendors practise food hygiene in the selected tertiary educational institution in Benin City?

Table 4: Food Vendors Practice of Food Hygiene

Food Vendors' Practice of Food Hygiene	**High Extent%**	**Low Extent%**	**Never%**	**Mean**	**Decisions**
1. I start the food preparation process before having my bath.	0 (0)	0 (0)	250 (100)	1	Negative
2. Washing of hands is done several times when handling food.	86 (34.4)	147 (58.8)	17 (6.8)	2.3	Positive
3. Raw food items are kept separate from food for immediate consumption.	97 (38.8)	150 (60.0)	3 (1.2)	2.57	Positive
4. Gloves are worn during food preparation.	55 (22)	111 (44.4)	84 (33.6)	1.88	Negative
5. Dangling earrings and other jewellery are worn during food preparation.	170 (68)	67 (26.8)	13 (5.2)	2.63	Positive
6. A cap is worn while preparing food.	120 (48)	90 (36)	40 (16)	2.32	Positive
7. Eating or drinking usually occurs during food preparation.	24 (9.6)	26 (10.4)	200 (80)	1.3	Negative
8. Left-over food is reheated for sale.	0 (0)	150 (60)	100 (40)	1.6	Negative
9. I wash my apron after each day's work.	198 (79.2)	52 (20.8)	0 (0)	2.7	Positive

10. I cook when I'm ill with cold, catarrh or cough.	7 (2.8)	200 (80)	43 (17.2)	1.85	Negative
11. A waste bin with a lid is used for storing refuse	176 (70.4)	70 (28)	4 (1.6)	2.6	Positive
OVERALL AVERAGE				**2.06**	**Positive**

Scale: Mean > 2.0 = Positive (3 Point Likert Scale)
Mean < 2.0 = Negative *The values in Parenthesis are in Percentages.

Table 4 shows the food vendors had a fair practice of food hygiene with a mean score of 2.06 (51.5%). Of the eleven items, positive food hygiene practice was recorded in six items while five items had negative food hygiene practice. These items with negative food hygiene practice are as follows: -

- 1: I start the food preparation process before having my bath.
- 4: Gloves are worn during food preparation.
- 7: Eating or drinking usually occurs during food preparation.
- 8: Left-over foods are reheated for sale.
- 10: I cook when I′m ill with cold, catarrh or cough.

Hypothesis One
There is no significant relationship between the level of education and the knowledge of food hygiene among the food vendors in the selected tertiary educational institution in Benin City.

Table .5: Chi-Square for Educational Qualification and Food hygiene knowledge							
Educational Qualification	Food hygiene knowledge		Total	**Chi-Square**	df	Asymp. Sig. (2-sided)	Decision
	Good	Poo		Value			

	od	or					
Primary	1	4	5	18.75	2	0.000	Statistically Significant.
Secondary	80	15	95				
Tertiary	133	17	150				
Total	214	36	250				

Table .5 shows that food vendors with tertiary Education recorded the highest frequency of 150 of tertiary education and a total of 214 respondents had good food hygiene knowledge while only 36 food vendors had poor knowledge food hygiene in University of Benin. The null hypothesis of no significant relationship between the level of education and the knowledge of food hygiene among the food vendors in the selected tertiary educational institution in Benin City were subjected to the statistical testing of chi-square which shows that the computed chi-square value of 18.75 at two degrees of freedom greater than a critical value of 5.99 at the p-value of 0.05 (see table 5). This suggests that there is a relationship between food vendor education and food hygiene knowledge. Hence, the computed chi-square is statistically significant with p-value 0.000 and therefore, the null hypothesis is rejected and the alternate accepted.

Hypothesis Two

There is no significant association between the sex of food vendors and the practice of food hygiene among the food vendors in the selected tertiary educational institution in Benin City.

Table 6: Chi-Square for Sex and Food Hygiene Practice

Sex	Food Hygiene Practice			Total	**Chi-Square**	df	Asymp. Sig. (2-sided)	Decision
	High Extent	Low Extent	Never		Value			
Male	7	20	10	37	51.4	2	0.000	Statis

								tically Significant
Female	163	40	10	213				
Total	170	60	20	250				

Table 6 shows that high extent of food hygiene practice recorded the highest frequency of 170 followed by a low extent of practice with a frequency of 67. In all, a total of two hundred and thirteen (213) were female while the male was thirty-seven (37). The null hypothesis of no significant association in the practice of food hygiene between sex of vendors in the selected tertiary educational institution in Benin City was subjected to the statistical testing of chi-square which shows that the computed chi-square value of 54.4 at two degrees of freedom greater than a critical value of 5.99 at the p-value of 0.05 (see table 6). This suggests that there is an association between food vendors sex and food hygiene practice. Hence, the computed chi-square is statistically significant with p-value 0.000 and therefore, the null hypothesis is rejected and the alternate accepted.

Discussion of Findings

The study was carried out to assess the knowledge, attitude and practice of food hygiene among food vendors in the University of Benin. The results of the study showed that 14.8% were males, while the remaining 85.2% were females. Similar sex distribution was seen in a study conducted by Aluh and Aluh (2017), with 94.11% females. The dominance of females in the food business as a result of the cultural practices of raising female to learn how to cook and feed the family. Oke, (1984) stated that the Nigeria culture has made the female child close to the kitchen where they learn the art of cooking while the males are designed for hunting, fishing, and farming and any other adventure. The following values, 34%, 8.8 %, 2.0% and 52.0% were found to be from the Igbo, Yoruba Hausa and Bini ethnic groups respectively. The Binis being in majority was very appropriate

because the study was domicile in Benin City. 2%, 38% and 60% were found to have primary, secondary and tertiary levels of education respectively. The 60% proportion having tertiary education engaged food vendors may be due to lack of gainful employment. In the study carried out by Adebukola, Opyeyemi and Ayodeji (2015) the food vendors with a secondary level of education were more (30.9%) with 17% having no formal education. A similar proportion of food vendors with a secondary level of education was found in the study carried out by Afolaranmi, Hassan, Bello and Misari. (2015) and Ituma, Akpa and Iyare. (2017) with 55.2% and 54.15 respectively. Galagamuwa, Iddawela, and Dharmoratne, (2016), however, reported a higher proportion (71%) of food vendors with primary educational qualifications, while Ntow, Kwabla, and Der (2016) had 60.43%. In this study, 13.6% were between the age ranges of 18-24, 40.8% were between the ages of 25-31, while 45.6% were above 31 years. The ages of 30 above years are the prime of the productive workforce. With regards to religion, 70%, 28.8%, and 2% practised Christian, Islamic and traditional religions respectively. Most Binis are Christian hence, the current result. Afolranmi et al. (2015) and Ntow et al. (2016) also had 68.4% and 61.5% Christian vendors, respectively.

The level of knowledge among the food vendors was almost universal as all of them knew about food hygiene involving the proper handling of food to prevent foodborne illness. 96.8% agreed that personal hygiene could improve food hygiene. The vendors also shared this view in a study carried out by Ismail, Chike, Muhammad and Yusoff (2016). The food vendors also agreed that the use of a clean uniform, washing of hands as well as using a clean uniform could help to improve food hygiene. This finding is similar to that done by Akabanda, Hlortsi & Owusu-Kwarteng. (2017) with the food vendors hygiene knowledge is only 48.5%, however, agreed that pest control was necessary to maintain food hygiene. In some other studies, the level of food hygiene knowledge was not satisfactory. Adebukola *et al*. (2015) reported that 7.6% had adequate knowledge, 50.7% had average knowledge, while the remaining 41.6 have poor knowledge. There is a strong relationship between the food vendors education qualification and food hygiene knowledge with p-value 0.000. This assertion was supported by Iwu, Uwakwe and Duru, et al. (2017) and Faremi, Olatubi and Nnabuife. (2018) that educational qualification of the food vendors to improve their food hygiene knowledge.

The attitude of the food vendors towards food hygiene was found to be positive. Hand washing and cleaning of cooking surfaces were viewed as proper by all the food vendors involved in the study. 88% agreed that the hair should be covered while cooking; however, only 6.4% agreed that gloves should be worn. 94% also agreed that food vendors should take a leave of absence when they are ill. 68% also did not see it as proper to eat, drink or smoke while cooking. 52% also saw it as proper to go for the medical examination to improve food hygiene. A similarly satisfactory attitude was observed in the study carried out by Kubde, Pattankar and kokwar. (2016). Lee, Halim, Thong, and Chairman (2017) also reported a positive attitude. However, Ezenwoko, Awosun, Once, Makosidi, Abubakar and Raji. (2017) and Faremi *et al*. (2018) reported a poor attitude on the part of the food vendors involved in their study.

The level of practice of food hygiene by the food vendors involved in this study was also assessed in the study. Thus, 93.2% of the food vendors wash their hands while handling food. Afolaranmi et al. (2015), however, reported a poor level of handwashing. A large number of food vendors involved in this study (98.8%) keep raw foods separate from cooked food. 93% stated that they never cook for sale when they have a skin infection. 84% of the food vendors use hair covering when handling food. This is contrasted in Ntow et al. (2016), finding, with 55% of the food vendors failed to cover their hair during food handling, especially while selling. The use of aprons by the food vendors was also found to be poor with 61.55% not using it while selling, and a large number of those who did had other reasons like a convenient face cleaner and a money purse. In this study, the majority of the food vendors 82.8% cook when they are ill with cold cough and catarrh. Galgamuwa et al. (2016), however, reported that 74.3% of the food vendors were isolated from the workplace when they were ill. A poor level of practice was seen in the habit of reheating leftover food for sale as 60% of the food vendors do so. Afolaranmi et al. (2015)), however, reported 31.6 % reheat food for sale. Generally, the food vendors had a positive practice except in a few hygiene promoting activities. A

similarly good level of practice was seen among food vendors in the Niger Delta Universities Communities (Oghenekohwo 2015) where the food vendors practised regular hand washing, covering of food to prevent flies from perching as well as the use of clean aprons. Galgamuwa et al. (2016), however, reported a small number of subjects ensuring proper control of pests, especially rodents. The study also demonstrated the association of sex of the food vendors to the practice of food hygiene in the venting site with a p-value of 0.000 which Oke, (1984) reiterated that the Nigeria culture has made the female child close to the kitchen where they learn the art of cooking while the males are designed for hunting, fishing, and farming and any other adventure.

Implications to Nursing

Health promotion and illness prevention are part of the roles of a nurse (Potter, Perry, Stockert, & Hall, 2017). The results of this study show that the vendors have an adequate level of knowledge of mean score of 1.85, attitude 1.73 and practice of food hygiene 2.06. However, there is a need for improvement in certain activities that contribute to food hygiene. The food vendors need to be given health education on activities like refreezing of already thawed (defrosted) food, cooking when they are ill with cold, cough or catarrh. Health education on the specific areas of deficits in knowledge, attitude and practice of the vendors should also be carried out. The need for medical examinations of the food vendors to improve their food hygiene. The implication of this study to nursing cuts across most areas of nursing such as clinical practice, where, the nurse as a caregiver help patient maintain and regain health, manage disease and symptoms caused by foodborne disease. Also, a nurse educator develops a curriculum that explains concepts and*--*facts about food hygiene process and demonstrates procedures such as self-care activities for the students, vendors and University community to attain a maximal level of function and independence through the healing process of gastrointestinal disorders. Lastly, nurse manager and administrator should formulate policy that will motivate health care providers to implement strategy that will create awareness on food hygiene techniques and standard food hygiene protocol for food vendor in the University campus.

Conclusion

The food vendors in the University of Benin, Benin City, have good knowledge, attitude and positive practice of food hygiene, however, poor knowledge, attitude and practice in food hygiene are observed in certain areas which were highlighted in some specific areas Jin the study.

Recommendations

The following recommendations have been made from the results of the study:

- regular medical examination should be made compulsory for food vendors to enhance food hygiene.
- the records and statistics of the food vendors should be kept with the student′s affairs office.
- regular inspection of the vendors' and their food vending sites should be carried out periodically by Public Health Nurses in the University Health Centre to ensure the maintenance of food hygiene standards.
- periodic health education and certification on the standard protocol of food hygiene practice should be done by Public Health Nurses and Home Economist to the food vendors on the campus before commencement of food sale to boost their knowledge.
- a post-intervention study should be carried out among the same vendors after carrying out health education to improve their level knowledge and practice of food hygiene especially when they are sick, they should not cook and sell

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