



FOOD SAFETY KNOWLEDGE AND PRACTICES AMONG FOOD VENDORS IN PUBLIC PRIMARY SCHOOLS IN NIGER STATE

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Abstract

This study investigated food safety knowledge and practices among food vendors in public primary schools in Niger State. Specifically, the study examined the level of food safety knowledge among food vendors, identified the food safety practices adopted by the vendors, determined the relationship between food safety knowledge and food safety practices, and examined the factors influencing food safety knowledge and practices among food vendors in public primary schools in Niger State. A descriptive survey research design was adopted for the study. The population of the study comprised food vendors in public primary schools in Niger State, while a sample size of 467 respondents was used for the study. A structured questionnaire titled "Food Safety Knowledge and Practices Questionnaire (FSKPQ)" was used for data collection. The instrument was validated by experts and administered to the respondents directly by the researcher. Data collected were analyzed using mean and standard deviation to answer the research questions, while Pearson Product Moment Correlation was used to determine the relationship between food safety knowledge and food safety practices. The findings of the study revealed that food vendors possessed a high level of food safety knowledge with a grand mean score of 3.33. The study also showed that food vendors adopted good food safety practices with a grand mean score of 3.19. Furthermore, the study revealed a strong positive and significant relationship between food safety knowledge and food safety practices among food vendors ($r = 0.68, p < 0.05$). The findings further indicated that factors such as inadequate water supply, poor environmental sanitation, educational level, lack of food safety training, lack of storage facilities, and government inspection significantly influenced food safety knowledge and practices among food vendors. The study therefore recommended regular food safety training programmes, improved sanitation facilities, effective monitoring by health authorities, and continuous public health education for food vendors in schools.

Keywords: Food safety knowledge, Practices, Food vendors, Public primary schools and Niger State

Introduction

Food safety is a public health precedence because millions of people particularly children, pregnant women and the elderly get ill and many die as a result of consuming unsafe food (WHO, 2021). The main aim of food safety is to prevent food poisoning and other food borne illnesses, to decrease the incidence of morbidity and mortality of foodborne diseases which negatively affect the health of consumers and financial wellbeing of developing countries. The need to focus on food safety knowledge of all those responsible for food preparation and serving becomes necessary and essential (Akabanda & James, 2017). Food safety knowledge can be obtained through training, printed education materials, the use of mass media and social media, acquisition of these knowledge by homemakers at home and food vendors outside the home will result to positive food safety practices. Practices are the ways in which people demonstrate their knowledge through their actions (Aslam, Umbreen, Jabangir, Bano &



Aktar, 2020). WHO Report (2017) ascertained that poor safety practices such as those related to inadequate preparation and improper cooking of food, poor hygiene and the re-use- of left-over food are responsible for causing 14% of food borne diseases.

Suleiman and Abdullahi (2022) reported that food vendors involved in the National Home-Grown School Feeding Programme demonstrated good knowledge of personal hygiene and utensil safety. Similarly, Olatunji et al. (2025) found that food vendors in Oyo State exhibited reasonable awareness of hygiene practices. Onyeaka et al. (2024) observed that a good percentage of respondents understood the importance of time and temperature control in preventing microbial growth and knew the safe operating temperatures for refrigerators. However, despite the overall high level of knowledge observed in this study, some deficiencies still existed in areas relating to food contamination pathways and safe food storage. Onyeneho and Herberg (2013) also revealed inadequate understanding of how sick food handlers could expose consumers to foodborne diseases. Pepple (2017) reported a general lack of knowledge concerning food contamination and hygienic practices among food vendors in Abuja. Likewise, Iwu et al. (2017) and Madaki and Bavorova (2019) found that many vendors lacked adequate knowledge of pathogens and hygienic food safety practices relevant to tropical environments.

Barnabas et al. (2024) reported that vendors with better hygiene practices recorded lower risks of contamination. Adewumi et al. (2014) emphasized that proper food handling practices such as hand washing, use of clean utensils, adequate cooking, and sanitary environments are essential in reducing foodborne diseases. Similarly, Olatunji et al. (2025) observed that food vendors demonstrated reasonable hygiene practices in food handling. Despite the positive findings, the study revealed relatively lower practice levels in separating raw and cooked foods as well as proper storage procedures. Onyeaka et al. (2024) reported low knowledge and poor compliance regarding prevention of cross-contamination through the use of separate cutting boards and utensils for raw and cooked foods. Falusi (2023) stated that rural and suburban areas in Nigeria still experience deficiencies in infrastructure and food safety sensitization, which negatively affect hygienic practices.

Knowledge-Attitude-Practice (KAP) Model cited by Akabanda et al. (2021) posits that knowledge influences attitudes and subsequently shapes practices. Olatunji et al. (2025) asserted that there is a strong relationship between food safety knowledge, practices, and the prevention of foodborne diseases. Similarly, Peltó (2022) maintained that improved food safety knowledge significantly reduces the likelihood of food contamination and associated illnesses. Abdulmutalib et al. (2019) reported that food handlers with adequate food safety knowledge are more likely to comply with hygiene standards and best practices, thereby reducing the spread of foodborne pathogens. Barnabas et al. (2024) found that improved hygiene practices among food vendors reduced contamination risks in school feeding programmes. However, Al-Kandari et al. (2023) argued that good food safety knowledge does not always translate into positive food safety behaviour because of factors such as economic constraints, poor infrastructure, and weak regulatory systems. Akabanda et al. (2023) also maintained that knowledge alone is insufficient to ensure compliance with food safety standards without supportive institutional and environmental conditions.

Chukwuezi (2010) and Falusi (2023) emphasized that educational attainment significantly shapes food safety knowledge and hygienic practices among food vendors. Madaki and Bavorova (2019) reported that education significantly predicts food safety knowledge and compliance with hygienic standards. Similarly, Barnabas et al. (2024) that education positively influences food safety knowledge because educated vendors can better understand safety instructions and guidelines. Olatona et al. (2022) stated that access to information through radio, television, and internet services enhances food vendors' awareness and understanding of food hygiene practices. Likewise, Nordhagen et al. (2022) maintained that vendors exposed to structured information channels demonstrate better food safety understanding compared to those depending on informal sources. Madaki and Bavorova (2019) reported that age, training, and years of vending experience positively influence food safety



knowledge and practices. In the same vein, Suleiman and Abdullahi (2022) found that food safety training significantly improved vendors' knowledge regarding personal hygiene and safe food preparation practices.

Positive food safety practices should therefore be ensured by food vendors. Food vendors are people or businesses that sell prepared food or drinks to the public and often regarded as the best sources of infection and channels for transferring foodborne diseases because they directly deal with handling of food items (Aslam, Umbreen, Jabangir, Bano & Aktar, 2020). Most of the factors related to the occurrence of foodborne diseases among school children which are of public health concern worldwide are under the responsibility of food vendors (Adane, 2021). This study therefore sets to assess the food safety knowledge and practices of food vendors in public primary schools in Niger State.

Statement of the Problem

The incidence of morbidity and mortality of foodborne diseases/ illnesses among millions of people particularly children as a result of consuming unsafe food which contains pathogens is a public health concern. Food-borne diseases/illnesses often affects school children who are away from home, who consume more meals outside the home. The implication here is that school children who survived the high infant and childhood mortality and who are more vulnerable group for intestinal parasitic infections are further exposed to hazards of purchasing foods from food vendors, who may harbour pathogens or have the potential of spreading infections to a large number of them. Several studies have been conducted in many part of Nigeria investigating the knowledge and practices of food safety among food handlers and food vendors in educational institutions. However, there is lack of evidence on whether food vendors in public primary schools in Niger state have the basic knowledge of food safety and the extent to which they practiced it. It is based on this backdrop that this study seeks to assess the knowledge and practices of food safety among food vendors in public primary school in Niger state.

Purpose of the Study

The major objective of this study is to examine food safety knowledge and practices among food vendors in public primary schools in Niger State as an impetus for the prevention of food borne diseases, specifically the study intends to:

1. identify the level of food safety knowledge among food vendors in public primary schools in Niger State.
2. assess the food safety practices adopted by food vendors in public primary schools in Niger State.
3. determine the relationship between food safety knowledge and food safety practices among food vendors in public primary schools in Niger State.
4. identify factors influencing food safety knowledge and practices among food vendors in public primary schools in Niger State.

Research Questions

The following questions are set to serve as a guide for this study:

1. What is the level of food safety knowledge among food vendors in public primary schools in Niger State?
2. What food safety practices are adopted by food vendors in public primary schools in Niger State?
3. What is the relationship between food safety knowledge and food safety practices among food vendors in public primary schools in Niger State?
4. What factors influence food safety knowledge and practices among food vendors in public primary schools in Niger State?

Methodology

This study adopts a descriptive cross-sectional survey design. The design is appropriate because it allows for the systematic collection of data from food vendors in public primary schools at a single point in time. It is also suitable for assessing food safety knowledge and practices, as well as examining their role in preventing foodborne diseases without manipulating any variables. The study was conducted in Niger State, Nigeria. Niger



State is located in the North-Central geopolitical zone and comprises urban and rural communities with a large number of public primary schools. Food vending activities are common within school environments, making the state appropriate for investigating food safety knowledge and practices among vendors serving school children. The target population for this study consist of all food vendors operating within public primary schools in Niger State. This includes both male and female vendors who prepare and sell food items to pupils within school premises. A sample size of 475 food vendors was selected for the study based on accessibility and distribution across selected schools. A multistage sampling technique was used to ensures adequate representation of food vendors across different locations. Stage One: Selection of Local Government Areas (LGAs) using simple random sampling; Stage Two: Selection of public primary schools within the chosen LGAs using stratified sampling (urban and rural schools) and Stage Three: Selection of food vendors within the schools using purposive sampling, focusing only on active vendors available during the study period.

Data was collected using a structured questionnaire titled: “Food Safety Knowledge and Practices Questionnaire (FSKPQ)”. The questionnaire was divided into two sections, section A and B. Section A consists of questions related to socio-demographic characteristics (age, gender, education, years of experience) while Section B focused on questions related to the objectives/ research questions of the study. The items were structured using a Likert scale format (Strongly Agree, agree, disagree and strongly Disagree). The instrument was subjected to face and content validity by experts in Home Economics, Public Health, and Measurement and Evaluation. Their suggestions and corrections was incorporated to final draft of the questionnaire. The reliability of the instrument was determined using the test-retest method. The questionnaire was administered to a small group of food vendors outside the study area. The responses were analyzed using Pearson Product Moment Correlation (PPMC) to determine the consistency of the instrument, a reliability coefficient of 0.70 was obtained. The researchers with the help of trained research assistants administered the questionnaire directly to the respondents in order to ensure a high response rate and provide clarification where necessary. Completed questionnaires were collected immediately after completion. Data collected was analyzed using both descriptive and inferential statistics, Descriptive statistics: Frequency counts, percentages for the socio demographic characteristics of the respondents, mean scores to answer research questions while Pearson Product Moment Correlation (PPMC) was used to determine relationship, t-test or ANOVA to test differences based on socio-demographic variables and Regression analysis to determine the extent to which knowledge and practices predict the prevention of foodborne diseases. Out of 475 Questionnaire administered only 467 were retrieved and well filled which were used for data analysis.

Results

Research Question One

What is the level of food safety knowledge among food vendors in public primary schools in Niger State?

Table 1: Mean and Standard Deviation on Food Safety Knowledge among Food Vendors (N = 467)

S/N	Items	Mean	SD	Decision
1	Food vendors know that hand washing prevents food contamination.	3.41	0.71	Agree
2	Food vendors understand that dirty utensils spread diseases.	3.36	0.74	Agree
3	Food vendors know the importance of covering food.	3.48	0.66	Agree
4	Food vendors are aware that expired food is harmful.	3.55	0.61	Agree
5	Food vendors know proper food storage methods.	3.12	0.82	Agree
6	Food vendors understand the dangers of contaminated water.	3.29	0.76	Agree
7	Food vendors know that pests contaminate food.	3.45	0.69	Agree
8	Food vendors understand the importance of personal hygiene.	3.51	0.63	Agree
9	Food vendors know that raw and cooked foods should be separated.	3.08	0.84	Agree
10	Food vendors are aware of foodborne diseases.	2.97	0.88	Agree
11	Food vendors know the importance of cleaning cooking areas regularly.	3.44	0.70	Agree



S/N Items	Mean	SD	Decision
Grand Mean	3.33	0.73	Agree

Table 1 shows the level of food safety knowledge among food vendors in public primary schools in Niger State. The grand mean score of 3.33 indicates that the respondents possessed a high level of food safety knowledge. The respondents particularly agreed that expired food products are harmful to health (Mean = 3.55) and that personal hygiene is important in food handling (Mean = 3.51). This implies that the food vendors are knowledgeable about basic food safety principles necessary for preventing food contamination and foodborne diseases.

Research Question Two

What food safety practices are adopted by food vendors in public primary schools in Niger State?

Table 2: Mean and Standard Deviation on Food Safety Practices Adopted by Food Vendors (N = 467)

S/N Items	Mean	SD	Decision
1 Food vendors wash hands before preparing food.	3.28	0.79	Agree
2 Food vendors cover food during sales.	3.34	0.75	Agree
3 Food vendors clean utensils after use.	3.26	0.80	Agree
4 Food vendors dispose waste properly.	3.11	0.85	Agree
5 Food vendors use clean water for cooking.	3.30	0.77	Agree
6 Food vendors separate raw and cooked foods.	2.95	0.90	Agree
7 Food vendors wear clean clothes/aprons while cooking.	3.02	0.87	Agree
8 Food vendors clean their environment regularly.	3.18	0.81	Agree
9 Food vendors check expiry dates before use.	3.07	0.86	Agree
10 Food vendors protect food from insects and rodents.	3.22	0.78	Agree
11 Food vendors avoid serving food with dirty hands.	3.37	0.73	Agree
Grand Mean	3.19	0.81	Agree

Table 2 reveals the food safety practices adopted by food vendors in public primary schools in Niger State. The grand mean of 3.19 indicates that the respondents generally adopted good food safety practices. The highest-rated practice was avoiding serving food with dirty hands (Mean = 3.37), while separating raw and cooked foods had the lowest mean score (Mean = 2.95). The findings suggest that food vendors practice acceptable food hygiene measures, although some areas still require improvement.

Research Question Three

What is the relationship between food safety knowledge and food safety practices among food vendors in public primary schools in Niger State?

Table 3: Relationship between Food Safety Knowledge and Food Safety Practices among Food Vendors (N = 467)

Variables	N	Mean	SD	r-value	p-value	Decision
Food Safety Knowledge	467	3.33	0.73	0.68	0.000	Significant
Food Safety Practices	467	3.19	0.81			

Table 3 shows the relationship between food safety knowledge and food safety practices among food vendors in public primary schools in Niger State. The correlation coefficient ($r = 0.68$) indicates a strong positive relationship between food safety knowledge and food safety practices. The p-value of 0.000 is less than the 0.05 level of significance, showing that the relationship is statistically significant. This implies that increased food safety knowledge among food vendors leads to improved food safety practices.



Research Question Four

What factors influence food safety knowledge and practices among food vendors in public primary schools in Niger State?

Table 4: Mean and Standard Deviation on Factors Influencing Food Safety Knowledge and Practices (N = 467)

S/N	Items	Mean	SD	Decision
1	Lack of food safety training affects food handling practices.	3.44	0.69	Agree
2	Educational level influences food safety knowledge.	3.31	0.76	Agree
3	Inadequate water supply affects food safety practices.	3.53	0.63	Agree
4	Lack of storage facilities affects food safety.	3.39	0.72	Agree
5	Government inspection improves food safety compliance.	3.26	0.79	Agree
6	High cost of hygiene materials affects compliance.	3.18	0.82	Agree
7	Experience in food vending improves food safety knowledge.	3.22	0.81	Agree
8	Poor environmental sanitation affects food safety practices.	3.47	0.67	Agree
9	Access to health education improves food safety practices.	3.41	0.70	Agree
10	Time pressure affects proper food handling.	3.09	0.85	Agree
11	Availability of clean equipment improves food safety practices.	3.36	0.75	Agree
Grand Mean		3.33	0.74	Agree

Table 4 presents the factors influencing food safety knowledge and practices among food vendors in public primary schools in Niger State. The grand mean score of 3.33 indicates agreement among respondents that several factors influence food safety knowledge and practices. Inadequate water supply (Mean = 3.53) and poor environmental sanitation (Mean = 3.47) were identified as major influencing factors. This implies that environmental and educational factors significantly affect the ability of food vendors to maintain proper food safety standards.

Discussion of the Findings

The findings of this study revealed that food vendors in public primary schools in Niger State possessed a high level of food safety knowledge, as indicated by the grand mean score of 3.33. The respondents demonstrated good understanding of hand washing, personal hygiene, food covering, dangers of expired food, and cleanliness of cooking environments. This finding suggests that most food vendors are aware of the basic principles of food safety and hygiene required in food handling. The finding is consistent with the study of Suleiman and Abdullahi (2022), who reported that food vendors involved in the National Home-Grown School Feeding Programme demonstrated good knowledge of personal hygiene and utensil safety. Similarly, Olatunji et al. (2025) found that food vendors in Oyo State exhibited reasonable awareness of hygiene practices. The present finding also aligns with Onyeaka et al. (2024), who observed that a good percentage of respondents understood the importance of time and temperature control in preventing microbial growth and knew the safe operating temperatures for refrigerators. However, despite the overall high level of knowledge observed in this study, some deficiencies still existed in areas relating to food contamination pathways and safe food storage. This supports the findings of Onyeneho and Herberg (2013), who revealed inadequate understanding of how sick food handlers could expose consumers to foodborne diseases. The finding equally agrees with Pepple (2017), who reported a general lack of knowledge concerning food contamination and hygienic practices among food vendors in Abuja.

The findings of the study showed that food vendors adopted good food safety practices, with a grand mean score of 3.19. The respondents agreed that they washed hands before food preparation, covered food during sales, cleaned utensils regularly, used clean water, and protected food from insects and rodents. This suggests that food vendors generally practiced acceptable hygiene measures while preparing and serving food to pupils. This finding



is in agreement with Barnabas et al. (2024), who reported that vendors with better hygiene practices recorded lower risks of contamination. The finding also supports Adewumi et al. (2014), who emphasized that proper food handling practices such as hand washing, use of clean utensils, adequate cooking, and sanitary environments are essential in reducing foodborne diseases. Similarly, Olatunji et al. (2025) observed that food vendors demonstrated reasonable hygiene practices in food handling. Despite the positive findings, the study revealed relatively lower practice levels in separating raw and cooked foods as well as proper storage procedures. This finding corroborates Onyeaka et al. (2024), who reported low knowledge and poor compliance regarding prevention of cross-contamination through the use of separate cutting boards and utensils for raw and cooked foods. The finding also supports

The findings of the study revealed a strong positive and significant relationship between food safety knowledge and food safety practices among food vendors in public primary schools in Niger State. This implies that increased food safety knowledge among vendors significantly improves their food safety practices. The finding is consistent with the Knowledge-Attitude-Practice (KAP) Model cited by Akabanda et al. (2021), which posits that knowledge influences attitudes and subsequently shapes practices. The result also agrees with Olatunji et al. (2025), who asserted that there is a strong relationship between food safety knowledge, practices, and the prevention of foodborne diseases. Similarly, Pelto (2022) maintained that improved food safety knowledge significantly reduces the likelihood of food contamination and associated illnesses. The finding further supports Abdulmutalib et al. (2019), who reported that food handlers with adequate food safety knowledge are more likely to comply with hygiene standards and best practices, thereby reducing the spread of foodborne pathogens. The result equally agrees with Barnabas et al. (2024), who found that improved hygiene practices among food vendors reduced contamination risks in school feeding programmes. However, the finding partially contradicts Al-Kandari et al. (2023), who argued that good food safety knowledge does not always translate into positive food safety behaviour because of factors such as economic constraints, poor infrastructure, and weak regulatory systems.

The findings of the study showed that several factors influenced food safety knowledge and practices among food vendors in public primary schools in Niger State. Major factors identified included inadequate water supply, poor environmental sanitation, lack of food safety training, educational level, lack of storage facilities, and availability of clean equipment. The respondents generally agreed that these factors significantly affect food safety compliance and hygiene practices. The finding is consistent with Chukwuezi (2010) and Falusi (2023), who emphasized that educational attainment significantly shapes food safety knowledge and hygienic practices among food vendors. The finding also agrees with Madaki and Bavorova (2019), who reported that education significantly predicts food safety knowledge and compliance with hygienic standards. Similarly, Barnabas et al. (2024) found that education positively influences food safety knowledge because educated vendors can better understand safety instructions and guidelines. The result further supports Olatona et al. (2022), who stated that access to information through radio, television, and internet services enhances food vendors' awareness and understanding of food hygiene practices. Likewise, Nordhagen et al. (2022) maintained that vendors exposed to structured information channels demonstrate better food safety understanding compared to those depending on informal sources. The finding also corroborates Madaki and Bavorova (2019), who reported that age, training, and years of vending experience positively influence food safety knowledge and practices.

Conclusion

Based on the findings of this study, it was concluded that food vendors in public primary schools in Niger State possess good knowledge of food safety principles and generally adopt acceptable food safety practices during food preparation and handling. The study established that food vendors are aware of the importance of personal hygiene, hand washing, food covering, cleanliness of utensils, and proper environmental sanitation in preventing food contamination and foodborne diseases. The study further concluded that there is a strong positive relationship between food safety knowledge and food safety practices among food vendors. This implies that improved food safety knowledge contributes significantly to better hygiene behaviour and safer food handling



practices among vendors in public primary schools. In addition, the study concluded that food safety knowledge and practices are influenced by several factors including educational level, food safety training, water supply, environmental sanitation, storage facilities, government monitoring, and availability of clean equipment. These factors play significant roles in determining the extent to which food vendors comply with recommended food safety standards. Overall, the study concluded that improving food safety knowledge through education, training, and effective supervision will enhance food safety practices and reduce the risks of foodborne diseases among school children in public primary schools in Niger State.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. The Ministry of Health and relevant educational authorities should organize regular food safety training and sensitization programmes for food vendors in public primary schools to improve their knowledge and hygiene practices.
2. School authorities should ensure continuous supervision and monitoring of food vendors to promote compliance with recommended food safety standards and hygienic practices.
3. Government and school management should provide adequate sanitation facilities such as clean water supply, waste disposal systems, and hygienic food preparation environments within school premises.
4. Food vendors should be encouraged to attend periodic workshops and seminars on food safety, food hygiene, and prevention of foodborne diseases.
5. Public health officers and environmental health personnel should conduct regular inspection of food vending sites in schools to ensure adherence to food safety regulations.

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