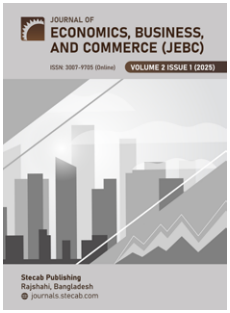


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*Research Article*

# Food Safety Knowledge, Attitude, and Practices Among Street Food Vendors in Alfonso Lista, Ifugao, Philippines

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## About Article

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**ABSTRACT**

Street food vendors occupy a modest yet vital role in Filipino society, offering economical and accessible meal alternatives. Nonetheless, it presents potential health risks stemming from food safety issues and the informal characteristics of the industry. This study aims to assess the knowledge, attitudes, and behaviors of street food sellers regarding food safety in Alfonso Lista, Ifugao, Philippines, towards capacity-building initiatives for Ifugao State University. This study also evaluates the practices of street food vendors based on specific demographic criteria. Descriptive-comparative research approaches were employed to collect data from 109 street food sellers utilizing a structured research instrument that underwent validation. Employing weighted means and the Kruskal-Wallis test, the results demonstrated that vendors possess a robust knowledge of food safety, reflecting a solid understanding of foodborne pathogens, hygiene procedures, and safety protocols. Moreover, street sellers exhibit a strong dedication to food safety and personal hygiene, consistently adhering to safe methods and recognizing the importance of food safety. The evaluation of food safety practices indicates that vendors generally comply with safe food handling protocols, including the avoidance of expired products, maintenance of clean utensils, and utilization of safe water. No significant difference ($p > 0.05$) was noted in the food safety practices of street food sellers concerning age and training received. These findings illustrate the vendors' effective food safety measures, highlighting the need for continuous education and training to ensure sustainable improvements.

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## 1. INTRODUCTION

Street food is more than a quick meal—it is a lifeline for millions. In both urban centers and rural areas, street food sellers function as essential components of informal economies, offering economical meals to working-class populations and creating employment opportunities for marginalized communities (Gonçalves *et al.*, 2024). Nonetheless, beneath the enticing skewers and colorful food trucks exists a significant public health issue. The industry that sustains daily life frequently lacks the necessary infrastructure, training, or oversight to guarantee food safety, thus endangering both vendors and customers to foodborne illnesses (Allah Rakha *et al.*, 2022).

Street-vended foods, as defined by the World Health Organization (WHO) and the Food and Agricultural Organization (FAO), are "ready-to-eat foods and beverages prepared and/or sold by vendors and hawkers, particularly in streets and similar public venues, for immediate or delayed consumption without additional processing or preparation." Their popularity has surged among urban populations owing to their cost-effectiveness, accessibility, and convenience. Additionally, street food vending offers economic prospects for numerous low-income citizens, particularly in developing nations. Vendors generally function in proximity to public assembly locations, including markets, educational institutions, medical facilities, construction zones, and residential areas.

Notwithstanding their socio-economic importance, the safety and sanitary standards of street food selling venues are frequently undermined. These facilities are often afflicted by unsanitary circumstances, such as inadequate waste disposal, rodent infestations, and exposure to environmental pollutants. Consequently, street-vended meals are frequently associated with the spread of foodborne illnesses, leading to an estimated 600 million cases and 420,000 fatalities globally each year. Substandard food handling techniques, insufficient hygiene expertise, and restricted access to sanitation facilities exacerbate these concerns, particularly among inexperienced street vendors. Multiple studies have underscored the food safety issues associated with street food sellers. A survey conducted in Dhaka indicated that none of the questioned vendors had undergone formal training in food safety or hygiene (Werkneh *et al.*, 2023). Vendors in Ghana, South Africa, and Jordan exhibited inadequate knowledge scores concerning food safety and storage (Barnabas *et al.*, 2024). Consistently documented factors include inadequate handwashing, substandard storage conditions, and the utilization of infected utensils. These behaviors stem not just from ignorance but also from economic limitations that hinder merchants from obtaining the requisite facilities or equipment (Barnabas *et al.*, 2023).

Studies from Ghana and Nigeria indicate a lack of awareness regarding food safety and standards among food workers. A survey in Ghana revealed that merely 67.3% of street food vendors possessed enough food safety knowledge, while 56% lacked formal training (Tuglo *et al.*, 2021). In Nigeria, a baseline evaluation revealed that merely 12.8% of food handlers have adequate food safety knowledge prior to intervention. Substandard hygiene procedures, insufficient education, and inappropriate food handling at markets and vending locations contribute to food contamination (Cudjoe *et al.*, 2022). Training interventions can markedly enhance food workers' knowledge and practices. In Nigeria, knowledge following the intervention rose to 56.7%. In Ghana, food merchants possessing secondary education, elevated income, and food safety training show superior cleanliness practices (Tuglo *et al.*, 2021). It is advisable to conduct regular training, certification, and inspections to improve food safety knowledge and practices (Arthur *et al.*, 2021). The issue is particularly acute in underdeveloped nations because street sellers lack the training, infrastructure, and resources necessary to comply with fundamental food safety regulations. In Brazil, sellers frequently neglected hygienic protocols, such as hair covering and cold storage maintenance, with numerous individuals attributing economic constraints as obstacles to adherence (Barnabas *et al.*, 2023). Moreover, environmental exposure, such as cooking in unprotected outdoor locations susceptible to dust or pests, exacerbates the hazards (Raza *et al.*, 2021).

In the Philippines, street food is integral to both culture and economy, providing consumers with economical and convenient choices (Tacardon *et al.*, 2023; Java, 2024). Notwithstanding its popularity, there exists a necessity to enhance knowledge regarding the cultural significance of street cuisine (Ortega *et al.*, 2023). Street food vending offers economic options, frequently derived from hereditary expertise and the aspiration to help families (Java, 2024). The industry embodies local identities, shown by "puso" in Cebu, and adjusts to urban lifestyles (Cabasag *et al.*, 2021). Determinants of street food consumption encompass convenience, hedonic value, and social factors (Tacardon *et al.*, 2023). Vendors encounter challenges such as adverse weather conditions and client misconduct (Java, 2024). Governments should emphasize the cultural importance of the sector (Tacardon *et al.*, 2023), while educational institutions can include street food culture into their curricula (Cabasag *et al.*, 2021). Street food constitutes a vital component of urban life and the economy in the Philippines.

Research in the Philippines indicates that numerous street food vendors lack adequate food safety knowledge and training (Rosales *et al.*, 2022). Prevalent problems encompass insufficient personal hygiene, inadequate sanitation, and substandard food handling techniques, which may result in microbial contamination and foodborne diseases (Rakha *et al.*, 2022). Although certain vendors exhibit awareness of cleanliness standards, their implementation is variable (Rosales *et al.*, 2022). Inadequate infrastructure, including restricted access to clean water and effective waste treatment, exacerbates the issue. To mitigate these issues, regular sanitary inspections, compulsory food safety training for vendors, and enhanced hygiene facilities supplied by local governments are essential. Cooperation between regulatory agencies and NGOs is crucial for the implementation of public health policies and the support of street food vendors (Rakha *et al.*, 2022).

A study revealed that street food vendors have insufficient knowledge and practices concerning food management, despite a generally favorable attitude towards it. This underscores a disparity between knowledge and implementation in Biliran Province (Pabilando & Gonzales, 2023). Research indicated that vendors possessed average food safety knowledge and positive attitudes; nevertheless, these did not manifest in

safe practices, especially in settings devoid of fundamental sanitary facilities in Batangas City (Argente *et al.*, 2020). A systematic research revealed that numerous street food sellers in low- and middle-income nations, including the Philippines, demonstrate considerable deficiencies in knowledge, attitudes, and practices, highlighting the necessity for training and instruction (Desye *et al.*, 2023). The absence of localized studies in CAR indicates that particular cultural and environmental factors affecting KAP among street food sellers have yet to be investigated. The lack of data can impede effective policy-making and health interventions specific to the region's distinct setting. Conversely, although particular studies have been undertaken in different areas, they may not adequately address the unique issues encountered by street food vendors in CAR, indicating an urgent necessity for localized research to enhance practices and legislation. This study tackles the gap by assessing the knowledge, attitudes, and practices (KAP) of street food vendors in Potia, Sta. Maria, Busilac, and Namillangan, Alfonso Lista, Ifugao. The objectives are to: (1) evaluate vendors' comprehension of food safety and hygiene; (2) examine their attitudes towards sanitary procedures; and (3) ascertain the degree to which they apply appropriate food handling techniques in their everyday operations. This study's findings are anticipated to guide policy and community educational initiatives, ultimately seeking to mitigate health risks, enhance food safety adherence among vendors, and safeguard customers.

### 1.1. Objectives of the study

This study aims to assess the food safety knowledge, attitudes, and practices of Street food vendors in Alfonso Lista, Ifugao, Philippines.

Specifically, this aims to :

i. Assess the level of food safety knowledge among street food vendors in the selected barangays.

ii. Identify common attitudes of street food vendors toward food hygiene and safety practices.

iii. Examine the actual food safety practices employed by street food vendors in their daily operations.

iv. Determine whether there are significant differences in food safety practices based on vendors' age and food safety training attendance.

v. Develop a targeted training program to enhance the knowledge, attitudes, and practices of street food vendors regarding food safety and hygiene.

## 2. LITERATURE REVIEW

Food security is a paramount concern for governments, civic society, the business sector, and international organizations worldwide. Shifting consumer tastes, alterations in production and distribution techniques, modifications in trade and tourism, evolving climatic and environmental conditions, and rising antibiotic resistance are all elements that elevate the probability of food risks and food safety occurrences. Foodborne illness presents a significant threat to public health. Reinstating consumer confidence in food is currently a priority for governments, regulatory bodies, law enforcement agencies, huge enterprises, and transnational entities. Moreover, food safety and quality management systems, product certification, and standardization are nascent and require urgent intervention (Rahman & Noor, 2016).

A safe food product is improbable to inflict harm or pose a threat to human health, including safety in manufacture, operation, outcomes, and procedures, both current and prospective. Conversely, sustainable food is defined as food that is produced economically and is grounded in the values of social justice. Agriculturists cultivate organic food utilizing renewable resources and safeguard ecological assets to enhance sustainability and avert environmental damage. Conversely, green food encompasses all products cultivated under a framework dedicated to minimizing ecological harm while upholding rigorous quality and safety standards. Traceability Fresh food is defined as food that has undergone evaluation by a national certification authority and has documentation maintained throughout the production process, regarded as one of the most effective strategies for ensuring food safety (Suhaimi *et al.*, 2024)

### 2.1. Food safety knowledge among street food vendors

Street food vendors play a vital role in urban food systems, especially in developing countries. However, numerous studies have highlighted that their food safety knowledge and practices are often inadequate, posing potential public health risks. For instance, a study in Malaysia found that 81.7% of vendors possessed adequate knowledge of food safety (Aziz *et al.*, 2023), while in Jordan, vendors exhibited moderate knowledge with significant gaps regarding specific pathogens (Elsahoryi *et al.*, 2024). Similarly, in Myanmar, although knowledge levels were high, only 41.1% demonstrated good food safety practices (Htway, 2023), revealing a disconnect between knowledge and practice.

In contrast, studies from Sri Lanka, Ghana, and Lesotho reported poor baseline knowledge among vendors (Karunapema, 2021; Addo-Tham *et al.*, 2020; Letuka *et al.*, 2021; Wickrematilake *et al.*, 2022). Encouragingly, educational interventions in these regions were found to significantly improve food safety knowledge (Karunapema, 2021; Wickrematilake *et al.*, 2022). Training programs were shown to be effective not only in enhancing knowledge but also in promoting safer food handling practices (Addo-Tham *et al.*, 2020). Nonetheless, converting improved knowledge into consistent hygienic practices remains a major challenge (Karunapema, 2021).

### 2.2. Attitudes and practices on food safety

While many vendors exhibit positive attitudes toward food safety, their actual practices frequently fall short due to socioeconomic limitations. Research suggests that favorable attitudes do not automatically translate into safe food handling behaviors, especially when vendors lack adequate resources or work in unhygienic conditions with limited access to clean water and handwashing facilities (Letuka *et al.*, 2021). Despite this, consumers continue to perceive street food positively, with only a minority avoiding it due to hygiene concerns (Letuka *et al.*, 2021).

Factors such as education level, previous training, public health inspections, and vending experience play a significant role in

shaping food safety practices (Addo-Tham *et al.*, 2020; Mwove *et al.*, 2020). Mobile vendors, in particular, are more prone to poor working conditions and unsafe practices (Mwove *et al.*, 2020). Improper food storage, handling with bare hands, and insufficient sanitation facilities remain widespread problems (Mwove *et al.*, 2020).

### 2.3. Policy and programmatic recommendations

To address these gaps, regular training programs and educational campaigns are widely recommended. Studies consistently call for the involvement of municipal authorities and cross-sectoral collaboration to sustain improvements in food safety among vendors (Addo-Tham *et al.*, 2020; Khomotso & Chelule, 2020; Mwove *et al.*, 2020). Policymakers are urged to develop supportive environments, improve access to sanitation infrastructure, and provide consistent health inspections to promote compliance with food safety standards (Elsahoryi *et al.*, 2024; Verma *et al.*, 2022; Ahmed *et al.*, 2024).

## 3. METHODOLOGY

### 3.1. Research design

This study employed a quantitative descriptive-comparative research approach to examine the Knowledge, Attitudes, and Practices (KAP) of street food vendors concerning food safety. A descriptive-comparative methodology is particularly appropriate for this study as it facilitates a comprehensive assessment of the existing knowledge, attitudes, and practices about food safety among street food vendors. Furthermore, the design facilitates significant comparisons among various demographic groups (e.g., age, training status) to discern factors affecting food safety behaviors. This design enables the study to delineate current knowledge and practices while contrasting variations among different segments within the vendor community, thereby offering nuanced insights into potential areas for enhancement.

### 3.2. Research environment

The study was carried out at Potia, Sta. Maria, Busilac, and Namillangan are situated in Alfonso Lista, Ifugao. These sites were chosen for their significant density of street food vendors, rendering them an optimal setting to evaluate food safety protocols. The selection of these regions also illustrates the cultural and socio-economic diversity of the street food vendors, enhancing the study's applicability to other comparable rural locations in the Philippines.

### 3.3. Research respondents

The research concentrated on street food vendors from designated locations in Alfonso Lista, Ifugao, selected for their significance to the study's aims. These vendors exhibit similarities in their knowledge, attitudes, and behaviors about food safety, rendering them suitable candidates for examination. A convenience sampling method was utilized to choose participants, targeting a minimum sample size of 109 vendors. The sample size was established to guarantee adequate statistical power while considering probable non-responses arising from privacy concerns or other variables. The non-random sampling strategy is warranted as it enables effective data collection in the absence of a complete vendor list for the region.

### 3.4. Data gathering instrument

The survey instrument employed in this study was adapted from validated questionnaires utilized in analogous research, including the Knowledge, Attitude, and Practice (KAP) of Street Food Vendors in Kathmandu (Subedi *et al.*, 2024), Food Safety Knowledge, Attitudes, and Practices of Food Vendors in Nigeria's School Feeding Program (Barnabas *et al.*, 2023), and the Knowledge, Practice, and Attitude on Food Handling of Street Food Vendors in Biliran Province (Pabilando & Gonzales, 2023). These instruments were meticulously tailored to the local environment and validated by expert consensus, pilot testing, and refinement. The Cronbach alpha scores for the questionnaire are presented here, demonstrating robust internal reliability across all parts.

**Table 1.** Cronbach alpha results

| Parts of the Questionnaire | Number of Items | Cronbach Alpha |
|---|---|---|
| Knowledge | 11 | .918 |
| Attitudes | 11 | .832 |
| Practices | 15 | .791 |
| **Overall Result** | **37** | **.863** |

These high reliability coefficients indicate that the instrument consistently measures the constructs of interest across different respondent groups. The questionnaire was divided into four sections: (1) demographic profile, (2) knowledge of food safety, (3) attitudes towards food safety, and (4) food safety practices. This structure ensures a comprehensive assessment of the vendors' food safety awareness and behavior.

### 3.5. Data gathering procedure

Before data collection, the researchers secured informed consent from all participants, assuring they were fully cognizant of the study's objectives, their right to anonymity, and their option to withdraw from the study at any time without repercussions. The informed consent procedure was established to maintain the ethical requirements of the research. Upon securing assent, the researchers personally distributed the surveys to the street food sellers. Respondents were allotted sufficient time to complete the surveys, facilitating considered and precise responses. Upon collection of the surveys, the researchers systematically arranged the data for the study. Data cleansing and verification for completeness were conducted to guarantee high-quality, dependable outcomes.

Ethical considerations were rigorously adhered to during the study process. The study obtained informed consent by elucidating the research objectives, methodologies, and potential dangers to all participants. The confidentiality and identity of participants were preserved, and all personal data were securely saved and utilized exclusively for research purposes. The study complied with ethical criteria of voluntary participation, guaranteeing that respondents might quit at

any point without incurring severe repercussions. The study was executed in strict adherence to ethical standards for social science research, demonstrating a dedication to participant rights and welfare.

### 3.6. Treatment of data

The data analysis employed both descriptive and inferential statistical methods. Descriptive statistics, comprising frequency distributions, mean, and standard deviation, were used to encapsulate the demographic profiles and KAP scores of the vendors. Mean and standard deviation were utilized to describe the primary tendencies and diversity of food safety knowledge, attitudes, and practices. Due to the failure of specific variables to satisfy normality assumptions, the researchers employed the Kruskal-Wallis test, a non-parametric method appropriate for comparing medians among numerous independent groups. This method was selected to guarantee accurate comparisons among vendor groups, including those based on age or training status.

## 4. RESULTS AND DISCUSSION

### 4.1. Level of Knowledge

**Table 2.** Mean and standard deviation on the level of knowledge of street food vendors

| Knowledge on Food Safety | Mean | Standard Deviation | Qualitative Interpretation |
|---|---|---|---|
| Microorganisms are frequently found on the hands. | 3.55 | .616 | SA |
| The taste of food should be checked with a different spoon. | 3.61 | .592 | SA |
| Food from unhygienic and unclean sources might harbor the disease-causing organism. | 3.59 | .697 | SA |
| After touching raw food, touching cooked food without cleaning your hands causes the transfer of microorganisms. | 3.53 | .632 | SA |
| Some foodborne diseases/contamination can cause death. | 3.46 | .856 | SA |
| Pathogenic microorganisms can be transmitted through contaminated food. | 3.62 | .558 | SA |
| Dirt on the street can seriously contaminate the open food. | 3.71 | .549 | SA |
| Reselling and using leftover food from previous days is not safe. | 3.50 | .801 | SA |
| Improper food handling can be a source of disease infection. | 3.66 | .581 | SA |
| Hepatitis A virus is a foodborne pathogen. | 3.65 | .498 | SA |
| **Overall Mean** | **3.59** | **.447** | **SA** |

*Legend: 1.0-1.74 Strongly Disagree (SD); 1.75-2.49 Disagree (D); 2.50-3.24 Agree (A); 3.25-4.0 Strongly Agree (SA)*

The data collected from respondents indicates a robust understanding of key food safety practices, with a notable consensus on the importance of hygiene and contamination prevention in food handling. The highest mean ($\bar{x}$ = 3.71) was recorded for the statement, "Dirt on the street can seriously contaminate open food," signaling a strong awareness of the environmental factors contributing to food contamination, particularly in open food markets or street food settings. This suggests that respondents recognize the significant risks posed by external contamination and the need for strict environmental control measures. Similarly, the statement, "Pathogenic microorganisms can transmit through contaminated food" ($\bar{x}$ = 3.62), highlights an understanding of the fundamental concept that foodborne diseases are primarily transmitted through improper handling or contamination of food.

Respondents also strongly agreed that certain practices, such as tasting food with a different spoon ($\bar{x}$ = 3.61) and preventing cross-contamination from raw to cooked foods ($\bar{x}$ = 3.53), are vital in maintaining food safety. These results suggest a deep comprehension of safe food handling practices that prevent the spread of harmful microorganisms, which is crucial in both domestic and commercial food preparation environments. In addition to hygiene practices, respondents also displayed significant awareness of the risks associated with food sourcing, as evidenced by the mean score of 3.59 for the statement, "Food from unhygienic and unclean sources might harbor disease-causing organisms." This finding suggests that respondents acknowledge the dangers of sourcing food from contaminated or unregulated environments, which has direct implications for food safety in both formal and informal food sectors.

The awareness of foodborne pathogens such as the Hepatitis A virus ($\bar{x}$ = 3.65) and the recognition that "Some foodborne diseases/contamination can cause death" ($\bar{x}$ = 3.46) demonstrate the respondents' understanding of the severe consequences of foodborne illnesses, reinforcing the need for preventive measures and public health interventions. This suggests that knowledge of the potential health impacts of foodborne pathogens may drive more conscientious food safety practices among individuals and food handlers. Generally, the findings, with an overall mean of 3.59, indicate a high level of agreement across respondents on the critical elements of food safety. The relatively low standard deviation (.447) points to a consistent and widespread understanding among the respondents, suggesting that these insights are generalizable to a broader population. Given the high level of agreement and the clear understanding of key food safety concepts, the implications of these findings are significant

for public health initiatives, food safety training programs, and policy development aimed at reducing the incidence of foodborne illnesses. Furthermore, the results underscore the importance of integrating food safety education at both the community and professional levels to ensure the continued promotion of safe food handling practices, thereby safeguarding public health. The findings provide valuable insights into the current state of food safety knowledge, which is critical for shaping future interventions, regulatory measures, and educational frameworks. By reinforcing key concepts such as proper food handling, hygiene practices, and the risks of contamination, public health officials and food safety organizations can more effectively address gaps in food safety practices and reduce the burden of foodborne diseases in various populations.

Studies across different countries have found that while vendors generally possess good knowledge of food safety. A study in Malaysia found that 81.7% of vendors had adequate knowledge of food safety (Aziz *et al.*, 2023). In Jordan, vendors exhibited a moderate level of knowledge, with notable gaps in understanding specific pathogens (Elsahoryi *et al.*, 2024). Conversely, a study in Myanmar revealed that while most vendors had high knowledge levels, only 41.1% demonstrated good food safety practices (Htway, 2023). Street food vendors play a crucial role in urban food supply, but their food safety knowledge and practices are often inadequate, posing health risks. Studies in Sri Lanka, Ghana, and Lesotho have shown that vendors generally have poor baseline knowledge of food safety (Karunapema, 2021; Addo-Tham *et al.*, 2020; Letuka *et al.*, 2021; Wickrematilake *et al.*, 2022). However, educational interventions can significantly improve vendors' knowledge (Karunapema, 2021; Wickrematilake *et al.*, 2022). Training is associated with better food safety knowledge and handling practices (Addo-Tham *et al.*, 2020). Despite improved knowledge, translating this into better practices remains challenging (Karunapema, 2021). Vendors often operate in unhygienic conditions with limited access to clean water and handwashing facilities (Letuka *et al.*, 2021). Consumers generally perceive street food positively, with only a small percentage avoiding it due to hygiene concerns (Letuka *et al.*, 2021). Regular training programs for vendors and collaboration between municipal authorities and other agencies are recommended to enhance food safety in street vending (Addo-Tham *et al.*, 2020).

### 4.2. Attitude on food safety

**Table 3.** Mean and Standard Deviation of Attitude on Food Safety

| Attitude on Food Safety | Mean | Standard Deviation | Qualitative Interpretation |
|---|---|---|---|
| I am using face masks, protective gloves, caps, and adequate clothing to reduce the risk of food contamination. | 3.38 | .541 | A |
| I do not have long nails and nail polish. | 3.67 | .578 | A |
| I am maintaining personal hygiene. | 3.73 | .521 | A |
| I am not touching food without gloves when I have an abrasion or cut on my hands. | 3.54 | .701 | A |
| I believe that food safety is everyone's responsibility. | 3.79 | .453 | A |
| I will attend training on food safety in order to know and reduce foodborne illnesses. | 3.61 | .624 | A |
| I do not rub my hands on my face, air, etc., while working. | 3.44 | .751 | A |
| I know that proper hand hygiene can prevent foodborne diseases. | 3.72 | .563 | A |
| I believe it is important to check my health status before starting to work. | 3.82 | .455 | A |
| I believe that safe food handling is an important part of my job responsibilities. | 3.87 | .387 | A |
| **Overall Mean** | **3.66** | **.266** | **A** |

*Legend: 1.0-1.74 Never(N)1.75-2.49 Seldom(S) 2.50-3.24 Often(O) 3.25-4.0 Always(A)*

The data presents a strong positive attitude toward food safety, with an overall mean of 3.66, which falls within the "Always" range on the Likert scale. This suggests that respondents consistently exhibit positive behaviors and attitudes toward food safety. The standard deviation of 0.266 indicates that responses were closely aligned, indicating a high level of agreement among participants.

The highest mean score of 3.87 is for the statement, "I believe that safe food handling is an important part of my job responsibilities." This indicates that respondents strongly view food safety as a core aspect of their professional duties, underlining the importance of integrating food safety into workplace practices. This high level of agreement reflects the acknowledgment of food safety's critical role in preventing foodborne illnesses and ensuring public health. Following closely, the statement, "I believe it is important to check my health status before starting to work" ($\bar{x}$ = 3.82), reveals that respondents understand the necessity of ensuring their health before handling food. This reflects a proactive attitude toward preventing contamination and protecting consumers from potential foodborne diseases caused by ill food handlers. Another key item is, "I believe that food safety is everyone's responsibility" ($\bar{x}$ = 3.79). This high score indicates a shared understanding that food safety is a collective responsibility, not just that of designated food safety personnel. This implication suggests that fostering a culture of responsibility at all levels,

from food handlers to managers, is essential for ensuring food safety within any food-related operation. "I know that proper hand hygiene can prevent foodborne diseases" ($\bar{x}$ = 3.72) and "I am maintaining personal hygiene" ($\bar{x}$ = 3.73) reflect respondents' strong commitment to maintaining hygiene practices. This suggests that respondents are likely adhering to standard food safety practices such as handwashing, which is a fundamental prevention measure for reducing foodborne illnesses.

The statement, "I will attend training on food safety in order to know and reduce foodborne illnesses" ($\bar{x}$ = 3.61) highlights a proactive attitude towards learning and improving food safety knowledge, reflecting a willingness to engage in further education to minimize foodborne risks. Respondents also agreed with the statement, "I am not touching food without gloves when I have an abrasion or cut on my hands" ($\bar{x}$ = 3.54), suggesting that they are cautious about preventing direct contact with food when personal injuries may pose a risk of contamination. The statement, "I do not have long nails and nail polish" ($\bar{x}$ = 3.67) suggests that respondents prioritize personal hygiene by ensuring that their nails are kept short and free from polish, which can harbor bacteria, further reducing the risk of contamination during food handling. Additionally, "I do not rub my hands on my face, air, etc., while working" ($\bar{x}$ = 3.44) reflects a commitment to avoiding actions that could potentially contaminate food. However, the slightly lower mean indicates room for improvement in this area. The lowest mean score (3.38) was recorded for the statement, "I am using face masks, protective gloves, caps, and adequate clothing to reduce the risk of food contamination." While respondents generally agree with this statement, the slightly lower score implies that there may be occasional lapses in consistently using all protective gear, suggesting an opportunity for reinforcing the importance of complete personal protective equipment in food handling settings.

The general positive attitude toward food safety is evident across various behaviors, from personal hygiene to the importance of training and health checks. The implications of these findings are significant for food safety education and policy development, as they highlight areas of strength, such as personal hygiene and the understanding of food safety as a collective responsibility. However, the findings also suggest areas where further reinforcement is needed, such as consistent use of personal protective equipment and preventing hand-to-face contact. Overall, fostering an environment where food safety is a shared responsibility and where employees feel confident in their knowledge and practices will continue to improve food safety standards and reduce the risk of foodborne illnesses.

The attitude towards food safety among street food vendors is crucial for ensuring public health and preventing foodborne illnesses. Research indicates that while many vendors possess adequate knowledge and favorable attitudes towards food safety, the actual practices often fall short due to various socioeconomic factors. This highlights the need for targeted interventions to enhance food safety standards in street food vending. There is a pressing need for educational programs and training to improve food safety practices among vendors, particularly in regions where knowledge is lacking (Ahmed *et al.*, 2024; Verma *et al.*, 2022). Policymakers should focus on creating supportive environments, including access to resources and infrastructure improvements, to facilitate better food safety practices (Elsahoryi *et al.*, 2024).

### 4.3. Practices of street food vendors

**Table 4.** Mean and standard deviation on the practices of street food vendors

| Practices on Food Safety | Mean | Standard Deviation | Qualitative Interpretation |
|---|---|---|---|
| I am not using products after the expiry date on labels. | 3.85 | .487 | A |
| I sterilize utensils before using them. | 2.69 | .572 | O |
| I am not involved in food handling and food services when I am sick. | 2.30 | .739 | A |
| I am keeping food covered. | 2.79 | .453 | A |
| I am properly cleaning knives and cutting boards to prevent contamination. | 3.53 | .617 | A |
| I sanitize service utensils after washing. | 2.52 | .661 | A |
| I am storing or displaying food in sealed containers. | 2.72 | .546 | A |
| I am using safe water for making food and drinks. | 2.81 | .440 | A |
| I am maintaining my vending stalls in clean conditions. | 3.72 | .507 | A |
| I cook food to the proper temperature. | 3.58 | .657 | A |
| I cool and store food promptly. | 3.67 | .578 | A |
| I am not smoking while handling food. | 3.79 | .473 | A |
| I am using soaps/detergents to wash my hands. | 3.62 | .650 | A |
| I clean utensils every time after usage. | 3.69 | .556 | A |
| **Overall Mean** | **3.23** | **.304** | **A** |

*Legend: 1.0-1.74 Never (N)1.75-2.49 Seldom(S)2.50-3.24 Often(O) 3.25-4.0 Always(A)*

The data on food safety practices, as reflected by the overall mean of 3.23, suggests that respondents exhibit food safety behaviors "Often" rather than "Always," highlighting a generally positive but still inconsistent adherence to proper food safety standards. While certain practices demonstrate strong compliance, other areas reveal significant gaps that could pose risks to public health if left unaddressed.

The highest mean score ($\bar{x}$ = 3.85) was observed for the statement "I am not using products after the expiry date on labels," indicating that most respondents are highly aware of the risks associated with expired food and consistently avoid such products. This reflects a strong preventive attitude toward foodborne illnesses. Other highly practiced behaviors include "I am not smoking while handling food" ($\bar{x}$ = 3.79), "I am maintaining my vending stalls in clean conditions" ($\bar{x}$ = 3.72), "I clean utensils every time after usage" ($\bar{x}$ = 3.69), "I cool and store food promptly" ($\bar{x}$ = 3.67), "I cook food to the proper temperature" (3.58), and "I properly clean knives and cutting boards to prevent contamination" ($\bar{x}$ = 3.53). These practices reflect well-ingrained habits related to cleanliness, temperature control, and avoidance of contamination, which are essential components of safe food handling and storage.

However, the results also expose concerning lapses in some essential safety behaviors. For instance, "I am not involved in food handling and food services when I am sick" received one of the lowest mean scores ($\bar{x}$ = 2.30), indicating that respondents only occasionally refrain from working while ill. This is particularly alarming, as sick food handlers constitute a significant vector for transmitting pathogens such as norovirus, Salmonella, and Hepatitis A. The implication is that there may be insufficient policies, awareness, or incentives for food handlers to self-exclude when ill, increasing the risk of widespread contamination. Similarly, practices like "I sterilize utensils before using them" (2.69), "I sanitize service utensils after washing" ($\bar{x}$ = 2.52), "I store or display food in sealed containers" ($\bar{x}$ = 2.72), "I keep food covered" ($\bar{x}$ = 2.79), and "I use safe water for making food and drinks" ($\bar{x}$ = 2.81) were only practiced occasionally, falling below the "Always" threshold. These are fundamental practices in preventing microbial contamination and ensuring the safety of food from preparation to consumption. The infrequent observance of these steps indicates a knowledge, resource, or behavioral gap that must be addressed through training, regulatory enforcement, and resource provision (e.g., access to clean water or sanitization equipment). While many food safety practices are followed consistently, the overall "Often" rating signifies that these behaviors are not yet habitual or universal among respondents. For food safety to be effectively ensured, these practices must become part of standard daily routines, backed by structural, educational, and policy-level support to minimize health risks to consumers and enhance public trust in food service providers.

Street food vending is prevalent in developing countries, but concerns about food safety persist. Studies in South Africa, Ghana, and Kenya reveal that while vendors often have good knowledge of food safety, their practices are frequently inadequate (Khomotso & Chelule, 2020; Addo-Tham *et al.*, 2020; Mwove *et al.*, 2020). Common issues include handling food with bare hands, improper storage, and lack of proper sanitation facilities (Mwove *et al.*, 2020). Factors influencing food safety practices include education level, training, public health inspections, and vending experience (Addo-Tham *et al.*, 2020; Mwove *et al.*, 2020). Mobile vendors are more likely to have poor working conditions and food handling practices (Mwove *et al.*, 2020). Regular training and public health inspections are recommended to improve food safety knowledge and practices among street food vendors (Khomotso & Chelule, 2020; Addo-Tham *et al.*, 2020; Mwove *et al.*, 2020). Collaboration between municipal assemblies and other agencies is suggested to strengthen and sustain food safety programs (Addo-Tham *et al.*, 2020).

### 4.4. Significance differences in the practices of street food vendors by age and training attended

**Table 5.** Kruskal-Wallis Test for significant difference in the practices of street food vendors by age and training attended

| Null Hypothesis | Test | Sig. | Decision |
|---|---|---|---|
| The distribution of P AVE is the same across age categories. | Independent-Samples Kruskal-Wallis Test | .075 | Retain the null hypothesis. |
| The distribution of P AVE is the same across categories of Training Attended. | Independent-Samples Kruskal-Wallis Test | .097 | Retain the null hypothesis. |

** Significant at.05 level of significance*

The results of the Kruskal-Wallis Test, as presented in Table 5, indicate that there are no statistically significant differences in the food safety practices of street food vendors when grouped according to age (p = 0.075) and training attended (p = 0.097), as both p-values exceed the 0.05 level of significance. Thus, the null hypotheses for both variables are retained. This suggests that street food vendors, regardless of their age or whether they have attended food safety training, tend to demonstrate similar levels of practice in maintaining food safety.

The findings imply that age does not significantly influence adherence to food safety practices, which may suggest that good practices are not necessarily acquired through age or experience alone. Likewise, the absence of significant variation in practices based on training attendance raises concerns about the effectiveness and impact of current food safety training programs. It is possible that the training content may be too theoretical or lacking in practical application, or that vendors face barriers in implementing what they have learned due to economic constraints, limited resources, or lack of follow-up support. These results underscore the need to enhance food safety interventions by developing more practical, behavior-oriented, and context-sensitive training programs. Additionally,

implementing regular monitoring, providing incentives for compliance, and promoting continuous education may improve the adoption of proper food safety practices. The findings also highlight the importance of reinforcing knowledge with behavior change strategies to ensure that training efforts translate into safe food handling behaviors among street food vendors.

### 4.5. Targeted training program for street food vendors

Street food vending plays a vital role in the local economy of Alfonso Lista, Ifugao, providing affordable and accessible meals to the community. However, due to the informal nature of this sector, there are often gaps in food safety knowledge and hygienic practices among vendors. These gaps can lead to food contamination, resulting in foodborne illnesses that affect both vendors and consumers.

To address these challenges, the College of Business and Management of Ifugao State University (IFSU) Potia Campus has developed a community-focused training initiative titled "Safe Food, Healthy Streets: Enhancing the Knowledge, Attitudes, and Practices of Street Food Vendors on Food Safety and Hygiene" based on the salient findsings of the study. This program is specifically designed for street food vendors operating in Alfonso Lista, with the goal of equipping them with practical knowledge, positive attitudes, and essential food safety skills. This training program, "Safe Food, Healthy Streets," is designed to address these challenges by enhancing the knowledge, attitudes, and practices of street food vendors regarding food safety and hygiene. Through a practical, hands-on approach, vendors will learn the essential principles of food safety—from proper handwashing and food handling to stall sanitation and waste management. The goal is to empower vendors with the skills and motivation needed to apply safe practices in their daily operations, ultimately promoting a healthier and safer street food environment for all. The "Safe Food, Healthy Streets" comprises a series of training and capacity-building programs, followed by three weeks of monitoring and support. It consists of five focused modules covering essential topics such as food safety awareness, personal hygiene, safe food handling, stall sanitation, and waste disposal. The program employs interactive lectures, demonstrations, role-plays, group discussions, and hands-on activities to ensure participant engagement and retention of learning. The training is designed specifically for street food vendors operating in Potia, Sta. Maria, Busilac, and Namillangan, Alfonso Lista, Ifugao. It aims to produce measurable improvements in vendors' food safety practices, with success indicators including increased knowledge test scores, observed behavioral changes, and participant feedback. By the end of the training, vendors will not only receive certificates of participation but also gain the confidence and competence to serve food that is safe, clean, and prepared with care, ultimately protecting public health and enhancing customer trust.

## 5. CONCLUSION

The findings of this study reveal that street food vendors in Potia, Sta. Maria, Busilac, and Namillangan, Alfonso Lista, Ifugao, generally possess a high level of knowledge and positive attitudes toward food safety and hygiene. Overall mean scores of 3.59 and 3.66, respectively, fall within the "Strongly Agree" and "Always" interpretation ranges. These results suggest that vendors are well-informed about the causes and consequences of foodborne illnesses and the importance of maintaining personal and environmental hygiene in their operations. However, the practical application of this knowledge and attitude appears to be less consistent. While many critical behaviors, such as using safe ingredients, cooking food to proper temperatures, and avoiding expired products, are frequently observed, several essential practices, like utensil sterilization, use of protective gear, and avoidance of food handling when sick, are only occasionally followed. This discrepancy points to a knowledge-practice gap that could compromise food safety in the community. The statistical analysis further confirms that neither age nor training attendance significantly affects vendors' food safety practices. This finding suggests that current training programs may not be effectively influencing behavior and that age-related experience does not guarantee improved safety compliance.

## RECOMMENDATION

Based on the findings of the study, several recommendations are proposed to enhance the knowledge, attitudes, and practices of street food vendors regarding food safety and hygiene. While the respondents demonstrated a generally high level of knowledge on food safety, there remains a clear need to strengthen the application of this knowledge in day-to-day vending practices. It is recommended that local government units (LGUs), in collaboration with the Department of Health (DOH) and other relevant agencies, conduct regular community-based food safety education campaigns using accessible and localized materials. These initiatives should be tailored to the local context, utilizing the vernacular language and culturally appropriate illustrations to enhance understanding and retention. Furthermore, the introduction of a mandatory Basic Food Safety Knowledge Certification for all street food vendors is advised, with periodic refresher sessions to ensure sustained awareness and compliance with evolving food safety standards. Although the study revealed that the respondents held positive attitudes toward food safety, reinforcing these attitudes through structured behavioral interventions is essential. LGUs can promote a stronger food safety culture by recognizing model vendors who consistently practice proper hygiene and safety protocols, thereby encouraging peer learning and mentorship within vendor communities. Instituting an incentive system, such as providing free sanitary supplies, offering business permit discounts, or public commendations, can further motivate vendors to uphold proper hygiene standards. Training programs should also incorporate behavior change strategies such as storytelling and value-based reflections, emphasizing the ethical responsibility of food handlers to protect public health.

In terms of actual food safety practices, while vendors reported often engaging in hygienic behaviors, gaps persist in areas such as hand hygiene, utensil sanitization, and avoiding food handling while sick. Addressing these gaps requires practical support, including the installation of accessible handwashing

stations near vending sites and the distribution of subsidized food safety kits containing essential items like gloves, soap, and alcohol. Moreover, LGUs should implement sanitation checklists and conduct routine, unannounced inspections to monitor vendor compliance. To address the risky practice of working while ill, a municipal ordinance should be enacted to prohibit food handling during illness, accompanied by temporary support mechanisms such as food assistance or small grants to reduce the economic pressure on affected vendors.

Lastly, the study found no significant differences in knowledge, attitudes, or practices based on age or prior training, suggesting that current training programs may not be sufficiently impactful. It is recommended that training content be redesigned to focus on hands-on, skills-based learning rather than purely theoretical instruction. Training modules should integrate adult learning strategies and be adaptable to various age groups. In addition, post-training support should be established, with barangay health workers or community volunteers conducting regular follow-ups to ensure that training concepts are translated into daily practices. Periodic assessment and revision of training materials, informed by vendor feedback and local challenges, will help maintain the relevance and effectiveness of these initiatives.

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