KNOWLEDGE, ATTITUDE AND PRACTICE OF FOOD HYGIENE AMONG FOOD VENDORS IN A TERTIARY ACADEMIC INSTITUTION IN EDO STATE

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IN PARTIAL FULFILLMENT OF THE REQUIREMENT OF THE AWARD OF BACHELOR OF NURSING (BNSC),

UNIVERSITY OF BENIN,

BENIN CITY.

OCTOBER, 2025

DECLARATION

This is to declare that this research project titled "**KNOWLEDGE, ATTITUDE AND PRACTICE OF FOOD HYGIENE AMONG FOOD VENDORS IN A TERTIARY ACADEMIC INSTITUTION IN EDO STATE "** was carried out by **EZI JOY UKAMAKA** and is solely the result of my work except were acknowledged as being derived from other person(s) or sources.

MATRICULATION NUMBER: BMS1902038

FACULTY/SCHOOL: NURSING SCIENCES, UNIVERSITY OF BENIN, BENIN CITY.

SIGNATURE: _____

DATE: _____

CERTIFICATION/ APPROVAL

This is to certify that this research project by EZI JOY UKAMAKA with matriculation Number _____ has been examined and approved for the award of BACHELOR IN NURSING SCIENCES CERTIFICATE

EZI JOY UKAMAKA _____

Student Sign & Date

Signature:_____ DATE: _____

SR. JOAN N. CHCKWURAH

(Project Supervisor)

Signature: _____ DATE: _____

PROF. (MRS.) C. E OMOREGBE

HEAD Of DEPARTMENT (MED SURG)

Signature: _____ DATE: _____

EXTERNAL EXAMINER

ABSTRACT

Food hygiene is a major public health concern in tertiary academic institutions where a large population depends on food vendors for daily meals. Poor food hygiene practices may expose consumers to foodborne diseases despite vendors' awareness of hygiene principles. This study assessed the knowledge, attitude, and practice of food hygiene among food vendors in a tertiary academic institution in Edo State. A descriptive cross-sectional design was adopted for the study. A convenience sampling technique was used to select 250 food vendors. Data were collected using a structured questionnaire covering socio-demographic characteristics, knowledge, attitude, practice, and factors influencing food hygiene practices. Out of 250 questionnaires distributed, 243 were properly completed and analyzed, giving a response rate of 97.2%. Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 27.0. Descriptive and inferential statistics were used at a 5% level of significance. Findings revealed that 53% (128) of the respondents had good knowledge of food hygiene, while 47% (115) had poor knowledge, with a grand mean score of 1.5, indicating overall good knowledge. Attitude toward food hygiene was generally positive, as 63% (153) of the vendors demonstrated positive attitudes, with a grand mean of 2.8. However, food hygiene practices were largely inadequate, as only 41% (99) exhibited good practices, while 59% (144) practiced poor food hygiene, with a low grand mean score of 2.4. Key factors influencing food hygiene practices included access to clean water, level of education, waste disposal facilities, training, financial constraints, regular inspection, and institutional support, with a grand mean of 3.0. Hypothesis testing showed no significant relationship between knowledge and food hygiene practice ($\chi^2 = 9.786$, $p = 0.092$) and no significant relationship between attitude and food hygiene practice ($\chi^2 = 6.876$, $p = 0.089$). Despite good knowledge and positive attitudes toward food hygiene, food vendors demonstrated poor hygiene practices, indicating a significant knowledge–practice gap. Regular training, improved access to water and sanitation facilities, routine health inspections, and institutional support are recommended to enhance food hygiene practices among food vendors in tertiary institutions.

Keywords: *Knowledge, Attitude, Practice, Food hygiene, Food vendors.*

DEDICATION

I dedicate this Project work to GOD ALMIGHTY, whose guidance and strength have been my constant companion throughout my academic journey, and to my wonderful Parents Mr. and Mrs. EZI, brothers and sister for their unwavering support.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Food has always been the backbone of human survival, yet as society has progressed, so have the perils disguised in what we eat. Despite technical advancements and increased worldwide awareness, foodborne illnesses continue to be an invisible menace in the world's kitchens, markets, and dining tables. Every year, over 600 million people, roughly one in ten people globally become unwell as a result of consuming hazardous food, and 420,000 of them die, with small children suffering the brunt of this burden (Subedi et al., 2024). However, the impact goes far beyond human misery; economies lose billions of dollars, with countries such as the United States incurring an annual cost of more than $75 billion in healthcare bills and lost productivity as a result of foodborne infections (Hoffmann et al., 2024). In poorer nations, where food safety systems are frequently frail, the difficulty is magnified, with informal food markets and little regulation allowing contamination to sneak through the cracks (Havelaar et al., 2022). The hazard manifests itself in a variety of ways: invisible microbes, deadly chemicals, and physical pollutants, all of which have the potential to turn sustenance into poison. As these issues rise, global efforts are shifting toward education, stronger policies, and joint action to ensure that food, the substance that nourishes life, is no longer the cause of death (Basak et al., 2021).

Food vendors in university settings are more than just meal suppliers; they are essential to the daily sustenance of students, healthcare professionals, and patients (Manoharan & Rangaswamy, 2024). Their convenience and accessibility make them essential, particularly for busy students who rely on ready-to-eat meals on campus

(Solon, 2022). However, these are high-risk zones, where poor hygiene measures can lead to large-scale foodborne outbreaks (Cataluna & Rukmini, 2024). Evidence from similar institutional environments indicates that, while vendors frequently demonstrate moderate awareness of food safety, they frequently fail to translate this into consistent hygiene practices due to factors such as a lack of resources, education, or regulatory enforcement (Babor et al., 2024). This is especially serious in universities because contamination might endanger students, academic staffs, non-academic staffs and the general population in the institution (Ibrahim & Adeola, 2024). Strong hygiene enforcement and targeted vendor training in these institutional environments are thus necessary not just for public safety, but also to protect educational and healthcare standards (Muhonja, 2021).

Understanding how food vendors function needs more than just observing their behaviors; it also necessitates an understanding of their knowledge, attitudes, and daily practices, which are together known as the KAP framework. This model has become an important tool for assessing food safety behavior in many populations and circumstances (Begum et al., 2025). Vendors may be aware of the dangers of incorrect food handling, but they nonetheless disregard optimal procedures owing to complacency, a lack of motivation, or cultural customs (Elsahoryi et al., 2024). Attitudes on cleanliness and hygiene, including whether vendors value and prioritize them, have a significant impact on how knowledge is applied in practice (Desye et al., 2023). Studies in various urban and institutional settings have found that, while sellers frequently have modest levels of food safety awareness, their actual adherence to hygiene measures is variable, exposing consumers to health hazards (Aba et al., 2023). The KAP framework, therefore, provides a structured strategy to finding these

disparities and evaluating the factors impacting food safety behaviors (Verma et al., 2022).

Food safety in university settings has been a major concern due to the large number of students, faculty, and visitors that rely on campus food vendors for daily meals (Serrem et al., 2021). Despite the availability of policies and procedures, many institutional settings experience failures in adequate food handling, storage, and hygiene practices (Zaki et al., 2024). In Nigerian tertiary institutions, these difficulties are exacerbated by inconsistent regulatory enforcement and infrastructural shortcomings (Oseyemi, 2023). Studies from various states has shown that, while food vendors frequently have an acceptable level of knowledge about food safety, their practical application is frequently hampered by factors such as a lack of potable water, insufficient training, and financial constraints (Leslie et al., 2021). In Edo State, research done in Benin City marketplaces found widespread poor hygiene compliance, with environmental and economic challenges impeding adequate procedures such as cooking close to dump sites, lack waste management system, lack of portable water in cooking areas, general high cost of food, and inadequate food storage facilities were reported to be major factors hindering safety practices among the respondents (Enunwaonye & Olugbade, 2021)]. Furthermore, bacteriological assessments of food vendors at the University of Benin food courts revealed the presence of pathogenic bacteria such as Staphylococcus aureus and Bacillus cereus, highlighting the potential health risks associated with food handling in Edo State university settings (Aziegbemhin & Dunkwu-Okafor, 2024). Hence this study seeks to assess the knowledge, attitude and practice of food hygiene among food vendors in a tertiary academic institution in Edo state.

1.2 Statement of problem

Food safety is still a major concern in university settings, as huge numbers of students, faculty, and visitors rely on food sellers for nutrition on a regular basis. The convenience and cost provided by these vendors are critical in satisfying the dietary needs of busy students, but these advantages come with considerable health hazards. Despite broad efforts by public health authorities to promote hygiene and safe food handling methods, observations have revealed that inadequate food handling and preparation skills are still prevalent among food vendors on university campuses (Madaki & Miroslava, 2021). Many vendors have a rudimentary awareness of food safety concepts, but they do not regularly apply this information in their everyday operations. Carelessness, economic pressure to cut corners, and a lack of proper training are common causes of lapses that expose consumers to foodborne illnesses. Furthermore, the absence of systematic, regular monitoring and enforcement by health authorities in academic settings permits harmful behaviors to continue. Many Nigerian postsecondary institutions have irregular inspections, and regulatory organizations lack the capacity or willingness to adequately enforce sanitary requirements (Oseyemi, 2023). This circumstance creates a substantial gap between established food safety rules and the realities of food handling on campus, potentially jeopardizing the health and well-being of the students.

In Edo State, these difficulties are exacerbated by infrastructural and environmental limitations that impede food vending operations in institutional settings. Many vendors in the state work in conditions with limited access to clean water, efficient waste disposal systems, and sanitation facilities (Enunwaonye & Olugbade, 2021). Even when vendors are knowledgeable about food safety, insufficient infrastructure makes it difficult for them to maintain the minimum standards for safe food

preparation and serving. Furthermore, cultural and social variables, such as poor education and budgetary restraints, have a significant impact on food vendor hygienic procedures. The lack of recent and localized research data particular to Edo State's tertiary institutions exacerbates these difficulties. While generic research on food vendor practices in Nigeria exist, there is a lack of empirical evidence on the present knowledge, attitudes, and sanitary behaviors of food vendors operating on university campuses in the state (Amaechi-Chijioke et al., 2024). The lack of current, institution-specific research presents a difficulty for policymakers and university administrators, who need reliable data to implement successful food safety programs. Without such information, students are still subject to avoidable health hazards linked with poor food handling and vendor hygienic practices in these academic settings.

1.3 Objectives of the study

The aim of this study is to assess the level of knowledge, attitude and practice of food hygiene among food vendors in the University of Benin, Ugbowo campus, Benin city, Edo state.

However, the specific objectives of this study include to;

1. assess the level of knowledge of food hygiene among food vendors in a tertiary academic institution in Edo state.

2. determine the attitude towards food hygiene among food vendors in a tertiary academic institution in Edo state.

3. assess the practice of food hygiene among food vendors in a tertiary academic institution in Edo state.

4. Identify the factors influencing practice of food hygiene among food vendors in a tertiary health institution in Edo state.

1.4 Research questions

1. What is the level of knowledge of food hygiene among food vendors in a tertiary academic institution in Edo state?

2. What are the attitudes towards food hygiene among food vendors in a tertiary academic institution in Edo state?

3. What are the practices of food hygiene among food vendors in a tertiary academic institution in Edo state?

4. What are the factors influencing practice of food hygiene among food vendors in a tertiary health institution in Edo state?

1.5 Hypotheses

: There is no significant relationship between the level of knowledge of food hygiene and the food hygiene practices of food vendors in a tertiary academic institution in Edo State.

: There is no significant relationship between the attitudes towards food hygiene and the food hygiene practices of food vendors in a tertiary academic institution in Edo State.

1.6 Significance of the study

This study will provide nurses, particularly those involved in community health and environmental health nursing, with evidence-based insights into food hygiene

challenges in tertiary institutions. This knowledge can enhance health education, advocacy, and interventions targeted at promoting food safety in institutional settings.

Also this study seeks to contribute to the body of nursing research by providing current data on food safety practices within tertiary academic institutions in Edo State. It will also serve as a reference for future studies, particularly for researchers interested in public health, environmental health, and preventive health practices.

Findings from this research will support the incorporation of practical public health content into nursing curricula. It will also inform nursing administrators on the need to engage in policy formulation, monitoring, and collaboration with institutions to ensure safe food practices are upheld within educational environments.

Ultimately, the study will benefit society by promoting safer food consumption practices, reducing the prevalence of food-borne diseases, and fostering a healthier population. The ripple effect of improved vendor hygiene practices will enhance the overall health of students and staff and contribute to a culture of safety in public food handling.

1.7 Scope/ Delimitation of the study

This study focuses on the knowledge, attitude and practice of food hygiene among food vendors in a tertiary academic institution in Edo state. The scope is restricted to food vendors operating within the University of Benin, Benin City. It covers aspects such as the level of knowledge of food hygiene principles, attitudes toward maintaining hygienic practices, and the actual hygienic behaviours exhibited during food preparation and service. The study targets only registered and actively operating food vendors within the university premises, excluding vendors in other academic institutions or informal/unregistered food sellers outside the campus environment.

This study is delimited to food vendors operating within the University of Benin, Benin City, Edo State. It focuses solely on assessing their knowledge, attitude, and practice (KAP) of food hygiene. The research excludes food vendors in other tertiary institutions, those operating outside the university premises, and unregistered or informal vendors. Additionally, the study does not cover other aspects of food safety such as food sourcing, regulatory compliance, or consumer hygiene practices. Its findings are specific to the study location and population, and may not be generalized to broader settings.

1.8 Operational definition of terms

Food Vendors: refers to individuals or groups engaged in the preparation, sale, and service of food and beverages to students and staff within the University of Benin, Ugbowo campus, Benin city, Edo state.

Food Hygiene: , all conditions and measures necessary to ensure the safety and cleanliness of food during preparation, handling, storage, and service to prevent contamination and foodborne illnesses.

Knowledge: the information and understanding possessed by food vendors regarding food hygiene practices, contamination risks, and the importance of cleanliness in food handling.

Attitudes: the beliefs, perceptions, and dispositions of food vendors toward the importance and consistent practice of food hygiene in their daily activities.

Practices: the actual behaviors and actions demonstrated by food vendors in relation to food preparation, handling, storage, and service, including adherence to hygienic standards.

Tertiary Academic Institution: a post-secondary educational institution in Edo State where teaching, learning, and research are conducted, specifically the University of Benin, Ugbowo campus, Benin city, Edo state.

CHAPER TWO

LITERATURE REVIEW

This chapter focuses on the review of related literature under the headings; conceptual review, theoretical review and empirical review. These are organized in order of the most important to least important to the variable of interest. Necessary literature would be gotten from published and unpublished works, articles, journals and textbooks in this study.

2.1 Conceptual review

2.1.1 Overview of food hygiene

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Food hygiene refers to the conditions and procedures required to assure food safety from manufacture to consumption. It includes a variety of techniques aimed at preventing contamination, lowering the risk of foodborne illnesses, and maintaining the overall quality of food items (Ramli and Wong, 2022). Proper food hygiene begins with obtaining raw materials from reputable and hygienic sources, ensuring that food is free of biological, chemical, and physical risks (Cataluna & Rukmini, 2024). Hygiene standards must be maintained at all stages of food processing, including washing hands before handling food, using clean utensils, and preventing cross-contamination between raw and cooked meals (Bezruchenko & Schuka, 2024). Proper storage conditions are also important in food hygiene because temperature, humidity, and contaminant exposure can all have a significant impact on food safety (Kanaan et al., 2023).

Food hygiene is governed by international and national food safety regulations, which include methods like Hazard Analysis and Critical Control Points (HACCP) for identifying and controlling possible hazards in food manufacturing. Compliance with these criteria ensures that food is safe throughout the supply chain, which reduces the number of foodborne illnesses. Inadequate food hygiene can have serious health repercussions, including bacterial infections such salmonella, E. coli, and listeria, which can cause gastrointestinal disorders, organ damage, and even death (Erah et al., 2024). Research has shown that foodborne infections are frequently associated with poor hygiene practices such as insufficient handwashing, incorrect food storage, and inadequate cooking techniques (Babor et al., 2024). Governments and health organizations around the world highlight the need of food cleanliness through awareness programs, frequent food safety inspections, and mandated food handler training (Singh & Singh, 2024). Personal hygiene among food handlers is one of the most critical aspects of food hygiene. This includes maintaining cleanliness, such as washing hands frequently, wearing clean clothing, and using protective gear like gloves and hair nets (Tokan et al., 2023).

Food hygiene is that critical component of public health that ensures food is handled, kept, and cooked correctly to avoid contamination and foodborne illness. Proper hygiene procedures are essential across the food supply chain, from production to consumption, to reduce health hazards and maintain food quality (Kanaan et al., 2023). According to research, foodborne infections remain a global concern, especially in developing nations with insufficient regulatory control and hygiene awareness (Cataluna & Rukmini, 2024). Contamination can occur at any point, including food handling, preparation, and storage, hence it is critical to enforce hygiene standards at all levels of the food sector (Tuglo et al., 2021). One of the most significant issues in

food hygiene management is a failure to follow adequate sanitation practices, particularly among street food vendors and small-scale food businesses (Babor et al., 2024).

2.1.2 Food hygiene in Nigeria

Food-borne illnesses constitute a significant public health risk in Nigeria due to improper food handling practices, insufficient cleanliness standards, and lax enforcement of food safety rules. Contaminated food is a key source of typhoid fever, cholera, salmonellosis, and Escherichia coli infections, which are common in both urban and rural regions (Akpan et al., 2024). According to research, poor personal hygiene among food handlers, such as failing to wash hands correctly, inadequate refrigeration, and cross-contamination between raw and cooked foods, contributes considerably to the spread of foodborne infections (Okwuanaso et al., 2024).

Street food vendors, who serve a substantial portion of Nigeria's population, frequently work in filthy conditions with poor waste disposal, exposure to pests, and a lack of clean water, making their food more susceptible to contamination (Lokoja et al., 2024). Oladeji et al. (2023) connected foodborne disease outbreaks to improper food handling conditions, which can result in severe diarrhea, vomiting, dehydration, and, in extreme circumstances, mortality, particularly among vulnerable groups such as children and the elderly. In addition to individual health hazards, foodborne infections have a considerable impact on Nigeria's healthcare system, increasing hospital admissions and resulting in economic losses due to decreased workforce productivity (Isah et al., 2021).

In Nigeria, several agencies are tasked with ensuring food safety and hygiene. The National Agency for Food and Drug Administration and Control (NAFDAC) plays a

pivotal role by regulating and controlling the importation, exportation, manufacture, advertisement, distribution, sale, and use of food products to ensure they meet the highest standards of safety and quality . Within NAFDAC, the Food Safety and Applied Nutrition (FSAN) Directorate focuses specifically on overseeing the safety and quality of food products . Additionally, the Standards Organisation of Nigeria (SON) is responsible for setting and enforcing standards for products and services, including food items, to ensure consistency and safety . The Federal Ministry of Health also contributes to food safety through its Food and Drugs Services department, which oversees various agencies and parastatals involved in food and drug regulation. The World Health Organization (WHO) has consistently emphasized the importance of food hygiene in preventing foodborne illnesses, which pose significant health risks globally (WHO, 2022). WHO's "Golden Rules for Safe Food Preparation" highlight essential food hygiene practices, such as proper cooking, storage, and handling, to minimize the risk of contamination.

2.1.3 Components of food hygiene

Food hygiene consists of several key components that ensure the safety and quality of food from production to consumption. One fundamental aspect is personal hygiene, which involves proper handwashing, wearing clean clothing, and maintaining overall cleanliness among food handlers to prevent contamination (WHO, 2022). Research highlights that poor personal hygiene, such as inadequate handwashing and failure to use protective gear, is a leading cause of foodborne illnesses (Okwuanaso et al., 2024). Another crucial component is food handling and preparation, which includes washing raw ingredients, cooking food at the correct temperatures, and avoiding cross-contamination between raw and cooked foods. Unsafe food handling practices can

introduce bacteria like Salmonella and E. coli, increasing the risk of foodborne diseases (Akpan et al., 2024).

Proper food storage and preservation are crucial to prevent spoilage and contamination. According to the Food and Agriculture Organization (FAO) (2021), effective preservation methods involve avoiding physical damage to food items, reducing the growth of germs, and preventing chemical and enzymatic activities that lead to spoilage. This can be achieved through various techniques such as refrigeration, canning, drying, and the use of preservatives. Implementing these methods helps extend the shelf life of food products and maintains their safety and nutritional value. Additionally, cleaning and sanitation of food preparation areas, cooking utensils, and storage facilities are essential to minimize microbial contamination. Studies have shown that foodborne illnesses are more prevalent in environments with inadequate sanitation, highlighting the need for strict hygiene protocols in food establishments (Lokoja et al., 2024).

Finally, waste management and pest control play a crucial role in food hygiene by preventing the accumulation of organic waste that attracts insects and rodents (WHO, 2022). Proper disposal of food waste, regular cleaning of drainage systems, and the use of pest control measures help maintain a hygienic food environment. Inadequate waste management has been linked to food contamination, emphasizing the need for strict regulatory enforcement (Akegbe et al., 2023). By adhering to these essential components, food handlers and consumers can significantly reduce the risks of foodborne illnesses and ensure food safety at all levels of the supply chain.

2.1.4 Factors influencing food hygiene practices

Knowledge and Awareness: A comprehensive understanding of food safety principles is crucial for proper food handling. Insufficient knowledge can lead to unhygienic practices, increasing the risk of contamination. Educational initiatives have been shown to enhance food handlers' knowledge and improve hygiene practices. **Infrastructure and Resources:** Adequate facilities, such as clean water supply, proper waste disposal systems, and well-maintained equipment, are vital for maintaining hygiene standards. Limited access to these resources can hinder the implementation of effective food hygiene practices. For instance, poor infrastructure and inadequate sanitation facilities in traditional food markets can promote the proliferation of pathogens. Iris

Cultural Practices and Attitudes: Cultural beliefs and traditional food handling methods can impact hygiene practices. In some communities, longstanding practices may not align with recommended food safety guidelines, posing challenges to implementing standardized hygiene measures.

Regulatory Environment: The presence and enforcement of food safety regulations play a significant role in shaping hygiene practices. Clear guidelines and regular inspections by food safety authorities can promote compliance among food handlers. For example, the implementation of Good Manufacturing Practices (GMP) and Hazard Analysis Critical Control Point (HACCP) systems are essential tools for controlling food hazards.

Economic Factors: Financial constraints can affect the ability of food businesses to invest in proper hygiene infrastructure and training. Small-scale vendors may face

challenges in affording necessary resources to maintain hygiene standards, impacting overall food safety.

Environmental Conditions: Factors such as climate and seasonal variations can influence food hygiene. High temperatures and humidity can accelerate food spoilage and bacterial growth, necessitating more stringent hygiene practices during certain periods.

2.2 Theoretical review

This study reviews the Theory of planned behaviour (TPB). TPB emphasizes the role of attitudes, subjective norms, and perceived behavioral control in shaping intentions and behaviors. It is particularly relevant for understanding how knowledge and attitude towards food hygiene influences the practice of food hygiene among food vendors in the University of Benin. Hence, this model was adopted as theory of best fit for this study.

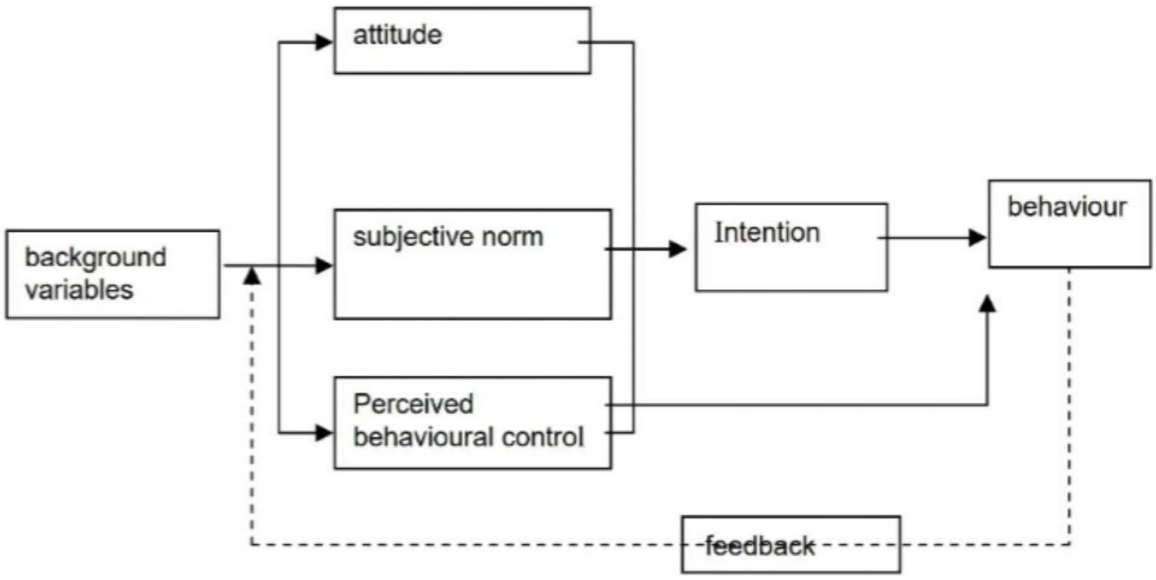

Figure 2.1: Adapted from theory of planned behaviour, Ajzen (1991).

2.2.1 Theory of Planned Behaviour

The Theory of Planned Behavior (TPB), developed by Icek Ajzen in 1985, is a psychological framework that explains how individual intentions to perform a behavior are shaped and how those intentions translate into actual actions. The theory builds upon the Theory of Reasoned Action (TRA) by adding a critical component: Perceived Behavioral Control (PBC). This addition acknowledges that not all behaviors are entirely under an individual's volitional control. TPB has been widely applied to health-related behaviors, including contraceptive use, as it provides a structured way to understand the factors influencing decision-making.

The TPB postulates that behavior is influenced by three core determinants:

Attitudes Toward the Behavior

This refers to an individual's overall evaluation of the behavior as positive or negative. Attitudes are shaped by beliefs about the outcomes of performing the behavior and the value placed on those outcomes. For example, if someone believes that using a method like emergency contraception is effective in preventing unwanted pregnancy and views this as a positive outcome, they will likely have a favorable attitude toward it.

Subjective Norms

These are the perceived social pressures to perform or avoid a particular behavior. Social influences may come from peers, family, government, institutions, religious groups, or cultural norms. If an individual believes that people or organizations important to them approve of the behavior, they are more likely to perform it. Conversely, negative social feedback or stigma can deter action.

Perceived Behavioral Control (PBC)

This refers to the individual's perception of their ability to perform the behavior, which is influenced by internal factors (e.g., confidence, knowledge) and external factors (e.g., availability of resources, societal barriers). The concept is similar to self-efficacy in psychology but is broader, encompassing not just personal ability but also external circumstances. A high sense of control enhances the likelihood of intention and actual behavior.

Behavioral Intention

Behavioral intention is the immediate predictor of action. It represents the motivational factors driving the individual's readiness to perform a behavior. TPB suggests that stronger intentions are more likely to lead to actual performance of the behavior, provided perceived control is high.

2.2.2 Application of the theory of planned Behavior to the study

Ajzen's Theory of Planned Behaviour (TPB) provides a strong theoretical framework for understanding the psychological factors that influence human behavior, especially in areas related to public health. The theory posits that behavioral intention , the most immediate predictor of behavior, is influenced by three key constructs: attitude toward the behavior, subjective norms, and perceived behavioral control.

Attitude toward the behavior

Refers to the food vendors' personal evaluation of food hygiene practices. Vendors who believe that good hygiene leads to fewer customer complaints, better health outcomes, and increased customer trust are likely to have a more favorable attitude toward practicing proper hygiene. A positive attitude, shaped by sufficient knowledge

and personal experiences, is therefore a crucial determinant of their willingness to act hygienically.

Subjective norms

Relate to the perceived social pressure that influences whether or not food vendors engage in hygienic practices. Within a tertiary academic environment, this could include pressure from health inspectors, institutional food service standards, peer vendors, and customers (students and staff). If vendors perceive that others expect them to maintain high food hygiene standards and that compliance will enhance their reputation or ensure continued business, they are more likely to adopt and maintain those behaviors.

Perceived behavioral control

Involves the vendors' belief in their capability to perform hygienic practices despite external constraints. In this context, factors such as access to clean water, sanitation facilities, storage equipment, and training opportunities will significantly affect their sense of control. Even with good knowledge and a positive attitude, a lack of resources can limit the actual practice of food hygiene. Therefore, perceived behavioral control moderates the transition from intention to behavior.

Applying TPB to this study allows for a deeper understanding of the gap that often exists between knowledge and actual practice. Vendors may possess the knowledge and even favorable attitudes, but without adequate social support (subjective norms) and enabling environments (behavioral control), they may fail to translate this into consistent hygienic behavior.

2.3 Empirical review

2.3.1 Level of knowledge of food hygiene among food vendors

In a study carried out by Rosales et al. (2022) in Ambato, Ecuador, the aim was to assess the level of knowledge and hygiene practices among street food vendors, as well as their perceptions of the available hygiene facilities. The researchers adopted a two-step mixed-methods design involving both a semi-structured questionnaire and in-depth interviews. A total of 99 vendors completed the questionnaire, while 25 participated in face-to-face interviews. Data were collected directly through on-site administration of the instruments, and the analysis was done using descriptive statistics for the quantitative data and thematic analysis for the qualitative data. Findings showed that more than two-thirds of the respondents demonstrated good knowledge of food hygiene and self-reported consistently practicing hygienic

behaviors. However, it was also revealed that challenges such as poor garbage disposal and pest control services compromised the overall safety of street food despite vendors' knowledge.

Cataluna and Rukmini (2024) conducted a systematic review to evaluate the knowledge and practice of food hygiene and sanitation among street food vendors across multiple developed and developing contexts. Although this was a global review, it included significant representation from developed countries, aligning with the criteria for this theme. The study followed the PRISMA guidelines for systematic reviews, selecting 18 studies out of an initial pool of 3,022 articles sourced from databases such as Scopus, PubMed, and Wiley Online. The data were synthesized using qualitative assessment methods focused on hygiene knowledge and sanitation practice. Findings showed that although street food vendors across many developed settings had an acceptable level of knowledge about food hygiene, this did not consistently translate into hygienic practices.

Similarly, in Digos City, Philippines, Babor et al. (2024) aimed to assess the level of food safety awareness and hygiene practices among street food vendors. The researchers employed a descriptive-comparative research design using a 5-point Likert scale questionnaire. A total of 150 food vendors were randomly selected to participate in the study. Data collection was done through direct administration of the questionnaire, and the data were analyzed using descriptive statistics. Findings showed that the level of awareness regarding food hygiene among the vendors was high, and most respondents demonstrated a good understanding of hygiene principles. However, it was also found that food hygiene practices varied based on demographic factors, suggesting that while knowledge was present, consistent application of hygiene practices still required improvement.

In contrast, Thapa et al. (2024) reported adequate knowleedge as shown in a study in Dhading Bensi, Nepal, to evaluate the knowledge and practices related to food hygiene among street food vendors. The study utilized a cross-sectional descriptive design and recruited 47 participants through purposive sampling. Data collection tools included a semi-structured questionnaire, direct face-to-face interviews, and an observation checklist. The data were analyzed using descriptive statistics through SPSS, and associations were tested using the Chi-square test. Findings showed that while 63.8% of the respondents had an adequate level of knowledge about food hygiene, 80.9% demonstrated poor hygiene practices. This gap between knowledge and practice highlighted the need for more effective training and stricter local regulations to ensure that food vendors not only understand but also implement hygiene protocols consistently.

Alhazmi et al. (2021) investigated street food truck vendors in Jeddah City, Saudi Arabia, aiming to assess their food safety knowledge and hygiene practices. The cross-sectional study included 123 food vendors, who completed a self-administered questionnaire to evaluate socio-demographic profiles and food safety knowledge. Data analysis revealed that the majority of vendors demonstrated good food safety knowledge and maintained satisfactory hygienic practices. Notably, educational attainment was the only socio-demographic factor significantly associated with their level of food safety knowledge.

In a developing country as Ghana, a persistent gap remains in knowledge and practice, Arthur et al. (2021) conducted a descriptive survey in Koforidua, Ghana, to appraise the knowledge and hygiene practices of food vendors regarding foodborne diseases and safety. A total of 50 food vendors were purposively and conveniently selected for the study. Data were collected using structured questionnaires and analyzed using

SPSS to generate frequencies and percentages. Findings showed that the majority of vendors had received some form of training and demonstrated basic knowledge of hygienic food handling. However, the study revealed a significant gap between knowledge as many of the food vendors failed to apply the hygiene principles in their day-to-day food handling. The researchers emphasized the need for regular follow-up inspections and refresher trainings to ensure the effective implementation of food hygiene standards.

Nkosi and Tabit (2021) carried out a study in the Zululand District of South Africa to evaluate the food safety knowledge of street food vendors and the sanitary conditions of their vending environments. The study used a descriptive cross-sectional design and included face-to-face interviews with 399 randomly selected vendors, alongside an inspection of 200 vending sites. Data were collected through structured interviews and analyzed using descriptive statistics. Findings showed that 76% of the vendors had low levels of food safety knowledge, and only 14% of vending locations met high sanitary standards. The study concluded that poor hygiene knowledge and inadequate infrastructure posed a significant risk to food safety in the area.

In Nigeria, Oseyemi (2023) conducted a study in Akure South Local Government Area of Ondo State, Nigeria, with the aim of assessing food vendors' knowledge and practices regarding food safety procedures and hygiene. The research design was a descriptive survey, and a sample size of 260 food vendors was selected using a multistage sampling technique. Data were collected through a structured questionnaire, and analyzed using descriptive statistics (frequency tables, percentages) and inferential statistics (chi-square). The key findings revealed that the majority of vendors possessed good knowledge of food safety and hygiene, as

demonstrated by their theoretical understanding of proper procedures. However, the study noted a disparity between this knowledge and actual practices.

Similarly, Erah et al. (2024) reported good knowledge as shown in a study among food vendors in a rural tertiary health facility in South-South Nigeria to assess their knowledge, attitude, and practice of food hygiene and safety. The descriptive cross-sectional study included 100 food vendors from ten premises within a teaching hospital environment, selected via total population sampling. Data were collected using a semi-structured validated questionnaire and analyzed with SPSS version 23, presented in tables and charts at a 95% confidence level ($p<0.05$). The results revealed that 67% of vendors had good knowledge of food hygiene and safety. The study concluded that while two-thirds of vendors possessed good knowledge this did not fully translate into adequate hygiene practices, highlighting a knowledge-practice gap.

In contrast, Osuchukwu and Udom (2022) findings revealed a higher knowledge among food vendors at the University of Calabar, Nigeria to assess their knowledge and practice of food hygiene. A cross-sectional descriptive survey which included 67 purposively selected food vendors. Data were collected using a researcher-developed and validated questionnaire, with analysis performed using SPSS software (presented as frequency counts and percentages). Key findings revealed that 85.1% of vendors demonstrated adequate knowledge of food hygiene. The study found a statistically significant relationship between knowledge and practice of food hygiene.

2.3.2 Attitude towards food hygiene among food vendors

Elsahoryi et al. (2024) examined street food vendors' attitudes toward food safety in Jordan's two most populous cities through a cross-sectional study of 405 vendors.

Data were collected via in-person interviews using a validated questionnaire and analyzed with SPSS version 25. The findings revealed that vendors held predominantly negative attitudes toward food safety, which were significantly influenced by age (older vendors had poorer attitudes), education (higher education correlated with better attitudes), work experience, gender, and marital status. These negative attitudes persisted despite moderate knowledge levels, highlighting a critical gap in food safety compliance. The study underscores the need for interventions targeting attitude improvement among vendors to enhance food safety practices.

Werkneh et al. (2020) conducted a community-based cross-sectional study of 185 street food vendors in Mekelle City, Northern Ethiopia, using face-to-face interviews with pre-tested questionnaires and observational checklists from February to August 2020. Multivariable logistic regression analysis revealed that 81.1% (146/185) of vendors demonstrated positive attitudes toward food safety, with attitude levels showing significant association with food safety practice in analysis. The study found these positive attitudes were independently maintained regardless of vendors' knowledge levels, suggesting attitude formation may be influenced more by practical experience than theoretical knowledge. The high prevalence of positive attitudes (over 80%) contrasted with only 58.9% demonstrating good practices, indicating potential gaps between expressed attitudes and actual implementation of food safety measures.

Desye et al. (2023) conducted a systematic review and meta-analysis of 14 studies (n=2,989 vendors) across low- and middle-income countries, following PRISMA guidelines with data extracted to Excel and analyzed using STATA 14/SE. The random-effects model revealed that 66% (95% CI: 47-86) of street food vendors demonstrated positive attitudes toward food safety, though significant heterogeneity existed (I^2 statistic). Key factors associated with positive attitudes included secondary

education (OR=5.95, 95% CI: 4.05-7.85) and prior food safety training (OR=4.64, 95% CI: 2.62-6.67). The Joanna Briggs Institute quality appraisal confirmed study reliability, while Egger's test showed no significant publication bias ($p>0.05$).

Nortey et al. (2024) conducted a cross-sectional study using a structured questionnaire with 406 randomly selected street food vendors in Ghana's Sekondi-Takoradi Metropolis, analyzing data through chi-square tests and binary logistic regression in Stata (v16). The study found 51% of vendors held negative attitudes toward food safety, with education level being a significant predictor - vendors with senior high education showed reduced odds of negative attitudes (aOR=0.37, $p=0.014$). Prior training (aOR=0.50, $p=0.010$) and higher knowledge levels (aOR=0.33, $p=0.001$) were also associated with more positive attitudes. These findings suggest educational interventions could improve vendors' food safety attitudes.

Lokoja et al. (2024) conducted a descriptive cross-sectional study of 261 randomly selected food vendors in Lafia, Nasarawa State, Nigeria, using a structured questionnaire for data collection. Analysis was performed with descriptive statistics (frequency percentages, mean, standard deviation) and Chi-square tests at 5% significance level. The study found that 88.1% (230/261) of vendors demonstrated generally positive attitudes toward food hygiene. However, the Fisher's exact test revealed no significant correlation between attitude and knowledge levels ($p=0.338$), suggesting these positive attitudes existed independently of food safety knowledge. The research identified gaps between expressed attitudes and actual practices, as only 62.5% maintained good hygiene practices despite the high percentage reporting positive attitudes.

2.3.3 Practice of food hygiene among food vendors

Singh and Singh (2024) carried out a descriptive cross-sectional study aimed at evaluating the food hygiene practices among food handlers in Kanpur. The study involved 110 food handlers drawn from 50 food establishments across the city. A structured questionnaire and observational checklist served as the instruments for data collection, focusing on key hygiene behaviors such as handwashing, utensil handling, and cleanliness of the food preparation area. Data were collected directly from the participants using face-to-face administration and site observation. The collected data were analyzed using descriptive statistics to categorize hygiene knowledge, attitude, and practice levels. Findings revealed that although a fair proportion of participants had satisfactory knowledge and attitude toward food hygiene (with over 50% scoring fair), actual hygiene practices were significantly lacking. Only 17.27% of respondents demonstrated good hygiene behaviors, such as consistent handwashing, use of gloves, and proper storage. The remaining majority practiced poor hygiene, including neglecting food safety protocols and lacking basic sanitation tools. This highlighted a concerning disconnect between awareness and real-life application, prompting the need for targeted behavioral interventions and regular hygiene monitoring.

Khan et al. (2024) conducted a cross-sectional comparative study to evaluate the sanitary practices of street food vendors in densely populated areas around Ameer-ud-Din Medical College in Lahore, Pakistan. A total of 288 street food vendors participated in the study, selected through convenience sampling. The researchers used a pre-structured questionnaire and observational checklist as instruments to gather data on vendors' hygiene-related behaviors, including water use, sanitation facilities, hand hygiene, and the cleanliness of the vending site. Data collection was performed on-site via direct interviews and observation. The data were analyzed using

SPSS version 23, employing chi-square tests to identify associations between hygiene practices and sociodemographic characteristics such as age, education, and work experience. Findings indicated that only 21.2% of respondents had a hygiene score of 75% or above — a threshold used to classify good practice. The majority failed to meet basic hygiene standards, often lacking proper water supply, protective clothing, or routine handwashing habits. Interestingly, the study found no significant correlation between hygiene scores and demographic variables, suggesting that poor hygiene practices were widespread regardless of background. These results underscored the need for universal hygiene training and stronger municipal oversight.

Thapa et al. (2024) conducted a cross-sectional descriptive study to assess the practice of food hygiene among street food vendors in Dhading Bensi, Nepal. The study involved 47 participants selected through purposive sampling. Data were collected using a semi-structured questionnaire, face-to-face interviews, and an observation checklist — all designed to capture hygiene-related behaviors such as handwashing, utensil cleaning, use of protective wear, and food storage. The researchers ensured ethical standards and direct engagement with vendors at their vending locations. Data were entered and analyzed using SPSS version 16, employing descriptive statistics and Chi-square tests to examine associations between hygiene practices and variables like education, employment duration, and vendor experience. Findings revealed that despite 63.8% of vendors having an adequate level of knowledge, a striking 80.9% demonstrated poor hygiene practices. These included failure to wash hands consistently, use of bare hands during food preparation, and lack of gloves, aprons, or covered utensils. The study concluded that while awareness existed, it did not translate into hygienic behavior, highlighting the need for targeted behavioral training and stronger regulatory involvement at the community level..

Kundu et al. (2021) carried out a cross-sectional study in the cities of Barishal and Patuakhali, Bangladesh, to examine the hygiene practices of 137 street food vendors. The sample was selected using simple random sampling, and data were gathered through a pre-structured questionnaire that included questions about hygiene behavior, infrastructure, staffing, and shop cleanliness. Data were collected directly through interviews with vendors and on-site observation. The analysis was conducted using logistic regression models to determine the influence of factors like education, presence of assistants, and shop setup on hygiene practice scores. The study found that only 43.1% of vendors practiced acceptable levels of hygiene, with the majority falling short in key areas such as food storage, reheating, and handwashing. Notably, vendors who had completed secondary education and those who employed extra staff were significantly more likely to follow hygienic practices. The study concluded that overall hygiene among vendors was inadequate, and improving education and staffing could enhance sanitary outcomes.

Klutse and Sampson (2025) conducted a descriptive cross-sectional study in the Volta Region of Ghana to assess hygiene practices among street food vendors. The study was framed using the Theory of Planned Behavior as a guiding model and employed a multistage random sampling technique to select 254 vendors from both rural and urban areas. Data collection was carried out using structured questionnaires and direct observational checklists, which assessed hygiene behaviors such as utensil cleaning, use of personal protective equipment (PPE), and environmental cleanliness. Statistical analysis was performed using SPSS, with chi-square tests applied to examine relationships between demographic variables (e.g., education, location) and hygiene practices. The findings revealed mixed hygiene practices: 87.8% of vendors cleaned utensils with soap and water, 79.1% wore aprons, and 86.6% wore head caps.

However, only 29.1% consistently washed hands before food handling, and usage of gloves and masks was limited to 41.7% and 33.9%, respectively. Environmental hygiene was poor, with 61% reporting pest presence around vending sites. The study concluded that despite basic awareness, hygiene practices were inconsistent and heavily influenced by education level and infrastructure access. The authors recommended enhanced vendor training and investment in sanitation facilities.

Girma, Yazew, Bedada, Daba, and Kuyu (2024) conducted a cross-sectional study in Bishoftu, Ethiopia, to assess the hygiene practices of street food vendors and identify factors influencing those practices. A total of 210 vendors were randomly selected using simple random sampling techniques. Data collection involved face-to-face interviews using a structured questionnaire that captured demographic characteristics and hygiene behaviors, such as cleaning routines, hand hygiene, waste disposal, and food storage. The responses were analyzed using SPSS version 21, applying descriptive statistics and logistic regression models to identify significant associations. Results showed that 64.8% of vendors demonstrated good food hygiene practices, while 35.2% practiced poorly. Key predictors of good hygiene practice included female gender (AOR = 0.191), greater vending experience (AOR = 5.793), maintaining a clean environment (AOR = 2.860), and possessing knowledge of food hygiene (AOR = 2.726). Despite these strengths, the study found that hygiene standards in Bishoftu lagged behind other Ethiopian regions, with many vendors lacking access to proper facilities. The authors recommended updates to national food safety regulations and training initiatives to close the gap between knowledge and practice.

Osuchukwu and Udom (2022) carried out a cross-sectional descriptive study aimed at appraising the knowledge and practice of food hygiene among food vendors within

the University of Calabar, Nigeria. The study purposively selected 67 food vendors operating within the institution's premises. Data collection was conducted using a researcher-developed and validated questionnaire, which covered areas such as hygiene behavior, food storage, utensil cleanliness, and use of protective gear. The method of data collection involved in-person administration of the instrument at vendor stalls, ensuring immediate response and clarification. The collected data were analyzed using SPSS, with findings presented as frequencies and percentages. The results indicated that 85.1% of the respondents not only had adequate knowledge of food hygiene but also demonstrated good hygiene practices. These practices included frequent handwashing, use of aprons and head coverings, and regular cleaning of work surfaces. Furthermore, a statistically significant relationship was found between knowledge and hygiene practice ($\chi^2 = 28.134$; $p < 0.05$), suggesting that training and awareness directly influenced behavioral outcomes. The authors recommended continuous hygiene education and institutional policies that reinforce regular inspections and training for vendors in tertiary institutions.

In Akure South Local Government Area of Ondo State, Nigeria, Oseyemi (2023) conducted a descriptive survey to appraise the knowledge and actual practice of food hygiene among food vendors. The study sampled 260 vendors using a multistage sampling technique. Data were gathered using a structured questionnaire that assessed hygiene behaviors including handwashing, food temperature control, equipment cleanliness, and environmental sanitation. Data were collected through on-site distribution of the questionnaire with support from local authorities to ensure vendor participation. The data were analyzed using both descriptive statistics (frequencies and percentages) and inferential statistics (chi-square tests). While the study found that the majority of respondents had a good level of knowledge about hygiene

practices, actual compliance was low. Most vendors did not consistently implement key hygienic practices, with lapses observed in food covering, use of gloves, and waste management. The study found a significant association between knowledge and practice ($\chi^2 = 12.39$; $p < 0.001$), but no significant association between practice level and educational attainment. The author concluded that despite awareness, structural barriers and lack of enforcement hindered actual practice, and recommended coordinated government efforts including provision of water, waste disposal systems, and regular hygiene inspections.

2.3.4 Factors influencing knowledge, attitude and practice of food hygiene among food vendors in a tertiary health institution in Edo state.

Cataluna and Rukmini (2024) conducted a systematic review aimed at examining the hygiene and sanitation knowledge and practices of street food vendors globally, with a significant portion of studies drawn from developed countries. The study followed PRISMA guidelines and included 18 eligible papers from an initial pool of over 3,000 articles searched across major academic databases such as PubMed, Scopus, and Wiley Online. Though this was not a primary data collection study, the methodology involved qualitative synthesis and comparative analysis. Findings revealed that even in developed countries, vendor hygiene practices were often inconsistent due to several influencing factors: lack of continuing hygiene training, inconsistent inspection systems, limited infrastructure at vending sites (especially mobile units), and poor waste disposal facilities. The authors emphasized that without structured regulatory follow-up and accessible sanitation infrastructure, even high initial knowledge levels do not lead to good hygiene practices.

Although Ecuador is a high-middle-income country, the research by Rosales et al. (2022) offers insights similar to those from developed settings. The study utilized a

two-step design: a semi-structured questionnaire was administered to 99 vendors, and in-depth interviews were conducted with 25 others. Data were collected through on-site visits, and the qualitative portion was thematically analyzed. Findings revealed that although vendors self-reported high compliance with hygiene standards, several external factors strongly influenced their ability to practice food hygiene. These included inadequate garbage collection, pest control issues, poor market infrastructure, and unreliable water supply. These infrastructural gaps, rather than lack of knowledge, were the major constraints in translating awareness into consistent hygiene behavior.

Kundu et al. (2021) conducted a cross-sectional study to examine the influence of socio-demographic factors on hygiene practices among 137 street food vendors in Barishal and Patuakhali, Bangladesh. Using a pre-structured questionnaire, data were gathered through direct interviews with vendors, covering shop setup, staffing, education level, and hygiene behaviors. Data were analyzed using logistic regression to identify variables that significantly affected hygiene practice scores. The findings revealed that only 43.1% of vendors had good hygiene practices. Two major factors emerged: educational attainment and employment assistance. Vendors who had completed secondary education were more likely to score higher on hygiene (AOR = 3.308), and those who had hired extra employees to assist in food handling were also significantly more compliant (AOR = 3.381). These results suggest that better education and staffing capacity are strong enabling factors for improving hygiene practices in street food businesses.

Babor et al. (2024) explored the relationship between food safety awareness and hygiene practices among 150 randomly selected street food vendors in Digos City, Philippines. The study employed a descriptive-comparative design using a 5-point Likert scale questionnaire. Data were collected on vendors' demographic

characteristics and hygiene behaviors, and analyzed using descriptive statistics and comparative analysis by vendor profile. The study revealed that although awareness was generally high, there were significant differences in hygiene practices based on profile characteristics such as age, education level, and years of vending experience. Specifically, more experienced and older vendors practiced better hygiene. The researchers concluded that food safety training, vendor monitoring, and targeted hygiene education must consider these factors to enhance practice levels across different subgroups.

Girma et al. (2024) conducted a community-based cross-sectional study in Bishoftu, Ethiopia, to assess food hygiene practices and the factors associated with them among 210 street food vendors. Participants were selected through a simple random sampling technique. Data collection involved face-to-face interviews using a structured questionnaire, and data were analyzed using SPSS version 21 with logistic regression to identify significant influencing factors. The results showed that 64.8% of vendors had good hygiene practices, while 35.2% practiced poorly. The key influencing factors were: being female (AOR = 0.191), having more years of vending experience (AOR = 5.793), maintaining a clean vending environment (AOR = 2.860), and possessing adequate food hygiene knowledge (AOR = 2.726). These findings suggest that vendor characteristics such as gender and experience, alongside environmental conditions and education, significantly impact the consistency and quality of hygiene practices. The researchers recommended improving infrastructure and revising national regulations to address these core determinants.

Klutse and Sampson (2025) conducted a descriptive survey in the Volta Region of Ghana to examine hygiene practices and the contributing factors among 254 street food vendors. The study applied a multistage random sampling technique and used

structured questionnaires and observational checklists to collect data on hygiene behaviors and influencing variables such as education, access to sanitation, and urban versus rural location. Statistical analysis was performed using SPSS, including chi-square tests to assess associations. The findings revealed that vendor education level, location (urban vs rural), and access to water and waste disposal facilities were significant determinants of hygiene practices. Vendors with higher education were more likely to consistently clean utensils, wear protective gear, and handle food properly. Rural vendors struggled more with environmental sanitation due to limited infrastructure. The study concluded that structural barriers like water access and vendor literacy levels must be addressed in tandem for hygiene standards to improve sustainably.

Osuchukwu and Udom (2022) conducted a cross-sectional descriptive study among food vendors at the University of Calabar to appraise both their knowledge and practice of food hygiene, and to explore any influencing relationships between the two. A total of 67 vendors were purposively selected for the study. Data were gathered using a researcher-developed, validated questionnaire, which was administered on-site. Data analysis was carried out using SPSS, with results expressed in frequencies and percentages. The study found that 85.1% of vendors demonstrated good hygiene practices and that there was a statistically significant relationship between knowledge level and hygiene practice ($\chi^2 = 28.134$; $p < 0.05$). This finding strongly suggests that knowledge is a key influencing factor on practice, indicating that the more informed vendors are about hygiene principles, the more likely they are to implement them. The researchers recommended continuous training and institutional support to maintain high hygiene standards in educational environments.

Leslie et al. (2021) investigated the pattern and influencing factors of food safety and hygiene practices among school food vendors in Ikenne Local Government Area of Ogun State. The study adopted a descriptive survey design with a total sample of 48 vendors from public primary schools. Data were collected using structured questionnaires and observation checklists, and analyzed using t-tests and descriptive statistics. The study revealed that while 66.7% of vendors practiced food hygiene at a high level, key influencing factors included access to protective equipment (100%), availability of potable water (100%), and the presence of an indoor food preparation environment (50%). Additionally, statistical analysis showed that both knowledge level ($p = 0.000$; $t = 45.208$) and educational status ($p = 0.00$; $t = 52.208$) significantly influenced the hygiene practices of food vendors. The study concluded that while knowledge was generally high, consistent practice depended on the availability of basic facilities and materials. The researchers recommended more training, routine monitoring, and infrastructure support to improve compliance among school food vendors.

2.4 Summary of literature review

The literature review examined food hygiene from conceptual, theoretical, and empirical perspectives, highlighting its significance in ensuring food safety and reducing foodborne illnesses. The conceptual review provided an overview of food hygiene, emphasizing its role in maintaining food quality and preventing contamination throughout the food supply chain. It identified key components such as personal hygiene, proper food handling, sanitation, and waste management as critical measures to enhance food safety. The review also explored food hygiene in Nigeria, noting that poor hygiene practices contribute to widespread foodborne diseases such as typhoid, cholera, and salmonellosis, particularly among street food vendors. The

role of regulatory bodies like NAFDAC, SON, and the Federal Ministry of Health was discussed, along with WHO's guidelines on food safety.

Theoretical perspectives were analyzed using the Theory of Planned Behavior (TPB), which explains how knowledge, attitude, and perceived behavioral control influence food hygiene practices among food vendors. This framework was adopted as the best fit for understanding hygiene behaviors among food handlers, particularly in the context of the University of Benin. The review highlighted how attitudes toward food hygiene, social norms, and access to resources shape vendors' hygiene practices. Empirical studies further reinforced these findings, showing a persistent gap between food hygiene knowledge and actual practices among food vendors in various regions. Studies from different countries, including Nigeria, Ghana, Ethiopia, and the Philippines, consistently revealed that while food vendors often demonstrate awareness of hygiene principles, challenges such as inadequate infrastructure, financial constraints, and cultural influences hinder proper implementation.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter is discussed under the following subheadings: Research design, Research setting, Target population, Sample size, Sampling technique, Instrument for data collection, Validity of instruments, Reliability of instruments, Ethical consideration, Method of data collection and Method of data analysis.

3.1 Research Design

The research design adopted is a descriptive cross-sectional design because it is the most suitable design to answer the research questions. A cross-sectional study is a type of study that analyses data from the population at a particular point in time (Maier et al., 2023) A descriptive survey attempts to observe and describe the behaviour of a subject without in any way influencing it. A descriptive design aims to identify problems, gain more information about the characteristics within a particular field of study and provide the researchers with the depiction of a specific situation as it naturally happened (Cvetkovic-Vega et al., 2021). This design is chosen because it allows for the collection of data at a single point in time to assess the level of knowledge, attitude and practice of food hygiene among food vendors in the University of Benin, Ugbowo campus, Benin city, Edo state.

3.2 Research Setting

A research setting refers to the specific environment or location where the study takes place, including its physical, social, and organizational characteristics. It plays a crucial role in shaping the feasibility, reliability, and contextual relevance of the research outcomes (Brown, 2022). This study was carried out among food vendors in the University of Benin, Ugbowo campus, Benin city, Edo state.

This research for this study was carried out at University of Benin (UNIBEN), which is delimited to only food vendors within the university of Benin. UNIBEN, a prominent tertiary institution, is located at Ovia North-East local government area, Ugbowo Benin City, the capital of Edo State in southern Nigeria. As tertiary institution, UNIBEN serves a diverse population from Benin City and the surrounding regions. The University of Benin was founded in 1970. It started as an Institute of Technology and was accorded the status of a full-fledged University by National Universities Commission (NUC) on 1st July, 1971. In his Budget Speech in April 1972, the then Military Governor of Mid-Western State, Col. S. O. Ogbemudia (then also Visitor to the University) formally announced the change of the name of the Institute of Technology to the University of Benin. On 1st April, 1975 the University at the request of the State Government, was taken over by the Federal Government and became a Federal University. Today, the University has continued to grow from strength to strength with a number of Faculties, Departments, Institutes and Units. UNIBEN has a teaching hospital called University of Benin Teaching Hospital (UBTH). Following NUC's directives, the University experimented with the Collegiate System in 1991/92 and 1992/93.

3.3 Target Population

The target populations for this study consists of food vendors in the University of Benin, Ugbowo campus, Benin city, Edo state. Food vendors from different location within ugbowo campus were recruited for this study. Food vendors form food court, Helena foods, Home and away, Faculty resturants, Hostel resturants, Main gate axis will be recruited for this study.

Location (within Ugbowo campus)	Number of shops (out-let)
Food court	22
Helena foods	3
Home and away	3
Faculty restaurants	40
Hostel restaurant	31
Main gate axis	50

3.4 Sample Size

The sample size is the number of participants or units involved in a study, and it impacts the correctness and dependability of the research findings. A suitable sample size ensures meaningful results that can be generalized to the target population (Sivasamy, 2023).

To calculate the sample size required Cochran formula was used

$$= \frac{Z^2 \times p \times (1 - p)}{e^2}$$

where

no=required sample size

Z=z-value (for 95%confidence level Z≈1.96)

P=estimated proportion of the population

e=margin of error

$$= \frac{Z^2 \times p \times (1 - p)}{e^2}$$

Z=1.96

P=0.5

e=0.00620(6.20%)

substituting the value

$$= \frac{(1.96)^2 \times 0.5 \times (1 - 0.5)}{(0.00620)^2}$$

$Z^2 = (1.96)^2$

$1 - p = 0.5$

$e^2 = (0.00620)^2 = 0.003844$

$$= \frac{3.8416 \times 0.5 \times 0.5}{0.003844}$$

$$= \frac{3.8416 \times 0.25}{0.003844}$$

$$= \frac{0.9604}{0.003844}$$

≈ 250

Therefore, the sample size was 250 food vendors in Ugbowo campus, Uniben.

3.5 Sampling Technique

The researcher used a convenience sampling technique in selecting the respondents into the study among food vendors in the University of Benin, Ugbowo campus, Benin city, Edo state. Convenience sampling is a non-probability sampling method that selects participants based on their ease of access and proximity to the researcher rather than at random. It is frequently utilized when the population is easily accessible and the purpose is to collect data quickly and effectively (Obilor & Isaac, 2023).

3.6 Instrument for Data Collection

A self-structured questionnaire was the instrument for data collection for this study (Appendix I). The items were constructed in a close-ended form where the respondents had to tick appropriately the option that suits their best knowledge. The questionnaires were divided into section A, B, C, D and E to address the research objectives under investigation. A five point likert scale and closed ended question format will be used in constructing the instrument that was used for this study.

Section A: Contained nine questions on the demographic information of the respondents

Section B: Contain seven questions on the level of knowledge of food hygiene among food vendors.

Section C: Contain six questions on the attitude towards food hygiene among food vendors.

Section D: Contain six questions on on the practice of food hygeine among food vendors.

Section E: Contain six questions on the factors influencing the practice of food hygiene among food vendors.

3.7 Validity of instrument

The validity used in the study refers to the extent to which a test appears to measures what it is intended to measure and how accurately an assessment or measurement tool taps into the various aspects of the specific construct in question (Lim, 2024). Face and content validity was used to validate the research instruments.

Face validity

Face validity is whereby the measuring instrument appears to be valid as though it is measuring what it is intended to measure (Bonnet, 2023). To address validity, the questionnaire was submitted to the supervisor for expert review. The purpose of submitting the questionnaire to the supervisor was to ensure that the data collection tools will be relevant and adequately answer the research questions.

Content validity

Content validity is the study's ability to measure and collect data about the phenomenon under study (Saw et al., 2025). The data collection tool was submitted to experts in public health nursing and a statistician for expert review.

3.8 Reliability of Instruments

Reliability refers to the extent to which a research instrument consistently produces accurate and stable results under similar conditions. It ensures that the measurement tool yields dependable outcomes when repeated over time or across different samples (Kumar, 2024).. A pilot study was conducted using 10% of the target population, 25

food vendors out of the total population of 250. These participants were selected from the University of Benin Teaching Hospital (UBTH) (Mat-ice resturant, food court in GPC) to test the reliability of the instrument, lapses in the tools were amended and corrections were made making the instrument reliable. The reliability of the instrument was confirmed using Cronbach's Alpha value of more than 0.71. Cronbach's Alpha is a coefficient of internal consistency. It is commonly used as an estimate of the reliability of a psychometric test for a sample of examinees. A Cronbach's value greater than 0.71 will e considered reliable . The results wias attached in appendix III

3.9 Method of Data Collection

The researcher administered a well-structured questionnaire containing items related to the knowledge, attitude, and practice of food hygiene to selected food vendors at the University of Benin, Ugbowo Campus, Benin City. The data collection was conducted over a period of two weeks, tentatively scheduled for April 2025, depending on the availability and convenience of respondents.

During this period, respondents were approached in person at their vending locations, and the purpose of the study was clearly explained. The questionnaires were completed on the spot under the supervision of the researcher to ensure proper understanding and accurate responses. Guidance was provided as needed, and completed questionnaires was collected immediately after completion to prevent loss or data distortion.

3.10 Method of Data Analysis

Data collected through the questionnaire was coded and analyzed using the Statistical Package for Social Sciences (SPSS) version 27.0 for Windows. Descriptive statistics such as frequency, percentage, mean, and standard deviation was used to summarize the data. Section A, which covers demographic information, was analyzed using frequencies and percentages. Sections B, C, and D, which assess knowledge, attitude, and practice of food hygiene respectively, was analyzed using mean and standard deviation. A cut-off mean score of 3.00 on a 4-point Likert scale was used to interpret responses: scores of 3.00 and above was considered as good knowledge, positive attitude, or good practice, while scores below 3.00 was interpreted as poor knowledge, negative attitude, or poor practice. To test the research hypotheses, Chi-square (χ^2) statistical analysis was used to determine the association between demographic variables and levels of knowledge, attitude, and practice. The level of significance for all statistical tests was set at $p < 0.05$.

3.11 Ethical Consideration

The researcher adhered to all ethical standards in the conduct of this study. Permission to carry out the research was obtained from the Head of Department, Nursing Science, University of Benin, and the Student Affairs Division to access food vendors on campus. A copy of the ethical approval letter is attached as Appendix II.

The major ethical principles that was upheld during this study are:

1. **Autonomy:** The individuals were not forced into participating in the research project. The respondents were allowed to make decisions for themselves without duress.

2. **Maintenance of confidentiality:** Throughout this study, the researcher was disclose personal details of the participants like name, phone number and address. Confidentiality will be ensured by not divulging the information to others and giving access or control to just the supervisor and the statistician.

3. **Informed consent:** The researcher ensured that the participants had full knowledge of the study, purpose and procedures to be followed, the possible risks and benefits. The researcher also ensured that the participants gave their full consent before they take part in the study.

4. **Avoidance of plagiarism:** Studies that were used were properly referenced.

5. **Right to fair treatment:** All participants were treated fairly without discrimination.

CHAPTER FOUR

RESULTS

This chapter deals with the representation of data collected regarding knowledge, attitude and practice of food hygiene among food vendors in a tertiary academic institution in Edo State. A total of 250 questionnaires were distributed to food vendors in a tertiary academic institution in Edo State during the period of this study. 243 were properly filled and valid for data analysis, giving a response rate of 97.2%.

Table 4.1: Socio-Demographic Characteristics of Respondents

Variable	Frequency (n=243)	Percent (%)
Age		
Below 20 years	21	8.6
21–30 years	58	23.9
31–40 years	72	29.6
41–50 years	54	22.2
Above 50 years	38	15.6
Sex		
Male	110	45.3
Female	133	54.7
Marital Status		
Single	68	28.0
Married	158	65.0
Divorced	7	2.9
Widowed	5	2.1
Educational Level		
No formal education	19	7.8
Primary education	47	19.3
Secondary education	81	33.3
Tertiary education	35	14.4
Vocational/Apprenticeship	61	25.1
Religion		
Christianity	187	77.0
Islam	23	9.5
Traditional	13	5.3
Others	20	8.2
Type of Food Vended		
Cooked food	96	39.5
Snacks / Pastries	51	21.0
Beverages / Drinks	38	15.6
Fruits / Salads	31	12.8
Others	27	11.1

Table 4.1 Cont'd

Variable	Frequency (n=243)	Percent (%)
Years of Vending Experience		
Less than 1 year	17	7.0
1 – 3 years	54	22.2
4 – 6 years	76	31.3
7 – 10 years	59	24.3
Above 10 years	37	15.2
Location of Vending within Campus		
Food Court	67	27.6
Helena Foods	10	4.1
Home and away	13	5.3
Faculty Restaurant	39	16.0
Hostel Restaurant	54	22.2
Main Gate Axis	60	24.7

Table 4.1 shows the socio-demographic characteristics of the 243 respondents. The majority (29.6%) were between 31 and 40 years, followed by 23.9% aged 21–30 years, while the least (8.6%) were below 20 years, indicating that most food vendors were adults in their productive age. In terms of sex, females (54.7%) slightly outnumbered males (45.3%), suggesting a higher female involvement in food vending activities. Regarding marital status, a significant proportion (65.0%) were married, while 28.0% were single, and a small percentage were divorced (2.9%) or widowed (2.1%), reflecting a predominance of married individuals in the trade. Educationally, most respondents had secondary education (33.3%), followed by those with vocational/apprenticeship training (25.1%) and primary education (19.3%), whereas only 7.8% had no formal education, showing a moderately educated population among vendors. In terms of religion, the majority (77.0%) were Christians, 9.5% were Muslims, and 5.3% practiced traditional religion, while 8.2% belonged to other faiths. Concerning the type of food vended, cooked food (39.5%) was the most common, followed by snacks/pastries (21.0%), beverages/drinks (15.6%), and fruits/salads (12.8%), indicating a dominance of prepared meals. The respondents' years of vending experience revealed that most had been in the business for 4–6 years (31.3%),

followed by those with 7–10 years (24.3%), and 1–3 years (22.2%), while only 7.0% had less than a year's experience, showing that the trade attracts long-term engagement. Finally, the location distribution within the campus showed that Food Court (27.6%), Main Gate Axis (24.7%), and Hostel Restaurants (22.2%) were the most common vending sites, while Helena Foods (4.1%) and Home and Away (5.3%) had fewer vendors, suggesting a concentration of vending activities in high-traffic areas.

Answering Research Questions

Research Question 1: What is the level of knowledge of food hygiene among food vendors in a tertiary academic institution in Edo state?

Table 4.2: Level of Knowledge of Food Hygiene among Food Vendors

Variables	Frequency	Correct (n, %)	Wrong (n, %)	Mean	Remark
What is the main purpose of food hygiene?		122 (50.2)	121 (49.8)	1.5	Good
To make food look attractive	69 (28.4)				
To prevent contamination and foodborne diseases	122 (50.2)				
To reduce the cost of food preparation	52 (21.4)				
Which of the following is a proper handwashing practice?		146 (60.1)	97 (39.9)	1.6	Good
Washing hands with soap and clean water before handling food	146 (60.1)				
Wiping hands on an apron before handling food	56 (23.0)				
Rinsing hands quickly under water only	41 (16.9)				
Cross-contamination occurs when:		122 (50.2)	121 (49.8)	1.5	Good
Raw and cooked foods come into contact directly or through utensils	122 (50.2)				
Food is stored in a refrigerator	69 (28.4)				
Different types of food are cooked together	52 (21.4)				
Which of the following microorganisms commonly causes food poisoning?		85 (35.0)	158 (65.0)	1.3	Low
Salmonella	85 (35.0)				
Plasmodium	70 (28.8)				
Trypanosoma	88 (36.2)				
Which of these practices helps to prevent food contamination?		122 (50.2)	121 (49.8)	1.5	Good
Leaving food uncovered	68 (28.0)				
Using the same knife for raw meat and vegetables	53 (21.8)				
Storing cooked and raw foods separately	122 (50.2)				
When should a food vendor wash their hands?		146 (60.1)	97 (39.9)	1.6	Good
Before and after handling food or after using the toilet	146 (60.1)				
Only at the end of the day	55 (22.6)				
Only when hands are visibly dirty	42 (17.3)				

Table 4.2 Cont'd

Variables	Frequency	Correct (n, %)	Wrong (n, %)	Mean	Remark
Why is it important to cook food thoroughly?		122 (50.2)	121 (49.8)	1.5	Good
To kill harmful microorganisms	122 (50.2)				
To make the food more colourful	70 (28.8)				
To improve the smell of the food only	51 (21.0)				
Which of the following best describes a hygienic food handler?		145 (59.7)	98 (40.3)	1.6	Good
A person who keeps personal and environmental cleanliness while handling food	145 (59.7)				
A person who cooks food very fast	58 (23.9)				
A person who prepares large quantities of food	40 (16.4)				
What should a food vendor do if they have a wound on their hand?		122 (50.2)	121 (49.8)	1.5	Good
Continue handling food with bare hands	68 (28.0)				
Cover it properly with a waterproof bandage or glove	122 (50.2)				
Ignore it as long as it is small	53 (21.8)				
Why is it important to use clean utensils during food preparation?		146 (60.1)	97 (39.9)	1.6	Good
To avoid transferring germs to food	146 (60.1)				
To make food taste better	54 (22.2)				
To reduce cooking time	43 (17.7)				
			Grand Mean	**1.5**	**Good**

Mean Cut-off = 1.5

Table 4.2 shows the level of knowledge of food hygiene among food vendors in the University of Benin, Ugbowo Campus. The highest mean score of 1.6 was recorded for proper handwashing practice, when food vendors should wash their hands, the definition of a hygienic food handler, and the importance of using clean utensils, all rated as good. This was followed by a mean score of 1.5 for the purpose of food hygiene, understanding of cross-contamination, practices that prevent food contamination, the importance of cooking food thoroughly, and the proper handling of wounds during food preparation, also rated as good. The lowest mean score of 1.3

was observed for knowledge of microorganisms that commonly cause food poisoning, which was rated as low. The overall grand mean was 1.5, indicating a generally good level of knowledge of food hygiene among the respondents.

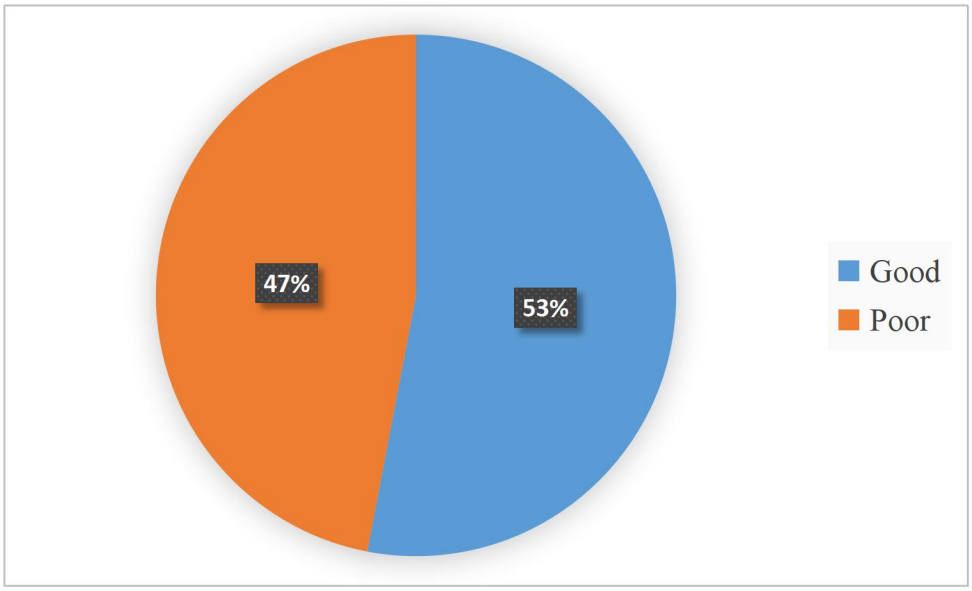

Fig 4.1: Pie-chart showing the level of knowledge of food hygiene among food vendors in a tertiary academic institution in Edo state.

Figure 4.1 shows the level of knowledge of food hygiene among food vendors in a tertiary academic institution in Edo State. The result indicates that 53% (128) of the vendors had good knowledge of food hygiene, while 47% (115) had poor knowledge, showing that slightly more than half of the vendors were knowledgeable about food hygiene.

Research Question 2: What are the attitudes towards food hygiene among food vendors in a tertiary academic institution in Edo state?

Table 4.3: **Attitude of Food Vendors Toward Food Hygiene**

Items	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Remark
Maintaining food hygiene is essential to prevent foodborne diseases.	88 (36.2)	92 (37.9)	38 (15.6)	25 (10.3)	3.0	Positive
It is unnecessary to wash hands every time before handling food.	34 (14.0)	60 (24.7)	83 (34.2)	66 (27.2)	2.7	Positive
Keeping the food preparation area clean shows respect for customers.	70 (28.8)	95 (39.1)	48 (19.8)	30 (12.3)	2.8	Positive
Using gloves and aprons while preparing food is a waste of time.	70 (28.8)	78 (32.1)	55 (22.6)	40 (16.5)	2.3	Negative
Food hygiene training helps vendors to improve their business.	73 (30.0)	84 (34.6)	50 (20.6)	36 (14.8)	2.8	Positive
It is acceptable to handle money and food at the same time.	45 (18.5)	60 (24.7)	78 (32.1)	60 (24.7)	2.6	Positive
I believe food hygiene is everyone's responsibility, not just the government's.	91 (37.4)	86 (35.4)	40 (16.5)	26 (10.7)	3.0	Positive
Customers do not care about how clean the food vendor looks.	38 (15.6)	57 (23.5)	90 (37.0)	58 (23.9)	2.7	Positive
Proper waste disposal around food stalls helps to attract more customers.	89 (36.6)	84 (34.6)	44 (18.1)	26 (10.7)	3.0	Positive
Attending periodic food hygiene workshops is not important for vendors.	41 (16.9)	52 (21.4)	84 (34.6)	66 (27.2)	2.7	Positive
				Grand Mean	2.8	**Positive**

Mean Cut-Off= 2.5

Table 4.3 shows the attitude of food vendors toward food hygiene in the University of Benin, Ugbowo Campus. The highest mean score of 3.0 was recorded for maintaining food hygiene as essential to prevent foodborne diseases, believing that food hygiene is everyone's responsibility, and proper waste disposal around food stalls helps attract more customers, all with positive remarks. This was followed by a mean score of 2.8 for keeping the food preparation area clean as a sign of respect for customers and for recognizing that food hygiene training helps vendors improve their business, also rated as positive. Mean scores of 2.7 were observed for attitudes toward handwashing before handling food, customer concern about vendor cleanliness, and attendance at periodic hygiene workshops, each reflecting a positive attitude. A mean score of 2.6 was recorded for handling money and food simultaneously, while the lowest mean score of 2.3 was for using gloves and aprons being considered a waste of time, which was rated as negative. The overall grand mean was 2.8, indicating a generally positive attitude toward food hygiene among the respondents.

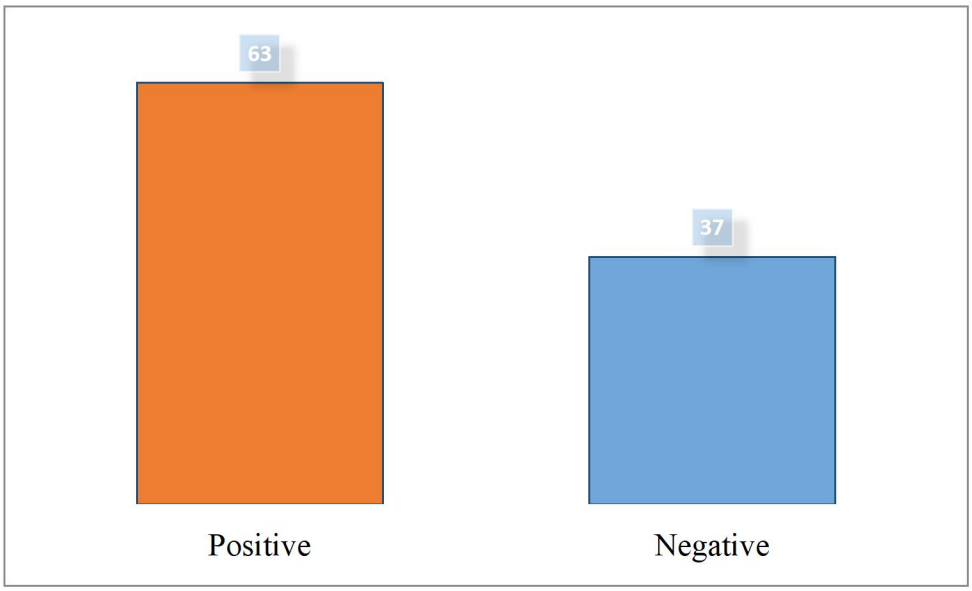

Figure 4.2: Bar chart showing the attitudes towards food hygiene among food vendors in a tertiary academic institution in Edo state.

Figure 4.2 shows the attitudes toward food hygiene among food vendors in a tertiary academic institution in Edo State. The result reveals that 63% (153) of the vendors had a positive attitude toward food hygiene, while 37% (90) exhibited a negative attitude, indicating that most vendors maintained a favourable outlook toward food hygiene.

Research question 3: What are the practices of food hygiene among food vendors in a tertiary academic institution in Edo state?

Table 4.4: Practice of Food Hygiene among Food Vendors

Items	Always	Sometimes	Rarely	Never	Mean	Remark
How often do you wash your hands with soap and clean water before handling food?	40 (16.5)	58 (23.9)	102 (42.0)	43 (17.7)	2.4	Poor
How often do you use clean utensils and equipment during food preparation?	42 (17.3)	60 (24.7)	100 (41.2)	41 (16.9)	2.4	Poor
How often do you cover food properly to prevent contamination from flies and dust?	38 (15.6)	62 (25.5)	101 (41.6)	42 (17.3)	2.4	Poor
How often do you wear protective clothing such as aprons, gloves, and head covers while preparing food?	36 (14.8)	59 (24.3)	103 (42.4)	45 (18.5)	2.4	Poor
How often do you separate raw foods from cooked foods during preparation and storage?	40 (16.5)	61 (25.1)	102 (42.0)	40 (16.5)	2.4	Poor
How often do you dispose of waste properly and keep your vending environment clean?	39 (16.0)	62 (25.5)	101 (41.6)	41 (16.9)	2.4	Poor
How often do you wash fruits and vegetables thoroughly before use?	37 (15.2)	63 (25.9)	102 (42.0)	41 (16.9)	2.4	Poor
How often do you store leftover food safely or reheat it properly before serving?	38 (15.6)	61 (25.1)	103 (42.4)	41 (16.9)	2.4	Poor
How often do you avoid handling food when you have open wounds or illnesses?	35 (14.4)	64 (26.3)	103 (42.4)	41 (16.9)	2.4	Poor
How often do you clean and disinfect your food preparation surfaces?	39 (16.0)	60 (24.7)	102 (42.0)	42 (17.3)	2.4	Poor
				Grand Mean	2.4	**Poor**

Mean Cut-off = 2.5

Table 4.4 shows the practice of food hygiene among food vendors in the University of Benin, Ugbowo Campus. All the items recorded the same mean score of 2.4, which is below the mean cut-off of 2.5 and rated as poor. These include washing hands with soap and clean water before handling food, using clean utensils and equipment during

food preparation, covering food properly to prevent contamination, wearing protective clothing such as aprons, gloves, and head covers, separating raw foods from cooked foods, disposing of waste properly, washing fruits and vegetables thoroughly before use, storing leftover food safely or reheating it properly before serving, avoiding handling food when having open wounds or illnesses, and cleaning and disinfecting food preparation surfaces. The overall grand mean was 2.4, indicating a generally poor level of food hygiene practice among the respondents.

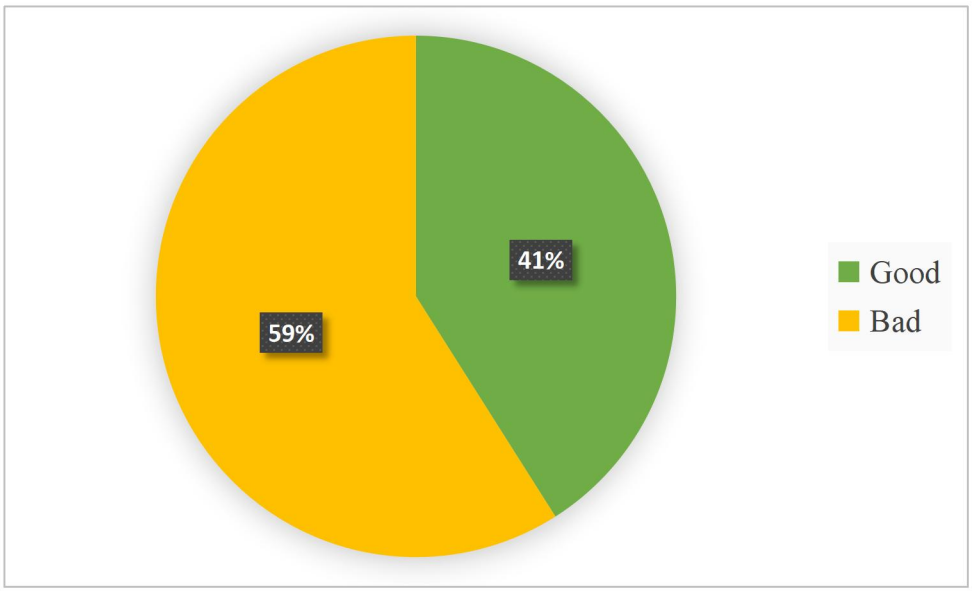

Fig 4.3: Pie chart showing the practices of food hygiene among food vendors in a tertiary academic institution in Edo state.

Figure 4.3 shows the practices of food hygiene among food vendors in a tertiary academic institution in Edo State. The result indicates that 41% (99) of the vendors demonstrated good food hygiene practices, while a higher proportion, 59% (144), exhibited poor practices. This reveals that the majority of the food vendors practiced inadequate food hygiene.

Research Question 4: What are the factors influencing practice of food hygiene among food vendors in a tertiary health institution in Edo state?

Table 4.5: Factors Influencing the Practice of Food Hygiene among Food Vendors

Items	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Remark
Adequate knowledge of food hygiene helps me maintain good hygiene practices.	86 (35.4)	98 (40.3)	36 (14.8)	23 (9.5)	3.0	Factor
Lack of access to clean water makes it difficult to maintain food hygiene.	82 (33.7)	92 (37.9)	40 (16.5)	29 (11.9)	2.9	Factor
My level of education influences how I practice food hygiene.	89 (36.6)	88 (36.2)	40 (16.5)	26 (10.7)	3.0	Factor
The availability of waste disposal facilities affects my hygiene practices.	84 (34.6)	94 (38.7)	38 (15.6)	27 (11.1)	3.0	Factor
Financial constraints prevent me from maintaining proper hygiene.	80 (32.9)	90 (37.0)	45 (18.5)	28 (11.5)	2.9	Factor
Regular inspection by health officers encourages me to follow hygiene standards.	92 (37.9)	85 (35.0)	39 (16.0)	27 (11.1)	3.0	Factor
Training on food hygiene improves my hygiene behaviour.	88 (36.2)	93 (38.3)	38 (15.6)	24 (9.9)	3.0	Factor
The attitude of customers toward cleanliness influences how I handle food.	90 (37.0)	86 (35.4)	41 (16.9)	26 (10.7)	3.0	Factor
Poor infrastructure (e.g., no water supply, poor drainage) affects my ability to practice food hygiene.	83 (34.2)	91 (37.4)	42 (17.3)	27 (11.1)	2.9	Factor
Support from the university or government helps me improve food hygiene practices.	87 (35.8)	90 (37.0)	40 (16.5)	26 (10.7)	3.0	Factor
				Grand Mean	**3.0**	**Factor**

Mean Cut-off = 2.5

Table 4.5 shows the factors influencing the practice of food hygiene among food vendors in the University of Benin, Ugbowo Campus. The highest mean score of 3.0 was recorded for adequate knowledge of food hygiene, level of education, availability of waste disposal facilities, regular inspection by health officers, training on food

hygiene, attitude of customers toward cleanliness, and support from the university or government, all identified as key factors influencing hygiene practices. Mean scores of 2.9 were observed for lack of access to clean water, financial constraints, and poor infrastructure, which were also recognized as significant factors. The overall grand mean was 3.0, indicating that these factors collectively have a strong influence on the practice of food hygiene among the respondents.

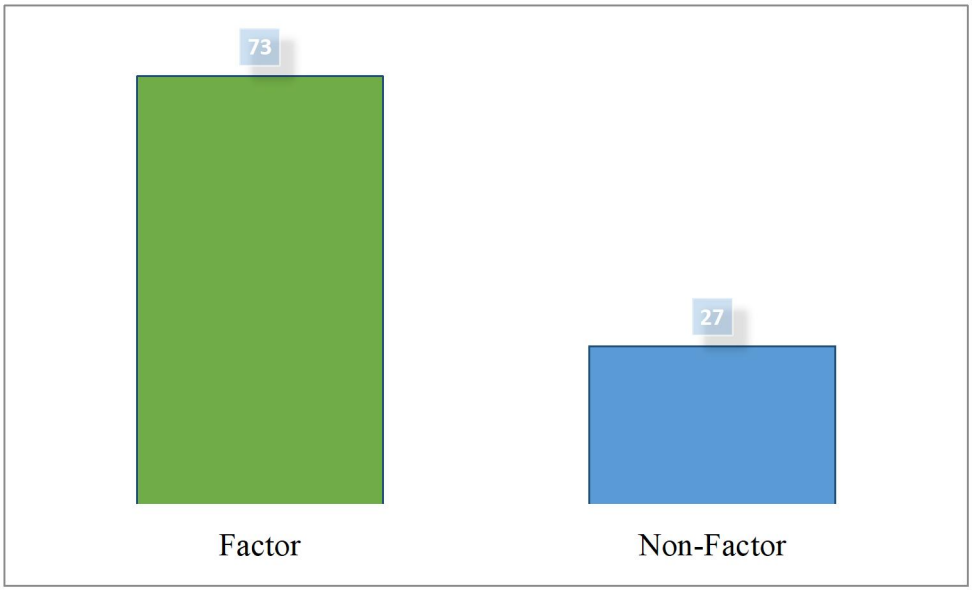

Fig 4.4: Bar chart showing the factors influencing practice of food hygiene among food vendors in a tertiary health institution in Edo state.

Figure 4.4 shows the factors influencing the practice of food hygiene among food vendors in a tertiary health institution in Edo State. The result indicates that 73% (177) of the respondents identified various elements as factors influencing their hygiene practices, while 27% (66) did not consider them as such. This suggests that the majority of vendors acknowledged the presence of factors that affect their food hygiene practices.

Hypothesis Testing.

: There is no significant relationship between the level of knowledge of food hygiene and the food hygiene practices of food vendors in a tertiary academic institution in Edo State.

Table 4.6: Relationship between the level of knowledge of food hygiene and the food hygiene practices of food vendors in a tertiary academic institution in Edo State.

Knowledge		**Practices**		**Test Statistics (χ^2)**	**df**	**P value**	**Decision**
		Good	**Bad**				
Good	128 (53%)	99 (41%)	144 (59%)	9.786	1	0.092	Accepted
Poor	115 (47%)						

Table 4.6 shows the relationship between the level of knowledge of food hygiene and the food hygiene practices of food vendors in a tertiary academic institution in Edo State. The result indicates that vendors with good knowledge of food hygiene (53%) did not significantly differ in their hygiene practices compared to those with poor knowledge (47%). The chi-square test value of $\chi^2 = 9.786$, with 1 degree of freedom and a p-value of 0.092, is greater than the 0.05 level of significance. Therefore, the null hypothesis was accepted, indicating that there is no significant relationship between the level of knowledge of food hygiene and the food hygiene practices of the food vendors.

2. **:** There is no significant relationship between the attitudes towards food hygiene and the food hygiene practices of food vendors in a tertiary academic institution in Edo State.

Table 4.7: Relationship between the attitudes towards food hygiene and the food hygiene practices of food vendors in a tertiary academic institution in Edo State.

Attitude		**Practices**		**Test Statistics (χ^2)**	**df**	**P value**	**Decision**
		Good	**Bad**				
Positive	153 (63%)	99 (41%)	144 (59%)	6.876	1	0.089	Accepted
Negative	90 (37%)						

Table 4.7 shows the relationship between attitudes toward food hygiene and the food hygiene practices of food vendors in a tertiary academic institution in Edo State. The result reveals that vendors with positive attitudes (63%) did not differ significantly in their hygiene practices compared to those with negative attitudes (37%). The chi-square test value of $\chi^2 = 6.876$, with 1 degree of freedom and a p-value of 0.089, which is greater than 0.05, indicates no significant association. Therefore, the null hypothesis was accepted, confirming that there is no significant relationship between attitudes toward food hygiene and the food hygiene practices of the food vendors.

CHAPTER FIVE

DISCUSSION OF FINDINGS

This chapter discusses the major findings of the research compared with the literature reviewed, the implication for nursing, summary, conclusion, Recommendations and Suggestions for further Studies.

5.1. Discussion of major Findings

The study assessed the knowledge, attitude and practice of food hygiene among food vendors in a tertiary academic institution in Edo State. The socio-demographic profile of the 243 food vendors revealed a diverse population operating within the tertiary health institution. The majority (29.6%) were aged 31–40 years, followed by 21–30 years (23.9%) and 41–50 years (22.2%), indicating a predominantly middle-aged and economically active workforce (75.7% aged 21–50). Only 8.6% were below 20 years, while 15.6% were above 50. This age distribution aligns with Elsahoryi et al. (2024), who reported that age significantly influenced food safety attitudes, with older vendors showing poorer hygiene attitudes. However, the current study's concentration of vendors in the active age range may favor receptiveness to hygiene training. Conversely, Babor et al. (2024) found that older, more experienced vendors in Digos City practiced better hygiene, suggesting that age–practice relationships may vary contextually. Gender distribution showed a slight female predominance (54.7%), consistent with trends observed by Girma et al. (2024) in Ethiopia, where female vendors were more likely to exhibit good hygiene practices (AOR = 0.191). The near balance of male and female vendors here may support equitable participation and potentially favorable hygiene outcomes, contrasting with contexts where food vending remains male-dominated. Most respondents were married (65.0%), followed by single

(28.0%), divorced (2.9%), and widowed (2.1%). The predominance of married vendors suggests food vending serves as a stable livelihood supporting family responsibilities. Although Elsahoryi et al. (2024) identified marital status as influencing food safety attitudes, its direct impact on hygiene knowledge remains unclear. Nevertheless, marital stability may correspond with longer experience and more consistent hygiene routines. Educational attainment varied, with secondary education being most common (33.3%), followed by vocational training (25.1%), primary education (19.3%), tertiary education (14.4%), and no formal education (7.8%). Education consistently emerges as a key determinant of food hygiene knowledge and practice (Kundu et al., 2021; Nortey et al., 2024; Alhazmi et al., 2021). The relatively high proportion of vendors with secondary or vocational education is a strength for potential training uptake. However, nearly 27% with only primary or no formal education highlight the need for training materials tailored to varying literacy levels (Klutse & Sampson, 2025). Religiously, most vendors were Christians (77.0%), followed by Muslims (9.5%), traditionalists (5.3%), and others (8.2%). Although religion has been less examined in food hygiene literature, it may shape attitudes toward cleanliness and sanitation practices. The dominance of Christianity likely mirrors regional religious demographics. Cooked food dominated vending activities (39.5%), followed by snacks and pastries (21.0%), beverages (15.6%), fruits and salads (12.8%), and others (11.1%). Given that cooked foods carry higher contamination risks during preparation and storage, this finding underscores the need for rigorous hygiene protocols (Kundu et al., 2021). The diversity of food types necessitates tailored hygiene interventions specific to each category's risk profile. Regarding experience, 31.3% had vended for 4–6 years, 24.3% for 7–10 years, 22.2% for 1–3 years, 15.2% for over 10 years, and 7.0% for less than a year. Over 70% had

four or more years of experience, suggesting a seasoned workforce. Studies by Girma et al. (2024) and Babor et al. (2024) both associate greater experience with improved hygiene practices, while Elsahoryi et al. (2024) linked it to attitude formation, indicating experience influences multiple dimensions of food safety behaviour. Vending locations were fairly distributed: Food Court (27.6%), Main Gate Axis (24.7%), Hostel Restaurant (22.2%), Faculty Restaurant (16.0%), Helena Foods (4.1%), and Home and Away (5.3%). Location can influence hygiene due to differences in infrastructure access, as shown by Klutse and Sampson (2025) and Rosales et al. (2022). Vendors at central sites may benefit from better water and waste disposal facilities, while peripheral vendors could face infrastructural constraints affecting hygiene regardless of knowledge.

Knowledge of food hygiene among food vendors

The study revealed that 53% demonstrated good knowledge of food hygiene, while 47% had poor knowledge. The 53% prevalence of good knowledge is lower than findings from several Nigerian studies. Osuchukwu and Udom (2022) reported 85.1% good knowledge among University of Calabar vendors, and Erah et al. (2024) found 67% in a rural tertiary health facility. Similarly, Oseyemi (2023) documented high knowledge levels in Akure South. The lower result here may reflect fewer training opportunities, weaker institutional oversight, or methodological differences. Given the study's setting in a health institution, higher knowledge levels might have been expected; the results therefore suggest that proximity to health facilities does not guarantee awareness of food hygiene principles. Internationally, this finding aligns more closely with those from comparable resource-limited contexts. Thapa et al. (2024) in Nepal found 63.8% adequate knowledge, while Nkosi and Tabit (2021) in South Africa reported 76% poor knowledge indicating that knowledge levels in

developing settings often range between 50–65%. The grand mean score of 1.5 barely above the "good knowledge" threshold shows that vendor understanding is marginal. Strengths were noted in personal hygiene areas: 60.1% correctly identified handwashing procedures and timing, and 59.7% recognized the importance of maintaining personal and environmental cleanliness. However, critical gaps persisted. Only about half (50.2%) correctly understood the purpose of food hygiene, prevention of cross-contamination, proper storage, thorough cooking, and wound management. Most strikingly, only 35% correctly identified *Salmonella* as a foodborne pathogen, while others incorrectly named *Plasmodium* or *Trypanosoma*. This mirrors Cataluna and Rukmini's (2024) finding that vendors often lack microbiological understanding even when they know basic hygiene routines. These results support Babor et al. (2024), who noted that general awareness is often superficial. The strong performance on basic hygiene items contrasts sharply with weak comprehension of microbial risks, implying that many vendors have acquired procedural but not conceptual knowledge. Without understanding *why* hygiene matters, their ability to adapt safe practices in new situations remains limited. That nearly half of vendors demonstrated poor knowledge is concerning in a tertiary health setting where higher standards are expected. Arthur et al. (2021) in Ghana observed similar discrepancies between knowledge and practice, emphasizing the need for continuous reinforcement. Likewise, Rosales et al. (2022) found that vendors' self-reported compliance often overestimated their actual knowledge. The borderline mean score suggests that vendors are at a tipping point meeting minimum adequacy but vulnerable to regression without structured education. Studies have consistently shown that knowledge alone is insufficient for good practice. Thapa et al. (2024) found that despite 63.8% adequate knowledge, 80.9% of vendors practiced poor hygiene.

Similarly, Cataluna and Rukmini (2024) concluded that acceptable knowledge does not necessarily translate into consistent hygienic behavior. The deficiency in microbiological understanding is particularly critical. Without grasping the microbial basis of foodborne illness, vendors may not appreciate the importance of temperature control or cross-contamination prevention. Singh and Singh (2024) in India similarly found that vendors often knew *what* to do but not *why*, resulting in inconsistent hygiene application. Compared with developed contexts, the current findings reveal a marked knowledge gap. Alhazmi et al. (2021) in Saudi Arabia reported that most food truck vendors had strong food safety knowledge, largely due to higher education and stricter regulation. The present study's educational profile 33.3% with secondary education, 19.3% primary, and 7.8% with none helps explain the weaker outcomes observed. These findings underscore the need for targeted, conceptually grounded training. As Leslie et al. (2021) noted, food hygiene education must extend beyond procedural instruction to build scientific understanding. The 47% with poor knowledge represent a clear priority group for intervention, echoing Nkosi and Tabit's (2021) call for enhanced training among low-education vendors.

Attitude towards food hygiene among food vendors

The findings shows that 63% (153) exhibited positive attitudes toward food hygiene, while 37% (90) displayed negative attitudes. With a grand mean of 2.8 above the 2.5 cut-off the overall attitudinal disposition can be described as favourable. The 63% prevalence aligns closely with Desye et al.'s (2023) meta-analysis, which reported 66% positive attitudes among street food vendors in low- and middle-income countries. This consistent two-thirds majority suggests a common pattern in resource-limited settings. The result also compares favourably to Nortey et al. (2024) in Ghana, where 51% of vendors held negative attitudes, and Elsahoryi et al. (2024) in Jordan,

who reported predominantly negative attitudes influenced by age, education, and experience. The comparatively better outcome here may reflect the institutional environment, where vendors face greater health awareness and social pressure to maintain hygiene. However, the level remains lower than that reported by Werkneh et al. (2020) in Ethiopia, where 81.1% of vendors displayed positive attitudes perhaps due to stronger awareness campaigns or differing measurement tools. This suggests that improved interventions could yield even higher positive attitude rates in similar institutional contexts. Analysis of individual items revealed strong positive attitudes toward key principles. The highest mean scores (3.0) were recorded for statements emphasizing the importance of hygiene in preventing foodborne disease (74.1% agreement), shared responsibility for hygiene (72.8%), and the business value of cleanliness (71.2%). These findings indicate that vendors appreciate both the health and economic benefits of hygiene consistent with Singh and Singh (2024), who noted that commercial incentives often motivate hygiene compliance. Such recognition offers a strategic entry point for behaviour change programs that link hygiene with customer satisfaction and business success. Moderately positive attitudes were also noted toward visible cleanliness, participation in hygiene workshops, regular handwashing, and avoiding simultaneous handling of money and food (means 2.6–2.8). These reflect openness to training and awareness of hygiene expectations. In contrast, the statement “Using gloves and aprons while preparing food is a waste of time” had a mean of 2.3, with 60.9% agreeing revealing resistance to personal protective equipment (PPE). This is concerning, as gloves and aprons are vital contamination barriers. Similar findings by Klutse and Sampson (2025) in Ghana showed low glove usage despite high apron adoption, suggesting discomfort, cost, or lack of appreciation for PPE’s benefits. Addressing this misconception should be a

priority in future interventions. The coexistence of strong general hygiene attitudes with resistance to specific practices underscores a selective attitude pattern also observed by Singh and Singh (2024): vendors often endorse hygiene in principle but resist practices seen as inconvenient or costly. Targeted behaviour change strategies should therefore address specific attitudinal barriers, particularly regarding PPE use. The finding that positive attitudes (63%) exceed good knowledge (53%) implies that favourable dispositions can develop independently of detailed understanding. Similar observations were made by Werkneh et al. (2020), who found that attitudes often stem from social norms or experience rather than formal education. Conversely, Nortey et al. (2024) found knowledge significantly predicted positive attitudes (aOR = 0.33, p = 0.001), while Lokoja et al. (2024) found no significant correlation. This variability supports a more complex view than the traditional linear knowledge–attitude–practice (KAP) model, suggesting that attitudes may be shaped by environmental factors and perceived benefits as much as by knowledge. Education appears to influence attitudes substantially. Elsahoryi et al. (2024) and Nortey et al. (2024) both reported that higher education correlated with more positive attitudes. Given that 47.7% of vendors in this study had at least secondary education, the generally positive attitude profile may partly reflect this composition, while the 27% with only primary or no formal education may contribute to the persistence of negative attitudes. Whether positive attitudes translate into practice remains uncertain. Studies by Lokoja et al. (2024) and Werkneh et al. (2020) revealed large attitude–practice gaps (26% and 22%, respectively), indicating that favourable attitudes alone do not guarantee hygienic behaviour. This underscores the need for knowledge reinforcement, resource support, and consistent supervision. The institutional environment likely plays a role in shaping attitudes. Proximity to health professionals and exposure to health messaging

may promote hygiene-conscious attitudes. Yet, the persistence of 37% negative attitudes shows that environmental exposure alone is insufficient without deliberate educational interventions.

Practice of food hygiene among food vendors

The study findings reveals that only 41% (99) demonstrated good practices, while 59% (144) exhibited poor ones. With a grand mean of 2.4 below the 2.5 cut-off for good practice the overall hygiene performance was inadequate. The 41% prevalence of good practices is lower than most comparable findings. Girma et al. (2024) in Ethiopia reported 64.8% good practice, Osuchukwu and Udom (2022) found 85.1% among university vendors in Nigeria, and Lokoja et al. (2024) observed 62.5% in Lafia. Even school vendors in Ogun State, Nigeria, showed higher levels (66.7%; Leslie et al., 2021). The weaker outcome in this tertiary health institution where heightened hygiene awareness might be expected raises concerns about the adequacy of supervision and supporting infrastructure. Nevertheless, the result is better than in some low-performing contexts. Thapa et al. (2024) in Nepal found 80.9% poor practice despite 63.8% knowledge, while Khan et al. (2024) in Pakistan reported only 21.2% good hygiene. Kundu et al. (2021) in Bangladesh recorded 43.1%, and Singh and Singh (2024) in India only 17.3%. The current finding, therefore, represents a mid-range performance: better than the worst cases but far from acceptable. Strikingly, all ten practice items scored the same mean (2.4), showing systemic inadequacy rather than weakness in specific areas. For instance, only 16.5% always washed hands with soap before handling food far lower than the 29.1% reported by Klutse and Sampson (2025) in Ghana. Similarly, just 14.8% consistently used protective clothing, confirming the earlier attitudinal finding that 60.9% viewed PPE as “a waste of time.” Consistent food covering was also low (15.6%), with 41.6% rarely covering food

mirroring Rosales et al.'s (2022) concerns about pest and environmental contamination risks. Cross-contamination control was poor: only 16.5% always separated raw and cooked foods despite half recognizing its importance, reflecting a clear knowledge–practice gap. Waste disposal was also substandard, with only 16% always managing waste properly suggesting inadequate institutional systems or access to them. Similarly, only 15.2% consistently washed fruits and vegetables thoroughly, and 15.6% safely stored and reheated leftovers, heightening contamination risks. The lowest compliance was avoiding food handling when ill (14.4%), representing a direct public health threat in a hospital environment. These uniformly poor scores (14–17% consistent compliance) point to deep structural constraints rather than mere negligence. As Cataluna and Rukmini (2024) and Leslie et al. (2021) emphasized, without basic infrastructure potable water, waste disposal, protective gear, and appropriate facilities even knowledgeable vendors cannot sustain good hygiene.

Factors influencing practice of food hygiene among food vendors

Findings reveal that 73% (177) recognized multiple factors influencing their hygiene behaviour, while 27% (66) did not. With a grand mean of 3.0 well above the 2.5 cut-off vendors demonstrated strong awareness that hygiene practices depend on interrelated individual, environmental, and systemic factors rather than personal willpower alone. This awareness is significant given that only 41% practiced good hygiene, suggesting that vendors understand the barriers limiting their compliance and may be receptive to interventions addressing them. All ten factors assessed received mean scores of 2.9–3.0, reflecting broad consensus that food hygiene is a complex, multi-determined behavior. This aligns with ecological models of health behavior emphasizing multi-level influences individual, organizational, and environmental. Six factors achieved the highest mean score (3.0). Knowledge was endorsed by 75.7% as

critical, confirming evidence that knowledge predicts good practice (Girma et al., 2024; Osuchukwu & Udom, 2022). Yet, only 53% of vendors demonstrated good knowledge and 41% good practice, echoing Thapa et al. (2024) that knowledge alone is insufficient without enabling conditions.

Education was equally endorsed (72.8%), consistent with findings that higher educational attainment improves hygiene practice (Kundu et al., 2021; Alhazmi et al., 2021; Leslie et al., 2021). The relatively high proportion of vendors with at least secondary or vocational education (58%) likely supports this recognition. Training on food hygiene was endorsed by 74.5%, aligning with Desye et al.'s (2023) meta-analysis linking prior training to improved attitudes (OR = 4.64, 95% CI: 2.62–6.67). Despite this, only 41% practiced well, implying that training opportunities are limited or of poor quality an issue also noted by Arthur et al. (2021), who emphasized regular follow-up and refresher sessions. Inspection by health officers (72.9% endorsement) was recognized as a key motivator, supporting Cataluna and Rukmini's (2024) and Nkosi and Tabit's (2021) findings that consistent oversight improves compliance. However, persistently poor practices suggest infrequent or ineffective monitoring. Customer attitudes (72.4%) were also influential, highlighting that vendors respond to market expectations. This supports Singh and Singh's (2024) argument that commercial incentives can effectively promote hygiene, particularly when linked to visible cleanliness or reputation. Institutional and governmental support (72.8%) was similarly valued, indicating recognition that access to resources and infrastructure is essential. The gap between this recognition and poor practices suggests institutional shortfalls consistent with Oseyemi's (2023) call for coordinated government provision of water, waste disposal, and inspection systems. Three additional factors scored slightly lower but remained strong (mean = 2.9). Access to clean water (71.6%) was

widely acknowledged as critical, echoing Klutse and Sampson (2025) and Rosales et al. (2022), who found water scarcity a major barrier. The study's finding that only 16.5% always wash hands with soap reinforces this constraint. Financial constraints (69.9%) also limited hygiene, particularly the purchase of protective gear and cleaning materials. This likely contributes to the low use of PPE (14.8%) and aligns with Babor et al. (2024), who found that hygiene compliance varied by vendors' economic circumstances. Poor infrastructure (71.6%) and waste disposal facilities (73.3%) were recognized as major determinants, consistent with Leslie et al. (2021) and Rosales et al. (2022), who identified inadequate market infrastructure and sanitation systems as key obstacles. The finding that only 16% of vendors consistently dispose of waste properly underscores this infrastructural deficit. Collectively, these results reflect the multi-level determinants widely reported in the literature: individual (knowledge, education), environmental (water, infrastructure), and systemic (training, inspection, institutional support). Vendors' acknowledgment of these influences reinforces that poor hygiene is not merely due to ignorance but to structural and resource constraints.

5.2 Implications to Nursing Practice

The findings of this study have significant implications for nursing practice, particularly in the areas of community health, public health education, and infection prevention and control. Nurses play a pivotal role in promoting and maintaining the health of populations through preventive measures, and food hygiene is a vital component of such efforts. The study revealed that while food vendors generally demonstrated good knowledge and positive attitudes toward food hygiene, their actual practices were poor. This knowledge–practice gap underscores the need for nurses, especially community and public health nurses, to intensify health education and

behaviour change communication targeted at food handlers. By providing regular training and demonstrations on proper food handling, personal hygiene, and environmental sanitation, nurses can help translate knowledge and attitudes into consistent hygienic practices, thereby reducing the risk of foodborne diseases within the university community and beyond.

Furthermore, the study highlights the need for nurses to collaborate with institutional authorities, environmental health officers, and regulatory bodies to strengthen monitoring and supervision of food vendors within academic environments. Nurses can serve as advocates for the establishment of structured hygiene inspection programs and mandatory periodic training for all food vendors. Such initiatives will ensure that food safety standards are consistently met and sustained. By engaging in these intersectoral collaborations, nurses contribute to the prevention of outbreaks of foodborne infections and promote a culture of health and safety within institutional settings.

The study also points to the importance of integrating food hygiene education into nursing curricula and continuous professional development programs. Since nurses frequently interact with communities and food handlers during outreach programs and health campaigns, equipping them with up-to-date knowledge of food safety principles will enhance their capacity to educate others effectively. This aligns with the nursing role as health educators and advocates for safe environmental practices.

In addition, the findings have implications for the preventive and promotive aspects of nursing care. Poor hygiene practices among food vendors, particularly in a tertiary academic setting that also houses a health institution, pose a public health threat to students, staff, and patients. Nurses, as frontline health professionals, must therefore

adopt proactive surveillance and early detection strategies to identify potential sources of foodborne illness. Routine health checks and health education sessions for food vendors should be incorporated into institutional health service activities, coordinated by the nursing department.

Finally, the study reinforces the broader responsibility of nurses in policy advocacy and community empowerment. Recognizing that factors such as inadequate infrastructure, financial constraints, and lack of clean water hinder good hygiene practices, nurses should advocate for improved facilities and support systems. By influencing policy and mobilizing community participation, nurses can help create enabling environments that promote sustainable food hygiene practices. In essence, this study emphasizes that nursing practice extends beyond bedside care to encompass community-based interventions that safeguard public health through effective food hygiene promotion.

5.3 Summary

This study investigated the knowledge, attitude, and practice of food hygiene among food vendors in a tertiary academic institution in Edo State, Nigeria. The research was motivated by the increasing concern over the prevalence of foodborne diseases, which are often linked to poor hygiene practices among food handlers. Given the vital role that food vendors play in providing meals to students, staff, and visitors within academic institutions, understanding their level of compliance with food safety standards is essential to safeguarding public health.

The study adopted a descriptive cross-sectional design and utilized a structured questionnaire to collect data from food vendors operating within the university environment. The instrument captured information on socio-demographic

characteristics, knowledge of food hygiene, attitudes toward hygienic practices, and actual hygiene-related behaviours. Data were analysed using descriptive and inferential statistics, including frequency distributions, means, percentages, and chi-square tests to determine associations between variables.

Findings revealed that the majority of the respondents were females, most of whom had attained secondary education and had been engaged in food vending for more than five years. The results showed that a high proportion of the food vendors possessed good knowledge of food hygiene principles, including the importance of handwashing, food covering, and proper waste disposal. Similarly, their attitude toward food hygiene was generally positive, as most respondents agreed that maintaining cleanliness was essential to preventing foodborne diseases and protecting consumer health.

However, despite their good knowledge and positive attitudes, the study revealed that many vendors exhibited poor hygiene practices in their daily operations. Lapses were observed in areas such as wearing of protective clothing, maintenance of clean environments, and consistent handwashing before handling food. The chi-square analysis further indicated that certain factors such as age, level of education, and years of experience significantly influenced the vendors' knowledge, attitudes, and practices.

5.4 Conclusion

This study examined the knowledge, attitude, and practice of food hygiene among food vendors in a tertiary academic institution in Edo State. The findings revealed that although the majority of the respondents possessed good knowledge of food hygiene and demonstrated positive attitudes toward hygienic food handling, their actual

practices were found to be inadequate. This disparity between knowledge and practice indicates that awareness alone is insufficient to ensure compliance with hygienic standards, as behaviour is often influenced by factors such as convenience, environmental conditions, resource availability, and level of supervision.

The results also showed that socio-demographic variables particularly age, educational level, and years of experience had significant associations with the respondents' knowledge, attitudes, and practices. This suggests that food hygiene interventions must be tailored to the specific characteristics and needs of food vendors in order to be effective.

From a public health perspective, the study concludes that poor food hygiene practices among vendors in academic environments pose potential risks of food contamination and disease transmission, which can adversely affect the health of students, staff, and the wider community. Therefore, sustained and coordinated efforts are required to promote safe food handling through continuous education, routine health inspections, and strict enforcement of hygiene regulations.

5.5 Limitations of the Study

Like all research, this study was subject to certain limitations which should be considered when interpreting its findings. Firstly, the study employed a descriptive cross-sectional design, which provides a snapshot of the participants' knowledge, attitudes, and practices at one point in time. Consequently, causal relationships between variables could not be established.

Secondly, a convenience sampling technique was used to select participants, which may have introduced selection bias and limited the generalizability of the findings to all food vendors within and outside the institution. Vendors who were more willing or

available to participate might have had better awareness of food hygiene than those who did not participate.

Thirdly, the study relied on self-reported data collected through questionnaires. This may have been affected by social desirability bias, as some respondents could have provided answers they believed to be acceptable rather than a true reflection of their actual practices. Additionally, recall bias might have influenced the accuracy of responses regarding previous hygiene behaviours.

Another limitation was the limited geographical scope, as the study focused on a single tertiary academic institution in Edo State. The findings, therefore, may not fully represent the situation in other educational or community settings with different environmental or socio-economic conditions.

Lastly, time and resource constraints restricted the use of observational methods that could have provided a more objective assessment of vendors' hygiene practices.

5.6 Recommendations

Based on the findings and conclusions of this study, the following recommendations are made to improve food hygiene knowledge, attitudes, and practices among food vendors within tertiary academic institutions and similar settings:

1. Food vendors should be provided with continuous education and periodic training sessions on food hygiene and safety practices. These programs should be organized by public health nurses and environmental health officers to enhance vendors' knowledge and reinforce hygienic behaviour in food handling, storage, and preparation.

2. Institutional authorities and public health departments should establish a structured system for regular inspection of food vending sites. Routine supervision will help ensure compliance with hygiene regulations and provide immediate feedback and corrective measures where lapses are identified.
3. Food vendors should be required to obtain a valid license or certification before operating within the campus or any public institution. Certification should be issued only after completion of training in food hygiene and safety to ensure that only competent and health-conscious individuals are permitted to sell food.
4. Adequate facilities such as clean water supply, waste disposal bins, handwashing stations, and sanitary toilets should be provided and maintained within vending areas. The absence of these facilities was identified as one of the barriers to good hygiene practice, and their availability will promote better compliance among food handlers.
5. There should be strong collaboration between institutional management, local government health departments, environmental health officers, and nurses in promoting food hygiene. This partnership will enhance surveillance, policy implementation, and the enforcement of hygiene standards across all food vending points.
6. Tertiary institutions should integrate food hygiene awareness sessions into their orientation programs for both staff and students. This will increase general awareness of food safety and encourage consumers to demand higher hygiene standards from vendors.
7. Periodic medical examinations should be made mandatory for all food handlers to detect and manage communicable diseases early. This will help

prevent the spread of infections through contaminated food and protect the health of the university community.

8. The government, in collaboration with institutional authorities, should formulate and enforce policies that regulate food vending activities. These policies should clearly define hygiene standards, penalties for non-compliance, and mechanisms for monitoring and evaluation.
9. Nurses should take an active role in advocacy for food hygiene by organizing community outreach programs, demonstrations, and sensitization campaigns. Their involvement will strengthen preventive health measures and reduce the incidence of foodborne diseases.

5.7 Suggestions for Further Study

While this study has provided valuable insights into the knowledge, attitude, and practice of food hygiene among food vendors in a tertiary academic institution in Edo State, there remain areas that warrant further investigation. The following suggestions are made for future researchers:

- Future studies should include food vendors from multiple tertiary institutions or various local government areas to allow for comparison and generalization of findings across different settings and cultural contexts.
- A qualitative study using interviews or focus group discussions could be conducted to explore in depth the reasons behind the gap between knowledge and actual practice. This would provide richer insights into the socio-cultural, economic, and environmental factors influencing food hygiene behaviour.
- Researchers should design intervention-based studies to evaluate the effectiveness of specific health education programs or training workshops on

improving food hygiene knowledge and practices among food vendors over time.

- Further studies could assess the level of food hygiene awareness among consumers (students and staff) and how their perceptions or purchasing habits influence vendors' hygiene practices.
- Future research may investigate the role and effectiveness of institutional or governmental policies and regulations on food hygiene enforcement in academic environments.
- Conducting longitudinal studies could help track changes in food hygiene practices among vendors after educational interventions or policy implementations, providing evidence of sustainability and behavioural change.
- Researchers should also explore the relationship between food hygiene practices and the incidence of foodborne illnesses within academic institutions to better understand the public health impact of poor food handling practices.
- Further research could compare hygiene practices between officially licensed vendors and informal street food vendors to determine how regulation and oversight affect compliance with hygiene standards.

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APPENDIX I

DEPARTMENT OF NURSING SCIENCE

SCHOOL OF BASIC MEDICAL SCIENCES

UNIVERSITY OF BENIN CITY

QUESTIONNAIRE ON KNOWLEDGE, ATTITUDE AND PRACTICE OF FOOD HYGIENE AMONG FOOD VENDORS IN A TERTIARY ACADEMIC INSTITUTION IN EDO STATE

Dear Respondents,

I am a student at the institution mentioned above, currently conducting research on the topic "**Knowledge, attitude and practice of food hygiene among food vendors in a tertiary academic institution in Edo State**". The purpose of this questionnaire is to gather pertinent information regarding the subject matter. I Kindly request that you select the most suitable option from the choices provided below. Please be assured that all information shared will be kept completely confidential. Thank you for your cooperation.

Please take note of this : Your participation is voluntary.

INSTRUCTION:

Please tick as appropriate in all the boxes provided.

Section A: Socio-Demographic Information

(Please tick (✓) the option that best applies to you)

1. **Age:** ( ) Below 20 years ( ) 21 – 30 years ( ) 31 – 40 years ( ) 41 – 50 years ( ) Above 50 years
2. **Sex:** ( ) Male ( ) Female
3. **Marital Status:** ( ) Single ( ) Married ( ) Divorced ( ) Widowed
4. **Educational Level:** ( ) No formal education ( ) Primary education ( ) Secondary education ( ) Tertiary education ( ) Vocational/Apprenticeship
5. **Religion:** ( ) Christianity ( ) Islam ( ) Traditional ( ) Others (please specify) _____
6. **Type of Food Vended:** ( ) Cooked food ( ) Snacks / Pastries ( ) Beverages / Drinks ( ) Fruits / Salads ( ) Others (please specify) _____
7. **Years of Vending Experience:** ( ) Less than 1 year ( ) 1 – 3 years ( ) 4 – 6 years ( ) 7 – 10 years ( ) Above 10 years
8. **Location of Vending within Campus:** ( ) Food Court ( ) Helena Foods ( ) Home and Away ( ) Faculty Restaurant ( ) Hostel Restaurant ( ) Main Gate Axis

Section B: Knowledge of Food Hygiene

(Tick (✓) the correct answer)

1. **What is the main purpose of food hygiene?** ( ) To make food look attractive ( ) To prevent contamination and foodborne diseases ( ) To reduce the cost of food preparation

2. **Which of the following is a proper handwashing practice?** ( ) Washing hands with soap and clean water before handling food ( ) Wiping hands on an apron before handling food ( ) Rinsing hands quickly under water only
3. **Cross-contamination occurs when:** ( ) Raw and cooked foods come into contact directly or through utensils ( ) Food is stored in a refrigerator ( ) Different types of food are cooked together
4. **Which of the following microorganisms commonly causes food poisoning?** ( ) Salmonella ( ) Plasmodium ( ) Trypanosoma
5. **Which of these practices helps to prevent food contamination?** ( ) Leaving food uncovered ( ) Using the same knife for raw meat and vegetables ( ) Storing cooked and raw foods separately
6. **When should a food vendor wash their hands?** ( ) Before and after handling food or after using the toilet ( ) Only at the end of the day ( ) Only when hands are visibly dirty
7. **Why is it important to cook food thoroughly?** ( ) To kill harmful microorganisms ( ) To make the food more colourful ( ) To improve the smell of the food only
8. **Which of the following best describes a hygienic food handler?** ( ) A person who keeps personal and environmental cleanliness while handling food ( ) A person who cooks food very fast ( ) A person who prepares large quantities of food
9. **What should a food vendor do if they have a wound on their hand?** ( ) Continue handling food with bare hands ( ) Cover it properly with a waterproof bandage or glove ( ) Ignore it as long as it is small

10. **Why is it important to use clean utensils during food preparation?** ( ) To avoid transferring germs to food ( ) To make food taste better ( ) To reduce cooking time

Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD).

Section C: Attitude Toward Food Hygiene

S/N	Statement	Strongly Agree (SA)	Agree (A)	Disagree (D)	Strongly Disagree (SD)
1	Maintaining food hygiene is essential to prevent foodborne diseases.				
2	It is unnecessary to wash hands every time before handling food.				
3	Keeping the food preparation area clean shows respect for customers.				
4	Using gloves and aprons while preparing food is a waste of time.				
5	Food hygiene training helps vendors to improve their business.				
6	It is acceptable to handle money and food at the same time.				
7	I believe food hygiene is everyone's responsibility, not just the government's.				
8	Customers do not care about how clean the food vendor looks.				
9	Proper waste disposal around food stalls helps to attract more customers.				
10	Attending periodic food hygiene workshops is not important for vendors.				

Scale: **Always (A), Sometimes (S), Rarely (R), Never (N)**

Section D: Practice of Food Hygiene

S/N	Statement	Always (A)	Sometimes (S)	Rarely (R)	Never (N)
1	How often do you wash your hands with soap and clean water before handling food?				
2	How often do you use clean utensils and equipment during food preparation?				
3	How often do you cover food properly to prevent contamination from flies and dust?				
4	How often do you wear protective clothing such as aprons, gloves, and head covers while preparing food?				
5	How often do you separate raw foods from cooked foods during preparation and storage?				
6	How often do you dispose of waste properly and keep your vending environment clean?				
7	How often do you wash fruits and vegetables thoroughly before use?				
8	How often do you store leftover food safely or reheat it properly before serving?				
9	How often do you avoid handling food when you have open wounds or illnesses?				
10	How often do you clean and disinfect your food preparation surfaces?				

Section E: Factors Influencing Practice of Food Hygiene

S/N	Statement	Strongly Agree (SA)	Agree (A)	Disagree (D)	Strongly Disagree (SD)
1	Adequate knowledge of food hygiene helps me maintain good hygiene practices.				
2	Lack of access to clean water makes it difficult to maintain food hygiene.				
3	My level of education influences how I practice food hygiene.				
4	The availability of waste disposal facilities affects my hygiene practices.				
5	Financial constraints prevent me from maintaining proper hygiene.				
6	Regular inspection by health officers encourages me to follow hygiene standards.				
7	Training on food hygiene improves my hygiene behavior.				
8	The attitude of customers toward cleanliness influences how I handle food.				
9	Poor infrastructure (e.g., no water supply, poor drainage) affects my ability to practice food hygiene.				
10	Support from the university or government helps me improve food hygiene practices.				