



**KNOWLEDGE, AND ATTITUDES OF STREET FOOD VENDORS  
TOWARDS FOOD SAFETY AS PERCEIVED AMONG RESIDENTS OF  
KWARA STATE**

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**Abstract**

This study was carried out to investigate (i) knowledge, and (ii) attitudes towards food safety of street food vendors as perceived among residents in Kwara State. A descriptive research design of the survey type was adopted for the study. The population for the study comprised all residents (both male and female) residing in Kwara State. A Multi-stage sampling techniques was used to select one thousand (1000) respondents. Developed structured questionnaire which was validated by 3 experts in the Health Education was used for data collection. The reliability of the instrument was carried out using split-half method using Spearman Brown Prophecy Formula and a coefficient of 0.76 was obtained. The data collected were subjected to frequency counts and inferential statistics of Chi-square to analyze the postulated hypotheses at 0.05 level of significance using SPSS Version 23.0.

The findings of the study showed that:

- i. level of knowledge of street food vendors significantly have influence towards foods safety, because cal.  $\chi^2$  value (162.51) > critical value (12.59) at df of 6.
- ii. attitude of street food vendors significantly have influence towards foods safety, because cal.  $\chi^2$  value (92.74) > critical value (12.59) at df of 6.

The study concluded that level knowledge and attitude of street food vendors have influence towards foods safety. The study recommended that Government should conduct special food safety training for street food vendors in accordance with global health guidelines; and also relevant regulatory bodies to enforce laws to limit the risk of food contamination by food handlers.

**Keywords:** Knowledge, Attitude, Food Safety, Street Food Vendors

**Introduction**

Globally, Food Borne Disease (FBD) is a serious public health concern, and it is primarily associated with poor food handling and sanitation practice (Zanin, Cunha, de Rosso, Capriles & Stedefeldt, 2017). Outbreaks of food-borne diseases could be due to poor hygiene in restaurants; thus, hygienic food handling is a possible way of protecting people from food borne illnesses (Gomes-Neves, Cardoso, Araújo & da Costa, 2011; Assefa, Tasew, Wondafrash & Beker, 2015).

Foodborne diseases are usually defined as infectious air-borne diseases caused by agents that enter the body through food consumption (World Health Organization, 2000). Foodborne diseases are a significant and growing public health problem in both developing and developed countries (Bhattacharjya & Reang, 2014).

The lack of accurate data on the occurrence of Food Borne Disease makes it difficult for policymakers to improve current regulations (Salleh, Lani, Abdullah, Chitek & Hassan, 2017). Moreover, Food Borne Disease not only affects one's health outcomes but even a single outbreak event results in economic losses due to changes in consumer purchasing behaviour and national expenditure for medical treatment (Hussain & Dawson, 2013). Therefore, food safety practices are essential to reducing the prevalence of Food Borne Disease.

Good knowledge and a positive attitude among food handlers and proper food handling practices can help control foodborne illness outbreaks in certain situations (Sharif & Al-Malki, 2010). In addition to good knowledge and positive attitudes about food safety, socio-demographic conditions, such as the education and food safety training attended by food handlers, play an important role in motivating food handlers to implement appropriate food handling practices (Al-Shabib & Mosi, 2016).

Creating a hygienic and sanitary environment in the food handling premises could be facilitated by food handlers who are knowledgeable and sensitized regarding food safety issues. Evidence shows that food handlers who are educated and trained in food safety practices maintain a hygienic environment in the food handling premises (Manes, Kuganatham, Jagadeesan, Laxmideyi & Dworkin, 2016; Derso, Tariku, Ambaw, Alemenhew, Biks & Nega, 2017).

Consumption of microbiologically and chemically contaminated foods causes illness in millions of people in the world everyday (Havelaar, Kirk, Torgerson, Gibb, Hald, et al., 2015; World Health Organization, (WHO), 1999). It has been estimated that 1 out of 10 people in the world (about 600 million) get sick from consuming contaminated food (WHO), 2020). Among them, 420,000 consequently died, which resulted in the loss of 33 million healthy life years (DALYs) per year, and it has an annual economic toll of US\$110 billion in productivity loss and medical expenses in low- and middle-income countries (WHO, 2020). Like other low-income countries, it is estimated that more than 200 diseases spread through contaminated foods (Loukieh, Mouannes, Abou-Jaoudeh, Hanna-Wakim, Fancello & Bou Zeidan, 2018).

However, many of them lack adequate food safety attitudes, knowledge, and practices due to the deficit of food hygiene training. The microbiological quality of street-vended food is an important concern and considered to be a significant contributor to food borne diseases (Al Mamun, Rahman & Turin, 2013; Sousa, Albuquerque, Gelormini, Casal, Pinho, et al., 2022; Rosales, Linnemann & Luning, 2023). The results of several studies conducted on street foods in different countries showed that the foods were positive vectors of food-borne illness (Al Mamun, Rahman & Turin, 2013; Girma, Ketema & Bacha, 2014; Hanashiro, Morita, Matt ´e, Matt ´e & Torres, 2005; Islam, Hassan, Amin, Madilo, Rahman, et al., 2022).

The relationship between knowledge, attitudes and practices are explained through the KAP model (Simelane, 2005). Knowledge is accumulated through learning processes, which may be formal or informal instruction, personal

experience and experience sharing are possible (Glanz, Rimer & Lewis, 2002). It has traditionally assumed that knowledge is automatically translated into behavior (Glanz, Rimer & Lewis, 2002).

Knowledge was found to be unimportant and cognitive processing of information important in the attitude-practice relationship (Simelane, 2005). Attitude is the way people think, it includes evaluative concepts related to how we feel and behave (Keller, 1998). It includes cognition, emotions and what to know a habit component that refers to how to feel and what to do (Keller, 1998). Attitudes can influence the intention to perform a given practice (Rutter & Quine, 2003).

Restaurant food handlers from low- and lower middle-income countries often have little knowledge about food safety issues (Onyeneho & Hedberg, 2013; Manes, Kuganantham, Jagadeesan, Laxmidevi & Dworkin, 2016). However, there is a possibility of virus transmission through food handlers as the virus could survive for several days on the surfaces of utensils or food handling materials (Olaimat, Shahbaz, Fatima, Munir & Holley, 2020). Proper hand-washing techniques; cleaning of raw materials, kitchen equipment, and environment; and food storage are required to combat food burn disease.

This requires a dire call for sanitation research that diminishes pathogenic pollution of road distributed food sources from the planning and up to utilization. In this regard, the level of knowledge, attitude, and practice on food safety in the street food sector is not well known. Therefore, the aim of this study was to investigate the knowledge, and attitudes of street food vendors towards food safety as perceived among residents in Kwara State.

## **Methods and Materials**

A descriptive research design of survey type was used adopted for the study. Asika (2010) noted that the descriptive research is concerned with the collection and analysis of data for the purpose of describing, evaluating or comparing current event or prevailing practices, event or occurrences. This design was deemed appropriate for the study. The population for this study comprised all residents (both male and female) residing in Kwara State with a projected population of about 3,551,000 (City Population, 2023). Kwara State is located at the North Central of Nigeria and also among the first 16 state created in Nigeria, having 16 local government area with 33,433 km<sup>2</sup> Area. The target population for the study consist of 8 selected local government area which are selected with systematic random sampling technique of pick one, skip one method which have a total number of 1,982,500 population.

The sample sizes for the study were one thousand (1000) residents (both male and female). The sample was selected through multi-stage sampling techniques of systematic, proportionate and accidental sampling technique was used for the study. In stage 1: systematic random sampling technique of pick one, skip one method was used to selected eight (8) Local Government Area from the sixteen (16) Local Government Area in Kwara State, with a population of 1,982,500. Stage 2: proportional sampling technique was used to select 0.05% of the target population which gives nine hundred and ninety-one (991) sample size but the researcher decide to make use of one thousand (1000) residents as sample size for the study. Stage 3: accidental sampling technique was used to select one thousand (1000) residents from the eight Local Government Area selected for the study. This was done when researcher administer the questionnaire with the researcher assistant to any residents from age 18 – 65 years which are also from the eight (8) Local Government Area selected for the study.

The research instrument adopted for this study was a researcher developed structured questionnaire title “Knowledge, and Attitudes of Street Food Vendors towards Food Safety as Perceived Among Residents in Kwara State Questionnaire (KASFVFSARKSQ)”. The questionnaire was validated by given a draft copy of the instrument to 3 experts in the Health Education for content validity. Comments and suggestions made by the experts were carefully studied and integrated to improve the quality of the research instrument.

The reliability of the instruments was carried out by adopting a split-half method of determine the internal consistency, by which the questionnaire was pretested among thirty residents from a Boluwaduro Local Government Area in Osun State who shared similar characteristics with the participants of this study. The result of the administration was analyzed using the Spearman Brown Prophecy Formula and a correlation coefficient of 0.76 was obtained, this shows that the research instrument was reliable enough for the study.

The instrument was administered with the help of twenty (20) trained research assistants. The training covered sampling procedures, contents of the questionnaire, how to interpret the items in the questionnaire, and how to get participants’ informed consent.

Ethical principles guiding the use of human participants in research was upheld throughout the conduct of this study also ethical approval was obtained. Participation in the study was made voluntary and informed consent was obtained from each participant in the study. The researcher kept confidential all the information supplied by the research participants, while also ensuring the privacy of the participants. The researcher ensures where possible that completed copies of the questionnaire were collected back immediately to avoid loss of the instrument. Frequency counts and percentage was used to answer the research questions while inferential statistics of Chi-square was used to test hypotheses set for the study at 0.05 level of significance using Statistical Package for Social Science Version 23.0.

## Results and Discussions

**Research Question 1:** What is the level knowledge of street food vendors towards foods safety as perceived among residents?

**Table 1:** Showing frequency counts and percentage of level of knowledge of street food vendors towards food safety as perceived among residents in Kwara State

S/N	Variables	YES (%)	NO (%)
1.	Does hand washing before handling raw food reduce the risk of food contamination?	730 (73%)	270 (27%)
2.	Does personal protective equipment have a role in reducing food contamination?	640 (64%)	360 (36%)
3.	Does dressed neatly is crucial while cooking?	770 (77%)	230 (23%)
4.	Is wearing a cape while working and selling is part of personal hygiene?	520 (52%)	480 (48%)
5.	Does re-heating the cooked foods can decrease food contamination?	580 (58%)	420 (42%)
6.	Do you know raw and cooked foods could be stored separately to reduce contamination?	660 (66%)	340 (34%)
7.	Does proper sanitation and cleaning of utensils decrease the risk of food contamination?	550 (55%)	450 (45%)
<b>Total</b>		<b>636 (63.6%)</b>	<b>364 (36.4%)</b>

The table 1 shows that 636 (63.6%) respondents indicate that street food vendors have high level knowledge towards food safety in Kwara State, while 364 (36.4%) respondents indicate that street food vendors have low level knowledge towards food safety in Kwara State.

**Research Question 2:** What is the attitude of street food vendors towards foods safety as perceived among residents?

**Table 2:** Showing frequency counts and percentage of attitude of street food vendors towards food safety as perceived among residents in Kwara State

S/N	Variables	YES (%)	NO (%)
8.	Do you think that well-cooked foods are free of pathogens?	660 (66%)	340 (34%)
9.	Do you wear an apron and cap while preparing and serving the food?	520 (52%)	480 (48%)
10.	Do you think safe food handling is an important part of job responsibilities?	630 (63%)	370 (37%)
11.	Do you think food vendors can be a source of food-borne diseases?	770 (77%)	230 (23%)
12.	Does paint fingers can contaminate the food?	510 (51%)	490 (49%)
13.	Did you think wearing a face mask to reduce the risk of food contamination?	580 (58%)	420 (42%)
14.	Do you believe personal protective equipment and clothes reduce the risk of food contamination?	640 (64%)	360 (36%)
	<b>Total</b>	<b>616 (61.6%)</b>	<b>394 (39.4%)</b>

The table 2 which shows that 616 (61.6%) respondents indicate that street food vendors have positive attitude towards food safety in Kwara State, while 394 (39.4%) respondents indicate that street food vendors have negative attitude towards food safety in Kwara State.

**Hypothesis 1:** The level knowledge of street food vendors will not significantly have influence towards foods safety as perceived among residents in Kwara State

**Table 3:** Chi-square analysis showing residents perception of the level knowledge of street food vendors towards foods safety

S/N	Variables	YES (%)	NO (%)	df	Cal. $\chi^2$ Value	Critical $\chi^2$ Value	Decision
1.	Does hand washing before handling raw food reduce the risk of food contamination?	730 (73%)	270 (27%)				
2.	Does personal protective equipment have a role in reducing food contamination?	640 (64%)	360 (36%)				
3.	Does dressed neatly is crucial while cooking?	770 (77%)	230 (23%)	6	162.51	12.59	H <sub>0</sub> is rejected
4.	Is wearing a cape while working and selling is part of personal hygiene?	520 (52%)	480 (48%)				
5.	Does re-heating the cooked foods can decrease food contamination?	580 (58%)	420 (42%)				
6.	Do you know raw and cooked foods could be stored separately to reduce contamination?	660 (66%)	340 (34%)				
7.	Does proper sanitation and cleaning of utensils decrease the risk of food contamination?	550 (55%)	450 (45%)				
<b>Total</b>		<b>4452</b>	<b>2548</b>				

$\alpha = 0.05$

The table 3 above shows the result of the hypothesis one which stated that the level knowledge of street food vendors will not significantly have influence towards foods safety as perceived among residents in Kwara State. The calculated chi-square value of 162.51 is greater than the critical value of 12.59 (cal.  $\chi^2$  val **> tab. > tab.**  $\chi^2$  val) with the degree freedom of 6 at 0.05 alpha level of significance. The hypothesis one was therefore rejected. This implies that hand washing before handling raw food reduce the risk of food contamination; also dressed neatly is crucial while cook; and having knowledge that raw and cooked foods could be stored separately to reduce contamination which have influence by street food vendors towards foods safety.

**Hypothesis 2:** The attitude of street food vendors will not significantly have influence towards foods safety as perceived among residents in Kwara State

**Table 4:** Chi-square analysis showing residents perception attitude of street food vendors towards foods safety

S/N	Variables	YES (%)	NO (%)	df	Cal. $\chi^2$ Value	Critical $\chi^2$ Value	Decision
8.	Do you think that well-cooked foods are free of pathogens?	660 (66%)	340 (34%)	6	92.74	12.59	H <sub>0</sub> is rejected
9.	Do you wear an apron and cap while preparing and serving the food?	520 (52%)	480 (48%)				
10.	Do you think safe food handling is an important part of job responsibilities?	630 (63%)	370 (37%)				
11.	Do you think food vendors can be a source of food-borne diseases?	770 (77%)	230 (23%)				
12.	Does paint fingers can contaminate the food?	510 (51%)	490 (49%)				
13.	Did you think wearing a face mask to reduce the risk of food contamination?	580 (58%)	420 (42%)				
14.	Do you believe personal protective equipment and clothes reduce the risk of food contamination?	640 (64%)	360 (36%)				
<b>Total</b>		<b>4312</b>	<b>2758</b>				

$\alpha = 0.05$

The table 4 above shows the result of the hypothesis two which stated that the attitude of street food vendors will not significantly have influence towards foods safety as perceived among residents in Kwara State. The calculated chi-square value of 92.74 is greater than the critical value of 12.59 (cal.  $\chi^2$  val  $>$  tab.  $>$  tab.  $\chi^2$  val) with the degree freedom of 6 at 0.05 alpha level of significance. The hypothesis two was therefore rejected. This implies that food vendors can be a source of food-borne diseases; likewise, personal protective equipment and clothes reduce the risk of food contamination; also, well-cooked foods are free of pathogens which have influence of street food vendors towards foods safety.

### Discussion

Hypothesis 1 result revealed that hand washing before handling raw food reduce the risk of food contamination; also dressed neatly is crucial while cook; and having knowledge that raw and cooked foods could be stored separately to reduce contamination have influence of street food vendors towards foods safety. This finding is in line with the finding of Musa and Akande (2003) opined that food poisoning and the other food born disease could occur in institution such as schools, hostels, hospitals and prisons, where food and drinks are served or sold to groups of people by food vendors or other handlers.



Hypothesis 2 result revealed that food vendors can be a source of food-borne diseases; likewise, personal protective equipment and clothes reduce the risk of food contamination; also, well-cooked foods are free of pathogens which have influence of street food vendors towards foods safety. This finding is similar to the findings of Al Mamun, Rahman and Turin, (2013); Sousa, et al., (2022); and Rosales, Linnemann and Luning, (2023), which says that many of street food vendors lack adequate food safety attitudes due to the deficit of food hygiene training. The microbiological quality of street-vended food is an important concern and considered to be a significant contributor to food borne diseases.

## **Conclusion**

Based on the findings of the study, the following conclusions were drawn:

- i. The level knowledge of street food vendors have influence towards foods safety as perceived among residents in Kwara State.
- ii. Attitude of street food vendors have influence towards foods safety as perceived among residents in Kwara State

## **Recommendations**

Based on the conclusion drawn the following recommendations were drawn:

- i. The study found that most street food vendors have good food safety knowledge, but their hygienic practices require improvement. Therefore, all levels of Government should conduct special food safety training for street food vendors in accordance with global health guidelines.
- ii. It also discovered that street food vendors have positive attitude towards safety food, but more still require towards hygienic environment. It is needed for relevant regulatory bodies to institute measures to ensure the enforcement of food handling laws to limit the risk of food contamination by food handlers.

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