integrity Research Journals

Journal of Public Health and Diseases
Volume 8(1), pages 31-40, April 2026
Article Number: 2781B5364
ISSN: 2705-2214
https://doi.org/10.31248/JPHD2026.162
https://integrityresjournals.org/journal/JPHD

Full Length Research

Food safety and public health risks of ready-to-eat foods in motor parks: A case study of Kofar Ruwa and Unguwa Uku, Kano State, Nigeria

Kamilu Ishaq

Department of Public Health, School of Health Sciences and Technology, Federal Polytechnic Kabo, Kano State, Nigeria.

Email: kamiluishaq2015@gmail.com

Received Date: 4 March 2026 | Accepted Date: 13 April 2026 | Published Date: 30 April 2026

ABSTRACT: This study investigated the public health risks associated with street-vended foods at Kofar Ruwa Motor Park and Unguwa Uku Motor Park in Kano. A mixed-methods design was employed, combining structured observational assessments of 100 street food vendors with questionnaire surveys administered to 365 consumers. Data were analysed using descriptive statistics (frequencies, means, and standard deviations) and inferential tests, including t-tests, chi-square tests, ANOVAs, and Pearson correlations, in SPSS version 25.0. The findings revealed generally poor hygiene practices among vendors (aggregate mean = 1.87), reflecting inadequate personal cleanliness and unsanitary environmental conditions. Consumers reported a moderate-to-high frequency of foodborne illness symptoms (aggregate mean = 3.16), with diarrhoea (mean = 3.76) and stomach pain (mean = 3.63) being the most frequently experienced. Notably, consumers demonstrated high awareness of food safety hazards (aggregate mean = 4.23) and strong risk perception (aggregate mean = 3.81). However, their actual preventive practices were only moderate (aggregate mean = 3.44). Although awareness was positively and significantly correlated with safety behaviour ($r = .481$, $p < .05$), the moderate strength of this association indicates a persistent awareness behaviour gap. The results suggest that socioeconomic considerations, particularly affordability and convenience, limit consumers' ability to translate knowledge into consistent protective actions. The study concludes that street-vended foods in the selected motor parks pose a continuing public health concern and recommends strengthened vendor training, improved sanitary infrastructure, and targeted interventions to bridge the gap between awareness and practice.

Keywords: Consumer awareness, food safety, hygiene practices, Kano City, food-borne illness, street food.

INTRODUCTION

Street food vending has become an integral component of the informal food sector in many urban centres across developing countries, including Nigeria. Street foods, defined as ready-to-eat foods and beverages prepared or sold by vendors and hawkers in streets and other public places, provide quick, affordable, and accessible meals to a large segment of the urban population (Food and Agriculture Organisation et al., 2020). In densely populated areas such as motor parks, markets, and city centres, these food items are widely consumed due to their affordability, convenience, and cultural relevance.

In Kano City, one of the most populous urban centres in Nigeria, motor parks such as Kofar Ruwa and Unguwa Uku have experienced a rapid increase in street food vending activities. Vendors provide a diverse range of food items, including cooked rice, fried snacks, and traditional delicacies. While this sector contributes significantly to food security and employment, concerns regarding food safety and hygiene remain critical. The informal nature of street food vending often results in operations within unsanitary environments characterised by limited access to potable water, poor waste disposal systems, and

inadequate hygiene practices (Omemu and Aderoju, 2008; Nordhagen, 2022).

Empirical evidence indicates that street-vended foods are highly susceptible to contamination due to poor handling practices, unsafe water use, and environmental exposure. Studies in Nigeria have shown that food vendors often lack adequate hygiene training and operate under conditions that promote microbial contamination (Omemu and Aderoju, 2008). More recent research further confirms that food safety risks persist in informal food systems due to infrastructural deficiencies, weak regulatory enforcement, and poor food safety culture (Odetokun et al., 2025; Onyeaka et al., 2021).

Consumption of contaminated street foods exposes individuals to foodborne diseases such as diarrhoea, cholera, and typhoid fever, which remain major public health concerns in developing countries. Globally, unsafe food continues to contribute significantly to disease burden, particularly in regions with weak food safety systems (World Health Organisation, 2022).

Furthermore, the largely unregulated nature of street food vending creates significant gaps in food safety monitoring, policy enforcement, and public awareness. Vendors often lack formal training, while consumers tend to prioritise affordability and convenience over safety considerations. This situation is particularly evident in high-traffic environments such as motor parks, where infrastructure is limited and regulatory oversight is weak (Adaku et al., 2024; Alawode and Tabit, 2025).

Despite the importance of street food vending in urban Nigeria, concerns about food safety remain widespread. Evidence shows that many vendors operate under poor hygienic conditions, with limited access to potable water and sanitation facilities (Omemu and Aderoju, 2008; Nordhagen, 2022). The situation is further exacerbated by weak regulatory enforcement and infrastructural deficiencies, which allow unsafe practices to persist in informal food environments (Adaku et al., 2024; Alawode and Tabit, 2025). As a result, foodborne diseases remain prevalent, posing significant public health risks (World Health Organisation, 2022).

Kano, in particular, has experienced recurring outbreaks of water- and food-related diseases, with vulnerable populations such as children, commuters, and low-income earners being most affected. Preliminary field observations and anecdotal reports from Kofar Ruwa and Unguwa Uku motor parks reveal poor hygiene practices among vendors, including the use of contaminated water for cooking, lack of refrigeration, handling of food with bare hands, and proximity of food stalls to open drainage systems and refuse dumps.

Moreover, there is limited empirical data on consumer awareness, risk perception, and safety behaviours related to street-vended foods in these areas. Most consumers prioritise affordability and convenience over hygiene and quality, often consuming meals without questioning their safety. This consumer behaviour, combined with a weak regulatory framework and poor vendor compliance with food safety guidelines, constitutes a serious public health concern.

Given this situation, there is a critical need to assess the public health risks associated with street-vended foods in these two major motor parks. Without such assessment, efforts to prevent foodborne illnesses and promote safe food environments will remain fragmented and ineffective. This research, therefore, seeks to bridge the knowledge gap by systematically evaluating vendor hygiene practices, consumer safety behaviours, and the associated public health implications in Kofar Ruwa and Unguwa Uku.

Objectives

The objective of this research is to assess the public health risks associated with street-vended foods in Kofar Ruwa and Unguwa Uku motor parks in Kano City, with particular focus on vendor hygiene practices and consumer safety behaviours.

Research questions

The study is set to answer the following research questions:

1. What are the hygiene practices of street food vendors in Kofar Ruwa and Unguwa Uku motor parks?
2. What are the public health risks associated with the consumption of street-vended foods?
3. What is the level of consumer awareness regarding the potential hazards of street-vended foods in the study areas?
4. How do consumers in the study areas perceive the risks associated with street-vended foods?
5. What safety behaviours do consumers exhibit when purchasing and consuming street-vended foods in the study areas?
6. What are the environmental conditions under which street-vended foods are prepared and sold in the study areas?

Hypotheses

The following null hypotheses are postulated to guide the study:

H_{O1}: There is no significant difference in the hygiene practices of street food vendors between Kofar Ruwa and Unguwa Uku motor parks.
H_{O2}: There is no significant association between the consumption of street-vended foods and the incidence of public health risks;
H_{O3}: The level of consumer awareness regarding the potential hazards of street-vended foods is not significantly different from a baseline of unawareness;

H_{O4}: There is no significant difference in the perception of risks associated with street-vended foods among various consumer demographics;
H_{O5}: Consumer awareness of potential hazards has no significant influence on the safety behaviors they exhibit when purchasing and consuming street-vended foods;

LITERATURE REVIEW

Conceptual framework

Street-vended foods are defined as ready-to-eat foods and beverages prepared and/or sold by vendors in public places for immediate consumption (Food and Agriculture Organisation et al., 2020). In developing countries, this sector plays a vital socioeconomic role by providing employment opportunities and affordable nutrition to urban populations.

However, the informal nature of this sector exposes food to contamination risks due to inadequate sanitation infrastructure, lack of potable water, and poor hygiene practices. Studies have shown that food safety challenges in informal systems are influenced not only by individual behaviours but also by structural constraints such as poverty, inadequate infrastructure, and weak regulatory systems (Nordhagen, 2022; Adaku et al., 2024). Consequently, street-vended foods are vulnerable to contamination from biological, chemical, and environmental sources, posing serious public health risks (Odetokun et al., 2025).

Empirical studies

Several empirical studies have examined food safety challenges in Nigeria's street food sector. Omemu and Aderoju (2008) reported poor compliance with hygiene practices among street food vendors, highlighting deficiencies in food handling and sanitation. More recent studies provide stronger evidence of contamination risks in informal food systems. Odetokun et al. (2025) reported that street-vended foods in Nigeria are frequently exposed to contamination due to unsafe handling practices, environmental exposure, and poor sanitation conditions. Similarly, Onyeaka et al. (2021) emphasised that weak food safety culture, inadequate infrastructure, and limited regulatory enforcement contribute significantly to food safety risks in Nigeria. In addition, Nordhagen (2022) noted that both vendors and consumers often operate within a system where food safety is constrained by economic and environmental limitations, further increasing the risk of foodborne illnesses.

Theoretical framework

The theoretical framework for this study is anchored on two interrelated models: the Health Belief Model (HBM) and the Social Ecological Model (SEM). These frameworks provide a comprehensive lens for understanding the hygiene behaviours of food vendors, the risk perception of consumers, and the broader environmental influences on street food safety.

Health Belief Model (HBM)

The Health Belief Model, developed by Rosenstock in the 1950s, is a psychological framework that explains and predicts health-related behaviours by focusing on the attitudes and beliefs of individuals. The core constructs of the HBM include perceived susceptibility**,** perceived severity**,** perceived benefits**,** perceived barriers**,** cues to action**,** and self-efficacy (Champion and Skinner, 2008).

In the context of street food safety, the HBM helps explain why food vendors and consumers may or may not engage in hygienic or protective behaviours. For instance, a consumer who perceives a high risk (susceptibility) of foodborne illness and understands its serious consequences (severity) is more likely to avoid unhygienic food outlets or demand better food safety standards. Similarly, a vendor who recognises the benefits of proper food handling and feels capable of applying hygienic practices (self-efficacy) is more likely to improve the safety of their products.

Thus, the HBM guides the exploration of individual motivations and barriers to hygienic food practices and informs the development of interventions that can increase compliance and awareness among both vendors and consumers.

Social Ecological Model (SEM)

The social-ecological model provides a multi-level perspective on behaviour, emphasising that health practices are influenced not just by individual choices but also by interpersonal, organisational, community, and policy-level factors (McLeroy et al., 1988). This model is especially relevant in public health studies that involve environmental, infrastructural, and regulatory dynamics, such as the present study.

Applying the SEM to street food safety, the individual level includes vendor hygiene knowledge and consumer risk perception; the interpersonal level includes influence from peers or family members; the community level considers the physical conditions of the vending environment (e.g., cleanliness of motor parks and waste disposal systems); and the policy level involves food safety regulations, inspection routines, and municipal enforcement.

By combining the HBM and SEM, this study captures the micro- and macro-level factors that shape food safety practices and public health risks in informal urban food settings.

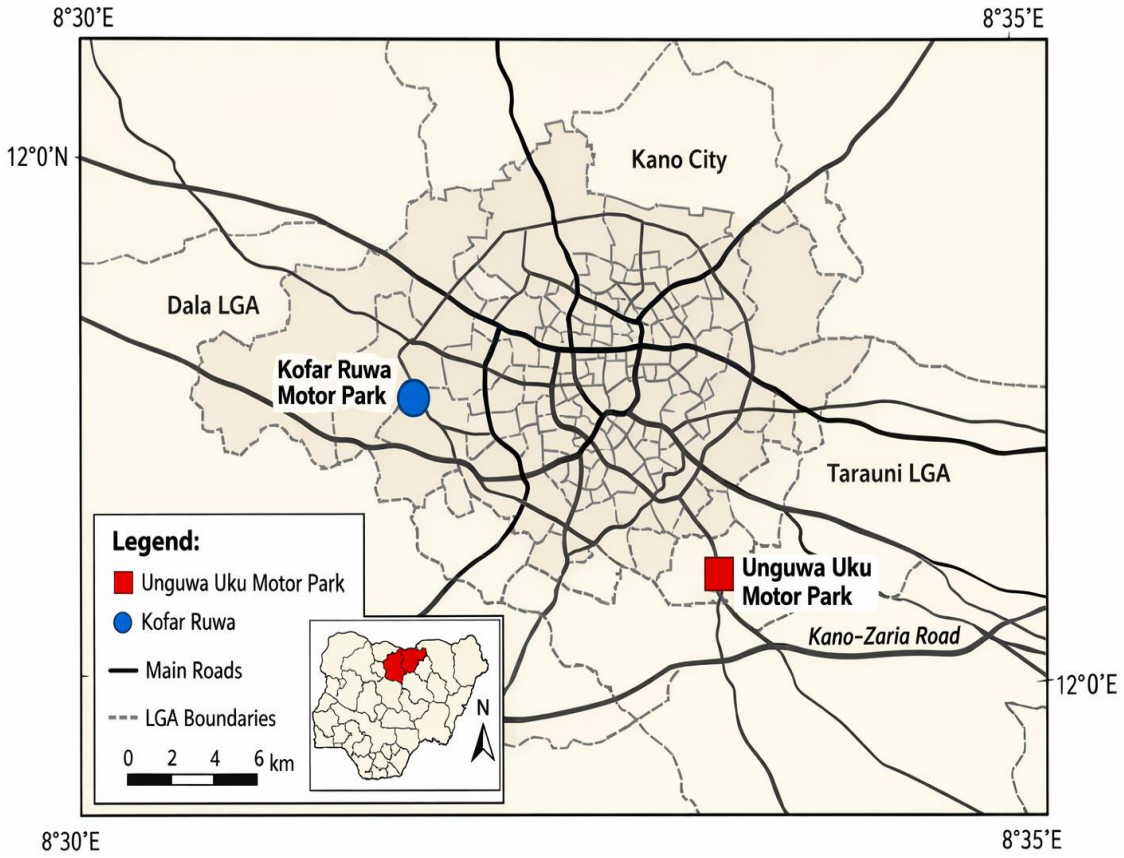

Figure 1. Kano metropolis: Location of Unguwa Uku Motor Park and Kofar Ruwa Motor Park.

MATERIALS AND METHODS

This study adopted a descriptive cross-sectional design utilising a mixed-methods approach. The quantitative component involved structured questionnaires administered to food vendors and consumers, while the qualitative component included direct field observations. This design enabled the capture of a comprehensive picture of hygiene practices, environmental conditions, and consumer safety behaviours at a specific point in time.

The study was conducted in Kofar Ruwa Motor Park and Unguwa Uku Motor Park, both located in Kano City, Northern Nigeria (Figure 1). These parks were purposively selected as case study areas because they are among the busiest in the state, characterised by a high volume of commuters, extensive street vending activities, and limited regulatory oversight. The study was conducted from March, 2025 to October 2025.

The study population comprised street food vendors engaged in the preparation and sale of ready-to-eat foods, and consumers who purchase and consume these foods within the parks. A multi-stage sampling technique was employed:

Stage 1: The two motor parks (Kofar Ruwa and Unguwa Uku) were purposively selected based on their large vendor populations, high commuter traffic, and observed sanitation concerns.

Stage 2: A systematic random sampling technique was used to select vendors and consumers. Following a preliminary enumeration of all active food vendors in each park, 100 vendors were selected using a calculated sampling interval. Similarly, 384 consumers were selected at systematic intervals (e.g., every third or fifth customer) while they were patronising food vendors.

The data were collected using structured questionnaires and an observation checklist. Structured questionnaires were administered to the vendors and consumers. A structured observation checklist was used to directly assess and document real-time environmental conditions and vendor hygiene practices.

RESULTS

A total of 384 questionnaires were administered to consumers of street-vended foods in the two selected motor parks. Out of this number, 365 were correctly filled and returned, representing a 95% rate of return, which was considered adequate for the analysis.

Table 1. Mean and standard deviation of observed hygiene practices of street food vendors.

S/N	Item	FO	PO	NO	x̄	SD	Remark
1	Vendor wears a clean apron or clean outer clothing	15	41	44	1.71	0.75	Poor
2	Vendor's hands and fingernails appear visibly clean	22	45	33	1.89	0.75	Poor
3	Vendor washes hands with soap after handling money	8	21	71	1.37	0.63	Very Poor
4	Vendor uses utensils to handle ready-to-eat food	35	38	27	2.08	0.81	Partial
5	Raw food items are stored separately from cooked food.	28	40	32	1.96	0.80	Poor
6	Food on display is adequately covered	25	55	20	2.05	0.70	Partial
7	Food preparation surfaces are visibly clean	19	48	33	1.86	0.74	Poor
8	Cooking and serving utensils are clean	29	51	20	2.09	0.72	Partial
9	Vendor refrains from unhygienic habits (e.g., coughing)	21	39	40	1.81	0.79	Poor
10	Vendor has access to and uses a clean water source	24	38	38	1.86	0.81	Poor
	Aggregate Score				1.87	0.55	Poor

Table 2. Independent samples t-test for difference in vendor hygiene practices by location.

Location	N	Mean (x̄)	SD	df	t-value	Sig. (2-tailed)	Decision
Kofar Ruwa	50	1.68	0.51	98	-4.52	.000	Reject H_{01}
Unguwa Uku	50	2.06	0.53				

Hygiene practices of street food vendors in Kofar Ruwa and Unguwa Uku motor parks

The results in Table 1 indicate that the hygiene practices of street food vendors in the selected motor parks are generally poor, with an aggregate mean score of 1.87, which is below the criterion mean of 2.0. The most neglected practice was handwashing with soap after handling money, which had the lowest mean score of 1.37 and was 'Not Observed' for 71% of the vendors. Other significantly poor practices included vendors not wearing clean clothing (Mean=1.71), engaging in unhygienic habits (Mean=1.81) and using unclean preparation surfaces (Mean=1.86).

Practices that were partially observed included the use of utensils to handle food (Mean=2.08) and ensuring cooking utensils are clean. (Mean=2.09). However, even these practices were not consistently followed. The overall findings suggest a substantial gap in food safety practices among vendors, corroborating the study's expected outcome of identifying poor hygiene standards.

The inferential statistics mean scores of vendor hygiene practices (from Table 2) were compared between the two locations using an Independent Samples t-test. The mean hygiene practice score for vendors in Unguwa Uku (${\bar{x}}$ = 2.06, SD = 0.53) was higher than that for vendors in Kofar Ruwa (${\bar{x}}$ = 1.68, SD = 0.51). The result of the t-test shows that this difference is statistically significant, $t(98) = -4.52, p = .000$. Since the p-value (0.000) is less than the alpha level of 0.05, the null hypothesis is rejected. This means there is a significant difference in the hygiene practices of street food vendors between Kofar Ruwa and Unguwa Uku motor parks, with vendors in Unguwa Uku demonstrating comparatively better (though still inadequate) hygiene.

Public health risks associated with the consumption of street-vended foods

As shown in Table 3, consumers reported a moderate to high incidence of symptoms associated with foodborne illnesses. The aggregate mean score was 3.16, indicating that, on average, consumers experience these symptoms between 'Sometimes' and 'often.' The most frequently reported symptoms were diarrhoea (Mean=3.76), stomach pain (Mean=3.63), and nausea, bloating (Mean=3.54), all of which fall into the 'High' frequency category. A moderate number of consumers also reported seeking medical treatment (Mean=3.00) for suspected foodborne illness. These findings strongly suggest that the consumption of street-vended foods in these motor parks poses a tangible public health risk, which is consistent with the poor vendor hygiene practices observed.

The results of the Chi-Square test (from Table 4) (chi^2(1) = 23.451, p = .000) indicate a statistically significant association between the frequency of consuming street-vended foods and the reported incidence of adverse health symptoms. Consumers who ate street food daily were significantly more likely to report a high incidence of symptoms (125 out of 166) compared to those who ate it less frequently (98 out of 199). Therefore, the null hypothesis is rejected. This provides strong evidence linking the consumption of these foods to public health risks.

Table 3. Mean and standard deviation of public health risks (experienced symptoms) associated with street-vended foods (N=365).

S/N	Item	VO	O	S	R	N	x̄	SD	Remark
1	Stomach pain or abdominal cramps	75	110	135	30	15	3.63	1.07	High
2	Diarrhea (loose or watery stools)	88	121	105	38	13	3.76	1.08	High
3	Nausea (feeling the urge to vomit)	55	95	140	55	20	3.32	1.10	Moderate
4	Vomiting	35	70	133	92	35	2.94	1.14	Moderate
5	Fever or chills	30	65	115	105	50	2.76	1.13	Low
6	General weakness or fatigue	60	105	125	50	25	3.41	1.12	Moderate
7	Headache	41	82	132	78	32	3.09	1.14	Moderate
8	Bloating or excessive gas	68	115	120	42	20	3.54	1.10	High
9	Skin rash or itching	15	25	70	125	130	2.16	1.09	Low
10	I had to seek medical treatment.	45	80	110	85	45	3.00	1.20	Moderate
	Aggregate Score						3.16	0.82	Moderate

Table 4. Chi-Square test of association between consumption frequency and health risks.

Consumption Frequency	Incidence of Health Risks	
	High	Low
High (Daily)	125	41
Lower (Weekly/Occasionally)	98	101
Total	**223**	**142**
Statistic	**Value**	**df**
Pearson Chi-Square ({\chi^2})	23.451	1

Table 5. Mean and standard deviation of consumer awareness of potential hazards (N=365).

S/N	Item	SA	A	N	D	SD	x̄	SD	Remark
1	Eating food from flies/cockroaches can cause illness.	185	120	45	10	5	4.30	0.90	High
2	It is safe to eat food prepared near an open gutter.	210	115	25	10	5	4.42	0.88	High
3	Vendors must wash hands with soap after using the toilet.	255	90	15	3	2	4.62	0.65	High
4	Food that looks good is always safe to eat.	145	125	55	25	15	3.99	1.13	High
5	Using the same knife for raw/cooked food is dangerous.	160	130	50	15	10	4.19	1.01	High
6	Food left uncovered for hours is still safe.	195	105	40	18	7	4.29	0.99	High
7	Water for washing plates must be clean.	220	110	25	8	2	4.50	0.77	High
8	Food poisoning is a minor illness and not fatal.	105	115	80	45	20	3.63	1.23	High
9	Serving food piping hot kills most germs.	95	135	95	30	10	3.82	1.05	High
10	It is okay for a sick vendor to sell food.	240	100	15	5	5	4.57	0.75	High
	Aggregate Score						4.23	0.58	High

Level of consumer awareness regarding the potential hazards of street-vended foods

The findings in Table 5 reveal a high level of awareness among consumers regarding the potential hazards of street-vended foods, with a high aggregate mean score of 4.23. Consumers demonstrated strong awareness of critical issues such as the necessity for vendors to wash their hands (Mean=4.62), the danger of sick vendors handling food (Mean=4.57), and the need for clean water for washing utensils (Mean=4.50).

This high level of awareness is somewhat contrary to the expected outcome of low awareness. It suggests that while consumers may possess the theoretical knowledge of food safety, this knowledge does not necessarily translate into safer consumption practices or a demand for higher standards from vendors. This "awareness-behaviour gap" is a critical finding of this study.

A One-Sample t-test was conducted to test this hypothesis. The average awareness score from the sample (from Table 6 was compared against a theoretical midpoint or baseline value of 3.0, which represents a

Table 6. One-sample t-test for consumer awareness level.

Parameter	N	Mean ($\bar{x}$)	SD	Test Value	t-value	Df	Sig. (2-tailed)	Decision
Awareness Score	365	4.23	0.58	3.0	40.59	364	0.000	Reject H_{03}

Table 7. Mean and standard deviation of consumer risk perception (N=365).

S/N	Item	SA	A	N	D	SD	$\bar{x}$	SD	Remark
1	I believe eating street food here is a significant risk.	95	145	85	30	10	3.84	1.05	High
2	I am confident that the food sold here is hygienic.	110	150	60	30	15	3.84	1.11	High
3	I worry about getting sick from the food here.	125	135	70	25	10	4.01	1.04	High
4	I think the water used by vendors is unsafe.	155	120	55	25	10	4.15	1.03	High
5	Convenience/price are more important than health risks.	40	75	90	105	55	2.75	1.25	Moderate
6	I trust the vendors in this park to sell safe food.	105	140	75	30	15	3.79	1.11	High
7	The risk of food poisoning is generally exaggerated.	130	125	65	30	15	3.92	1.14	High
8	Food sold near a dirty environment is contaminated.	205	105	35	15	5	4.38	0.88	High
9	I can tell if food is safe just by looking at it.	90	110	85	50	30	3.44	1.25	Moderate
10	Overall, I feel unsafe consuming food in this location.	120	140	65	28	12	3.97	1.07	High
	Aggregate Score						3.81	0.71	High

Table 8. ANOVA for difference in risk perception by educational level.

Parameters	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Between Groups	21.88	3	7.29	16.06	0.000	Reject H_{04}
Within Groups	163.81	361	0.45			
Total	185.69	364				

neutral or uncertain level of awareness on the 5-point scale. The results are presented in Table 6.

The results indicate that the sample mean awareness score of 4.23 is significantly higher than the test value of 3.0, t(364) = 40.59, p = .000. Since the p-value is less than 0.05, the null hypothesis is rejected. This confirms that the level of consumer awareness is not neutral or low; rather, consumers in the study areas possess a significantly high level of awareness regarding the potential hazards of street-vended foods.

Consumers' perception of the risks associated with street-vended foods

The analysis in Table 7. shows a high level of risk perception among consumers, with an aggregate mean of 3.81. Consumers strongly agreed that food sold near a dirty environment is likely contaminated (Mean=4.38) and believed the water used by vendors is unsafe (Mean=4.15). They also generally felt unsafe consuming food at the location (Mean=3.97) and worried about getting sick (Mean=4.01).

However, a critical finding is the moderate agreement with the statement that "Convenience and low price are more important than potential health risks" (Mean=2.75). This suggests that despite being aware of and perceiving the risks, socioeconomic factors significantly influence consumer choices, forcing them to prioritise affordability and accessibility over safety. This supports the emerging theme of a disconnect between perception and behaviour.

A one-way Analysis of Variance (ANOVA) was used to compare the mean risk perception scores across the four educational levels: No Formal Education, Primary, Secondary, and Tertiary. The results are presented in Table 8.

The ANOVA result shows a statistically significant difference in risk perception scores among the different educational levels, F(3, 361) = 16.06, p = .000. Since the p-value is less than 0.05, the null hypothesis is rejected.

A Tukey HSD post-hoc test revealed that consumers with Tertiary Education ({\bar{x}}=4.15) had a significantly higher risk perception than those with Secondary Education ({\bar{x}}=3.80), Primary Education ({\bar{x}}= 3.65), and No Formal Education ({\bar{x}}=3.51). This suggests that higher education is associated with a greater perception of the risks involved in consuming street-vended foods.

Table 9. Mean and standard deviation of consumer safety behaviors (N=365).

S/N	Item: How often do you...	A	O	S	R	N	$\bar{x}$	SD	Remark
1	Check the cleanliness of the vendor's stall.	60	95	155	40	15	3.40	1.06	Moderate
2	Observe the personal hygiene of the vendor.	75	110	130	35	15	3.59	1.08	High
3	Avoid buying food if the stall is near a waste dump.	95	125	90	35	20	3.74	1.15	High
4	Choose food that is freshly prepared or piping hot?	150	120	65	20	10	4.20	0.99	High
5	Avoid buying food that has been left uncovered.	135	115	75	25	15	4.05	1.08	High
6	Wash your own hands before eating.	45	70	120	85	45	2.94	1.21	Moderate
7	Check if the vendor uses different utensils for raw/cooked food.	20	45	95	115	90	2.37	1.18	Low
8	Avoid buying food from a vendor who appears sick.	105	130	85	30	15	3.90	1.11	High
9	Check if the plates or cutlery look clean.	85	120	115	30	15	3.69	1.09	High
10	Complain to the vendor if you see unhygienic practices.	25	55	105	110	70	2.53	1.18	Moderate
	Aggregate Score						3.44	0.75	Moderate

Table 10. Pearson correlation between consumer awareness and safety behavior.

Variable		Awareness	Behavior	Decision
Awareness	Pearson Correlation (r)	1	0.481	Reject H_{05}
	Sig. (2-tailed)		0.000	
	N	365	365	
Behavior	Pearson Correlation (r)	0.481	1	
	Sig. (2-tailed)	0.000		
	N	365	365	

Correlation is significant at the 0.01 level (2-tailed).

Safety behaviours consumers exhibit when purchasing and consuming street-vended foods

Table 9 indicates that consumers exhibit a moderate level of safety behaviour, with an aggregate mean of 3.44. Consumers reported a high frequency of practising passive safety behaviours, such as choosing freshly prepared food (Mean=4.20), avoiding uncovered food (Mean=4.05), and avoiding sick vendors (Mean=3.90).

However, they showed lower frequency in practising more proactive or difficult behaviours. The least practised behaviour was checking for cross-contamination (Mean=2.37), which received a 'Low' remark. Furthermore, consumers only 'sometimes' washed their own hands before eating (Mean=2.94) and were only moderately likely to complain about unhygienic practices. (Mean=2.53). This reinforces the awareness-behaviour gap, where consumers perform easy, observable checks but fail to engage in more rigorous or confrontational safety measures.

The results in Table 10 show a positive and statistically significant correlation between consumer awareness and safety behaviour r(363) = .481, p = .000$. The null hypothesis is therefore rejected. This indicates that there is a significant positive relationship: as consumer awareness of hazards increases, their reported engagement in safety behaviours also tends to increase. However, the correlation coefficient of .481 suggests a moderate, not strong, relationship. This explains the "awareness-behaviour gap" observed descriptively; while awareness influences behaviour, other factors are also clearly at play.

Environmental conditions under which street-vended foods are prepared and sold

The data in Table 11 unequivocally show that the environmental conditions of the vending sites are extremely poor, with an aggregate mean score of 1.66. The most critical deficiencies were the lack of proper liquid waste disposal (Mean=1.35) and the near-total absence of hand-washing facilities for vendors (Mean=1.31). The vast majority of stalls (54%) were located near sources of contamination like open gutters or refuse dumps, and 63% lacked a proper covered waste bin. The visible presence of pests was also a major issue (mean=1.41).

The only aspect that was rated as 'Fair' was the presence of overhead cover (Mean=2.28), which is more for sheltering from sun and rain than for hygiene. These deplorable environmental conditions provide a fertile ground for food contamination and directly contribute to the public health risks identified in Research Question 2.

The descriptive data in Table 11 showed an aggregate

Table 11. Observed environmental conditions of vending sites (N=100).

S/N	Items	Good	Fair	Poor	x̄	SD	Remark
1	Proximity to sources of contamination.	11	35	54	1.57	0.70	Poor
2	Solid Waste Management (covered bin).	9	28	63	1.46	0.67	Poor
3	Liquid Waste Disposal.	7	21	72	1.35	0.62	Very Poor
4	Cleanliness of the immediate ground surface.	13	41	46	1.67	0.72	Poor
5	Availability of a clean, covered water container.	25	48	27	1.98	0.74	Poor
6	Availability of a hand-washing facility for the vendor.	6	19	75	1.31	0.58	Very Poor
7	Visible presence of pests (flies, rodents).	8	25	67	1.41	0.66	Poor
8	Adequate overhead cover for the stall.	45	38	17	2.28	0.77	Fair
9	Storage of clean utensils.	21	52	27	1.94	0.71	Poor
	Aggregate Score				1.66	0.49	Poor

mean score of 1.66 on a 3-point scale for environmental conditions, which is firmly in the 'Poor/Unsanitary/ Inadequate' category. Key public health standards mandate the availability of potable water, dedicated hand-washing facilities with soap, proper waste disposal systems, and locations free from pests and contaminants. The study found that 75% of vendors lacked a hand-washing facility, 72% disposed of liquid waste improperly, and 67% had a visible pest presence.

Based on this overwhelming descriptive evidence, the observed conditions are profoundly different from, and fall drastically short of, established public health standards. Therefore, the premise of the null hypothesis is rejected on a descriptive and comparative basis.

DISCUSSION

This study assessed hygiene practices among street food vendors and the associated public health risks in motor park environments within Kano metropolis. The findings indicate generally poor compliance with recommended food safety standards, particularly in personal hygiene, food handling, and environmental sanitation. These conditions suggest that food is frequently prepared and sold under environments that increase the risk of microbial contamination and foodborne disease transmission.

The results align with global evidence showing that foodborne diseases remain a major public health challenge, particularly in low- and middle-income countries where informal food systems dominate urban food supply. The World Health Organisation reports that unsafe food contributes significantly to the global burden of disease, especially in regions with weak sanitation systems and limited regulatory enforcement (World Health Organisation, 2022).

Recent systematic evidence from Africa further confirms that food safety practices among food handlers remain suboptimal. Soboksa et al. (2025) found that only about half of food handlers demonstrate good hygiene practices, with lack of access to clean water and poor sanitation identified as key determinants. This supports the present study, where motor park environments lack the basic infrastructure required for safe food preparation.

Empirical evidence from Nigeria also supports these findings. Onyeaka et al. (2021) reported that food safety culture remains weak due to inadequate infrastructure, limited training, and poor regulatory enforcement. Similarly, Adaku et al. (2024) identified structural barriers such as poor access to potable water and inadequate sanitation as major contributors to unsafe food practices.

Furthermore, Odetokun et al. (2025) highlighted that street-vended foods are frequently exposed to contamination due to poor hygiene practices and environmental exposure, particularly in informal settings where regulatory oversight is minimal.

Conclusion

This study empirically demonstrates the significant public health risks associated with the consumption of street-vended foods in Kofar Ruwa and Unguwa Uku motor parks. The research concludes that food is prepared and sold under grossly unhygienic personal and environmental conditions, which directly contribute to a high incidence of foodborne symptoms among the consuming public. While consumers are surprisingly aware of the associated dangers and perceive the risks as high, a significant gap exists between their knowledge and their protective behaviours. This gap is largely driven by overriding socioeconomic factors such as affordability and convenience, forcing consumers into a reluctant acceptance of risk. The street food sector in these locations operates in a state of critical failure regarding public health standards, posing a continuous threat to the urban populace that relies on it.

Recommendations

Based on the findings and conclusions of this study, the

following recommendations are proposed:

1. There is a need for public health authorities (Kano State Ministry of Health & Local Government) to develop and enforce a mandatory food safety training program for all street food vendors, focusing on practical skills like hand hygiene, cross-contamination prevention, and waste management. Certification should be contingent on passing an assessment.
2. Vendors should organise into associations to self-regulate, pool resources for buying items like soap and clean water containers, and collectively bargain with park authorities for better facilities.
3. Since knowledge is already high, campaigns should move beyond simple information dissemination. They should focus on bridging the awareness-behaviour gap by highlighting the *real* health and economic costs of foodborne illness and empowering consumers to demand better hygiene from vendors.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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