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APPRAISAL OF KNOWLEDGE AND PRACTICE OF FOOD HYGIENE AMONG FOOD VENDORS IN UNIVERSITY OF CALABAR, CALABAR, NIGERIA

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ABSTRACT

Food vendors with poor knowledge and practice of food hygiene are potential source of food contamination and food borne diseases in institutions of learning in developing countries. The study was conducted to appraise the knowledge and practice of food hygiene among food vendors in the University of Calabar, Calabar, Nigeria using a cross - sectional descriptive survey as the research design. A total of sixty – seven food vendors were purposely recruited for the study. Researcher's developed and validated questionnaire was used for data collection. Collated data were sorted, coded, and analysed with SPSS software. The results were described using frequency counts and percentages. Findings from the study indicated that majority of the respondents 57 (85.1%) had adequate knowledge of food hygiene and the same percentage also engaged in good food hygienic practices. The result also revealed that, there was a statistically significant relationship between knowledge and practice of food hygiene (χ^2=28.134**;** p<0.05). Thus, the researchers suggested continuous education of food vendors on the need to maintain hygiene practices during preparation and handling of food to safeguard the health of the students.

KEYWORDS: Knowledge, practice, food hygiene, food vendor.

INTRODUCTION

Food hygiene and food safety has been an ongoing concern in Nigeria. Unhygienic handling of food by food vendors has been identified as a major contributory factor to transmission of food borne diseases and related mortality. Individual at high risk of food borne diseases are adults and students. Basurra (2020) noted that 65.6% of students patronized ready – to - eat meal and 52% eat two to four times a week. The desire to patronize the food vendor included convenient, cheap and easily accessible. The food could be served in canteens, stores, mobile carts or carrying on their heads. This ready - to - eat food could be sold to groups, individuals in schools, hostels, hospitals and this may also serve as source of income to the food vendors (Onyeneho & Hedberg, 2013).

The food vendors have the traditional way of preparing and packing food, visible in the inappropriate handling of food materials, temperature and personal hygiene which may be related to poor access to potable water, poor knowledge of basic food hygiene, limited space and poor environmental sanitation, inappropriate food storage facilities and unhygienic food handling practices (Ifeadike et al.,2012). The consumption of unwholesome food may result in food poisoning. About 70% of diarrhoea diseases are related to eating of unsafe food contaminated by microorganisms such as E. coli, Staphylococci and Shigella. This could manifest as vomiting, diarrhoea and fever with associated loss of school hours, economic losses and possible deaths.

In an effort to ensure food safety standards as well as reduction and elimination in the incidence of food borne and related diseases, the Nigerian government established the National Agency for Food and Drug Administration and Control in 1993 and also launched the National Policy of Food Hygiene and Safety in 2000. The World Health Organisation has also provided guidelines on safe food preparation. This include thorough cooking of raw food, reheating of leftover food, safety of stored food to prevent them from rodents and other animals (Ifeadike et al., 2012).

However, there have been challenges on issues of surveillance and compliance as a result of lack of monitoring and lack of enforcement by food safety officers which may be due to lack of logistics, self-medication indulged by the victims of food poisoning thus, preventing case identification and follow up.

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Studies suggest that food contamination are common in institutions of learning in Nigeria with elevated risk for food poisoning (Leslie et al., 2021). The morbidity and mortality may indicate a lack of knowledge about hygiene practices and wholesome handling of food by food vendors. Various studies have been conducted to explore the knowledge and practice of food hygiene among food vendors but such data is limited in Cross River State and Calabar in particular (Iwu et al., 2017; Onyeaka et al., 2021). Thus, this study was undertaken to fill this gap.

MATERIAL AND METHOD

A descriptive non-experimental survey design was used to assess the knowledge and practice of food hygiene among food vendors in the University of Calabar, Nigeria. The population of study was made up of the entire 67 food vendors operating in the University of Calabar, Calabar. Therefore, this number represented the target population and self-structured questionnaire was used for data collection.

Study Setting

The study setting was the University of Calabar Campus. It is located in Calabar Municipal Local Government Area of Cross River State. It is one of Nigeria's second generation Universities, was established in 1975 by the Federal Government of Nigeria. The University is built to fulfil its motto: "Knowledge for Service". Thus, it offers accredited programmes leading to officially recognized degrees such as bachelors, masters and Ph.D programmes in several disciplines. The University places a great premium on learning and character. The University has 19 Faculties and four institutes including a College of Medicine where it places a great premium on learning and character. The University has facilities for both students and staff for learning such as lecture halls, E-library, science laboratories, student halls of residence and staff quarters. It also accommodates places for leisure such as the Abraham Ordia stadium and food outlets distributed majorly around the academic and administrative blocks. These food outlets are managed by food vendors who serve ready – to - eat meal to the students.

Population of Study

The population of study was made up of all the 67 food vendors operating in the University of Calabar campus, Calabar. Ethical approval for the study was obtained from the Cross River State Ministry of Health Research Ethics Committee. Informed consent was also obtained from all the respondents verbally before recruiting them to partake in the study. They were assured of strict confidentiality and anonymity of information provided during and after the study.

Research Instrument

Researcher's developed self-administered questionnaire was used for data collection after validation by experts in the field. Test-retest approach was adopted to test the reliability of the instrument using food vendors from the University of Cross River State, Calabar campus, Calabar, who were not included in the study, but had similar characteristics with the study group. A reliability co-efficient of 0.85 was obtained indicating that the instrument was suitable for data collection. The questionnaire was divided into three sections; section A was designed to elicit demographic data from the respondents and was made up of six (6) items. Section B consisted of eleven (11) items on knowledge of food hygiene among food vendors. Those who answered correctly scored one point while incorrect answer scored zero point. The scores were converted to 100%. Those who scored less than 50% were considered to have inadequate knowledge while those scored 50% and above were judged as having adequate knowledge. Section C consisted of 13 items, correct response had one point while incorrect response had zero point. The scores were converted to 100%. Those who scored less than 50% were considered as having poor practice while those with 50% and above were considered as good practice.

Data Analysis

The generated data were analysed using the computer software programme statistics package for the social sciences (SPSS Version 23). Results were presented in frequency tables and described using frequency counts and percentages.

RESULTS

Table 1: Socio-demographic Variables of Respondents n = 67

Variable	Frequency	Percentage
Gender		
Male	25	37.3
Female	42	62.7
Total	**67**	**100**
Age in years		
20-24	5	7.5
25-29	16	23.9
30-34	28	41.8
35-39	11	16.4
≥40	7	10.4
Total	**67**	**100**
Marital Status		
Single	30	44.8
Married	37	55.2
Total	**67**	**100**
Educational Status		
Secondary	28	41.8
Tertiary	39	58.2
Total	**67**	**100**
Years of experience		
<1 year	12	17.9
2-5 years	34	50.7
>5 years	21	31.4
Total	**67**	**100**
Training Course		
Yes	44	65.7
No	23	34.3
Total	**67**	**100**

The result of socio-demographic distribution of respondents presented in table 1 shows that the majority of the respondents were female 42 (62.7%). The table also indicated that the majority of the respondents were aged 30-34. The majority of the respondents were married representing 37 (55.2%). Majority had tertiary education 39 (58.2%). Majority 34 (50.7%) also had 2 - 5 years of experience in canteen business and 44 (65.7%) of respondents had attended private training course in catering services and food safety.

Table 2: Knowledge of Food Hygiene among Food Vendors n =67

Item	Frequency	Percentage
Basic food hygiene includes clean, separate, cook and store in safe temperature.		
Correct response	65	97
Incorrect response	2	3
Total	**67**	**100**
Regular hand hygiene can prevent food contamination.		
Correct response	67	100
Incorrect response	0	0
Total	**67**	**100**
Wash cooking utensils and coolers before/after use.		
Correct response	66	98.5
Incorrect response	1	1.5
Total	**67**	**100**
Sore throat, cough and catarrh poses risk of food contamination		
Correct response		
Incorrect response	55	82.1
Total	12	17.9
	67	**100**
Nails must be kept short and clean.		
Correct response	66	**98.5**
Incorrect response	1	**1.5**
Total	**67**	**100**
Use of protective clothing could prevent contamination.		
Correct response	67	100
Incorrect response	0	0
Total	**67**	**100**
Contact between raw and cooked food could promote food contamination.		
Correct response	66	98.5
Incorrect response	**1**	1.5
Total	**67**	**100**
Reheating leftover food for sale can cause food-borne illness.		
Correct response		
Incorrect response	51	76.1
Total	16	23.9
	67	**100**
Cover cooked food to avoid contact with pests.		
Correct response	66	98.5
Incorrect response	1	1.5
Total	**67**	**100**
Use of jewellery while handling food can promote food contamination.		
Correct response	51	76.1
Incorrect response	16	23.9
Total	**67**	**100**
Chilling or freezing can eliminates harmful microorganism.		
Correct response		
Incorrect response	55	82.1
Total	12	17.9
	67	**100**
To sanitize kitchen sink regularly could prevent food poisoning.		
Correct response		
Incorrect response	57	85
Total	10	15
	67	**100**
Recommend freeze temperature for food preservation is.		
-0^{o}c	0	0
-4^{o}c	20	30
-18^{o}c	37	55
-9^{o}c	10	15
Total	**67**	**100**
Frozen food can be thawed at room temperature.		
Correct response	22	32
Incorrect response	45	67
Total	**67**	**100**
Overall knowledge		
Adequate	57	85.1
Inadequate	10	14.9

Table 2 revealed that majority of the respondents 65 (97%) indicated that food hygiene practices includes clean, separate, cook and store within safe temperature to prevent food contamination. All the respondents 67 (100%) felt that regular hand hygiene can prevent food contamination. Almost all the respondents 66 (98.5%) indicated that cooking utensils and coolers should be washed before and after use. Majority of the respondents 55 (82.1%) knew that people with sore throat, cough and catarrh should not handle food. Almost all the respondents 66 (98.5%) felt that food handlers must keep their nails short and clean. All the respondents 67 (100%) knew that use of protective clothing by food vendors while at work promote food hygiene. Majority of the respondents 66 (98.5%) also indicated that contact between raw and cooked food could promote food contamination. Fifty-one (76.1%) respondents knew that reheating leftover food for sale can pose risk for food borne diseases. Almost all the respondents 66 (98.5%) indicated that cooked food should be covered to avoid contact with pests. Majority of the respondents 51 (76.1%) knew that the use of jewellery while handling food contributes to food contamination and poor food hygiene. Also majority of respondents knew that freezing could not eliminate microorganisms. Majority of the respondents 57 (85%) knew that sanitizing kitchen sink regularly could prevent food poisoning. Regarding recommended freeze temperature for food preservation, 37 (55%) of the respondent had correctly -18^{o}c. However, majority of the respondents 45 (67%) did not know that frozen food should not be thawed at room temperature. A summary of the respondents' knowledge revealed that majority 57 (85.1%) had adequate knowledge of food hygiene.

Table 3: Practice of Food Hygiene among Food Vendor Operators in UNICAL n = 67

S/No.	Items	Frequency	Percentage (%)
1.	Cleans work surface before food preparing.		
	Yes	67	100
	No	0	0.0
	Total	67	100
2.	Wash my hands with soap and water at all times before/after meal preparation.		
	Yes	65	97.0
	No	2	3.0
	Total	67	100
3.	Wash all cooking utensils and coolers before and after use.		
	Yes		
	No	63	94.0
	Total	4	6.0
		67	100
4.	Handles food when I am sick of sore throat, cough or catarrh		
	Yes		
	No	30	44.8
	Total	37	55.2
		67	100
5.	Trim my nails regularly to avoid food contamination.		
	Yes		
	No	64	95.5
	Total	3	4.5
		67	100
6.	Wear apron and cover my hair while at work.		
	Yes	61	91.0
	No	6	9.0
	Total	67	100
7.	Cover dust bins and empty them promptly when filled up.		
	Yes		
	No	67	100
	Total	-	0.0
		67	100
8.	Use clean water to prepare food.		
	Yes	61	91.0
	No	6	9.0
	Total	67	100
9.	Chew gum while preparing food.		
	Yes	13	19.4
	No	54	80.6
	Total	67	100

10.	Take bath, brush teeth and wear clean clothes before handling food.		
	Yes	48	71.6
	No	19	28.4
	Total	67	100
11.	Reheat leftover food for sale.		
	Yes	25	37.3
	No	42	62.7
	Total	67	100
12.	Use jewellery and wedding rings while preparing food.		
	Yes		
	No	20	29.9
	Total	47	70.1
		67	100
13.	Bite nails while at work		
	Yes	6	9.0
	No	61	91.0
	Total	67	100
14.	Overall practice of food hygiene		
	Good	57	85.1
	Poor	10	14.9
	Total	67	100

Results presented in **Table 3** shows that majority of the respondents 54 (80.6%) indicated that they cleaned work surface before food preparation. In reference to hand washing before and after food preparation, 65 (97.0%) respondents answered in affirmative. Majority of the respondents 63 (94.0%) washed all cooking utensils and coolers before and after use. With reference to handling of food when having cold or catarrh 37 (52.2%) respondents did not engage in this unhygienic practice. Most respondents 64 (95.5%) trimmed their nails regularly to avoid food contamination. About 61 (91.0%) wore protective clothing while at work. All the respondents 67 (100%) covered dust bins and empty them promptly when filled. In addition, majority of the respondents 61(91.0%) used clean water to prepare food. Majority 54 (80.6%) did not chew gum during food preparation. About 48 (71.6%) took their bath and wore clean clothes before handling food; while majority 42 (62.7%) did not reheat leftover food for sale. Majority 47 (70.1%) did not put on jewellery while preparing food. Regarding biting of nails, 61 (91.0%) being the highest proportion of the respondents did not engage in this unhygienic practice. A summary of the above result shows that among the 67 vendors who participated in the study, majority 57 (85.1%) engaged in good food hygiene practices.

Table 4: Relationship between knowledge and practice of food hygiene

Knowledge	**Practice of food hygiene**		**Row total**	**df**	**Cal χ^2**	***p-value***
	Good	**Poor**				
Adequate	54	3	**57**	1	28.134	0.000
Inadequate	3	7	**10**			
Column total	**57**	**10**	**67**			

0.05 level of significance

Table 4 shows that at 1 degree of freedom, the p-value (.000) associated with the computed chi-square value (28.134) was less than the level of significance (.05). Thus, it was concluded that there was a statistically significant relationship between knowledge and practice of food hygiene among food vendors in University of Calabar, Calabar.

DISCUSSION

Findings from this study indicated that majority of the respondents knew that cleaning, separating, cooking and storing of food at the appropriate temperature were basic principles of food hygiene. They also knew that regular hand hygiene can prevent food contamination; and were aware that cooking utensils and coolers should be washed before and after food preparation. Majority of the participants knew that sore throat, catarrh and cough, could pose risk of food contamination. Almost all of them answered correctly that nails should be kept short and clean while handling food items. All of the respondents were aware that the use of protective clothing could prevent food contamination and nearly all the participants knew that coming in contact with raw and cooked food could promote food contamination. In addition, slightly more than half of the respondents knew the recommended freezing temperature for food preservation. However, majority of them showed poor knowledge on thawing of frozen food. On the overall, findings of the study showed that majority of respondents had adequate knowledge on preparation, handling and storage of food. This could be explained by the facts that majority of the respondents had tertiary education which made them to appreciate the existence of microorganisms, importance of hygienic environment and serving wholesome meals. This result agrees with report of Rosnani, Radu, Othman, Poh See, Lay Ching (2014) who noted that knowledge of food hygiene among restaurant workers in Malaysia was adequate. This finding also asserts with previous studies done in Sepang and Nigeria (Emmanuel, Ibesally, Emmanuel &

Sule, 2017; Iwu et al. 2017; Johnson, 2019; Mahat, Shi & Hamid, 2016; Oghenekohwo, 2015; Johnson, 2019).

Findings from the study also showed that the respondents engaged in proper food handling, preparation and storage practices. It was reported that most of the respondents washed their hands with soap and water before and after meal preparation, did not handle food when infected with cough or catarrh. The respondents also trimmed their nails regularly to avoid food contamination, used clean water to prepare food; wore apron and covered their hair while preparing meal, covered dust bins and emptied them promptly when filled. Findings also revealed that the respondents neither chewed gum nor wore jewellery while handling food. Thus, the overall results indicated good food hygienic practices among food vendors in University of Calabar, Calabar. This could be due to the fact that majority of the respondents were young graduates from university where entrepreneurial skill acquisition had been made compulsory during the undergraduate years irrespective of academic discipline so that they can start businesses of their own on graduation. This finding is in agreement with report from (Idung, Ekanem & Oloyede, 2020; Iwu et al., 2012; Tugho et al., 2021) who reported good food hygiene practices among food handlers in Nigeria and Ghana.

However, though majority of the respondents disagreed wearing pieces of jewelry while preparing and serving food, a fair number of respondents agreed wearing jewellery. These is unacceptable as it can easily transmitted pathogenic organisms which can cause food contaminate and death.

CONCLUSION

From the above results, it can be concluded that food vendors at the University of Calabar had adequate knowledge of food hygiene and that was reflected in the hygienic food practices among the respondents. Thus, having adequate knowledge of food hygiene, is significantly associated with good food hygiene practices among food vendors in the University of Calabar, Calabar.

RECOMMENDATIONS

The school authority in collaboration with Student's Union government should continue to organize educational programs on current trends in food hygiene/safety to maintain the knowledge base of food vendors to ensure food safety and prevent food poisoning. The school authority should also ensure supply of portable water and adequate space for kitchen and service space to promote compliance to food safety and hygiene practices. There should also be an accurate registration of all food vendors in the University community to enhance easy and regular supervision for compliance.

IMPLICATION TO NURSING

This study revealed good knowledge of food hygiene and practices among food vendors. This implies that nurses as advocates should work in collaboration with the university to make available continuous food safety information and regular surveillance of food vendors to ensure best practices thereby protecting the University community from food contamination and food poisoning.

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