

Original Research Article

Assessment of Environmental Condition of Food Vending Sites and Food Handling Practices in Yenagoa Bayelsa State, Nigeria

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Abstract: Aim/Objective: This study determine the common practice adopted by public food vendors and the environmental condition of the vending sites in yenagoa LGA. **Methods:** A descriptive research design was adopted for this study sample size to select all 330 participants randomly with a well-structured questionnaire and a checklist in line with study objectives to obtain data from respondents. **Results:** Concerning the distribution of participants age group it was observed that 38% of the participants were within the age group of 28-32years which possessed the highest proportion from the study population, 27% were within the age group of 38years and above, 19% were within the age group of 33-37years, while the least proportion 16% of the participants were within the age group of 23-27years. The sex distribution indicates that majority (87%) of the participants were female while (13%) were male. The distribution of participants ethnicity indicates that Majority (42%) of the participants were Yoruba, followed by (38%) of the participants indicates Igbo, 6% were Ijaw, 5% were Ogbia, 8% of the participants were others, while (1%) possessing lowest proportion from the study population represent Hausa. The distribution of participants religion indicates that majority 97.9% were Christian, (1.2%) were Islamic while (0.90%) indicates others. Finally, the distribution of participants educational status indicates that majority (47%) had secondary education, followed by 30% with primary education while (23%) of the participants had tertiary education. The results indicates that food vendors practice environmental sanitation with a mean score of 3.73, the presence of waste bin was observed with a mean score of 4.33, the presence of hand towel with a mean score of 3.68, presence of soap were observed with a mean score of 3.40. Water supply possess a mean score of 2.84 while presence of flies/rat and cockroach possessed a mean score of 3.14. Therefore with the grand mean of 3.52 which implies that sanitary condition of food vendors within the study environments were good. However the study revealed that majority (53.33%) of the participants were not aware of food safety laws, out of (n=330), only 154(46.67%) of the participants were aware of food safety laws. Participant's safety food handling practice was poor with an overall grand mean score of 2.3 which is below criterion 2.5 mean. **Conclusion:** Findings from this study shows poor food safety and handling practices along with limited awareness and lack of training which pose a significant public health concerns. However, there is a need for addressing the knowledge and training gap through structured education, ongoing support and regulatory enforcement that are essential for ensuring safety and wellbeing of consumers.

Keyword: Food, Site, Yenagoa, Venting, Sanitary.

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INTRODUCTION

In recent years, foodborne diseases linked to poor food handling practices and unsanitary conditions at food vending sites have become a growing public health issue in many parts of the world. However, in developing countries like Nigeria, sanitation conditions at food vending sites are often substandard due to the lack of proper infrastructure, insufficient regulation, and limited resources. Food vending is an essential part of urban life worldwide, providing affordable and accessible meals to diverse populations. However, food vending sites, particularly in informal or street settings, are often associated with sanitation challenges (Rane, 2011; Aryae *et al.*, 2020). Poor sanitary conditions and inadequate food handling practices at these sites can significantly increase the risk of foodborne diseases which remain a major public health concern especially in developing countries (Aluko *et al.*, 2017; Omemu & Aderoju, 2018). Foodborne diseases, including gastrointestinal infections which are frequently linked to pathogenic microbes that can contaminate food. According to WHO, 2015, millions of people fall ill each year due to unsafe food, leading to thousands of deaths. Street food vending due to limited regulatory oversight may increase this risk particularly when vendors lack formal training in food hygiene and sanitation (Badrie *et al.*, 2017; Muinde & Kuria, 2017). Social reinforcement such as receiving positive feedback from customers may encourage vendors to continue practicing good sanitation and food handling behaviors (Bandura, 2019; Becker, 2021).

The sanitary condition of food vending sites includes various factors such as cleanliness of the environment, availability of waste disposal facilities, access to potable water, and pest control measures. Studies have shown that environmental hygiene significantly impacts food safety, with poor sanitary conditions contributing to the contamination of food and surfaces which can facilitate the spread of harmful pathogens (Tan *et al.*, 2013; Akinbami & Ojelabi, 2013; Nwachukwu *et al.*, 2021).

Food handling practices, on the other hand, encompass the methods and procedures used by vendors to prepare, store, and serve food. Proper hand washing, temperature control, and cross-contamination prevention are critical practices that can reduce the risk of food borne diseases. However, research indicates that many food vendors lack knowledge or fail to adhere to recommended food safety practices, often due to resource limitations or insufficient training (Monney *et al.*, 2014). Assessing the sanitary conditions and food handling practices at food vending sites is crucial for understanding potential health risks and developing interventions. This assessment provides insights into the gaps in vendor practices and environmental conditions, which can inform public health strategies aimed at improving food safety standards (Bas *et al.*, 2016; Rosenstock *et al.*, 2022).

Street food supply to individual and teaming population of the society has gained much popularity (WHO, 2015). The supply of quick meals to individual and other teaming population of the society have gained much popularity. The meals are readily available, affordable and look attractive and appetizing. However, the handlers or operators of the quick meals should realize that food should be protected irrespective of how it reaches the consumers (Havelaar *et al.*, 2018; James *et al.*, 2018). Most food vendors comes from poor socio-economic background, low education level, poor personal hygiene which hinders food handling practice as they are located in crowded areas, dusty places where flies are setting on food near garbage dump or closed to public toilets (Chen *et al.*, 2019). Street food provides an affordable and convenient option for many, especially low-income communities which often come with a higher risk of contamination due to inadequate infrastructure and limited regulatory oversight (Omemu & Aderoju, 2018). However, inadequate food safety measures and improper sanitary conditions are major concerns in food vending (Ijeoma *et al.*, 2017). In cities like Lagos, Abuja, and Port Harcourt, the situation is exacerbated by rapid urbanization, with many food vendors operating in overcrowded areas without proper access to sanitation facilities (Fadamiro *et al.*, 2012; Hara *et al.*, 2020).

A study by Ijeoma *et al.*, (2017) found that 72% of food vendors in urban areas like Lagos and Port Harcourt had not received formal training in food safety, and many vendors handled food with bare hands, increasing the risk of contamination. Furthermore, the lack of food storage and refrigeration facilities means that perishable food items are often left at room temperature for extended periods, which can promote the growth of harmful bacteria (Chen *et al.*, 2019).

Maintaining appropriate temperatures is critical in preventing the growth of foodborne pathogens. According to (FSA, 2019), food should be kept at a minimum temperature of 5°C to prevent bacterial growth and should not be left at room temperature for more than two hours (Fadamiro *et al.*, 2012) (Ajzen, 2023).

RESEARCH METHODOLOGY

Research Design: A descriptive research design was used for this study.

Study Population: The target populations of this study consist of food vendors from selected vending sites at Opolo, Ekeki and Edepie communities in Yenagoa.

Sample Size: The sample size of this study was determined using Cochran's formula.

$$n = \frac{Z^2 P(1-p)}{d^2}$$

Where

Z= normal standard deviation is 1.96² confidence interval

P= prevalence of previous study by Okoji and Isah (2014), reported about 68% of food vendors were not aware of food safety laws in Benin City, Nigeria

D= marginal error set as 5% or 0.5

$$n = \frac{1.96^2 \times 0.68(1-0.68)}{0.05^2}$$

$$n = \frac{3.8416 \times 0.68(0.32)}{0.0025}$$

$$n = \frac{3.8416 \times (0.68 \times 0.32)}{0.0025}$$

$$n = \frac{3.8416 \times 0.2176}{0.0025}$$

$$n = \frac{0.83593216}{0.0025}$$

$$n = 330.372864 \sim 330$$

Instrument Design

A structured questionnaire and a checklist designed in line with study objectives was used to obtain data on background characteristic of respondents. However an observational checklist was adapted from (WHO) essential requirement for safety of street vended food was used to assess sanitary condition of food vending site.

Data Collection

A structured questionnaire was used to obtain relevant information, however food vendor who are presently seen at their vending sites where given questionnaire to fill to assess the sanitary condition of food vendors and handling practice in Yenagoa Bayelsa State.

Data Analysis

SPSS version 24.0 was used for data analysis and are presented in tables and expressed as frequency, simple percentage and mean.

Ethical Consideration

Ethical approval to conduct this study was obtained from the Research Ethics Committee of Bayelsa State College of Health. Permission was obtained from community council, however, written inform consent was sought from Participants in the study before conducting of interview Confidentiality and privacy were maintained during this research.

RESULTS

Table 1: Socio-demographic Data of respondents

Variables (n=330)		Frequency (n=330)	Percentage (%)
Age group	23-27years	54	16
	28-32years	126	38
	33-37	62	19
	38years and above	88	27
Sex	Male	42	13
	Female	288	87
Ethnicity	Igbo	124	38
	Yoruba	138	42
	Hausa	4	1
	Ijaw	20	6
	Ogbia	16	5
	Others	28	8
Religion	Christianity	323	98
	Islamic	4	1.2
	Others	3	0.90
Educational status	Primary	100	30
	Secondary	154	47
	Tertiary	76	23
Total		330	100

Table 1 above indicates the Socio-demographic data of participants.

Table 2: Sanitary condition of food vending sites

s/n	Variables	A	S	O	N	$\bar{x}\%$	\bar{x}	\overline{CX}	\overline{GM}
1.	I practice environmental sanitation (clean environment)?	270	32	28	-	17.89	3.73		
2.	Is there presence of waste bin?	288	84	10	-	2.50	4.33		
3.	Presences of hand towel?	226	104	-	-	17.42	3.68	2.5	3.52
4.	Presence of soap?	196	88	30	16	16.09	3.40		
5.	Water supply?	100	103	103	24	13.44	2.84		
6.	Presence of flies/ rat and cockroach	88	201	41	-	14.86	3.14		

Key: A=always, S= Sometimes, O=often, N= Never, CM= criterion mean, GM=grand mean.

Table 2 above shows the sanitary condition of food vending sites.

Table 3: Safety practice in food handling among food vendors

s/n	Are you aware of food safety laws (n=330)	Frequency	Total (%)
1.	Yes	154	46.67
2.	No	176	53.33
	Total	330	100

Table 3 above indicates the safety practice in food handling among food vendors, it revealed that majority 176(53.33%) of the participants were not aware

of food safety laws, out (n=330), only 154(46.67%) of the participants were aware of food safety laws.

Table 4: Source of information of food safety laws

s/n	Variables (n=154)	Frequency	Percentage (%)
1.	School	63	41
2.	NGOs or Government	54	35
3.	Radio/TV	12	8
4.	Magazine	10	6
5.	Seminar	15	10
	Total	154	100

Table 4 above indicates the source of information of food safety laws, however out 154 participants who have had food safety laws, majority 63(41%) were school, 54(35%) had their source of information through NGOs or Government, 15(10%) of

the respondents had their source of information through Seminar, 12(8%) of the respondents had their source of information through radio while the least proportion 10(6%) of the respondents had their source of information from magazine.

Table 5: Have you ever undergo food safety training?

s/n	Variables	Frequency	Percentage (%)
a.	Yes	142	43
b.	No	188	57
	Total	330	100

Table 5 indicate whether respondents has undergo food safety training, it shows that majority 188(57%) of the respondents has not really undergo food

safety training while 142(43%) of the respondents has undergo food safety training.

Table 6: Food safety handling practices

s/n	Variables	A	S	O	N	$\bar{x}\%$	\bar{x}	\overline{CX}	\overline{GM}
1.	Food covered with containers?	244	74	12	-	22.4	3.7		
2.	Do you reheated before sales?	103	140	87	-	18.1	3.0		
3.	Do you wear hand jewelry when serving food?	54	88	103	85	13.9	2.3		
4.	Do you cut your nails?	74	38	130	88	13.3	2.2	2.5	2.3
5.	Do you blew air into cellophane when selling food?	26	75	129	100	12.1	2.0		
6.	Do you put on apron while serving food	21	21	100	188	7.8	1.3		
7.	Do you Cover your hair while serving food	48	54	88	140	12.1	2.0		

Key: A=always, S= Sometimes, O=often, N= never

Table 6 above indicates the food safety practice: the result shows that response on food covered with containers has a mean score of 3.7. Participant's response on reheating food before sales possessed a mean score of 3.0. Participants' response on wearing of handing jewelry when serving food has a mean score of 2.3. Participant's response on cutting nails has a mean score of Participants' response on blowing air into cellophane when selling food has a mean sore of 2.0. Participants' response on putting on apron while serving food possessed a mean score of 1.3. Participants'

response for covering their hair while serving food has a mean sore of 2.0.

DISCUSSION

Majority (53.33%) were not aware of food safety laws; though 46.67% who were aware, 41% and 35% of the participants had their source from school and non-Governmental Organizations. Majority 57% of the participants have not undergone food safety training. The overall grand mean 2.3 which implies that participants for food safety and handling practice were poor.

The result shows an overall grand mean score of 3.52 which implies that sanitary condition of food vendors in food vending site were good in the study communities. Food vendors who understood the importance of sanitary practice and food safety laws will likely keep his/ her surrounding or vending site clean which in turns influence most consumers to purchase food. This study is in agreement with Bandura, 2019, in the case of food vending, Social Cognitive Theory help to explain how food vendors adopt and maintain certain practices based on what they observe in their social environment. For example, food vendors may model their hygiene practices after other successful vendors or follow local norms regarding cleanliness and food safety. Social reinforcement, such as receiving positive feedback from customers may also encourage vendors to continue practicing good sanitation and food handling behaviors. Additionally environmental factors such as the availability of clean water, waste disposal services, and access to food safety training programs also shape the vendors' ability to implement safe practices (Baker *et al.*, 2019). Another study conducted by Ajzen, (2023), shows that food vendor' attitudes toward hygiene, such as whether they perceive proper sanitation practices as important, influence their behavior. Thus the social norms within the community regarding food safety and cleanliness will impact vendors' adherence to hygiene standards.

Food safety practice in food handling among food vendors from the result obtained shows that majority of the participants has not undergo food safety training, likewise higher proportion from the study population affirmed to involved in poor food safety practice when handling food. This issues might be as a result of vendor level of education and peers influence as most food vendor prepare food with the assumption that it is easier to cooked with the idea of food prepare from their homes without following regulatory food safety laws. This study is in line with Baker *et al.*, (2019) whose studies on food safety have shown that food vendors who observe peers practicing safe food handling are more likely to adopt these behaviors. A study by Okafor *et al.* (2015) showed that over 60% of food vendors in urban Nigeria had never received food safety training. This lack of knowledge about safe food handling practices contributes to the high incidence of foodborne diseases. One of the biggest challenges food vendors face in ensuring food safety is the lack of access to adequate resources such as clean water, refrigeration, and waste disposal systems. A study by Akinbami *et al.*, (2013) highlighted that over 70% of food vendors in Nigeria did not have access to clean water, and most worked in poorly maintained environments with limited waste disposal systems. This lack of infrastructure makes it difficult for vendors to maintain food safety practices.

CONCLUSION

While the environmental conditions of food vendors at vending sites appear generally good, the

findings also indicated poor food safety and handling practices, along with limited awareness and lack of training pose significant public health concerns. However, there is a need for addressing the knowledge and training gap through structured education, ongoing support, and regulatory enforcement which is essential for ensuring safety and wellbeing of consumers and improving overall food safety standards in the communities.

Conflict of Interest: None declared.

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