

Knowledge and Practice of Food Hygiene and Safety among Food Vendors in a Tertiary Health Facility and its Environs in Akwa Ibom State

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ABSTRACT

Background: Eating food from vendors is a common practice globally but not without the challenges of food borne diseases and deaths. Poor preparation and handling of food by vendors in a hospital environment could increase morbidity and mortality from foodborne diseases. The study aimed to determine the level of knowledge and practice of food hygiene and safety by food vendors in Uyo, Akwa Ibom State. A descriptive cross-sectional study using a mixed-methods approach was conducted among 247 food vendors in the University of Uyo Teaching Hospital and its Environs. Eligible food vendors were consecutively enrolled after obtaining consent from them. Data were analyzed using Stata version 10.0. The majority 81.4% had good knowledge of food hygiene and safety while good practice was reported by 43.7% of the vendors. Only 30.4% were observed to use both aprons and hair covers. Predictors of good knowledge of food hygiene and safety were post-secondary education (OR=10.5; 95% CI=1.61-67.76; P=0.01) and location outside UUTH (OR=0.26; 95% CI=0.09-0.73; P=0.01). Older age (OR 0.43; 95% CI=0.24-0.79; P=0.01), primary education (OR 0.11; 95% CI=0.02-0.61; P=0.01), lack of formal training (OR 0.45; 95% CI= 0.24-0.86; P=0.02), location outside UUTH (OR 0.48; 95% CI =0.25-0.91; P=0.03) and fair knowledge (OR 0.26; 95% CI= 0.10-0.68; P=0.01) were predictors of poor practice of food hygiene and safety. Majority of the food vendors had a good knowledge of food hygiene and safety. The self-reported practise of food hygiene and safety and use of PPEs was poor. Continuous training/workshops and constant monitoring and supervision are strongly recommended.

Keywords: Food, Safety, Knowledge, Practice, Vendors, Uyo

INTRODUCTION

Food safety is defined as the conditions and measures that are necessary along the food production chain to ensure that food is safe, sound and fit for human consumption.¹ Poor handling of food results in foodborne diseases which remains a major public health problem globally.² Estimates by the World Health Organization suggest that food-borne illnesses account for about 2.2 million deaths annually, out of which about 86% are children.³

With increasing population, urbanization and very busy work schedule, many people find it difficult to eat in their homes and thus have settled for alternatives in restaurants and fast food centres. According to the Food and Agricultural Organization

(FAO), over 2.5 million people are known globally to eat food prepared on the streets every day.⁴ Poor preparation and handling of foods by vendors result in numerous cases of foodborne diseases and death.⁵ Infected food-handlers involved in catering services have also been attributed to reported cases of viral foodborne diseases, which highlights the role and significance of food vendors in mitigating the menace of foodborne diseases in the society.⁶ Studies in Ghana, India, and Nigeria have demonstrated various levels of knowledge and hygiene practices of food vendors.⁷⁻¹⁰

Poor preparation and handling of food by food vendors in a hospital setting could lead to more cases of foodborne diseases among members of the hospital community that patronize them. The assessment of knowledge and practice of food safety and hygiene among food vendors, observation of their use of personal protective equipment (PPEs) and the sanitary conditions of their work environment in Akwa Ibom state formed the objectives of this study.

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MATERIALS AND METHODS

Settings

The study was carried out in the University of Uyo Teaching Hospital (UUTH) and its environs between June and November 2019. The hospital is located along Abak Road, Uyo, Akwa Ibom State in the Niger Delta region of Nigeria. It is the only federal government-owned tertiary hospital in the state and serves as a reference centre for private hospitals, primary and secondary public health facilities in the state and beyond. The hospital has various cadres of health workers including Environmental Health Officers who monitor food vendor activities. To cater to the food needs of health workers, the teaching hospital has a central hospital canteen, a fast-food facility and canteens for medical and dental consultants and resident doctors. There are other rented shops for food vendors at the hospital premises and its environs. These food vendors cater for the nutritional needs of some members of the hospital community.

Study Population

The study was carried out amongst food vendors operating in the University of Uyo Teaching Hospital and its immediate environs.

Study Design

A descriptive cross-sectional study design was conducted among food vendors in UUTH and its environs. A mixed-method data collection approach was used in the study. An interviewer-administered questionnaire was used to obtain quantitative data while a checklist was used to collect qualitative data.

Sample Size Determination

A minimum total sample size of 260 was estimated using the Cochran formula for cross sectional studies. The formula is given as $n = z^2 pq / d^2$.¹¹ Where n = minimum sample size, $z = 1.96$ (standard normal deviate at 95% confidence interval), $P = 81\%$ (prevalence of food vendors with good level of knowledge in Owerri)⁹, $\delta = 0.05$ (degree of accuracy) and $q = 1 - p = 1 - 0.81 = 0.19$. Therefore; $n = (1.96)^2 \times 0.81 \times 0.19 / 0.0025 = 0.5912 / 0.0025$

$n = 236$. Adding 10% of non-response rates makes a total of 260.

Inclusion and exclusion criteria

All consenting food vendors including their apprentices and labour workers involved in the handling of food at the hospital and environs during the period of study were included. All food vendors who were not available at the workplace for various reasons were excluded.

Sampling Technique

All food vendors, who met the inclusion criteria and gave consent to participate in the study were recruited consecutively into the study until the minimum sample size was obtained.

Data Collection

(a) *Questionnaire*: A pre-tested semi-structured interviewer-administered questionnaire developed by the researchers according to the objectives of the study was used for data collection. The study instrument had 3 sections: Section A obtained data on the socio-demographic characteristics of respondents, section B on knowledge of food vendors on food hygiene and safety while section C was on hygiene and safety practices reported by respondents. There were 15 questions assessing knowledge of food hygiene and safety. Every correct response was scored 1 and wrong or don't know responses were scored 0 marks. The total obtainable minimum and maximum points were 0 and 15 respectively. Scores of 0 to 5 were classified as poor, 6-10 as fair and 11-15 as a good level of knowledge. There were 7 questions to assess self-reported practice (practice of food hygiene and safety as reported by the respondent and not observed by the researcher). A 2-point Likert rating scale was used for the responses (1 point was awarded for always and zero points for sometimes or never responses). The median practice score of 4 was determined. Scores of less than 4 were regarded as poor/unsatisfactory practice while 5 and above was regarded as a good or satisfactory level of practice.

(b) *Observation*: Observation of the actual practices of food vendors and their use of personal protective equipment (PPEs) was done and recorded on a prepared checklist. The observed practices were summarized in frequencies and percentages.

Ethical clearance

Ethical approval for the study with reference number UUTH/AD/S/96/VOL. XX1/318 was obtained from the University of Uyo Institutional Health Research Ethics Committee. Written informed consent was obtained from respondents. Confidentiality was ensured and participation was voluntary.

Data Analysis

Data was collated and analyzed with Stata 10.0 statistical software. Categorical data were summarized in frequency and percentages while mean and standard deviation were used for continuous data. Associations between categorical data were determined using a Chi-square test while predictors of knowledge and practice were done using the adjusted binary logistic regression. All statistical tests were done at a significant level of $P < 0.05$.

Outcome variables

In this study, level of knowledge of food hygiene and safety (categorized as poor, fair and good) and level of practise of food hygiene and safety (categorized as poor and good) were the primary outcome variables. Independent variables used in the study included age, sex, level of education, tribe, years of practice, formal training and location of the business. Independent variables that were significant (p -value < 0.05) at bivariate analysis were fed into a multi variate model to compute the adjusted odds ratio, 95% confidence interval and p -value.

RESULTS

Two hundred and forty-seven out of 260 respondents completed the study giving a response rate of 95%. The mean age of respondents was 33.8 ± 7.6 years. Majority of the respondents were females - 195(78.9%). About half, 125(50.6%) had completed secondary education and 124(50.2%) were of

the *Ibibio* tribe. Median years of practice was 5(3-8) years. Ninety (36.4%) had formal training out of which more than half 52(57.8%) were trained in catering school. The majority of 210(85%) operated in restaurants. Most were located outside UUTH 178(72.1%). One hundred and seventy-two (69.6%) respondents never had a medical check-up as food vendors. (Table 1)

The majority, 228(92.3%) knew that eating poorly prepared food can cause illness. Most (80.9%) knew that ill vendors should not prepare food. That typhoid fever and diarrhoea can result from eating contaminated food was known by 179(72.4%) and 219(88.7%) of the respondents respectively. A large proportion, 227(91.9%) knew that food vendors should have medical check-up yearly and 241(97.6%) knew that all food vendors should have their hair covered while preparing/serving food. The knowledge of hand washing with soap and water after using the toilet and wearing gloves to prevent getting infected was lacking in 22(8.9%) and 61(24.8%) respondents respectively. Regarding food preparation surfaces, 212(85.8%) knew that these can contaminate foods and that ready-to-eat food should not be prepared on the same cutting board used for the preparation of raw meat 94(38.1%). The majority, 201(81.4%) had a good level of knowledge of food safety and hygiene practices (Table 2)

Regarding practice, 143(57.9%) always checked the expiry dates of products before use, 127(51.4%) reported always wearing head cover while preparing/serving food, 44(17.8%) do not come to work when ill, 171(69.2%) always wash their hands with soap and water before preparing food while 242 (98%) always wash their hands with soap and water after using the toilets. While 105(42.5%) always use an apron while preparing and serving food, 141(57.1%) store their refuse in a covered waste bin. One hundred and eight vendors (43.7%) reported a good level of practice (Table 3).

During observation, 120(48.6%) of the food vendors used an apron while 100(40.5%) covered their hair when serving food. Covered waste bin was sighted in

113(45.7%) premises. The premises of 137(55.5%) vendors were observed to have flies on food serving 'surfaces'. Serviette was used in serving customers by 208(84.2%) vendors. Hand washing soap or liquid soap was observed in 233(94.3%) of the premises. Vendors observed to use both PPEs (aprons and also covered their hair) was 75(30.4%) (Table 4)

Level of education ($p<0.001$), location of practice site ($p=0.004$) and years of practice ($p=0.02$) were significantly associated with level of knowledge of food vendors on food safety and practice on bivariate analysis (Table 5). Post-secondary educated vendors (OR 10.5 95% CI 1.61-67.7, $p=0.01$) and location outside UUTH (OR 0.26 95% CI 0.09-0.73 $p=0.01$) predicted good level of knowledge (Table 6)

Age of respondents ($p<0.001$), level of education ($p<0.001$), formal training ($p<0.001$), location of practice site ($p<0.001$) and level of knowledge ($p<0.001$) were significantly associated with level of practice of food hygiene and safety among food vendors on bivariate analysis ($p<0.001$). (Table 7). Predictors of good practice were age of food vendors 34 years and above (OR 0.43;95%CI 0.24-0.79; $p=0.01$), vendors with primary education, (OR 0.11,95%CI 0.02-0.61; $p=0.01$), no formal training (OR=0.45; 95%CI 0.24-0.86; $p=0.02$), location outside UUTH (OR=0.48;95%CI 0.25-0.91; $p=0.03$) and having a fair level of knowledge of food hygiene and safety (OR=0.26; 95% CI 0.10-0.68; $p=0.01$)(Table 8).

Table 1: Socio-demographic characteristics of respondents

Variables	Frequency	Percent
Age group (years)		
Less than 34	114	46.2
34 and above	133	53.8
Mean age	33.8±7.6	
Sex		
Females	195	78.9
Males	52	21.1
Educational Level		
No formal education	9	3.6
Primary	35	14.2
Secondary	125	50.6
Postsecondary	78	31.6
Tribe		
<i>Ibibio</i>	124	50.2
<i>Annang</i>	64	25.9
<i>Oron/Eket</i>	42	17.0
<i>Igbo</i>	13	5.3
<i>Yoruba</i>	3	1.2
<i>Others</i>	1	0.4
Median years of practice (IQR)	5(3-8)	
Formal Training		
Yes	90	36.4
No	157	63.5
Place of training [n=90]		
Catering school	52	57.8
Apprenticeship	38	42.2
Practice type		
Fast food	19	7.7
Restaurant	210	85.0
Mobile vendor	18	7.3
Food Vending Location		
Within UUTH	69	27.9
Outside UUTH	178	72.1
Ever had a medical checkup		
Yes	75	30.4
No	172	69.6

Table 2: Knowledge of Food Hygiene and Safety among Food vendors

Knowledge Questions	Responses		
	Yes n(%)	No n(%)	Don't Know (%)
Eating of poorly prepared food can cause illness	228(92.3)	4(1.6)	15(6.1)
Ill food vendors should not prepare food	200 (80.9)	31 (12.6)	16(6.5)
Eating of contaminated food can cause typhoid fever	179 (72.4)	30 (12.2)	38(15.4)
Malaria can result from eating of contaminated food	94(38.1)	118(47.8)	35(14.2)
HIV can result from eating of contaminated food	34(13.8)	197(79.8)	16(6.5)
Diarrhoea can result from eating of contaminated food	219(88.7)	18(7.3)	10(4.0)
Food vendors should have a medical check-up every year	227(91.9)	7(2.8)	13(5.3)
Food vendors should cover their hair while preparing/serving food	241(97.6)	1(0.4)	5(2.0)
Food vendors with a wound on the hand should cover with plaster before touching food	237(95.9)	10(4.1)	0(0.0)
Hands should be properly washed with soap and water after sneezing or blowing the nose	242(98.0)	3(1.2)	2(0.8)
Hands should be properly washed with soap and water after using the toilet	225(91.1)	22(8.9)	0(0.0)
Wearing gloves while handling food protects food vendor from infection	144(58.5)	61(24.8)	41(16.7)
Foodborne diseases can result from storing raw meat and cooked food in the same refrigerator	157(63.6)	36(14.6)	54(21.9)
Food preparation surfaces can contaminate the meat [food]	212(85.8)	23(9.3)	12(4.9)
Ready to eat foods can be prepared on the same cutting board that was used to prepare raw meat	94(38.1)	151(61.1)	2(0.8)
Mean Knowledge Score + Standard Deviation	12.2 + 1.9		
Level of Knowledge			
Good	201(81.4%)		
Fair	46(18.6%)		

Table 3: Self- Reported Practice of Food Hygiene and Safety among the Food Vendors

Practice Variables	Frequency	Percentage
I check expiry dates of all products I use		
Always	143	57.9
Sometimes	100	40.5
Never	4	1.6
I wear a hat or cover my head while preparing or serving food		
Always	127	51.4
Sometimes	103	41.7
Never	17	6.9
I do not come to work when I am ill		
Always	44	17.8
Sometimes	170	68.8
Never	33	13.4
I wash my hands with soap and water before preparing food		
Always	171	69.2
Sometimes	75	30.4
Never	1	0.4
I wash my hands with soap and water after using the toilets		
Always	242	98.0
Sometimes	5	2.0
I use apron while preparing and serving food		
Always	105	42.5
Sometimes	108	43.7
Never	34	13.8
I store/dispose of my refuse in a covered waste bin		
Always	141	57.1
Sometimes	78	31.6
Never	28	11.3
Level of Practice		
Good	108	43.7
Poor	139	56.3
Median Practice score (IQR)	4(2-6)	

Table 4: Use of Personal Protective devices and sanitary status of premises

Variables	Observation status	
	Present n (%)	Not present n (%)
Use of apron by a food vendor	120(48.6)	127(51.4)
Covering of hair by a food vendor	100(40.5)	147(59.5)
Covered waste bin	113(45.7}	134(54.3)
Presence of flies on food serving surfaces/tables	137(55.5)	110(44.5)
Use of serviette by customers	208(84.2)	39(15.8)
Use of hand towel by customers	93(37.6)	154(62.4)
Presence of handwashing soap or liquid soap	233(94.3)	14(5.7)
Use of both apron and hair cover	75(30.4)	172(69.6)

Table 5: Association between selected factors and Level of Knowledge of Food Vendors

Variables	Level of Knowledge		Total N (%)	Statistical tests and P-value
	Good n (%)	Fair n (%)		
Age group				
Less than 34	91(45.3)	23(50.0)	114(46.2)	$\chi^2 = 0.34$ p=0.56
34 and above	110(54.7)	23(50.0)	133(53.8)	
Sex				
Male	43(21.4)	9(19.6)	52(21.1)	$\chi^2 = 0.08$ p =0.78
Female	158(78.6)	37(80.4)	195(78.9)	
Level of Education				
No formal	6(3.0)	3(6.5)	9(3.6)	p<0.001+
Primary	19(9.5)	16(34.8)	35(14.2)	
Secondary	101(50.3)	24(52.2)	125(50.6)	
Post-secondary	75(37.3)	3(6.5)	78(31.6)	
Formal training				
Yes	78(38.8)	12(26.1)	90(36.4)	$\chi^2 = 2.61$ p =0.11
No	123(61.2)	34(73.9)	157(63.6)	
Food vending location				
Within UUTH	64(31.8)	5(10.9)	69(27.9)	$\chi^2=8.18$ p= 0.004*
Outside UUTH	137(68.2)	41(98.1)	178(72.1)	
Years of Practice				
Less than 5	86(42.8)	11(23.9)	97(39.3)	$\chi^2= 5.59$ p=0.02*
5 and above	115(57.2)	35(76.1)	150(60.7)	

*Significant p-value + Fishers Exact

Table 6: Predictors of Good Knowledge of Food Hygiene and Safety among Food vendors in Uyo

Variables	Adjusted Odds ratio	P-value	95% Confidence interval
Level of Education			
No formal education ref	1		
Primary	0.59	0.52	0.12-2.97
Secondary	2.21	0.31	0.48-10.22
Post-secondary	10.47	0.01*	1.61-67.76
Food vending location			
Within UUTH ref	1		
Outside UUTH	0.26	0.01*	0.09-0.73
Duration of practice			
Less than 5 years ref	1		
5 years and above	0.46	0.06	0.21-1.02

*significant p value ref=Reference

Table 7: Selected Factors and Practice of food safety and hygiene among food vendors

Variables	Level of Practice		Total N (%)	Statistical tests and P-value
	Good n (%)	Poor n (%)		
Age group (years)				
Less than 34	64(59.3)	50(36.0)	114(46.2)	$\chi^2 = 13.26$
34 and above	44(40.7)	89(64.0)	133(53.8)	$p < 0.001^*$
Sex				
Male	18(16.7)	34(24.5)	52(21.1)	$\chi^2 = 2.22$
Female	90(83.3)	105(75.5)	195(78.9)	$p = 0.136$
Level of Education				
No formal	5(4.6)	4(2.9)	9(3.6)	
Primary	4(3.7)	31(22.3)	35(14.2)	$p < 0.001^{*+}$
Secondary	48(44.4)	77(55.4)	125(50.6)	
Postsecondary	51(47.2)	27(19.4)	78(31.6)	
Years of practice				
Less than 5	49(45.4)	48(34.5)	97(39.2)	$\chi^2 = 2.99$
5 and above	59(54.6)	91(65.5)	150(60.7)	$p = 0.08$
Formal training				
Yes	57(52.8)	33(23.7)	90(36.4)	$\chi^2 = 22.13$
No	51(47.2)	106(76.3)	157(63.6)	$p < 0.001^*$
Food vending				
Location				
Within UUTH	43(39.8)	26(18.7)	69(27.9)	$\chi^2 = 13.45$
Outside UUTH	65(60.2)	113(81.3)	178(72.1)	$p < 0.001^*$
Level of Knowledge				
Good	100(92.6)	101(72.7)	201(81.4)	$\chi^2 = 15.9$
Fair	8(7.4)	38(27.3)	46(18.6)	$p < 0.001^*$

*significant P-value + Fishers exact

Table 8: Predictors of Good Practice of Food Hygiene and Safety Practice among Food vendors

Variables	Adjusted Odds ratio	P-value	95% Confidence interval
Age group (years)			
Less than 34 ref	1		
34 and above	0.43	0.01*	0.24-0.79
Level of Education			
No formal education ref	1		
Primary	0.11	0.01*	0.02-0.61
Secondary	0.36	0.16	0.09-1.49
Postsecondary	0.61	0.51	1.14-2.68
Formal training			
Yes ref	1		
No	0.45	0.02*	0.24-0.86
Food vending location			
Within UUTH ref	1		
Outside UUTH	0.48	0.03*	0.25-0.91
Level of knowledge			
Good ref	1		
Fair	0.26	0.01*	0.10-0.68

*significant p-value ref=reference

DISCUSSION

The majority of respondents had a good knowledge of food hygiene and safety. This corroborates findings of similar studies in Nigeria and Ghana¹²⁻¹⁶ but contradicts reports in Sudan and in Ethiopia^{17,18} that showed poor knowledge of foodborne disease and food safety. The fact that more than half of the respondents had at least secondary level of education, a basic minimum needed to understand most health issues and make health-related decisions, may account for this high level of knowledge amongst our respondents.

The majority knew that eating poorly prepared food can cause illness and that ill food vendors should not prepare food. Corroborating the findings of similar studies in Ghana^{7,14} our respondents knew that eating contaminated foods could result in typhoid fever and diarrhoea. Though majority knew that malaria and HIV/AIDS do not result from eating food, as equally reported by a similar study in Ghana,¹² some still believed both diseases could be contracted through food. These misconceptions were also reported in a study where many feared that HIV could be transmitted by eating food prepared by an HIV-positive person or using eating utensils that have been touched by an HIV-positive person¹⁹ while others believed that eating cold food and mangoes cause malaria.²⁰ These misconceptions have serious implications on the control of HIV/AIDS, malaria and foodborne diseases. Hence, the need for creating more awareness of the causes of these ailments in the state. Furthermore, a good proportion said that ready to eat foods can be prepared on the same cutting board that was used to prepare raw meat. This practice will increase the risk of contamination of food and lead to foodborne diseases. Periodic training for food vendors in different areas where knowledge gaps were noticed is necessary.

Respondents demonstrated good knowledge concerning hand washing. Many knew they should wash their hands with soap and water after blowing their nose and after using the toilet. This finding is consistent with reports by Adadow *et al.*¹⁴ but Abdalla *et al.*¹⁷ reported otherwise that majority of their respondents saw no need to wash hands after

scratching or continuous handling of food but agreed that hand washing after use of toilet is very important. The good knowledge on the washing of hands with soap and water after use of toilets may be because they all believed that the hands become dirty after the use of toilet but don't feel so in other situations. Proper handwashing by food-handlers has been reported to significantly decrease the risk of diarrheal disease in childcare facilities.²¹ A small proportion of our respondents knew that wearing gloves while handling food protects food vendors from infection compared to a similar study.⁷

In this study, the level of education was predictive of the good level of knowledge of respondents. Those with tertiary education were more knowledgeable as higher education increases their capacity to understand issues about food safety. A similar study in Ghana, however, found no relationship between level of education and knowledge of food vendors.⁷ Also, location of practice was predictive of a good level of knowledge of food hygiene and safety among vendors. Vendors located outside UUTH were significantly less knowledgeable than those within. The activities of the Environmental Health Officers (EHOs) in UUTH who constantly supervise, monitor and train the food vendors in the institution may be responsible for this. This constant supervision may not be available to the vendors outside UUTH.

Our study revealed that a little more than half of the food vendors always check the expiry dates on products before usage, a finding better than 17% reported by Akananda *et al.* in Ghana.⁷ About half of the vendors reported that they cover their head/hair while preparing and serving food, a finding consistent with the result of a similar study by Iwu *et al.*⁹ Though the self-reported practice of use of apron and hair cover amongst the vendors was low, the observed usage of these PPEs at the time of the visit was even lower. Most of our respondents did not always use apron while preparing food, a finding also consistent with a study by Akananda *et al.* in Ghana.⁷ Interestingly, WHO reports that the use of apron and hair cover by food vendors has more to do with

aesthetics and consumer assurances than food safety.³ The self-reported practice of handwashing always with soap and water before preparing food was much better than 13.6% reported in a similar study in Ghana by Adadow *et al.* in Mamprusi district of Ghana.¹⁴ Self-reported hand-washing with soap and water after using the toilets was also good in this study. This agrees with findings of a similar study in Ghana.²² This is a commendable practise because hands of food handlers can serve as a medium in the spread of food borne diseases from poor personal hygiene and cross-contamination.²³ Disposing of refuse always in a covered waste bin was seen in a little above half of the respondents thus agreeing with a fairly good level of environmental hygiene of food vendors reported in Nigeria and South Africa.^{9,24} This is in keeping with the World Health Organization requirements of standard guidelines and recommendations for street food vendors.³ However, the presence of flies was seen on food serving surfaces/tables in more than half of the visited premises. A similar study in Benin, Nigeria reported same findings but in a slightly smaller proportion of visited premises.²⁵ This situation should be prevented as flies are known mechanical vectors involved in the transmission of infective agents that can lead to food borne diseases such as dysentery and cholera. Good sanitary conditions in and around food vending premises are likely to increase consumers' confidence in the vendor and improve consumers' patronage of the food vendors business.²⁵

Good practice of food hygiene and safety among the food vendors was low in this study. Similar studies in Nigeria and Ghana equally reported an inadequate practice.^{9,13,14} Older vendors were less likely to have good practice in this study. The younger vendors may be more educated and thus exhibit better practice than the older ones. Moreover, this study has shown that vendors with primary education were less likely to have a good practice. This level of education probably is not sufficient for them to understand the principles of food safety and hygiene. In this study, fair level of knowledge predicted poor

practice, a finding consistent with results from a similar study.²⁶ Good knowledge of food hygiene predicted good practice in other studies.¹⁰ Thus training, which can ensure that food handlers have all the required amount of awareness and education to meet the food hygiene requirements is vital. However, this alone may not necessarily lead to positive change in the management and handling of food by the vendors.^{27,28} Practicing outside UUTH was also significantly associated with poor practice. Lack of constant supervision and monitoring by EHOs in these locations may account for this observation highlighting the place of supervision of food vendors by health professionals.¹⁰

CONCLUSION

The level of knowledge of food hygiene and safety amongst food vendors in UUTH and its environs was good but the self-reported and observed practices were poor. A policy stipulating secondary education as the minimum level of education food vendors should attain before practising is necessary. Training and workshops along with regular monitoring of their practices in the state by relevant authorities should be put in place.

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