



Evaluation of Hygiene Practices Among Food Vendors and Implications for Students' Health in Selected Tertiary Institutions in Ogun State, Nigeria

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Abstract

Food hygiene practices among vendors in tertiary institutions significantly influence students' health and academic performance. However, there is limited multi-institutional evidence on vendor hygiene compliance across public tertiary institutions in Ogun State, Nigeria. This study evaluated hygiene practices among food vendors and their implications for students' health across five selected tertiary institutions in Ogun State. A descriptive cross-sectional survey design was adopted. The target population comprised an estimated 850 food vendors across the Federal College of Education Abeokuta (FCE), the Federal University of Agriculture Abeokuta (FUNAAB), the Moshood Abiola Polytechnic (MAPOLY), the Olabisi Onabanjo University (OOU), and the Federal Polytechnic Ilaro. Using the Krejcie and Morgan (1970) sample size determination table, 270 food vendors were selected through a multistage sampling procedure. Data were collected using a structured questionnaire and analysed using descriptive statistics comprising frequency counts and percentages. Findings revealed that food vendors demonstrated good knowledge of food hygiene practices, with agreed responses accounting for 309.8° out of 360 on the knowledge subscale. A high level of hygiene practice compliance was similarly observed, with agreed responses representing 317.9°. The overwhelming majority of respondents acknowledged that poor food hygiene practices negatively affect students' health, including increased illness and absenteeism, corresponding to 313.9° of agreement. Broad endorsement of hygiene promotion strategies, such as the use of protective clothing, water treatment, and utensil sanitation, was also recorded at 317.6°. While food vendors across the selected institutions possess adequate knowledge of hygiene, behavioural compliance and institutional support remain inconsistent across institution types. Periodic food safety training, regulatory supervision, adequate sanitation infrastructure, and institutional policy frameworks are critical for sustaining hygienic practices and protecting students' health in Ogun State tertiary institutions.

Keywords: food hygiene, food vendors, students' health, tertiary institutions, Ogun State, Nigeria, foodborne illness, food safety



INTRODUCTION

Background of the Study

Students' health refers to the overall physical, mental, and social well-being of learners, enabling them to effectively participate in academic and extracurricular activities. Good health is fundamental for students as it influences concentration, memory retention, class attendance, and ultimately, academic achievement. The World Health Organisation (WHO, 2022) emphasises that health is not merely the absence of disease but a state of complete well-being, encompassing adequate nutrition, food safety, personal hygiene, and mental resilience. For students in Nigerian tertiary institutions, this well-being is substantially mediated by the quality of food consumed on campus and the hygiene standards of those who prepare and serve it.

Tertiary institutions are densely populated environments where students live, study, and interact closely, creating conditions conducive to the rapid spread of infectious diseases when hygiene standards are compromised. In Nigeria, food vendors operating within tertiary institution campuses are indispensable to campus life, providing affordable and convenient meals to large student populations who cannot always afford restaurants or prepare their own food. However, poor food handling practices, inadequate water supply, improper waste disposal, and limited handwashing facilities among these vendors pose serious health risks to students (Leslie et al., 2021; Ojo, 2021). Foodborne illnesses, including diarrhoea, typhoid, dysentery, and cholera, remain prevalent among Nigerian university students and have been consistently linked to poor food vendor hygiene (Olaoye & Onilude, 2021; Olaniran et al., 2022). These illnesses do not merely compromise physical well-being; they disrupt academic participation, reduce concentration and productivity, and contribute to absenteeism (WHO, 2023).

Ogun State hosts a significant and diverse concentration of tertiary institutions serving hundreds of thousands of students. These institutions vary considerably in size, infrastructure, governance structure, and regulatory oversight. Federal University of Agriculture, Abeokuta (FUNAAB), one of the largest, accommodates thousands of students and a substantial vendor population. Federal College of Education Abeokuta (FCE), Moshood Abiola Polytechnic Abeokuta (MAPOLY), Olabisi Onabanjo University Ago-Iwoye (OOU), and Federal Polytechnic Ilaro similarly host large student communities who depend on campus food vendors for daily nutrition. Despite this dependence, the food-vending environment in these institutions is characterised by improvised vendor operations, inconsistent regulatory monitoring, and infrastructural deficits, such as irregular water supply and poor sanitation, all of which undermine food hygiene compliance (Olaniran et al., 2022).

The consequences of these conditions are documented. Chief Examiners' reports and institutional health records consistently flag foodborne illness as a recurring problem across Nigerian campuses, yet systematic regulatory responses remain inadequate (Adeoye & Olagunju, 2024). The absence of routine inspection, weak enforcement of food safety standards, and limited vendor training perpetuate cycles of hygiene non-compliance. Adebayo and Dada (2023) found that 63% of food vendors in Lagos State stored cooked food at ambient temperatures for extended periods, a practice widespread across Nigeria's informal food sector. Mensah et al. (2022) identified poor environmental sanitation and inadequate utensil washing as leading causes of bacterial contamination in African street foods, including ready-to-eat meals sold in institutional settings.

The public health significance of this problem is compounded by the scale of student exposure. Unlike a single household or a restaurant with a small clientele, a campus food vendor may serve hundreds of students daily. A single hygiene failure, whether contaminated water, an unwashed utensil, or food stored at unsafe temperatures, can therefore precipitate a large-scale foodborne outbreak. WHO (2023) reports that approximately 600 million people fall ill annually due to unsafe food handling globally, with disproportionate burdens borne in low- and middle-income countries. Nigeria, with its underfunded institutional health infrastructure, is particularly vulnerable to this burden.

Despite the documented significance of this problem, most existing studies in Nigeria have been confined to single institutions or narrowly localised contexts, limiting the generalisability of their findings. There is a marked dearth of multi-institutional, comparative evidence spanning different types of tertiary institutions within a single geopolitical setting. This gap is particularly significant in Ogun State, where the diversity of institutional types, ranging from colleges of education and agriculture universities to polytechnics and state universities, offers a valuable comparative context. Understanding whether hygiene practices and their health implications vary by institutional type, size, and governance structure has important implications for policy and intervention design. This study addresses that gap directly.

The study is significant for several stakeholders. For institutional management across the five campuses, the findings provide an evidence base for policy decisions on vendor registration, hygiene training, and sanitation infrastructure. For government regulatory agencies, including NAFDAC and the State Ministry of Health, the study supplies cross-institutional data to guide inspection priorities and enforcement strategies. For food vendors, it reflects their own practices back to them in a structured way that can inform self-improvement. For students, it raises awareness of hygiene risks in campus food environments. And for the academic community, it contributes to a growing literature on environmental health in Nigerian tertiary education, providing a baseline for future comparative and longitudinal research.

This study is therefore designed to evaluate hygiene practices among food vendors and their implications for students' health across five selected tertiary institutions in Ogun State. Specifically, the study set out to: ascertain the level of knowledge of hygiene practices among food vendors in the selected institutions; determine the level of hygiene practice compliance among food vendors; examine the impact of poor food hygiene practices on students' health; and identify ways to promote hygiene practices among food vendors to improve students' health outcomes.

METHODOLOGY

Research Design

This study adopted a descriptive cross-sectional survey design. This design is appropriate for investigating the current status of hygiene practices among food vendors across multiple institutions without manipulating variables. Structured questionnaires were administered to elicit standardised responses from the selected sample.

Population

The target population comprised all food vendors operating within the campuses of five selected tertiary institutions in Ogun State, Nigeria: Federal College of Education Abeokuta (FCE), Federal University of Agriculture Abeokuta (FUNAAB), Moshood Abiola Polytechnic Abeokuta (MAPOLY), Olabisi Onabanjo University Ago-Iwoye (OOU), and the Federal Polytechnic Ilaro (Ilaro Poly). Based on reconnaissance visits and institutional records, the estimated total population of food vendors across the five institutions is approximately 850, distributed as presented in Table 1.

Table 1: Distribution of Estimated Food Vendor Population across Selected Institutions

Institution	Abbreviation	Estimated No. of Food Vendors
Federal University of Agriculture, Abeokuta	FUNAAB	220
Olabisi Onabanjo University, Ago-Iwoye	OOU	200
Moshood Abiola Polytechnic, Abeokuta	MAPOLY	160
Federal College of Education, Abeokuta	FCE	140
Federal Polytechnic, Ilaro	Ilaro Poly	130
Total		850

Sample and Sampling Technique

Sample size was determined using the Krejcie and Morgan (1970) table. For a population of 850, the recommended minimum sample size is 265. Accordingly, a sample of 270 food vendors was selected to provide an adequate and reliable representation of the population.

A multistage sampling technique was employed:

Stage 1 (Purposive Selection of Institutions): Five tertiary institutions in Ogun State were purposively selected to represent different institutional types: a federal college of education, a federal university of agriculture, two polytechnics, and a state university, ensuring diversity in institution size and governance.

Stage 2 (Proportionate Stratified Sampling): Food vendors in each institution were stratified by vending zone (e.g., main cafeteria, hostel area, faculty canteens, and market periphery). The number of vendors sampled from each institution was proportionate to its share of the total estimated population.

Stage 3 (Simple Random Sampling): Within each stratum, vendors were selected by simple random sampling using a random number table. The resulting institutional samples are presented in Table 2.

Table 2: Proportionate Sample Distribution across Institutions

Institution	Estimated Population	Proportionate Sample
FUNAAB	220	70
OOU	200	64
MAPOLY	160	51
FCE Abeokuta	140	44
Federal Polytechnic, Ilaro	130	41
Total	850	270

Research Instrument

Data were collected using a self-administered structured questionnaire titled 'Food Vendor Hygiene Practices Questionnaire' (FVHPQ). The instrument comprised two sections. Section A collected demographic information, including age, sex, level of education, years of vending experience, and institution of operation. Section B consisted of 20 items distributed across four subscales, each aligned with one of the four research questions. Items were rated on a four-point Likert scale: Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD).

Validity and Reliability of the Instrument

The instrument was subjected to face and content validity by the research supervisor and two experts in Environmental Health and Food Science from the Department of Integrated Science, FCE Abeokuta. Their comments and corrections were incorporated into the final version. A pilot study was conducted with 20 food vendors outside the main sample, yielding a Cronbach's alpha reliability coefficient of 0.81, confirming the instrument's internal consistency.

Data Collection

The questionnaires were administered in person by the researcher, with the assistance of two trained research assistants, during a four-week data collection period. Vendors were approached during off-peak hours to minimise disruption to their business. Completed questionnaires were retrieved immediately. Of the 270 questionnaires distributed, 265 were returned and found valid for analysis, yielding a response rate of 98.1%.

Data Analysis

Data were analysed using descriptive statistics comprising frequency counts and percentages. Demographic data (Section A) are presented in frequency tables. Responses to Likert-scale items (Section B) were aggregated by subscale and presented in summary tables and pie charts. For the purposes of analysis, Strongly Agree and Agree responses were combined as 'Agreed', and Disagree and Strongly Disagree were combined as 'Disagreed'. The proportional degree representation (out of 360°) was computed to visualise the distribution of responses.

RESULTS AND DISCUSSION

Demographic Characteristics of Respondents

A total of 265 valid questionnaires were analysed. The demographic profiles of respondents are presented in Tables 3-6.

Table 3: Distribution of Respondents by Age

Age Range	Frequency (F)	Percentage (%)
18-25 years	52	19.6
26-35 years	97	36.6
36-45 years	85	32.1
Above 45 years	31	11.7
Total	265	100.0

Table 3 shows that the majority of food vendors (36.6%) were between 26 and 35 years of age, followed by those aged 36 to 45 years (32.1%). Vendors aged 18 to 25 years constituted 19.6% of the sample, while those above 45 years represented 11.7%. This suggests that food vending in Ogun State tertiary institutions is predominantly undertaken by adults in their productive years.

Table 4: Distribution of Respondents by Level of Education

Level of Education	Frequency (F)	Percentage (%)
Primary	18	6.8
Secondary	91	34.3
Tertiary	156	58.9
Total	265	100.0

Table 4 indicates that 58.9% of respondents held tertiary-level education, while 34.3% had secondary education and 6.8% had primary education. The relatively high educational attainment of vendors may be associated with greater awareness of hygiene standards.

Table 5: Distribution of Respondents by Years of Vending Experience

Period of Vending	Frequency (F)	Percentage (%)
Less than 5 years	63	23.8

Period of Vending	Frequency (F)	Percentage (%)
5-10 years	143	54.0
Above 10 years	59	22.3
Total	265	100.0

Table 5 reveals that the largest proportion of vendors (54.0%) had between 5 and 10 years of vending experience, followed by those with less than 5 years (23.8%) and those with more than 10 years (22.3%). Experience may influence hygiene compliance through accumulated practical knowledge.

Table 6: Distribution of Respondents by Institution

Institution	Frequency (F)	Percentage (%)
FUNAAB	69	26.0
OOU	62	23.4
MAPOLY	50	18.9
FCE Abeokuta	43	16.2
Federal Polytechnic, Ilaro	41	15.5
Total	265	100.0

Level of Knowledge of Hygiene Practices among Food Vendors

The result shows that approximately 309.8° of respondents agreed and strongly agreed with statements on knowledge of hygiene practices, while 50.2° disagreed or strongly disagreed. This indicates that the majority of food vendors across the five institutions possess good knowledge of food hygiene practices.

Table 7: Summary of Responses on Knowledge of Hygiene Practices

S/N	Item	SA	A	D	SD
1	Food vendors are aware of hygiene practices in the kitchen	142	88	25	10
2	Food vendors always observe different hygienic practices during cooking and selling of food	138	95	22	10
3	Food vendors keep their kitchen and canteen clean in a hygienic way	151	82	21	11

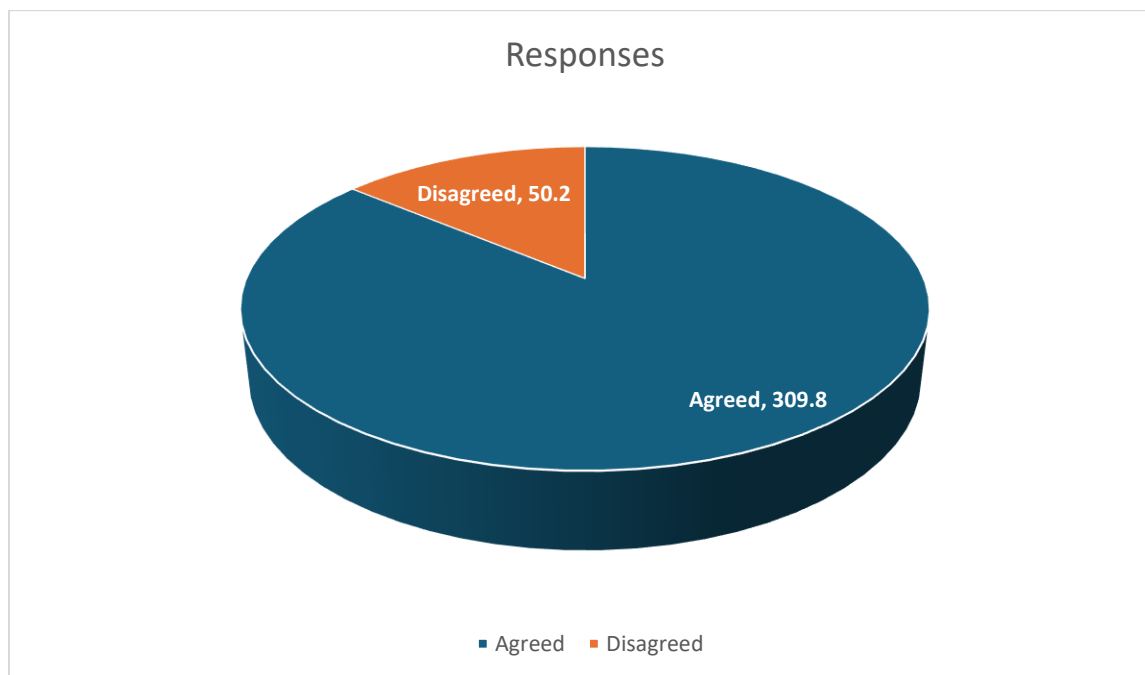
S/N	Item	SA	A	D	SD
4	Food vendors frequently utilise hygienic equipment at their disposal	126	98	28	13
5	Food vendors properly manage and maintain their food items and utensils	129	92	31	13
Total		686	455	127	57

Total responses: $686 + 455 + 127 + 57 = 1,325$.

Agreed (SA + A) = 1,141; **Disagreed** (D + SD) = 184.

Degree for Agreed = $(1141/1325) \times 360 = 309.8^\circ$.

Degree for Disagreed = $(184/1325) \times 360 = 50.2^\circ$.



Level of Hygiene Practices among Food Vendors

The result indicates that approximately 317.9° of respondents agreed that key hygiene practices such as handwashing after handling money, cleaning utensils, and maintaining sanitary preparation surfaces are consistently observed. This reflects a generally high level of hygiene practice compliance among food vendors across the selected institutions.

Table 8: Summary of Responses on Level of Hygiene Practices

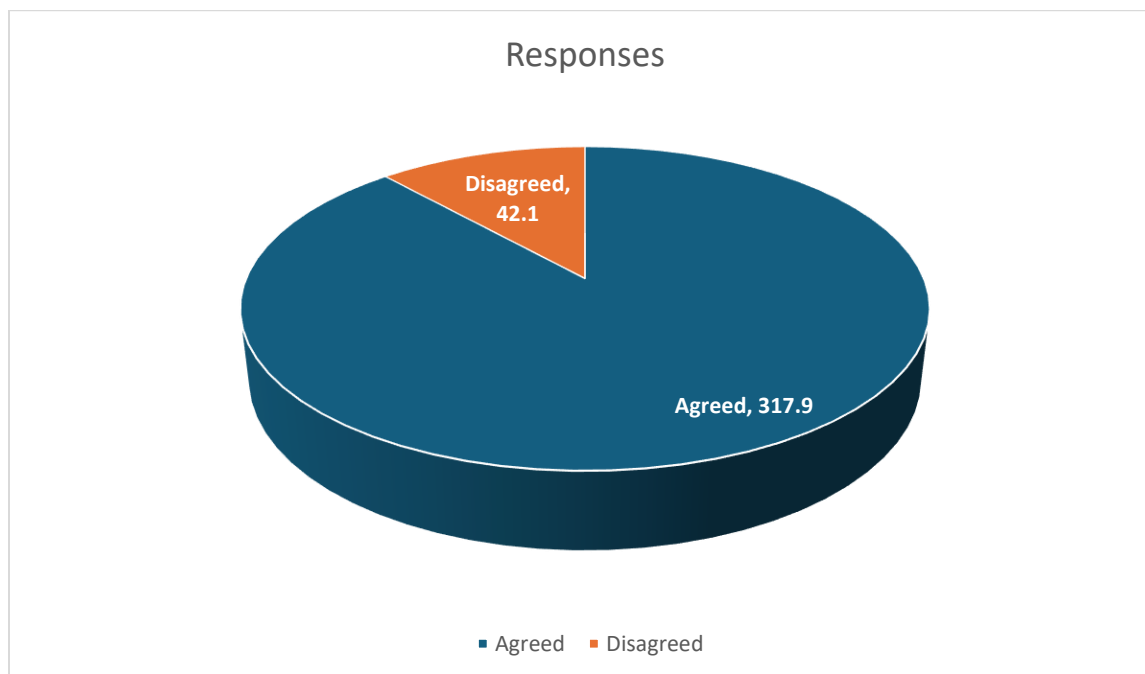
S/N	Item	SA	A	D	SD
6	Food vendors wash chopping boards after handling raw meat before reuse	158	81	18	8
7	Hands are properly washed after sneezing or blowing the nose	162	77	17	9
8	Hands are washed after taking money from customers	170	70	17	8
9	Water used in washing utensils is disposed of and replaced frequently	145	88	22	10
10	Handwashing is done using warm water, soap, and dried with a clean towel	128	91	32	14
Total		763	407	106	49

Total responses: $763 + 407 + 106 + 49 = 1,325$.

Agreed (SA + A) = 1,170; **Disagreed** (D + SD) = 155.

Degree for Agreed = $(1170/1325) \times 360 = 317.9^\circ$.

Degree for Disagreed = $(155/1325) \times 360 = 42.1^\circ$.



Impact of Poor Food Hygiene Practices on Students' Health

The result demonstrates that approximately 313.9° of respondents acknowledged that poor food hygiene practices among food vendors negatively impact students' health. The near-unanimous recognition of this link, including the association between poor hygiene, illness, and absenteeism,

underscores the public health significance of food vendor hygiene in Ogun State tertiary institutions.

Table 9: Summary of Responses on Impact of Poor Hygiene on Students' Health

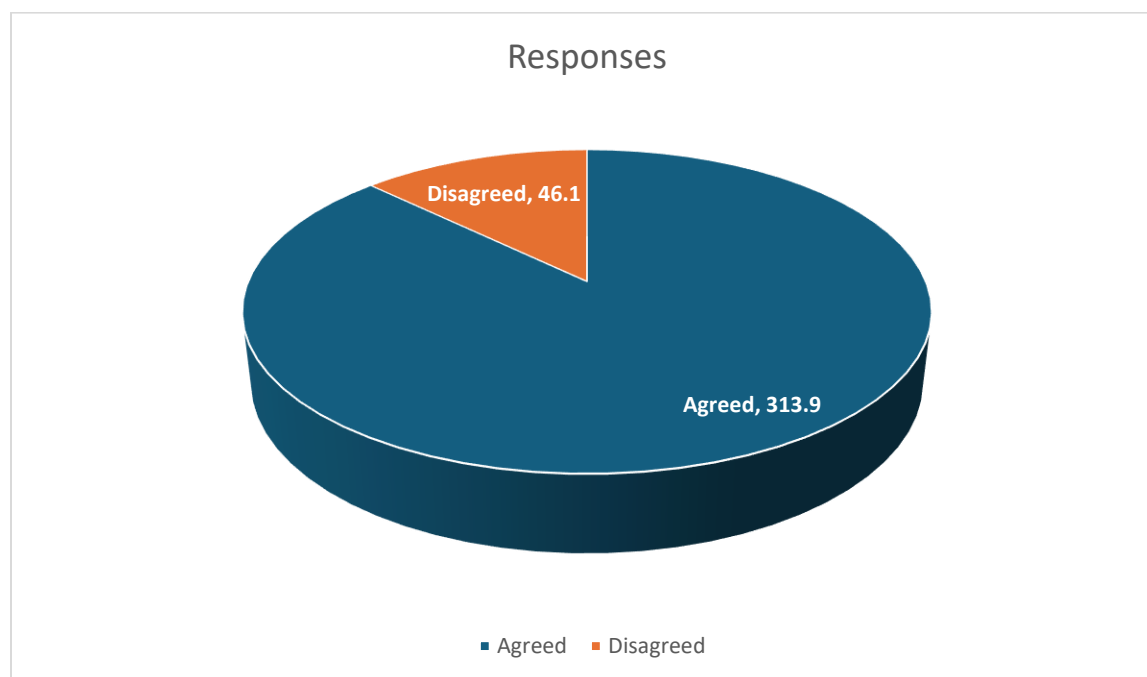
S/N	Item	SA	A	D	SD
11	Eating contaminated food due to bad hygiene practices can lead to illness among students	178	56	21	10
12	Sanitising utensils daily with boiled water helps protect students from foodborne diseases	148	87	21	9
13	Food not properly cooked can cause diseases	135	96	24	10
14	Poor hygiene practices can lead to higher absenteeism rates among students	151	82	23	9
15	Poor hygiene among food vendors reduces students' self-esteem and confidence in academic activities	134	88	29	14
Total		746	409	118	52

Total responses: $746 + 409 + 118 + 52 = 1,325$.

Agreed (SA + A) = 1,155; **Disagreed** (D + SD) = 170.

Degree for Agreed = $(1155/1325) \times 360 = 313.9^\circ$

Degree for Disagreed = $(170/1325) \times 360 = 46.1^\circ$.



Ways to Promote Hygiene Practices to Improve Students' Health

The results show that approximately 317.6° of respondents supported the promoted hygiene strategies. Broad consensus was observed across all five items, including the use of gloves, protective clothing, nail hygiene, water treatment, and proper utensil sanitation as practical and effective measures for improving food safety and student health outcomes.

Table 10: Summary of Responses on Promotion of Hygiene Practices

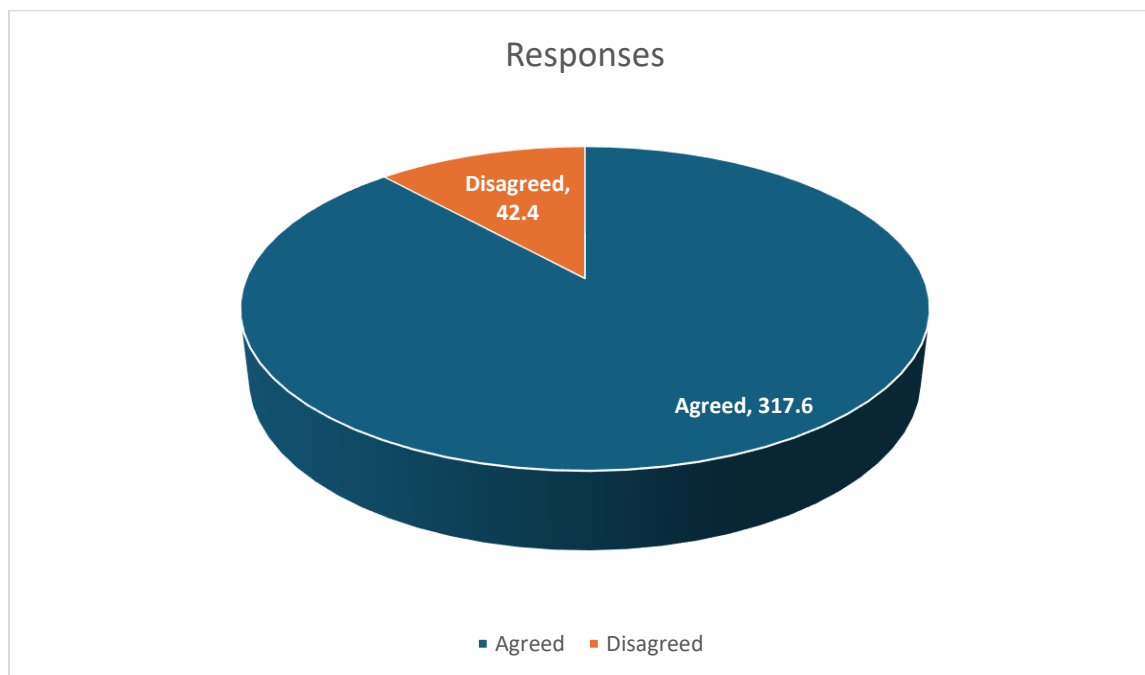
S/N	Item	SA	A	D	SD
16	Use of disposable gloves to handle food items will help promote student health	118	105	28	14
17	Use of protective clothing will reduce the risk of food contamination	143	90	22	10
18	Trimming nails weekly prevents germ spread in food during preparation	151	84	21	9
19	Cooking and drinking water should be treated by boiling or other purification methods	129	107	19	10
20	Soap and water should be used on cutting boards after preparation of raw meat	156	86	14	9
Total		697	472	104	52

Total responses: $697 + 472 + 104 + 52 = 1,325$.

Agreed (SA + A) = 1,169; **Disagreed** (D + SD) = 156.

Degree for Agreed = $(1169/1325) \times 360 = 317.6^\circ$.

Degree for Disagreed = $(156/1325) \times 360 = 42.4^\circ$.



Discussion of Findings

The study found that the majority of food vendors across the five institutions demonstrated good knowledge of food hygiene practices, with agreed responses accounting for 309.8° out of 360 on the knowledge subscale. This finding is consistent with Ezenwoko et al. (2023), who reported a significant association between formal education and knowledge of good hygiene among food handlers in Sokoto, Nigeria. The relatively high proportion of tertiary-educated vendors in this study, at 58.9% of the sample, likely contributes to this level of awareness. Items related to kitchen cleanliness and hygienic equipment utilisation showed the widest spread of disagreement, suggesting that while general awareness is high, operational compliance in these areas is less uniform across the five institutions.

A high level of hygiene practice compliance was observed, with agreed responses representing 317.9°, the highest degree value recorded across all four subscales. Practices such as handwashing after handling money and washing chopping boards after contact with raw meat received particularly strong endorsement. This aligns with Sylvia, RoseAnna, and John (2025), who reported good personal hygiene practices among food handlers at Makerere University in Uganda. However, the item on handwashing technique, specifically using warm water, soap, and a clean towel drying, recorded the highest disagreement within this subscale, indicating that while the practice of handwashing is widely acknowledged, the correct method is not consistently followed. This distinction between knowing that handwashing is necessary and knowing how to do it properly has practical implications for training design.

Agreed responses on the health impact subscale corresponded to 313.9°, reflecting near-unanimous recognition among vendors that poor hygiene practices negatively affect student health. The item

linking contaminated food to student illness recorded the strongest agreement of all 20 items across the questionnaire, with 178 strongly agreeing and only 10 strongly disagreeing. The item on reduced student self-esteem and academic confidence recorded comparatively more disagreement within this subscale, suggesting that vendors more readily accept the physical health consequences of poor hygiene than its psychosocial effects. These findings corroborate Oghenekohwo (2025), who posited that mishandling and disregard of proper hygiene by food vendors enable pathogenic bacteria to contaminate food and cause illness in consumers, and are consistent with WHO (2023) data on the global burden of foodborne illness.

Agreed responses on the promotion subscale corresponded to 317.6°, indicating broad vendor endorsement of the proposed strategies. However, this subscale also recorded the highest total disagreement across all four research questions, with 104 disagreeing and 52 strongly disagreeing out of 1,325 total responses. The item on disposable gloves recorded the most disagreement within this subscale, likely reflecting practical concerns about cost and availability rather than opposition to the principle. Items on water treatment, nail hygiene, and soap washing of cutting boards attracted stronger agreement, suggesting that vendors are more receptive to low-cost, easily implemented hygiene measures. This is consistent with WHO (2025) guidelines emphasising safe water use, proper cooking, and utensil sanitation as foundational food safety behaviours, and aligns with Adeyemi and Olayinka (2022), who found that vendors in Nigerian tertiary institutions respond more positively to hygiene interventions that are affordable and practically feasible.

SUMMARY

This study evaluated hygiene practices among food vendors and their implications for students' health across five selected tertiary institutions in Ogun State: FCE Abeokuta, FUNAAB, MAPOLY, OOU, and Federal Polytechnic Ilaro. A descriptive cross-sectional survey was conducted with 265 food vendors selected through multistage sampling based on the Krejcie and Morgan (1970) table. Key findings were as follows: the majority of food vendors demonstrated good knowledge of food hygiene practices across all five institutions; a high level of hygiene practice compliance was reported, particularly regarding handwashing, utensil management, and food storage, though variations were noted across institutions; an overwhelming majority of vendors acknowledged that poor food hygiene practices negatively affect students' health, including increased illness, absenteeism, and reduced academic confidence; and vendors broadly endorsed practical hygiene promotion strategies including the use of protective clothing, gloves, water treatment, and regular utensil sanitation.

CONCLUSION

The study concludes that food vendors in selected tertiary institutions in Ogun State generally possess good knowledge of food hygiene practices and report relatively high levels of hygiene compliance. Nevertheless, self-reported knowledge does not always translate into consistent behavioural compliance, and institutional variations suggest that regulatory oversight, infrastructure, and training remain uneven across the institutions studied. Poor food hygiene practices are widely recognised as a significant health risk to students, and targeted hygiene promotion strategies are broadly supported by vendors. Sustained improvement in food hygiene across Ogun State tertiary institutions requires coordinated action at the institutional, regulatory, and policy levels.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made:

- i. Institutional management across all five tertiary institutions should organise regular food safety training workshops, seminars, and in-service programmes for food vendors to reinforce and update hygiene knowledge and practice.
- ii. Government regulatory agencies, including NAFDAC and State Ministry of Health officers, should implement routine, unannounced inspections of food vending sites across tertiary institution campuses to ensure compliance with food safety standards.
- iii. All five institutions should invest in adequate sanitation infrastructure, including clean water supply, handwashing stations, waste disposal systems, and covered food preparation areas, to create environments conducive to hygienic food vending.
- iv. Institutional management and students' union bodies should establish recognition and certification systems that publicly acknowledge food vendors who consistently maintain high hygiene standards, creating positive incentives for compliance.
- v. Pre-service and in-service health education curricula for food vendors should be standardised across institutions, incorporating practical demonstrations on cross-contamination prevention, temperature control, and personal protective hygiene.
- vi. Government and local authorities should provide baseline amenities and financial support to food vendors in smaller institutions and polytechnics, where hygiene compliance was found to be comparatively lower, to reduce structural barriers to safe food vending.

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