ENSIGN GLOBAL UNIVERSITY, KPONG
EASTERN REGION, GHANA

FACULTY OF PUBLIC HEALTH
DEPARTMENT OF COMMUNITY HEALTH

HYGIENE PRACTICES AMONG FOOD VENDORS IN EDUCATIONAL INSTITUTIONS IN LOWER MANYA KROBO MUNICIPALITY IN THE EASTERN REGION OF GHANA

BY

LILLIAN MONICA ADAMS
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A THESIS SUBMITTED TO THE DEPARTMENT OF COMMUNITY HEALTH, FACULTY OF PUBLIC HEALTH, ENSIGN GLOBAL COLLEGE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE MASTER OF PUBLIC HEALTH DEGREE

NOVEMBER 2025

DECLARATION

I hereby certify that, except for references to other people's work, which I have duly cited, this project submitted to the Department of Community Health, Ensign Global University, Kpong, is the result of my own investigation and has not been presented for any other degree elsewhere.

LILLIAN MONICA ADAMS …….. 07-11-25 ……

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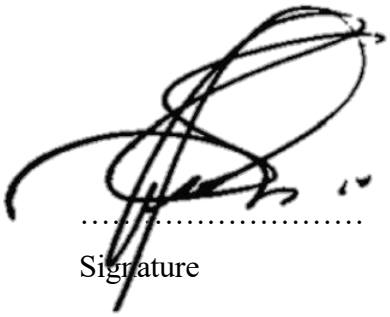
(STUDENT)



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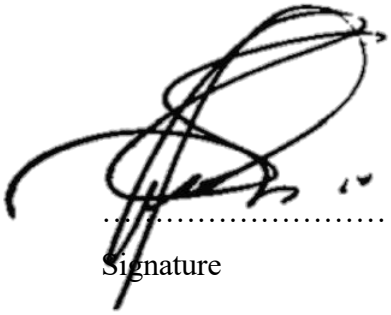
DR. STEPHEN MANORTEY …… 7-11-25 ……

(Supervisor) Signature Date



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DR. STEPHEN MANORTEY …… 7-11-25 ……

(Head of Academic Program) Signature Date

DEDICATION

This work is dedicated first to God Almighty, whose grace, wisdom, and strength made this study possible from inception to completion.

Secondly, I am grateful to my beloved father Rev. Josephus Bonnie for his love, guidance, and sacrifices which has been my greatest inspiration. Your faith in me gave me the strength to persevere even in challenging times.

I also dedicate this study to all food vendors and educators whose daily efforts ensure that students are nourished and cared for in school environments. Your hard work, often unseen, inspired the motivation behind this research.

Finally, this work is lovingly dedicated to my cherished grandparents, whose constant prayers unwavering love, wisdom, and encouragement have always been my guiding light. Your moral and emotional support provided the motivation that carried me through this journey.

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First and foremost, I give thanks to Almighty God for His divine guidance, grace, and strength that have sustained me throughout the course of this study. Without His favor, this achievement would not have been possible.

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I would also like to extend my heartfelt gratitude to Mr. Stephen Afakorzi for his genuine support, dedication and, assistance throughout this journey. His kindness and willingness to help at every stage greatly contributed to the successful completion of this work.

My sincere appreciation goes to the management and staff of the Lower Manya Krobo Municipal Education Directorate and all school authorities who granted permission and supported data collection in their institutions. I also extend heartfelt thanks to the food vendors who willingly participated in this study and shared their experiences despite their busy schedules.

Finally, I express profound gratitude to my family and friends for their unwavering love, prayers, and encouragement.

ABSTRACT

Background: Food hygiene plays a critical role in safeguarding public health, particularly in school environments where students are reliant on food vendors for daily meals. In Ghana, lapses in hygiene among food vendors have been linked to foodborne illnesses and outbreaks, emphasizing the need for targeted interventions. Despite the widespread presence of food vendors in educational settings, there is limited data on their hygiene-related knowledge, attitudes, and practices (KAP), especially in the Lower Manya Krobo Municipality. This study aims to assess the levels of hygiene KAP among food vendors in educational institutions and examine the socio-demographic factors that influence these practices.

Methodology: An analytical cross-sectional survey design was employed, targeting food vendors operating within public and private schools in the Lower Manya Krobo Municipality. Data were collected using a structured, interviewer-administered questionnaire based on validated KAP tools. Pre-testing of the questionnaire was conducted among schools in a town not included in the data collection. Data were analyzed using STATA version 18, employing descriptive statistics and inferential methods such as Chi-square tests and logistic regression to identify predictors of good hygiene behavior.

Results: A total of 388 vendors were surveyed. Overall hygiene knowledge was high in 29.1%, moderate in 44.1%, and low in 26.8%. Hygiene attitudes were positive in 57.5%, fair in 30.6%, and poor in 11.9%. Hygiene practices were good in 34.0%, fair in 44.3%, and poor in 21.6%. Bivariate analyses showed no significant associations between socio-demographic variables and knowledge (all $p > 0.05$). Attitudes were associated with age ($p < 0.001$), sex ($p = 0.039$) and training ($p = 0.05$) but not with marital status, education, work experience, or training ($p > 0.05$). Practices were associated with age ($p = 0.012$) and marital status ($p = 0.041$), but not with sex, education,

work experience, or training ($p > 0.05$). In multivariable models of formal training, vendors with tertiary education had lower odds of having received training than those with JHS (AOR = 0.418; $p = 0.028$); vendors with low (AOR = 0.386; $p = 0.033$) and moderate knowledge (AOR = 0.407; $p = 0.016$) also had lower odds compared with those with high knowledge.

Conclusion: Food vendors in educational settings in Lower Manya Krobo Municipality exhibit generally moderate KAP, but there is a clear knowledge-to-practice gap, especially for hand hygiene and waste management. Age and marital status shape hygiene practices, and younger/single vendors appear more vulnerable to suboptimal behaviours. Improving safety requires continuous, practical hygiene training, regular supervision/inspection, and basic infrastructure (handwashing stations, covered bins) at vending points. Given the training disparities, targeted outreach should prioritize vendors with lower knowledge and ensure training access across all education levels, including those with tertiary education, to translate awareness into consistent safe practices.

Keywords: Food hygiene, Food vendors, Environmental Health and Sanitation, Lower Manya Krobo, Ghana

LIST OF ABBREVIATIONS

Abbreviation	Meaning
AOR	Adjusted Odds Ratio
BCC	Behavior Change Communication
CI	Confidence Interval
FDA	Food and Drugs Authority
GES	Ghana Education Service
GHS	Ghana Health Service
IRB	Institutional Review Board
JHS	Junior High School
KAP	Knowledge, Attitude, and Practice
KG	Kindergarten
LMK	Lower Manya Krobo
MMDA	Metropolitan, Municipal and District Assembly
NGO	Non-Governmental Organization
OR	Odds Ratio
PTA	Parent-Teacher Association
SHS	Senior High School
STATA	Data Analysis and Statistical Software
TVET	Technical and Vocational Education and Training
WHO	World Health Organization

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

In many developing countries, including Ghana, informal food vending plays a vital role in the daily lives of the population (Forkuor, Akuoko, & Yeboah, 2017). Food vending is an essential part of the informal economy in Ghana, providing accessible and affordable meals to many segments of the population. In educational institutions, particularly basic and secondary schools, food vendors play a critical role in meeting the daily nutritional needs of students and staff. Many students, especially in urban and peri-urban settings, depend on these vendors due to the absence, or inadequacy of school feeding programs or canteen services (John, 2024). Despite their importance, food vendors often operate in conditions that do not meet minimum hygiene and safety standards (Akabanda *et al.,* 2017; Muyanja, 2011).

Globally, foodborne diseases remain a significant public health issue. The World Health Organization (WHO) estimates that approximately 600 million people fall ill and 420,000 die each year due to contaminated food, with the highest burden in low- and middle-income countries (WHO, 2015). In Ghana, foodborne illnesses such as cholera, typhoid, and food poisoning are frequently reported and often linked to poor hygiene among food handlers (Cudjoe et al., 2022). Studies from urban centers like Accra and Kumasi have highlighted issues such as inadequate hand hygiene, improper food storage, and the use of contaminated water by food vendors (Ahiabor *et al.,* 2024; Botha *et al.,* 2023).

Research conducted in Ghana has consistently revealed substandard hygiene practices among food vendors, including improper handwashing, use of contaminated water, inadequate food storage,

and poor waste disposal (Cudjoe et al., 2022; Dwumfour-Asare & Agyapong, 2014). These practices increase the risk of food contamination, potentially leading to outbreaks of diseases such as typhoid, cholera, and various diarrheal illnesses. In many cases, food vendors lack formal training in food hygiene and operate in environments without access to clean water or sanitation facilities (Canuto et al., 2024; Moges, Rodland & Argaw, 2024).

One of the primary determinants of food hygiene practices among food vendors is their level of knowledge regarding food hygiene. This knowledge is widely regarded as a critical factor influencing both their attitude and actual hygiene-related behaviours. For instance, a study conducted by Annor and Baiden (2011) assessing food hygiene knowledge, attitudes, and practices among food handlers in Accra found that, while participants generally demonstrated satisfactory levels of knowledge and positive attitudes, their actual hygiene practices were inadequate. Similarly, Ababio and Lovatt (2015), in their review of studies involving food vendors in Ghana, also reported substandard hygiene practices, highlighting the significant public health risks this poses, particularly within educational settings.

The educational setting presents unique vulnerabilities. Students often have limited choices regarding where and what to eat and may be unaware of the risks associated with poor hygiene. Moreover, educational institutions, especially public schools are often overcrowded with limited monitoring of food vending activities. Food vendors operating around these institutions are sometimes unregistered and unsupervised, further increasing the potential for unhygienic practices and foodborne disease transmission. Many of these vendors operate in unsanitary environments and lack basic facilities such as clean water, handwashing stations, and proper waste disposal (Ababio & Lovatt, 2015). Despite these challenges, there is limited local data on the food hygiene practices of vendors serving educational institutions in this municipality.

Although Ghana has policies and guidelines on food hygiene developed by bodies such as the Food and Drugs Authority (FDA) and the Environmental Health and Sanitation Department, their implementation and enforcement at the local level remain weak. For example, regular inspection of vending sites and licensing of vendors are often not carried out due to resource constraints and lack of coordination among regulatory agencies (Ababio & Lovatt, 2015). Furthermore, previous studies have primarily focused on street food vendors in general markets and urban areas, with little emphasis on those who operate in or near schools.

Given the critical importance of food safety in educational institutions, there is a need to assess the current hygiene practices among food vendors in these settings. Understanding their level of knowledge, daily practices, and compliance with food safety regulations will help identify gaps and inform targeted interventions. Such evidence is vital for developing public health strategies aimed at reducing foodborne illnesses and promoting a safe food environment for students and staff in Ghanaian schools.

1.2 Problem statement

Food safety is a critical public health concern globally, with unsafe food handling and poor hygiene practices contributing significantly to the burden of foodborne illnesses. According to the World Health Organization (WHO, 2020), an estimated 600 million people fall ill and 420,000 die annually due to foodborne diseases, with most cases occurring in low- and middle-income countries. The World Health Organization further reports that the African Region bears the highest per-capita burden of foodborne diseases, accounting for over 91 million cases and approximately 137,000 deaths each year (Mensah et al., 2016; WHO, 2020). In Ghana, foodborne illnesses remain a significant public health challenge, with an estimated 626,000 cases of food poisoning reported

annually, leading to nearly 298,000 hospitalizations and over 90,000 deaths (Cudjoe et al., 2022; Botha et al., 2023).

Food vending is a key source of livelihood for many individuals in Ghana, especially in urban and peri-urban communities. However, a large proportion of these vendors operate informally and outside the regulatory framework of health and food safety standards (Mensah *et al.,* 2016).

Educational institutions present a unique setting where students, many of whom are children and adolescents rely on food vendors for their daily meals. These students are particularly vulnerable to foodborne diseases due to their developing immune systems and limited capacity to assess food safety. In the Lower Manya Krobo Municipality, food vending around schools is widespread, yet little is known about the hygiene knowledge, attitudes, and practices of the vendors who serve these institutions.

Preliminary observations indicate persistent issues with hand hygiene, waste disposal, and food storage among vendors in the area. Despite these concerns, few studies have explored the determinants of proper hygiene practices in educational settings within this municipality. Without data-driven evidence, it is difficult for local health authorities and educational stakeholders to develop effective interventions and policies that protect students' health.

This study seeks to address this gap by assessing the hygiene practices of food vendors operating in educational institutions in the Lower Manya Krobo Municipality and examining the socio-demographic factors that influence these practices. Understanding these relationships is critical to designing context-specific strategies aimed at improving food safety and reducing the incidence of foodborne diseases in school environments (World Health Organization, 2022).

1.3 Rationale

In terms of scientific relevance of the study, the findings may help fill important knowledge gaps and guide future research efforts on food hygiene and public health in similar settings. This is because most existing studies in Ghana have focused on urban centers like Accra and Kumasi, leaving peri-urban and rural areas underrepresented in the scientific literature. By focusing on food vendors in educational institutions within the Lower Manya Krobo Municipality, this study may contribute new evidence from a less-studied geographical context. For the educational relevance of the study, understanding hygiene knowledge, attitudes, and practices of food vendors who serve these students is essential for developing effective school health strategies. Findings from this study can inform the Ghana Education Service (GES), Parent-Teacher Associations (PTAs), and school administrators in implementing food safety education, monitoring policies, and regulations that protect student health and improve school food environments.

Finally, the findings may have practical implications for health authorities, policymakers, and environmental health officers working at the district and regional levels. By identifying gaps in hygiene practices and their socio-demographic determinants, the study will provide data to support targeted interventions such as training programs, behavior change communication strategies, and enhanced inspection protocols. Moreover, the study will offer insights that can be used by the Environmental Health and Sanitation Unit in Lower Manya Krobo Municipality to revise licensing and monitoring procedures for food vendors. Ultimately, improving food hygiene among vendors in school settings has the potential to reduce the incidence of foodborne diseases, minimize student absenteeism, and enhance community health outcomes.

1.4 Conceptual framework

The conceptual model for this study pictorially presents the study objectives, which seek to examine the factors influencing food vendors' hygiene knowledge, attitudes, and practices (KAP) within educational institutions. The model is grounded in the KAP framework, which posits that knowledge influences attitudes, which in turn shape practices. The first component of the model focuses on assessing the level of hygiene knowledge among food vendors. This includes understanding basic food safety principles, contamination risks and preventive measures. The second component evaluates the attitudes toward hygiene, such as perceptions of the importance of cleanliness, motivation to maintain hygiene standards, and willingness to adopt best practices. The third component involves analyzing actual hygiene practices, including handwashing, use of protective clothing, and food storage methods. Central to the model is the interrelationship between these three domains, that is, knowledge, attitude, and practice based on the assumption that higher knowledge levels foster positive attitudes, which in turn promote improved hygiene behaviours. However, the model also acknowledges that this relationship may not be linear or automatic. To further contextualize these relationships, the model incorporates socio-demographic factors (such as age, gender, education level, training, and years of experience) as key variables that may influence each domain of the KAP framework. The interrelationships are summarized in Fig. 1 below.

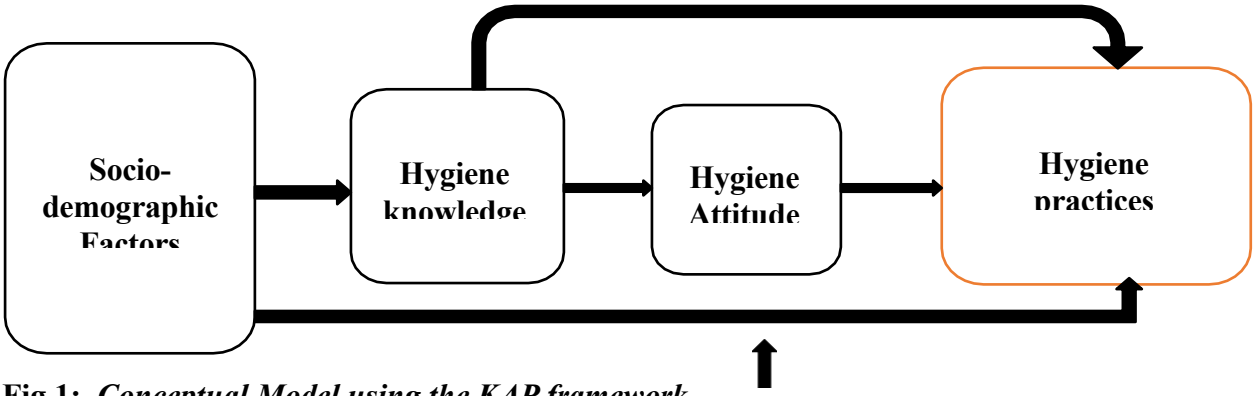

Fig.1: ***Conceptual Model using the KAP framework***

Source: Adapted from KAP Framework (World Health Organization, 1950)

1.5 Research questions

1. What is the overall level of food hygiene knowledge, attitudes, and practices among food vendors in educational institutions within the Lower Manya Krobo (LMK) Municipality?
2. What are the statistical associations between selected socio-demographic characteristics of food vendors and their levels of food hygiene knowledge, attitudes, and practices in the LMK Municipality
3. Which socio-demographic factors significantly influence food hygiene knowledge, attitudes, and practices among food vendors in educational institutions within the LMK Municipality?

1.6 General Objective

This study seeks to investigate the hygiene practices among food vendors in educational institutions in the Lower Manya Krobo Municipality.

1.7 Specific objectives

1. To assess the overall level of food hygiene knowledge, attitudes, and practices among food vendors in educational institutions in LMK Municipality.

2. To analyze the statistical associations between selected food vendor socio-demographic characteristics and their food hygiene knowledge, attitudes, and practices.
3. To identify the socio-demographic factors that influence food hygiene knowledge, attitudes, and practices among food vendors in educational institutions in the LMK Municipality.

1.8 Profile of study area

Lower Manya Krobo Municipal is one of the 261 Metropolitan, Municipal, and District Assemblies (MMDAs) in Ghana, and forms part of the thirty-three (33) Municipalities and Districts in the Eastern Region. It lies between latitudes 6.05S and 6.30N and longitudes 0.08E and 0.20W. with the Administrative Capital of the District as Odumase. The Municipality covers an area of approximately 316 km², representing about 1.64% of the total land area of the Eastern Region, which spans 19,323 km² (Ghana Statistical Service, 2021). The major towns in the district include Odumase township (which incorporates Atua, Agormanya and Nuaso), Akuse and Kpong in the Lower Manya area. The Municipality shares boundaries with Upper Manya Krobo District to the north, to the south with Shai Osudoku District, to the west with Yilo Krobo Municipal and to the east with Asuogyaman District. The population of the Municipality according to 2021 population and housing census stands at 121,478 with 56,662 males and 64,816 females.

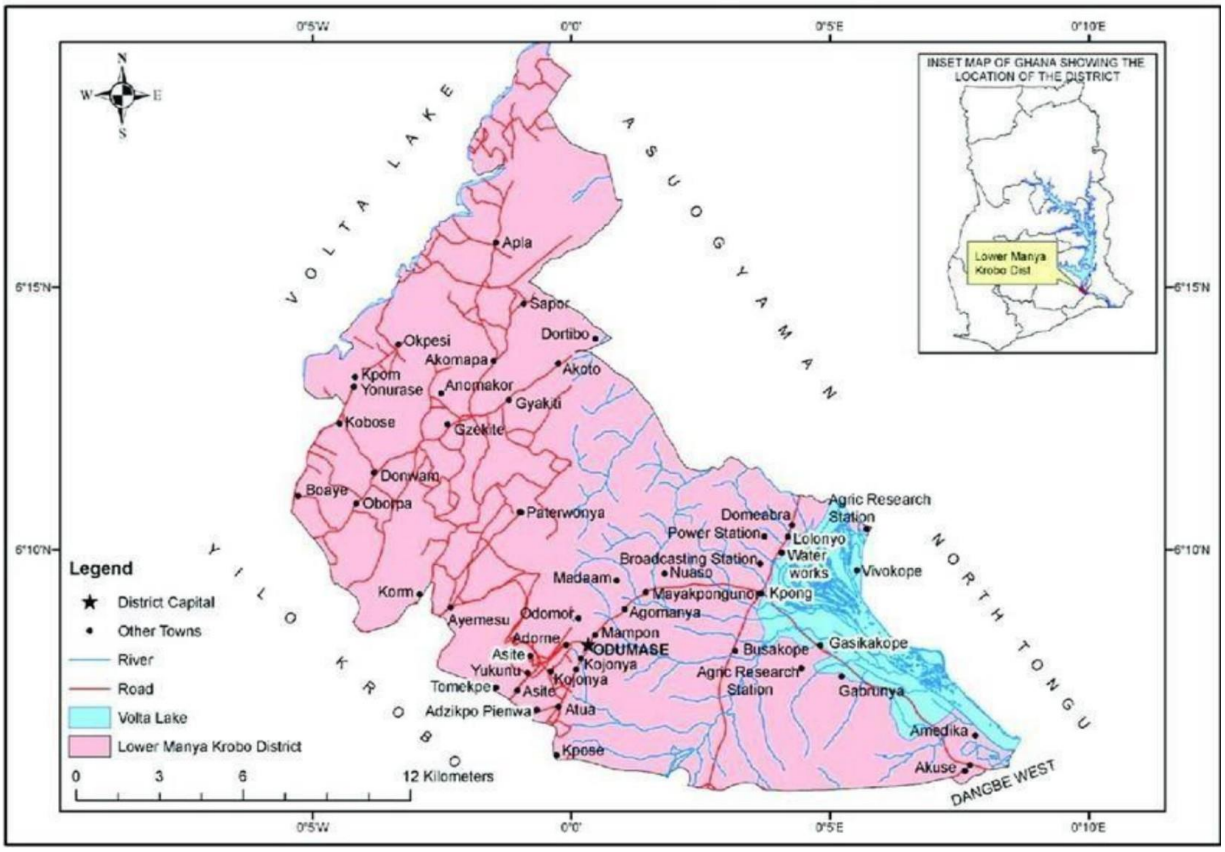

Figure 2 Map of the lower Manya Krobo municipal area

Source: (Lartey-Nyaanu, R. 2023)

1.9 Scope of Study

This study is geographically limited to the Lower Manya Krobo Municipality in the Eastern Region of Ghana. The Municipality covers an estimated area of 316 km², representing approximately 1.64% of the total land area of the Eastern Region, which spans 19,323 km² (Ghana Statistical Service, 2021). The area was chosen due to the high concentration of food vendors operating within and around basic and secondary schools, making it an ideal context for assessing hygiene practices and compliance with food safety regulations.

Thematically, the study focuses on assessing food hygiene knowledge, attitudes, and practices

among food vendors serving educational institutions. It specifically examines their awareness of hygiene standards, actual hygiene behaviors during food preparation and service, and adherence to environmental health and sanitation guidelines. The study does not extend to household food handlers, restaurant operators, or vendors in unrelated commercial settings.

Methodologically, the research is limited to quantitative data collected through a structured questionnaire administered to selected food vendors within the Municipality. Data collection, analysis, and interpretation are therefore confined to responses obtained during the study period. Consequently, while the findings offer valuable insights into the hygiene behaviours of food vendors within the Lower Manya Krobo Municipality, they may not be generalizable to all food vendors across Ghana due to contextual variations in enforcement, infrastructure, and training exposure.

1.10 Organization of Report

Chapter One presents the introduction, which includes the background of the study, statement of the problem, objectives, research questions, justification, significance, scope, and organization of the report. This chapter establishes the foundation and rationale for the study.

Chapter Two provides a review of relevant literature, covering theoretical perspectives and empirical studies related to food hygiene, food safety knowledge, and hygienic practices among food vendors. The chapter also identifies gaps in existing literature that justify the need for this study.

Chapter Three outlines the research methodology, describing the research design, study area, population, sample size, sampling techniques, data collection tools, procedures, analysis methods, and ethical considerations guiding the study.

Chapter Four presents the results and findings, including descriptive and inferential analyses of

the data collected, with appropriate tables and figures for interpretation.

Chapter Five discusses the findings in relation to existing literature, highlighting areas of convergence or divergence and their implications for public health and food safety in educational institutions.

Finally, Chapter Six provides the conclusions and recommendations, summarizing key findings and proposing actionable measures for policy makers, local authorities, and health institutions to improve food hygiene practices among food vendors in the Lower Manya Krobo Municipality.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

Food hygiene has emerged as a central issue in global public health discourse, given its direct implications for foodborne disease prevention and overall community well-being. According to the World Health Organization (WHO), unsafe food causes more than 200 diseases, with an estimated 600 million cases of foodborne illnesses and 420,000 deaths annually worldwide, disproportionately affecting low- and middle-income countries where regulation and monitoring systems are often weak (WHO, 2020). Schools represent a particularly sensitive environment because children and adolescents are physiologically more vulnerable to foodborne pathogens due to their developing immune systems. With many students in low- and middle-income countries, including Ghana relying on food vendors for daily meals, food hygiene in educational settings becomes a matter of both health protection and academic productivity. Poor hygiene among food vendors in schools has been linked not only to outbreaks of foodborne diseases but also to increased absenteeism and reduced academic performance, further highlighting its societal impact (Grace, 2015; Ahiabor *et al*., 2024).

The literature on food hygiene practices has often adopted the Knowledge, Attitude, and Practice (KAP) framework, which emphasizes the interconnection between what individuals know, how they perceive an issue, and the behaviors they demonstrate. While numerous studies show that food vendors may possess satisfactory levels of knowledge, actual practices frequently fall short of established safety standards, reflecting a gap between awareness and behavior (Akabanda *et al*., 2017; Moges *et al*., 2024). Furthermore, socio-demographic factors such as education, training,

age, and years of experience have been shown to significantly influence hygiene-related behaviors, underscoring the importance of context-specific assessments (Canuto *et al*., 2024).

Despite the growing body of evidence globally and across Africa, research focusing on food vendors in peri-urban Ghanaian school environments remains limited. Most studies have been concentrated in metropolitan centers like Accra and Kumasi, leaving municipalities such as Lower Manya Krobo underexplored. This literature review therefore situates the study within global, African, and Ghanaian scholarship on food hygiene, critically assessing knowledge, attitudes, practices, and their socio-demographic determinants to highlight existing gaps and justify the present research.

2.2 Hygiene Knowledge of Food Vendors

Food hygiene knowledge forms the foundation for safe food handling practices and is often considered the first barrier against foodborne illnesses (Akabanda, Hlortsi & Owusu-Kwarteng, 2017). Knowledge in this context refers to an individual's understanding of principles related to contamination, personal hygiene, safe storage, and cross-contamination prevention. Globally, foodborne diseases remain one of the most significant public health concerns, with an estimated 600 million people falling ill each year and 420,000 deaths attributed to contaminated food (WHO, 2020). Food vendors, particularly those operating in schools and public institutions, play a crucial role in either preventing or exacerbating these risks. Studies have consistently demonstrated that even where food handlers are aware of basic hygiene requirements, lapses in knowledge such as the correct temperature for food storage or the importance of handwashing create vulnerabilities in the food safety chain (Basch *et al*., 2019). This suggests that knowledge is not only a determinant of attitudes and practices but also a predictor of the quality of meals served to populations at risk, including school children.

Globally, literature has shown variability in the hygiene knowledge of food vendors and handlers across different contexts. For instance, in Brazil, Canuto *et al*. (2024) assessed food handlers in public schools and found that while many vendors were aware of the importance of personal hygiene and preventing contamination, gaps existed in their understanding of foodborne pathogens and safe storage practices. In China, studies by Liu *et al*. (2019) revealed similar trends, showing that although food handlers demonstrated basic awareness of hand hygiene, only a minority understood critical control points such as avoiding cross-contamination between raw and cooked foods. Likewise, in India, Choudhury *et al*. (2019) reported that while street food vendors possessed some knowledge of hygiene due to routine exposure to training campaigns, their knowledge of regulatory standards and microbiological risks was limited.

In developed countries, food hygiene training programs have demonstrated strong links between knowledge and compliance. For example, a systematic review by Soon, Baines, and Seaman (2020) concluded that structured food safety training significantly improved knowledge retention among institutional food handlers, though its translation into practice varied. The global evidence therefore points to a common pattern: food vendors typically possess some level of basic hygiene knowledge, but advanced or technical understanding, such as temperature control, pathogen risks, and regulatory standards, remains limited.

In African contexts, the issue of food hygiene knowledge is compounded by limited infrastructure, weak enforcement of food safety laws, and resource constraints. A cross-sectional study in Ethiopia by Moges, Rodland and Argaw (2024) found that although most street food vendors reported awareness of handwashing as a hygiene requirement, few could identify the health consequences of poor food storage, reflecting significant knowledge gaps. In Uganda, Muyanja *et al*. (2011) showed that vendors often lacked formal training, and their knowledge was primarily acquired

informally through observation or experience, which left critical areas like contamination pathways inadequately understood.

More recent research from Nigeria highlights similar challenges. Okojie and Isah (2019) found that while food handlers in university canteens had reasonable knowledge of personal hygiene, their knowledge of microbial risks and safe food handling practices was insufficient, leading to heightened risks of contamination. Across the continent, the common issue remains that training, when it exists, tends to be sporadic and does not always cover the breadth of food hygiene knowledge needed to prevent outbreaks. This lack of comprehensive knowledge leaves many food handlers and vendors inadequately prepared to implement effective safety measures.

In Ghana, several studies have explored food hygiene knowledge among food vendors, though most are concentrated in urban settings. Akabanda, Hlortsi and Owusu-Kwarteng (2017) conducted a study among institutional food-handlers and found that while respondents were knowledgeable about the importance of handwashing and general cleanliness, much lacked knowledge of safe food temperatures and contamination risks. Similarly, Ababio and Lovatt (2015) in a review of food hygiene studies in Ghana, reported that food vendors frequently demonstrated gaps in their understanding of microbial hazards, despite showing awareness of basic hygiene concepts such as washing hands and keeping cooking areas clean.

Recent work by Cudjoe *et al*. (2022) confirmed these findings, noting that food handlers in Ghana displayed significant disparities between their awareness of hygiene standards and their deeper understanding of foodborne pathogens. Moreover, Ahiabor *et al*. (2024), in a scoping review on foodborne microbiological hazards in Ghana, argued that while most food vendors know about visible cleanliness, their knowledge rarely extends to less visible but equally critical elements such

as time–temperature control or pathogen transmission routes. This suggests that while knowledge exists at the surface level, critical technical knowledge remains underdeveloped.

Another important dimension in Ghana is the role of training and education. For instance, Cudjoe et al. (2022) reported that food vendors who had received formal hygiene training or attained higher education levels were significantly more likely to demonstrate correct food safety knowledge compared to those without such exposure. Similarly, Ahiabor et al. (2024) emphasized that continuous refresher training strengthens vendors' compliance with hygiene standards and improves long-term food safety outcomes. Yet, training opportunities are often irregular, and when they exist, they are not always systematically reinforced. This points to the importance of continuous capacity-building for food vendors, particularly those working in school environments where the risks of outbreaks are higher due to the vulnerability of children.

The evidence across global, African, and Ghanaian contexts demonstrates that food vendors often have partial but insufficient knowledge of food hygiene. Globally, there is a clear recognition of the importance of food hygiene, but gaps exist in technical understanding. In Africa, particularly in resource-limited contexts, knowledge deficiencies are more pronounced due to inadequate training infrastructure and limited enforcement of regulations (Moges, Rodland & Argaw, 2024; Nkosi & Tabit, 2021). In Ghana, while vendors often exhibit awareness of basic hygiene requirements, gaps remain in technical areas such as microbial risks and safe storage practices. The school environment further amplifies these challenges, as students are a vulnerable group with little control over their food sources (Ahiabor et al., 2024; Ababio & Lovatt, 2015).

In summary, the literature shows that while food endorse generally possess a baseline of hygiene knowledge, significant gaps persist, especially in peri-urban areas that receive less regulatory attention. This underscores the need for targeted interventions to strengthen food hygiene

knowledge through systematic training, reinforcement, and monitoring. Addressing these gaps is essential not only to improve vendor compliance but also to safeguard the health of schoolchildren and the wider community.

2.3 Hygiene Attitudes of Food Vendors

Attitudes toward food hygiene represent a critical intermediary between knowledge and actual practices. In the Knowledge–Attitude–Practice (KAP) framework, attitudes are conceptualized as the beliefs, perceptions, and dispositions that shape how knowledge is internalized and translated into behaviour (Akabanda, Hlortsi & Owusu-Kwarteng, 2017; Nee & Sani, 2019). Food vendors may possess the necessary knowledge of safe food handling, but unless they perceive hygiene as important, feasible, and relevant to their work, the likelihood of consistent safe practices remains limited (Choudhury et al., 2019; Nkosi & Tabit, 2021). Attitudes therefore bridge the gap between awareness and behavior, determining whether food safety standards are taken seriously or neglected (Soon, Baines & Seaman, 2020).

In the context of school food environments, the attitudes of food vendors are particularly important because children are both vulnerable to foodborne illness and often unable to question food safety practices (Canuto *et al*., 2024). Studies globally and regionally have highlighted that while many food vendors express positive attitudes towards hygiene, these attitudes do not always align with their actual behavior (Akabanda, Hlortsi & Owusu-Kwarteng, 2017; Moges, Rodland & Argaw, 2024).

Globally, research indicates that attitudes toward food hygiene among food handlers are shaped by multiple factors, including prior training, regulatory environments, cultural norms, and economic incentives. In a review of food safety training interventions, Soon, Baines and Seaman (2020) reported that food handlers often displayed more positive attitudes following structured training

sessions, particularly regarding hand hygiene, use of protective clothing, and willingness to comply with regulations. However, this attitudinal shift did not always persist long-term, suggesting that reinforcement is necessary for sustainability.

In a study conducted in Malaysia, Nee and Sani (2019) found that although most food vendors believed hygiene was important for protecting customers, a large proportion admitted that they cut corners when faced with high customer demand or time pressures. This highlights the attitudinal conflict between economic pressures and hygiene standards. Similarly, Basch *et al.* (2019), studying food vendors in New York City, noted that while vendors expressed favorable attitudes towards maintaining hygiene, their behavior was influenced by environmental constraints such as limited access to clean water or storage facilities.

From these studies, a pattern emerges: positive attitudes are common but not sufficient predictors of hygiene behaviors, especially when structural and resource limitations undermine their application.

In African contexts, attitudes toward food hygiene often reveal the tension between awareness of the importance food safety and the practical challenges of adhering to high standards. In Nigeria, Okojie and Isah (2019) found that university food handlers generally expressed positive attitudes toward hand hygiene, cleanliness, and customer protection. However, many admitted that in practice, they prioritized speed of service and cost reduction over rigorous hygiene standards. This suggests that while attitudes are favorable competing demands dilute their effect on practice.

Similarly, a study in Ethiopia by Moges, Rodland and Argaw (2024) reported that street food vendors had overwhelmingly positive attitudes toward food safety, with most agreeing that hygiene was critical to consumer health. Yet, these attitudes did not translate into consistent safe practices, largely due to a lack of facilities such as handwashing stations and access to clean water. This

reflects the broader challenge in African countries, where attitudes may be supportive, but the environment makes their implementation difficult.

In Uganda, Muyanja *et al*. (2011) observed that many vendors expressed strong concerns about hygiene but lacked the structural capacity to maintain cleanliness, such as refrigeration or waste disposal systems. Such findings point to the importance of distinguishing between attitudes as ideals and their real-world application under constraints.

In Ghana, the available literature highlights similar disjunctions between hygiene attitudes and practices among food vendors. Akabanda, Hlortsi and Owusu-Kwarteng (2017) studied institutional food handlers and reported that the majority held positive attitudes toward food safety, with most participants recognizing its importance in preventing foodborne diseases. Despite this, the study observed a mismatch between attitudes and behaviours, as many vendors still engaged in unsafe practices such as inadequate handwashing or improper storage.

Ababio and Lovatt (2015) echoed these findings in their review, noting that while Ghanaian food vendors often voiced strong positive attitudes towards cleanliness, food protection, and customer health, their practices revealed persistent shortcomings. More recent work by Cudjoe *et al*. (2022) has further reinforced this trend, reporting that although food handlers recognized the importance of hygiene, actual compliance remained low, particularly in peri-urban settings where enforcement was weak.

Attitudes in Ghana also appear to be influenced by socio-demographic characteristics. Mensah et al. (2016) found that food vendors with formal training or higher education levels not only possessed more knowledge but also expressed stronger positive attitudes toward food hygiene. However, these attitudes were often undermined by external constraints such as cost of compliance, weak regulation, and limited monitoring.

The global, African, and Ghanaian evidence reveals a consistent pattern: food vendors generally express positive attitudes toward hygiene, but these attitudes do not reliably predict safe practices.

The global, African, and Ghanaian evidence reveals a consistent pattern: while food vendors often demonstrate positive attitudes toward hygiene, these attitudes do not reliably translate into safe practices (Akabanda, Hlortsi & Owusu-Kwarteng, 2017; Nkosi & Tabit, 2021; Moges, Rodland & Argaw, 2024). This persistent gap underscores the complexity of the Knowledge–Attitude–Practice (KAP) framework, where attitudes are influenced not only by knowledge but also by broader contextual and structural determinants (Nee & Sani, 2019; Choudhury et al., 2019). In many instances, favorable attitudes remain shaped by awareness of what ought to be done, yet are undermined by economic constraints, inadequate infrastructure, limited supervision, and weak enforcement of hygiene regulations (Mensah et al., 2016; Botha et al., 2023; Cudjoe et al., 2022). For Ghana specifically, the problem is compounded by the limited regulatory attention given to peri-urban and rural settings. Vendors may genuinely believe in the importance of hygiene, but without systemic support, their attitudes remain aspirational rather than practical. This has serious implications for schools, where students are uniquely vulnerable to foodborne diseases.

In conclusion, while food vendors in Ghana and other contexts demonstrate broadly positive attitudes towards food hygiene, these attitudes alone are insufficient to safeguard public health. There is a need for interventions that go beyond promoting awareness or shaping attitudes and instead address the systemic barriers that prevent their translation into safe practices. Training, monitoring, and resource provision are essential to bridge the gap between what food vendors believe and what they do.

2.5 Socio-Demographic Factors Influencing Hygiene KAP

Hygiene behaviours do not occur in isolation; they are significantly shaped by the socio-

demographic characteristics of food vendors, which influence their knowledge, attitudes, and practices. The Knowledge–Attitude–Practice (KAP) framework acknowledges that variables such as age, gender, education, training, and experience moderate the pathways between what food handlers know, how they feel about hygiene, and how they behave (Soon, Baines & Seaman, 2020; Akabanda, Hlortsi & Owusu-Kwarteng, 2017). Understanding these dynamics is critical for designing effective, context-specific interventions that promote safe food handling among diverse groups of vendors.

Globally, education and training consistently emerge as the strongest predictors of proper food hygiene behavior. Vendors with higher levels of education or those who have undergone structured food safety training are more likely to internalize hygienic principles and apply them in practice (Soon, Baines & Seaman, 2020; Canuto et al., 2024). In contrast, limited education often correlates with poor understanding of contamination pathways and weak compliance with hygiene regulations. Similarly, formal training has been shown to strengthen both knowledge retention and behavioral consistency, enabling vendors to adopt updated safety standards (Choudhury et al., 2019).

Age and experience of vendors also play important roles in shaping hygiene behavior. Younger vendors are generally more receptive to training and innovation, while older vendors tend to rely on long- established routines that may not align with current food safety guidelines (Choudhury et al., 2019; Moges, Rodland & Argaw, 2024). Although greater experience can foster familiarity with food handling processes, it can also entrench unhygienic habits if not reinforced by continuous education and monitoring.

Studies across Asia and Africa have consistently reported that female food handlers demonstrate stronger hygiene attitudes and higher compliance with food safety measures compared to their

male counterparts (Nee & Sani, 2019, Nkosi & Tabit, 2021). This tendency may be linked to women's traditional roles in household food preparation, which often enhance their awareness of cleanliness and safety.

In African contexts, these socio-demographic factors interact in complex ways. Evidence from Nigeria indicates that vendors with higher educational attainment and prior training are more likely to practice safe food storage and handling, while those with minimal education often neglect essential hygiene measures despite understanding their importance (Okojie & Isah, 2019). Similarly, research in Ethiopia and South Africa confirms that education, training, gender, and years of experience collectively shape hygiene-related outcomes among food handlers (Moges, Rodland & Argaw, 2024; Nkosi & Tabit, 2021).

Recent studies demonstrate that socio-demographic attributes exert a multidimensional influence on food hygiene behaviours. Their combined effects determine how effectively food vendors translate knowledge into safe practices. Addressing these differences through tailored training, regular monitoring, and inclusive policy frameworks is therefore essential for improving food safety outcomes in both formal and informal food vending environments.

In Uganda, Muyanja *et al*. (2011) found that vendors with more years of experience tended to underestimate the importance of formal hygiene practices, if their longevity in the business equated to competence. This reliance on experience over training was identified as a major barrier to adopting improved food safety standards. Collectively, African studies underscore the importance of education, gender, and experience in shaping hygiene KAP among food vendors.

2.6 Gaps in Literature

Despite the extensive body of research on food hygiene worldwide, several critical gaps remain, particularly in relation to food vendors operating in school environments. Globally, most studies

have examined food hygiene in general food service industries or urban street vending contexts, but relatively fewer have focused specifically on educational institutions. This is a significant oversight because schools host a vulnerable population of children and adolescents whose immune systems are still developing, and who therefore face greater risks from unsafe food. The existing global evidence highlights that while food handlers may demonstrate adequate knowledge and sometimes positive attitudes, practices consistently fall short of international safety standards (Soon *et al*., 2020). However, few studies explore why this gap persists in relation to institutional or school-based food vendors, where regulatory oversight may differ from broader commercial environments.

In Africa, research has documented widespread deficiencies in food hygiene practices, particularly in informal food vending sectors. Studies from Ethiopia, Nigeria, Uganda, and South Africa have identified inadequate handwashing, unsafe storage, poor waste disposal, and minimal use of protective clothing as persistent challenges (Moges *et al*., 2024; Okojie & Isah, 2019; Nkosi & Tabit, 2021), yet most of these investigations remain limited to urban markets or street food contexts. The educational environment with its distinct setting and population is rarely studied. Furthermore, while African studies frequently note the importance of socio-demographic factors in shaping hygiene behaviours, there is a lack of systematic integration of these variables into the KAP framework. Research tends to treat knowledge, attitudes, and practices as isolated domains, rather than analyzing how they interact under the influence of education, gender, age, or training. This leaves an incomplete picture of how vendor characteristics influence food hygiene outcomes.

In Ghana, the evidence base is growing but remains concentrated in metropolitan centers such as Accra, Kumasi, and Tamale. Several studies have confirmed that food vendors in these urban centers possess some level of knowledge and positive attitudes but fail to consistently apply safe

practices (Akabanda *et al.,* 2017; Cudjoe *et al.,* 2022; Ahiabor *et al*., 2024). However, little is known about food vendors in peri-urban municipalities like Lower Manya Krobo, where monitoring and enforcement mechanisms are weaker, and access to infrastructure is more limited. Importantly, the literature rarely focuses specifically on vendors serving educational institutions, even though these vendors operate in environments where lapses in hygiene can directly affect children's health and educational outcomes. This creates a critical gap in both the academic and policy literature.

Another important limitation is the lack of longitudinal or intervention-based research. Most existing studies adopt cross-sectional designs, which are effective for identifying associations but not for establishing causality or evaluating the long-term effectiveness of training and regulatory interventions. For example, while studies repeatedly demonstrate that training improves knowledge and attitudes, there is limited evidence on whether these improvements are sustained over time or effectively translated into lasting behavioral change.

Finally, while Ghana has food hygiene policies and regulations administered by the Food and Drugs Authority and Environmental Health Departments, very few studies critically examine how these frameworks are implemented at the municipal level. There is insufficient evidence on how regulatory lapses, resource shortages, or weak inter-agency coordination affect vendor behaviours in school environments. Without this knowledge, policy recommendations risk being generic and failing to address the context-specific barriers faced by peri-urban food vendors.

In summary, three major gaps stand out in literature. There is inadequate focus on school- based food vendors globally, regionally, and in Ghana, despite the high vulnerability of the populations they serve. Also, while knowledge and attitudes are well documented, practices remain poorly explained in relation to socio-demographic influences, leaving an incomplete understanding of the

KAP framework in real-world contexts. Furthermore, there is limited attention to peri-urban Ghanaian municipalities where enforcement and infrastructure gaps exacerbate food hygiene challenges. Addressing these gaps is essential to inform targeted, context-specific interventions. This study therefore positions itself to contribute new evidence by systematically examining the knowledge, attitudes, and practices of food vendors in educational institutions within the Lower Manya Krobo Municipality, while explicitly incorporating the role of socio- demographic factors.

2.7 Conclusion of the Literature Review

The literature on food hygiene has established a consistent pattern across global, African, and Ghanaian contexts: food vendors often demonstrate some level of knowledge and express generally positive attitudes, but their practices remain inadequate. This disconnects between what vendors know or believe and what they do continues to drive foodborne disease risks, particularly in vulnerable populations such as schoolchildren. Using the KAP framework as a lens, the reviewed studies suggest that knowledge is a necessary but insufficient determinant of behavior. Attitudes serve as an important intermediary, yet they too are undermined by contextual, economic, and infrastructural barriers that limit their translation into safe practices. Globally, food hygiene research has shown that training improves knowledge and attitudes, but long-term changes in practice are harder to achieve. Studies in Brazil, India, Malaysia, and China demonstrate that while food handlers often express positive attitudes, practices such as consistent handwashing, safe storage, and prevention of cross-contamination are not reliably implemented (Canuto *et al.,* 2024; Choudhury *et al*., 2019; Liu *et al*., 2019; Nee & Sani, 2019). These findings point to the structural limitations that constrain behavioral change, even in contexts where regulatory systems are relatively strong.

In Africa, the challenges are compounded by infrastructural deficits and weak regulatory oversight. Research from Ethiopia, Nigeria, Uganda, and South Africa highlights persistent problems with unsafe storage, poor waste management, and inadequate hand hygiene (Moges *et al*., 2024; Okojie and Isah, 2019; Muyanja *et al*., 2011; Nkosi & Tabit, 2021). These practices persist despite widespread awareness of the importance of hygiene, suggesting that knowledge and attitudes are consistently overridden by contextual realities such as lack of water, sanitation, and inspection systems. Moreover, socio-demographic influences, particularly education, gender, and training have been identified as critical determinants of hygiene outcomes, though they are rarely integrated systematically into KAP-based analyses.

Within Ghana, studies confirm the same gap between awareness and behavior. Vendors in Accra, Kumasi, and other urban centers have been shown to possess reasonable knowledge and positive attitudes but continue to demonstrate unsafe practices, such as irregular handwashing, reuse of cooking oil, and poor storage (Ababio & Lovat, 2015; Ahiabor *et al*., 2024; Akabanda *et al*., 2017; Cudjoe *et al*., 2022). Importantly, most Ghanaian research remains urban-focused, with peri-urban and rural municipalities like Lower Manya Krobo receiving little scholarly or policy attention. The school environment is almost absent from the literature, despite being a high-risk setting where food hygiene failures can directly impact child health and educational outcomes.

The synthesis of global, regional, and national evidence highlights three key insights. First, there is a persistent and well-documented gap between knowledge, attitudes, and practices, with practices consistently emerging as the weakest link. Second, socio-demographic factors such as education, training, age, gender, and years of experience, play a powerful but underexplored role in shaping hygiene behaviours, requiring more systematic analysis. Third, the Ghanaian evidence base is limited by its concentration in urban centers, leaving peri-urban educational institutions

underrepresented. These gaps collectively justify the present study, which seeks to assess food hygiene knowledge, attitudes, and practices among food vendors in educational institutions in the Lower Manya Krobo Municipality, while explicitly examining the socio-demographic factors that influence them.

In conclusion, the reviewed literature underscores the importance of moving beyond knowledge dissemination to targeted, context-specific interventions that address structural barriers and socio-demographic determinants. By filling the identified gaps, this study has the potential to inform municipal-level strategies, contribute to national food safety policies, and ultimately promote healthier and safer school environments in Ghana.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study design

This study employed an analytical cross-sectional survey design, a quantitative approach that involved collecting data from a sample of participants at a single point in time. This design was particularly suitable for assessing the prevalence of hygiene knowledge, attitudes, and practices (KAP) among food vendors, as well as for identifying associations between socio-demographic factors and these key variables (Ofori, 2023; Boateng & Appiah, 2022). One of the major strengths of the analytical cross-sectional design was its efficiency in terms of time and resources, allowing simultaneous measurement of multiple variables and the identification of potential associations within a defined population (Mensah & Amponsah, 2021; Ofori, 2023). In this study, the design facilitated analysis of how socio-demographic characteristics such as age, education level, and work experience influenced hygiene KAP among food vendors in educational institutions. Descriptive statistics were used to summarize respondents' characteristics and KAP levels, while Chi-square tests assessed associations between socio-demographic variables and hygiene outcomes. Additionally, binary logistic regression analysis was conducted to identify the independent predictors of good hygiene practices after controlling for potential confounders.

However, the cross-sectional nature of the study also presented certain limitations. Most notably, the design did not permit causal inferences, as data on exposure and outcome were collected at the same time, making it difficult to determine the directionality of observed associations (Ofori, 2023). Additionally, since the data were self-reported, there was a potential risk of social desirability bias, where participants might have overstated positive hygiene behaviours. Despite

these limitations, the analytical cross-sectional survey remained appropriate for the study's objectives, providing valuable insights that could inform future interventions and longitudinal research.

3.2 Study site

The study was conducted in the Lower Manya Krobo Municipality, located in the Eastern Region of Ghana. The municipality has a diverse mix of public and private educational institutions where food vending is common. These institutions included kindergartens, primary schools, junior high schools (JHS), senior high schools (SHS), and technical/vocational education and training (TVET) schools.

Table 1: Number of public and private schools in the municipality:

S/N	PUBLIC	NUMBER OF SCHOOLS	PRIVATE	NUMBER OF SCHOOLS
1	KG/NURSERY	45	KG/NURSERY	77
2	PRIMARY	47	PRIMARY	77
3	JHS	41	JHS	43
4	SHS	4	SHS	5
5	TVET	1	TVET	1
	Total	**138**		**203**

This wide distribution of schools makes the municipality a suitable setting for assessing hygiene practices among food vendors serving students across various educational levels.

3.3 Study population

The target population included food vendors operating within educational institutions (both public and private) in the Lower Manya Krobo Municipality. This comprised individuals selling cooked meals, snacks, beverages, and other ready-to-eat foods within or around school premises.

3.3 Inclusion and Exclusion Criteria

To be included in the study, the participants had to be:

1. Registered food vendors who were operating within selected educational institutions at the time of the study.
2. 18 years of age or older and able to provide informed consent to ensure legal and ethical participation.
3. Vendors who had been operating at the institution for a minimum of three months to ensure they had adequate exposure to food hygiene practices in that setting.

The following vendors were excluded from taking part in the study:

1. Food vendors who were temporary, substitute, or newly recruited (less than three months at the institution) were excluded, as they might not have had sufficient experience with the institutional food hygiene environment.
2. Individuals who were unable or unwilling to provide informed consent, including those with cognitive impairments or significant language barriers, were excluded to uphold ethical standards of voluntary participation and comprehension.
3. Vendors who were not available during the data collection period, despite at least two follow-up visits, were excluded to maintain data consistency and minimize recall bias.

3.4 Sample size and Sampling Technique

The sample size was calculated using the Cochran's formula:

$$n = \frac{Z^2 \times pq}{e^2}$$

Where:

n = sample size (Cochran, 1977)

Z = the z-score that corresponds with 95% confidence interval which is 1.96

p = estimated proportion of food vendors with good hygiene (0.417)

(Amegah et al., 2020)

q = Proportion of food vendors with poor hygiene = 1-0.417 = 0.583

e = Margin of error set at 5% (0.05)

Therefore:

$$n = \frac{(1.96)^2 \times (0.417 \times 0.583)}{(0.05)^2} \cong 374$$

Considering possible non-responses, a non-response rate of 10 % was added to the sample size to inflate it, which results in a total of 415 participants (Yaya & Adomako, 2023).

A stratified random sampling approach was employed to ensure adequate representation of food vendors across different categories of educational institutions in the Lower Manya Krobo Municipality.

Stage 1: Stratification of Schools

The educational institutions in the municipality were stratified into six categories based on their ownership and level of education:

i. Public Basic Schools (Kindergarten, Primary, JHS)
ii. Private Basic Schools (Kindergarten, Primary, JHS)
iii. Public Senior High Schools (SHS)
iv. Private Senior High Schools (SHS)
v. Technical and Vocational Education and Training (TVET) institutions
vi. University/tertiary institutions

This stratification ensured a balanced representation across the different educational levels and institutional types where food vending is prevalent. From each stratum, a specified number of schools were randomly selected using simple random sampling techniques, such as a lottery method "From the total of 341 educational institutions identified (138 public and 203 private), proportional allocation was used to determine the number of schools to be selected within each stratum. For instance, Public Basic Schools (133 out of 341) contributed approximately 39%, while Private Basic Schools (197 out of 341) contributed 58%, with the remaining 3% distributed among SHS, TVET, and tertiary categories. The number of schools selected from each category is proportionate to their distribution in the municipality to maintain representativeness.

At each selected school, all food vendors operating within or immediately around the school premises were identified. All eligible vendors who met the inclusion criteria were invited to participate in the study.

3.5 Data Collection Procedure

Data collection took place within the selected educational institutions in the Lower Manya Krobo Municipality. Before commencing data collection, permission was sought from the relevant municipal educational authorities and school heads. Trained field assistants were used to administer the questionnaires to selected food vendors at their vending sites within the school premises. The data collection process was carried out during working hours when food vendors were present and available, ensuring minimal disruption to their activities. The purpose of the study was clearly explained to participants before seeking informed consent. The estimated duration for completing each questionnaire was 15-20 minutes. Data were collected over a period of two weeks, during which all selected respondents were contacted to complete the questionnaires.

3.6 Data Collection Tools/Instruments

Data for the study were collected using a structured, self-administered questionnaire. The instrument was adapted from previously validated Knowledge, Attitude, and Practice (KAP) survey tools used in similar studies on food hygiene in Ghana and other developing contexts (Odonkor and Adomako, 2021; Samapundo et al., 2020). The questionnaire was designed to obtain quantitative data on respondents' socio-demographic characteristics as well as their knowledge, attitudes, and practices related to food hygiene within school settings.

The questionnaire consisted of four main sections with a total of thirty-eight (38) items. Section

A, which focused on biographical information, contained five (5) items that sought to capture socio-demographic data such as age, gender, level of education, years of experience as a food vendor, and whether respondents had received any formal training in food hygiene.

Section B assessed hygiene knowledge and comprised ten (10) items. These items measured respondents' understanding of basic food hygiene concepts, including contamination, temperature control, safe reheating, storage, and prevention of foodborne diseases. Each knowledge question had either a "Yes/No" or multiple-choice response format, and each correct response was scored as one (1) point while an incorrect response was scored as zero (0).

Section C focused on hygiene attitudes and consisted of ten (10) items. This section explored food vendors' perceptions and beliefs about the importance of maintaining hygiene, their sense of responsibility toward customers' health, and their willingness to comply with hygiene regulations. Responses were measured on a four-point Likert scale ranging from "Strongly Agree" to "Disagree," with higher scores representing more positive attitudes toward food hygiene.

Section D measured hygiene practices and contained thirteen (13) items. These questions examined the actual food safety behaviors of respondents, such as frequency of handwashing, covering of food, storage of raw and cooked foods, cleaning of utensils, and waste disposal.

Overall, the questionnaire was quantitative in nature and took approximately fifteen to twenty minutes to complete. It was administered in English, but field researchers provided explanations in the local languages (Dangme and Twi) where necessary to enhance understanding and ensure valid responses.

The items were reviewed by public health experts for content validity and pretested among a small group of food vendors in a neighboring municipality to ensure clarity, reliability, and cultural appropriateness before the main data collection.

For knowledge, attitude and practice variables, responses were assigned numerical values and classified using the Modified Bloom's cut-off: scores below 60% were categorized as low/poor, 60–79% as moderate/fair, and ≥80% as high/positive/good.

3.7 Pre-testing

Prior to the main data collection, the questionnaire was pre-tested among a sample of 20 food vendors operating within educational institutions in a neighboring district that shares similar demographic and environmental characteristics with Lower Manya Krobo Municipality. This pre-test helped assess the clarity, relevance, and appropriateness of the questionnaire items. Field assistants used the pre-test situation to familiarize themselves with the tool and the digital data collection process.

Data from the pre-test were analyzed using Cronbach's alpha to determine the internal reliability of each construct. The reliability coefficients were as follows: Knowledge ($\alpha = 0.78$), Attitude ($\alpha = 0.83$), and Practice ($\alpha = 0.81$), indicating acceptable internal consistency for all three domains according to standard thresholds ($\alpha \geq 0.70$). The overall reliability of the questionnaire was $\alpha = 0.84$, demonstrating that the instrument was both reliable and suitable for the main survey.

3.8 Data Handling

To ensure data integrity and confidentiality, only the principal investigator, project supervisor and authorized research personnel were allowed to have access to the password-protected data files. Data were checked for completeness and accuracy during the collection period. After data collection, the dataset was exported to Microsoft Excel and cleaned to eliminate errors, inconsistencies, and duplicates. Cleaned data were then transferred to STATA version 18 for analysis. No personally identifiable information was included in the dataset to maintain participant

anonymity. Data will be kept for a maximum of 5 years before being destroyed in line with research requirements.

3.10 Statistical analysis

Data analysis was carried out using Stata Statistical Software, Version 18 (StataCorp LLC, College Station, TX, USA). Both descriptive and inferential statistical methods were employed to address the analyses based on the study objectives. The level of statistical significance was set at $p < 0.05$ for all inferential tests and results were presented in tables and charts for clarity.

Descriptive statistics were used to summarize respondents' sociodemographic characteristics and their levels of hygiene knowledge, attitude and practice. For each construct: knowledge, attitude, and practice, individual items were scored, and total composite scores were generated.

For hygiene knowledge, a score of one (1) was assigned to each correct response and zero (0) to each incorrect response. The total score was converted into percentages and categorized using the Modified Bloom's cut-off points as Low knowledge (<60%), Moderate knowledge (60–79%) and High knowledge (≥80%)

For hygiene attitude, a similar scoring system was applied, with positive responses assigned a score of one (1) and negative or neutral responses scored zero (0). Composite scores were categorized as Poor attitude (<60%), Fair attitude (60–79%) and Positive attitude (≥80%).

For hygiene practice, correct or appropriate practices were scored one (1) and incorrect or unsafe practices were scored zero (0). Total scores were also categorized using Modified Bloom's criteria into poor practice (<60%), fair practice (60–79%) and good practice (≥80%).

Bivariate analyses were conducted to examine the association between selected sociodemographic characteristics (including age, sex, marital status, educational level, and work experience) and the categorical outcomes of hygiene knowledge, attitude, and practice.

The Chi-square test (χ^2) was used to assess the strength and direction of association between variables by employing Fisher's Exact values.

To identify independent predictors of formal food hygiene training among food vendors, a binary logistic regression analysis was performed. The dependent variable was whether a vendor had received Formal Food Hygiene Training (Yes = 1, No = 0). An Unadjusted (Crude) Model in which each explanatory variable was entered into the model individually to estimate the crude odds ratio (OR) using a 95% confidence interval (CI) and an adjusted Model where all the variables that were statistically significant or theoretically relevant were included simultaneously to control for potential confounding effects were carried out. Adjusted odds ratios (AORs) with 95% CIs were computed to determine the independent predictors of formal training.

Results from the logistic regression analyses were presented in tabular form, showing both crude and adjusted odds ratios, confidence intervals, and p-values.

3.11 Ethical Issues

Ethical clearance was obtained from the Institutional Review Board (IRB) of Ensign Global University before any data collection began. In addition, official permission was sought from the Lower Manya Krobo Municipal Assembly, Municipal Education Directorate, and relevant school authorities.

Participation in the study was entirely voluntary. All potential respondents were adequately informed about the nature and purpose of the study, their rights as participants, and the confidentiality of the data they provide. Informed consent was obtained from each participant prior to data collection. For participants with low literacy, the consent form was read aloud in their preferred language, and consent was documented in the presence of a witness. Participants were assured that their personal identity and responses would remain confidential and anonymous. No

names or identifiable details were recorded or disclosed at any stage of the study. Data were stored securely and accessed only by authorized members of the research team. Respondents were informed of their right to withdraw from the study at any stage without any penalty or consequence.

3.12 Limitations of Study

First, most practice indicators were self-reported, which introduces social desirability and recall bias. Also, the sampling frame covered vendors operating in and around educational institutions within Lower Manya Krobo Municipality; findings may not generalize to restaurants, households, or vendors in other municipalities where infrastructure, enforcement, and clientele differ.

3.13 Assumptions of the Study

The study proceeded on several methodological and analytical assumptions. It was assumed that the proportional allocation across strata assumed that the documented distribution of educational institutions (public/private basic, SHS, TVET, tertiary) accurately reflected the true composition during sampling, and that vendors present at the time of data collection were representative of usual operations. Responses were assumed to be truthful and independent across vendors, it was also assumed that the questionnaire adequately assessed knowledge and hygiene practice, and that all respondents were able to understand.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

This section presents the analysis of socio-demographic characteristics and their influence on food hygiene knowledge, attitudes, and practices (KAP) among food vendors in educational institutions within the Lower Manya Krobo Municipality. The analysis begins with a description of respondents' background characteristics such as age, sex, marital status, education, work experience, and type of food sold. This is followed by an assessment of their knowledge of food hygiene, attitudes toward safe food handling, and the extent to which they put these into practice. The aim is to establish how variations in demographic factors shape levels of knowledge, attitude, and practice, thereby identifying groups that may be more vulnerable to poor food hygiene behaviors. This provides the basis for understanding current gaps and for informing targeted interventions that can strengthen food safety within the municipality.

4.2 Socio-Demographic Characteristics of Respondents

Table 1 below presents the socio-demographic characteristics of the respondents. A total of 388 participants were interviewed. The largest proportion, 35.8%, was those aged between 36–45 years, followed by 23.2% who were 46–55 years, and 20.6% who were 26–35 years. Those aged 18–25 years constituted 13.1%, while the least represented group was respondents above 55 years (7.2%). The sample was predominantly female, representing about 82.2% of the total study participants.

In terms of marital status, single respondents represented 45.1%, married 38.1%, and separated 10.6%. With respect to education, the majority had attained senior high school (40.2%), followed by junior high school (35.3%) and tertiary education (11.6%). A smaller proportion had primary education (6.7%), while 6.2% reported no formal education.

Work experience showed that 40.7% had worked between one and five years, 23.7% had six to ten years, and 22.2% had more than ten years, while 13.1% reported less than one year of experience. The most common food type sold was rice (27.3%), followed by pastries (22.2%), waakye (12.4%), banku (11.6%) and other foods (11.6%). Beans with plantain and yam were less common, each accounting for 7.5%. Most respondents (89.4%) had undergone medical examination, while 10.6% had not. In addition, 60.3% reported receiving formal food hygiene training, compared with 39.7% who had not.

Table 2 Socio-Demographic Characteristics of Food Vendors

Variable	Category	n (%)
Age Group (years)	18-25 years	51 (13.14)
	26-35 years	80 (20.62)
	36-45 years	139 (35.82)
	46-55 years	90 (23.20)
	Above 55 years	28 (7.22)
Sex	Male	69 (17.78)
	Female	319 (82.22)
Marital Status	Married	147 (37.98)
	Separated	42 (10.60)
	Single	199 (51.42)
Educational Level	No formal education	24 (6.19)
	Primary	26 (6.70)
	Junior high school	137 (35.40)

	Senior high school	156 (40.21)
	Tertiary (diploma/degree)	45 (11.50)
Work Experience (years)	Less than 1 year	52 (13.44)
	1-5 years	158 (40.57)
	6-10 years	92 (23.77)
	More than 10 years	86 (22.22)
Food Type Sold	Banku	45 (11.60)
	Beans and plantain	29 (7.47)
	Pastries	86 (22.16)
	Rice	106 (27.32)
	"Waakye"	48 (12.37)
	Yam	29 (7.47)
	Other	45 (11.61)
Medical Examination	Yes	347 (89.43)
	No	41 (10.57)
Formal Food Hygiene Training	Yes	234 (60.31)
	No	154(39.69)

4.3 Hygiene Knowledge of Food Vendors

The findings indicate that nearly all respondents recognized the risks associated with food contamination. Specifically, almost all vendors (99.7%) acknowledged that contaminated food can cause diseases. The analysis indicates that overall hygiene knowledge among respondents was high, with 42.3% able to identify three or four correct symptoms. However, there remains a notable gap, as 40.8% demonstrated only moderate knowledge and 16.9% low knowledge. This finding highlights the need for targeted health education to improve comprehensive recognition of foodborne illness symptoms. Regarding safe food storage, 39.7% believed that "very cold" frozen

conditions were correct, while 29.4% selected “warm conditions,” and 16.2% opted for “cold conditions.” Hand hygiene knowledge was stronger, with two-thirds of respondents (68.0%) recognizing the importance of washing hands before handling food, after toilet use, and after touching money simultaneously. Another 19.4% identified at least two correct moments. This highlights a broad awareness of critical handwashing points, though a small fraction still demonstrated gaps.

Concerning food handling practices, majority of respondents (9098%) understood that food should not be reheated multiple times, while 97.16% correctly affirmed that raw and cooked food should be stored separately. Concerning sources of contamination, the analysis indicates that overall contamination knowledge among respondents was high, with majority identifying three or four correct contamination sources. Nonetheless, nearly two in five respondents had only low to moderate knowledge, underscoring the need for continuous training to ensure food handlers recognize the full range of contamination risks. In addition, 82.2% correctly noted that using the same cutting board for raw meat and vegetables without washing is unsafe. Similarly, 71.4% correctly indicated that perishable foods become unsafe after four hours at room temperature, while smaller groups selected shorter times. Finally, a large majority (99.0%) agreed that good hygiene can reduce the risk of foodborne disease.

Table 3 Hygiene Knowledge of Food Vendors

Construct	Category	n (%)
Can contaminated food cause diseases?	Yes	387 (99.74)
	No	1 (0.26)
Which of these are symptoms of foodborne illness?	Diarrhea only	67 (17.05)
	Fever only	1 (0.26)
	Vomiting only	9 (2.33)

	Diarrhea and fever only	1 (0.26)
	Diarrhea and vomiting only	143 (36.95)
	Diarrhea, vomiting and fever	18 (4.65)
	Diarrhea, vomiting and headache	32 (8.27)
	Diarrhea, vomiting, fever and headache	114 (29.46)
	Vomiting and headache only	1 (0.26)
	Vomiting and fever only	2 (0.51)
What is the correct temperature for storing cooked food?	Cold condition (frozen food)	63 (16.24)
	Very cold condition (frozen food)	154 (39.69)
	Very warm condition (non-frozen)	57 (14.69)
	Warm condition (non-frozen)	114 (29.38)
At what moment should food handlers wash their hands?	Only after touching money	1 (0.26)
	After using the toilet	37 (9.56)
	After toilet + touching money	1 (0.26)
	Before handling food	10 (2.58)
	Before food + after toilet	75 (19.38)
	Before food + after toilet + after money	264 (67.96)
Can food be safely reheated multiple times?	Yes	353 (90.98)
	No	35 (9.02)
Should raw and cooked food be stored separately?	Yes	377 (97.16)
	No	11 (2.84)
Which of these contaminate food?	Dirty hands only	7 (1.81)
	Flies only	61 (15.76)
	Uncooked meat only	2 (0.52)
	Flies and uncooked meat	1 (0.26)
	Dirty hands and flies	69 (17.83)
	Dirty hands + improperly stored	2 (0.52)
	Flies + uncooked meat + improperly stored	4 (1.03)

	Dirty hands + flies + uncooked meat	16 (4.13)
	Flies + improperly stored	5 (1.29)
	Dirty hands + flies + improperly stored	60 (15.50)
	Dirty hands + flies + improperly stored + uncooked meat	160 (41.34)
Is it safe to use the same cutting board for raw meat & vegetables without washing?	Yes	69 (17.78)
	No	319 (82.22)
How long can perishable food be left at room temperature?	1 hour	8 (2.06)
	2 hours	103 (26.55)
	4 hours	277 (71.39)
Can good hygiene reduce foodborne disease risk?	Yes	384 (98.97)
	No	4 (1.03)

4.4 Hygiene Attitude of Food Vendors

Table **3** presents respondents' perceptions and attitudes towards food hygiene. Nearly all respondents (74.0%) strongly agreed that food hygiene is important to customers' health, while 25.0% agreed and only 1.0% remained neutral. Similarly, 70.1% strongly agreed and 29.1% agreed that training in food safety would improve their hygiene practices, with less than 1.0% neutral.

On whether maintaining hygiene is time-consuming, 67.5% responded yes, while 32.5% said no. When asked about responsibility for customer illness, 51.6% denied responsibility, while 48.5% felt accountable.

Inspection of food vendors was strongly supported, with 93.8% agreeing vendors should be regularly inspected and only 6.2% opposing. Almost all respondents (94.9%) agreed that wearing gloves while handling food improves hygiene, compared to 5.2% who disagreed. An overwhelming 99.5% indicated that covering food to protect it from flies and dust is necessary, while only 0.5% thought otherwise. Likewise, 95.6% believed customers care about hygiene when buying food, and 99.2% acknowledged that poor hygiene can damage a business's reputation.

Table 4 Hygiene Attitude of Food Vendors

Constructs	Category	n (%)
Do you believe food hygiene is important to customers' health?	Agree	97 (25.06)
	Neutral	4 (1.03)
	Strongly agree	287 (73.91)
Do you think training in food Safety would improve your hygiene practices?	Agree	113 (29.20)
	Neutral	3 (0.77)
	Strongly agree	272 (70.03)
Is maintaining hygiene time-consuming?	Yes	262 (67.53)
	No	126 (32.47)
Do you feel responsible if a customer falls ill after eating your food?	Yes	188 (48.45)
	No	200 (51.55)
Should food vendors be regularly inspected for hygiene compliance?	Yes	364 (93.80)
	No	24 (6.20)
Do you think wearing gloves while handling food improves hygiene?	Yes	368 (94.85)
	No	20 (5.15)
Is it necessary to cover food to protect it from flies and dust?	Yes	386 (99.48)
	No	2 (0.52)
Do you think customers care about food hygiene when buying from vendors?	Yes	371(95.62)
	No	17 (4.38)
Do you believe poor hygiene can harm the business's reputation?	Yes	385 (99.23)
	No	4. (0.77)

4.5 Hygiene Practices of Food Vendors

Table 4 presents respondents' food hygiene practices. On handwashing, 74.5% reported sometimes washing their hands before handling food, 23.7% said always, while 1.8% never did. Cleaning of food preparation areas was frequent, with 66.8% cleaning after each use, 31.2% twice daily, 1.6% once daily, and only 0.5% occasionally. Almost all respondents (97.2%) indicated that they used

soap and clean water for handwashing, while 2.8% did not. Food covering practices were common, with 78.6% always covering food, 20.1% sometimes, and 1.3% never. All respondents (100.0%) reported storing raw and cooked food separately. Similarly, 98.2% checked expiry dates before use, compared with 1.8% who did not.

In terms of protective clothing, 81.2% wore gloves or aprons while handling food, while 18.8% did not. Waste disposal methods varied: 49.5% used covered bins, 23.2% used open bins, 20.4% disposed of on the ground, and 7.0% used rubber. On hygiene infrastructure, 77.1% reported having a designated handwashing station, while 22.9% did not. Almost all respondents (97.4%) said they kept their nails short and clean, while 2.6% did not. Finally, 91.0% possessed a food hygiene certificate, whereas 9.0% did not.

Table 5 Hygiene Practices of Food Vendors

Constructs	Category	n (%)
Do you wash your hands before handling food?	Always	92 (23.77)
	Never	7 (1.81)
	Sometimes	289 (74.42)
How often do you clean your food preparation area?	After each use	259 (66.75)
	Occasionally	2 (0.52)
	Once a day	6 (1.55)
	Twice a day	121 (31.18)
Do you use soap and clean water for handwashing?	Yes	377 (97.16)
	No	11 (2.84)
Do you cover food to prevent contamination?	Always	305 (78.61)
	Never	5 (1.29)
	Sometimes	78 (20.10)
How do you store raw and Cooked food?	Separately	388 (100.00)

Do you check the expiry date of ingredients before use?	Yes	381 (98.20)
	No	7 (1.80)
Do you wear gloves/apron while handling food?	Yes	315 (81.19)
	No	73 (18.81)
How do you dispose of waste?	Covered bin	192 (49.48)
	On the ground	79 (20.36)
	Open bin	90 (23.20)
	Rubber	27 (6.96)
Do you have a designated hand washing station?	Yes	299 (77.06)
	No	89 (22.94)
Are your nails kept short and clean?	Yes	378 (97.42)
	No	10 (2.58)
Do you have a food hygiene certificate?	Yes	353 (90.98)
	No	

4.6 Hygiene Knowledge Among Food Vendors

Among the 388 food vendors surveyed, almost all (99.7%) correctly recognized that contaminated food can cause disease, and 99.0% agreed that good hygiene can prevent foodborne diseases. About 80% identified at least two common symptoms of foodborne illness, while 82.2% knew not to use the same cutting board for raw meat and vegetables without washing. However, knowledge on certain critical practices was poor: only 9.0% knew that food should not be reheated multiple times, 26.6% knew that perishable foods should not be left at room temperature for more than two hours, and 41.2% correctly identified all major food contamination sources.

Using the modified Bloom's cut-offs, overall hygiene knowledge was categorized as low in 26.8%

of respondents, moderate in 44.1%, and high in 29.1%. This indicates that while general awareness is high, there are substantial knowledge gaps in key areas of food safety practices.

Table 6 Hygiene Knowledge Among Food Vendors

Construct	Item	Correct Response	n (%) correct
Hygiene Knowledge	Contaminated food causes disease	Yes	387 (99.7)
	Symptoms of foodborne illness	≥2 correct symptoms	311 (80.2)
	Correct storage temperature	Cold/Very cold	217 (55.9)
	Proper handwashing moments	Before food + after toilet + after money	263 (68.0)
	Safe to reheat multiple times	No	35 (9.0)
	Raw and cooked storage	Yes	377 (97.2)
	Sources of contamination	All combined	160 (41.2)
	Same cutting board	No	319 (82.2)
	Room temp for perishables	2 hours	103 (26.6)
	Hygiene prevents disease	Yes	384 (99.0)

Overall Hygiene knowledge Leve: Löw> 104 (26.8%); Moderate> 171 (44.1%); High: 113 (29.1%)

4.6 Attitudes towards Hygiene among Food Vendors

Most food vendors exhibited positive attitudes toward food hygiene. Nearly all respondents agreed that food hygiene is important to customers' health (98.97%), that training in food safety would improve their practices (99.23%), and that food should be covered to prevent contamination (99.48%). Similarly, 95.6% believed customers care about food hygiene, and 99.2% agreed that poor hygiene can damage business reputation. However, only 32.5% disagreed that maintaining hygiene is time-consuming, and less than half (48.5%) reported feeling responsible if a customer fell ill after consuming their food, indicating attitudinal gaps in personal accountability and

perceived effort. Overall, using Bloom's cutoffs, hygiene attitudes were categorized as poor in 11.9% of vendors, fair in 30.6%, and positive in 57.5%. This reflects generally favorable attitudes toward food hygiene, though some misconceptions and low personal responsibility persist.

Table 7 Attitudes towards Hygiene among Food Vendors

Construct	Item	Positive response	n (% positive)
Hygiene Attitude	Hygiene is important to customers' health	Agree/Strongly agree	384 (98.97)
	Training improves hygiene	Agree/Strongly agree	385 (99.23)
	Hygiene time-consuming (reversed)	No	126 (32.47)
	Feel responsible if customer gets ill	Yes	188 (48.45)
	Vendors should be inspected	Yes	364 (93.80)
	Wearing gloves improves hygiene	Yes	368 (94.85)
	Food should be covered	Yes	386 (99.48)
	Customers care about hygiene	Yes	371 (95.62)
	Poor hygiene harms reputation	Yes	385 (99.23)

Overall Hygiene Attitude Level: Poor>46(11.9%); Fair >118(30.6%); Positive>222(57.5%)

4.7 Hygiene Practices of Food Vendors

Most food vendors reported good hygiene practices such as storing raw and cooked foods separately (100%), checking the expiry date of ingredients (98.2%), using soap and clean water for handwashing (97.2%), and keeping nails short and clean (97.4%). A large proportion also indicated wearing gloves or aprons (81.2%) and covering food during sale (78.6%). However, some essential practices were less consistently followed: only 23.7% always washed their hands before handling food, and just 49.5% disposed of waste in covered bins. Additionally, while 91.0%

possessed a food hygiene certificate, only 77.1% had a designated handwashing station at their vending site.

Using modified Bloom's cut-offs, overall hygiene practices were categorized as poor in 21.6% of vendors, fair in 44.3%, and good in 34.0%. This indicates that while most vendors are aware of and implement many safe practices, critical gaps remain in consistent hand hygiene and waste management practices.

Table 8 Hygiene Practices of Food Vendors

Construct	Item	Positive response	n (% positive)
Hygiene Practice	Wash hands before food	Always	92 (23.7)
	Clean food area	After each use / twice a day	380 (97.9)
	Use soap & clean water	Yes	377 (97.2)
	Cover food	Always	305 (78.6)
	Store raw & cooked food	Separately	388 (100)
	Check expiry date	Yes	381 (98.2)
	Wear gloves/apron	Yes	315 (81.2)
	Dispose waste properly	Covered bin	192 (49.5)
	Designated hand washing station	Yes	299 (77.1)
	Nails short and clean	Yes	378 (97.4)
	Food hygiene certificate	Yes	353 (91.0)

Overall Hygiene Practice Level: Poor>84(21.6%); Fair>172(44.3%); Good>132(34.0%)

4.8 Overall Hygiene Knowledge, Attitude, and Practice and Food Vendors in Lower Manya Krobo

Overall, the study revealed mixed levels of food hygiene knowledge, attitudes, and practices among food vendors. About 29.1% demonstrated high knowledge, while 44.1% were at a moderate level and 26.8% at a low level. Attitudes were more favorable: 57.5% of vendors demonstrated positive attitudes, 30.6% were fair, and only 11.9% showed poor attitudes. Hygiene practices, while generally positive, showed gaps in consistency: 34.0% had good practices, 44.3% had fair practices, and 21.6% had poor practices. These results suggest that while awareness and attitudes toward food hygiene are relatively strong, gaps persist in translating knowledge and attitudes into consistent, safe practices, particularly in areas such as hand hygiene and waste management.

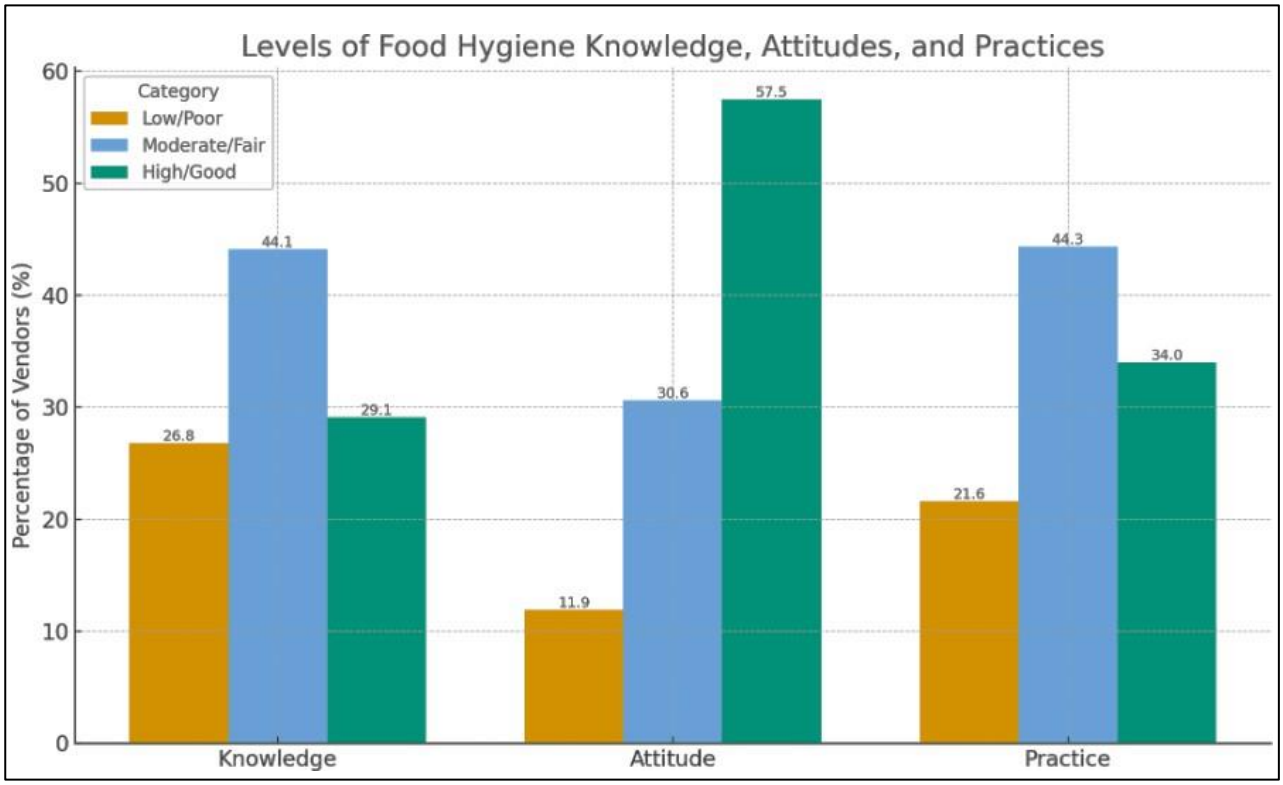

Figure 3 Overall Hygiene Knowledge, Attitude and Practice and Food Vendors in Lower Manya Krobo

4.9 Association between Sociodemographic Factors and Hygiene Knowledge

Values are presented as frequency and percentages. Hygiene knowledge was categorized into *high* (8–10 correct answers), *moderate* (6–7 correct answers), and *low* (0–5 correct answers) using Modified Bloom's cut-offs. *p*-values were obtained using the Chi-square test of independence; Fisher's exact test was reported where cell counts were <5.

Table 8 presents the distribution of hygiene knowledge levels among food vendors across different sociodemographic characteristics. Overall, hygiene knowledge was categorized into high, moderate, and low levels. Although differences were observed across categories of age, sex, marital status, education, work experience, and formal training, none of the associations reached statistical significance (all $p > 0.05$).

Age-wise, hygiene knowledge varied across age groups ($p = 0.106$). Vendors aged 35–44 years accounted for the highest proportion of moderate knowledge (76.3%), while those aged 45–54 years recorded a relatively higher proportion of low knowledge (25.8%) compared with other groups. Younger vendors (18–25 years) demonstrated a higher proportion of moderate knowledge (70.6%) but also showed the lowest proportion of high knowledge (17.7%).

Female vendors exhibited slightly higher levels of high knowledge (11.0%) compared with their male counterparts (5.8%). Conversely, males were more likely to demonstrate moderate knowledge (82.6%) than females (70.4%). However, the association between sex and hygiene knowledge was not statistically significant ($p = 0.134$).

By marital status, knowledge levels differed across marital status groups ($p = 0.277$). Single vendors showed the highest proportion of high knowledge (12.1%), whereas married vendors were

more represented in the low knowledge category (20.4%). Separated vendors recorded the lowest proportion of high knowledge (2.4%).

Educational attainment showed some variation in hygiene knowledge ($p = 0.087$). Vendors with primary education recorded the highest proportion of low knowledge (26.9%), whereas those with tertiary education demonstrated higher proportions of high knowledge (13.6%) and moderate knowledge (79.6%). Vendors with no formal education exhibited a relatively balanced distribution across high (12.5%), moderate (79.2%), and low (8.3%) knowledge categories. Hygiene knowledge also varied with work experience ($p = 0.099$). Vendors with less than one year of experience were more likely to have moderate knowledge (84.6%) compared to those with longer experience. Those with over 10 years of work experience recorded the highest proportion of low knowledge (26.7%).

Formal food hygiene training: Interestingly, vendors who had received formal training in food hygiene were not significantly different from those without training ($p = 0.177$). Among trained vendors, 7.7% exhibited high knowledge compared to 13.6% of untrained vendors. Although not statistically significant, patterns observed suggest that hygiene knowledge among food vendors may be influenced by education level, work experience, and formal hygiene training. Vendors with higher education and shorter work experience demonstrated relatively higher knowledge levels, while those with prolonged work experience or only primary education appeared more likely to have lower knowledge. The lack of statistical significance indicates that other unmeasured factors may also play a role in shaping food hygiene knowledge among vendors.

Table 9 Bivariate Analysis of Factors that Influence Hygiene Knowledge

FACTOR	CATEGORY	HYGIENE KNOWLEDGE			P-VALUE
		High n (%)	Moderate n (%)	Low n (%)	
Age	18-25	9(17.65)	36(70.59)	6(11.76)	0.106
	26-34	5(6.25)	60(75.00)	15(18.75)	
	35-44	14(10.07)	106(76.26)	19(13.67)	
	45-54	10(11.24)	56(62.92)	23(25.84)	
	55 and above	1(3.57)	24(82.14)	4(14.29)	
Sex	Male	4(5.80)	57(82.61)	8(11.59)	0.134
	Female	35(11.01)	224(70.44)	59(18.55)	
Marital Status	Married	14(9.52)	103(70.07)	30(20.41)	0.277
	Separated	1(2.44)	33(80.49)	7(17.07)	
	Single	24(12.06)	145(72.86)	30(15.08)	
Education	No F. Educ.	3(12.50)	19(79.17)	2(8.33)	0.087
	Primary	5(19.23)	14(53.85)	7(26.92)	
	Junior High	9(6.57)	99(72.26)	29(21.17)	
	Senior High	16(10.26)	114(73.08)	26(16.67)	
	Tertiary	6(13.64)	35(79.55)	3(6.82	
Work Exp.	Less 1 year	3(5.77)	44(84.62)	5(9.62)	0.099
	1-5 years	17(10.83)	113(71.97)	27(17.20)	
	6-10 years	9(9.78)	71(77.17)	12(13.04)	
	10 years+	10(11.63)	53(61.63)	23(26.74)	
Formal Food Hygiene Training	Yes	18(7.73)	174(74.68)	41(17.60)	0.177
	No	21(13.64)	107(69.48)	26(16.88)	

4.10 Association between Sociodemographic Characteristics and Hygiene Attitude

Table 9 presents the distribution of hygiene attitudes among food vendors according to their sociodemographic characteristics. Overall, hygiene attitudes were largely fair across most categories, though variations were observed by age, sex, and training status.

Regarding age, hygiene attitudes varied significantly ($p < 0.001$). The highest proportion of fair attitudes was observed among vendors aged 26–34 years (62.5%), while poor attitudes were most common among those aged 18–25 years (64.7%). In contrast, positive attitudes were more evident among vendors aged 45–54 years (31.5%) and 55 years and above (25.0%), suggesting that older vendors tended to demonstrate more favorable hygiene attitudes than younger ones.

A statistically significant association was also found between sex and hygiene attitudes ($p = 0.039$). Among male vendors, poor (36.2%) and fair (36.2%) attitudes were reported in nearly equal proportions, while only 27.5% demonstrated positive attitudes. In comparison, female vendors were more likely to report fair attitudes (52.2%), although their proportion with positive attitudes (23.6%) was slightly lower than that of males. For marital status, no significant association was detected ($p = 0.140$). Fair attitudes were most common across all groups, particularly among married respondents (51.0%) and those separated (46.3%). Positive attitudes were highest among married vendors (29.3%).

Similarly, education level showed no significant association with hygiene attitudes ($p = 0.277$). Vendors with junior high school education were most likely to demonstrate fair attitudes (56.2%), whereas positive attitudes were most common among those with primary education (30.8%).

Work experience also did not significantly influence hygiene attitudes ($p = 0.241$). Vendors with less than one year of experience demonstrated relatively balanced proportions of fair (36.5%) and positive (36.5%) attitudes, while those with longer experience tended to exhibit predominantly fair

attitudes (47–56%). Lastly, formal training in food hygiene approached statistical significance (p = 0.051). Vendors without training were more likely to have positive attitudes (30.5%) compared with those who had received training (20.2%). On the other hand, trained vendors reported slightly higher proportions of fair (50.6%) and poor (29.2%) attitudes.

Summarily, hygiene attitudes were significantly associated with age and sex, with younger vendors and males more likely to demonstrate poor attitudes. While training did not reach statistical significance, the observed patterns suggest that the nature and quality of training may influence attitudes in complex ways, warranting further exploration.

Table 10 Bivariate Analysis of Factors that Influence Hygiene Attitude

FACTOR	CATEGORY	HYGIENE ATTITUDE			P-VALUE
		Fair n (%)	Poor n (%)	Positive n (%)	
Age	18-25	11(21.57)	33(64.71)	7(13.73)	<0.001*
	26-34	50(62.50)	12(15.00)	18(22.50)	
	35-44	70(50.36)	35(25.18)	34(24.46)	
	45-54	48(53.93)	13(14.61)	28(31.46)	
	55 and above	12(42.86)	9(32.14)	7(25.00)	
Sex	Male	25(36.23)	25(36.23)	19(27.54)	0.039*
	Female	166(52.20)	78(24.21)	75(23.58)	
Marital Status	Married	75(51.02)	29(19.73)	43(29.25)	0.140
	Separated	19(46.34)	12(29.27)	10(24.39)	
	Single	97(48.74)	61(30.65)	41(20.60)	
Education	No F. Educ.	11(45.83)	8(33.33)	5(20.83)	0.277
	Primary	12(46.15)	6(23.08)	8(30.77)	
	Junior High	77(56.20)	26(18.98)	34(24.82)	
	Senior High	69(44.23)	52(33.33)	35(22.44)	
	Tertiary	22(50.00)	10(22.73)	12(27.27)	

Work Exp.	< year	19(36.54)	14(26.92)	19(36.54)	0.241
	1-5 years	74(47.13)	43(27.39)	40(25.48)	
	6-10 years	50(54.35)	23(25.00)	19(20.65)	
	10 years+	48(55.81)	22(25.58)	16(18.60)	
Formal Food Hygiene Training	Yes	118(50.64)	68(29.18)	47(20.17)	0.051*
	No	73(47.40)	34(22.08)	47(30.52)	

4.11 Association between Sociodemographic Characteristics and Hygiene Practices

Table 10 presents the distribution of hygiene practice levels among food vendors according to their sociodemographic characteristics. Overall, most vendors demonstrated either fair or good hygiene practices, while a smaller proportion reported poor practices.

With respect to age, hygiene practice was significantly associated with practice levels ($p = 0.012$). Vendors aged 18–25 years had the highest proportion of fair practices (49.0%) and recorded a notable share of poor practices (27.5%). By contrast, vendors aged 35–44 years exhibited the highest proportion of good practices (54.7%), followed by those aged 45–54 years (48.3%). This suggests that middle-aged vendors are more likely to adopt proper hygiene practices compared with their younger counterparts.

Sex was not significantly associated with hygiene practice ($p = 0.113$). Among males, good practices were more common (52.2%) compared with females (44.7%), though females had a higher share of fair practices (41.8%). Poor practices were slightly more common among males (18.8%) than females (13.5%).

Marital status showed a statistically significant association with hygiene practices ($p = 0.041$). Married vendors were most likely to demonstrate good practices (55.1%), while single respondents were more likely to display fair practices (46.2%). Separated vendors had a relatively balanced distribution, with 46.3% showing good practices and 36.6% reporting fair practices.

No significant differences were observed across educational levels (p = 0.414). Vendors with primary and tertiary education showed higher proportions of good practices (53.9% and 47.7% respectively), while those with no formal education had the highest proportion of fair practices (50.0%).

Similarly, work experience did not significantly influence hygiene practice (p = 0.584). Vendors with more than 10 years of experience demonstrated slightly higher proportions of good practices (51.2%), while those with less than one year of experience showed a near-equal distribution between fair (42.3%) and good practices (44.2%).

Finally, formal food hygiene training did not show a significant association (p = 0.246). However, vendors without training demonstrated a slightly higher proportion of good practices (51.3%) compared with those who had received training (42.5%). On the other hand, trained vendors recorded higher proportions of fair (42.1%) and poor (15.5%) practices.

In summary, hygiene practices were significantly influenced by age and marital status. Middle-aged and married vendors tended to have better hygiene practices, while younger and single vendors were more likely to exhibit fair or poor practices. Education, sex, work experience, and training did not show statistically significant associations, although patterns in the data highlight areas that could be targeted in future interventions to improve vendor hygiene practices.

Table 11 Bivariate Analysis of Factors that Influence Hygiene Practice

FACTOR	CATEGORY	HYGIENE PRACTICE			P-VALUE
		Poor n (%)	Fair n (%)	Good n (%)	
Age	18-25	15(27.45)	25(49.02)	12(23.53)	0.012*
	26-34	12(15.00)	33(41.25)	35(43.75)	
	35-44	17(12.23)	46(33.09)	76(54.68)	
	45-54	8(8.99)	38(42.70)	43(48.31)	
	55 and above	5(17.86)	11(39.29)	12(42.86)	
Sex	Male	13(18.84)	20(28.99)	36(52.17)	0.113
	Female	43(13.52)	134(41.82)	142(44.65)	
Marital Status	Married	20(13.61)	46(31.29)	81(55.10)	0.041
	Separated	8(17,07)	15(36.59)	19(46.34)	
	Single	29(14.57)	92(46.23)	78(39.20)	
Education	No F. Educ.	3(12.50)	12(50.00)	9(37.50)	0.414
	Primary	14(53.85)	9(34.62)	3(11.54))	
	Junior High	68(49.64)	57(40.88)	13(9.49)	
	Senior High	66(42.31)	62(39.74)	28(17.95)	
	Tertiary	21(47.73)	14(31.82)	9(20.45)	
Work Exp.	Less 1 year	23(44.23)	22(42.31)	8(13.46)	0.584
	1-5 years	74(47.13)	64(40.76)	19(12.10)	
	6-10 years	37(40.22)	36(39.13)	19(20.65)	
	10 years+	45(51.16)	31(36.05)	11(12.79)	
Formal Food Hygiene Training	Yes	99(42.49)	98(42.06)	36(15.45)	0.246
	No	79(51.30)	55(35.71)	20(12.99)	

CHAPTER FIVE

5.0 DISCUSSION

5.1 Food Hygiene Knowledge, Attitudes, and Practices

The findings of this study revealed a generally high level of awareness of food hygiene among food vendors in educational institutions within the Lower Manya Krobo Municipality. Nearly all respondents recognized that contaminated food causes disease (99.7%), and a large majority acknowledged that good hygiene practices can prevent foodborne illnesses. This is a positive outcome, reflecting the effectiveness of public health messaging and the possible influence of periodic inspections and training programmes by municipal health authorities. The widespread agreement that poor hygiene can harm business reputation (99.2%) also indicates that vendors appreciate the economic as well as health-related value of maintaining hygienic standards. These findings are consistent with global observations that food handlers often possess baseline awareness of contamination risks, especially when their livelihoods are closely tied to consumer perceptions of safety (WHO, 2015; Ababio and Lovatt, 2015).

Despite this high level of awareness, the study also revealed gaps in comprehensive knowledge, particularly concerning critical aspects of foodborne disease prevention. Only 42.3% of respondents could identify three or more symptoms of foodborne illness, and knowledge on time–temperature safety was limited, with just 26.6% knowing that perishable foods should not be left at room temperature for more than two hours. Similarly, only 9% knew that food should not be reheated multiple times. These gaps suggest that while basic awareness is strong, specific technical knowledge of safe food handling remains incomplete. Similar limitations were observed in Akabanda et al.'s (2017) study among food vendors in senior high schools in Ghana, where

vendors understood broad concepts of hygiene but performed poorly on specific questions relating to temperature control and cross-contamination. Comparable results were also reported in Nigeria, where Okojie and Isah (2019) found that although street food vendors had high general knowledge, awareness of time–temperature control and safe reheating practices was weak, pointing to a common trend in resource-limited settings.

Attitudes towards food hygiene were largely positive in this study. Almost all respondents believed that food safety training could improve their practices (99.2%) and supported regular inspection by authorities (93.8%). This suggests a readiness to embrace formal structures of accountability and capacity-building, an encouraging sign for policymakers aiming to strengthen regulatory frameworks. However, two gaps emerged: first, 67.5% felt that maintaining hygiene is time-consuming, and second, less than half (48.5%) accepted responsibility if customers fell ill from consuming their food. These findings mirror the attitudinal contradictions reported in Annor and Baiden's (2011) research in the Accra metropolis, where vendors acknowledged the importance of hygiene but deflected personal responsibility for foodborne disease outbreaks. Similarly, Nkosi and Tabit (2021) in South Africa highlighted that vendors often externalize blame, attributing illness to customers' health rather than their own handling practices. This lack of accountability could undermine efforts to achieve sustainable improvements in food safety, as personal responsibility is a crucial driver of behavioral change.

When examining reported hygiene practices, a mixed picture emerges. Encouragingly, nearly all respondents used soap and water for handwashing (97.2%), stored raw and cooked food separately (100%), and checked expiry dates (98.2%). These results are in line with findings from Mensah et al. (2016), who emphasized that visible practices such as separating raw and cooked foods are easier for vendors to adopt, particularly when these are reinforced by training or inspection. On

the other hand, only 23.7% of respondents reported always washing their hands before handling food, and just 49.5% used covered bins for waste disposal. The inconsistency in handwashing and poor waste management practices highlight the gap between knowledge and actual practice, a trend also observed in Ababio and Lovatt's (2015) study in Kumasi. They reported that while most vendors claimed to understand the importance of hygiene, only a fraction translated this knowledge into consistent daily practice. Internationally, Choudhury et al. (2019) reported similar inconsistencies in Bangladesh, where food vendors demonstrated good knowledge but poor compliance with safe practices, particularly in hand hygiene.

The overall categorization of hygiene practices in this study 34.0% good, 44.3% fair, and 21.6% poor further illustrates this knowledge–practice gap. This aligns with Liu et al. (2019), who found that knowledge levels among Chinese street food vendors were not always predictive of behavior, with contextual factors such as time pressure, lack of infrastructure, and economic constraints limiting the adoption of safe practices. In Ghana, Christiana Cudjoe et al. (2022) similarly noted that while vendors possessed health certificates, infrastructural deficits such as absence of handwashing stations and inadequate waste disposal systems undermined actual food safety practices. These parallels suggest that structural and environmental enablers are as critical as individual knowledge in achieving consistent hygienic practices.

In summary, the study demonstrates that while food vendors in LMK Municipality possess commendable knowledge and attitudes towards food hygiene, significant gaps persist in specific technical knowledge, personal accountability, and consistent hygienic practices. These findings echo those of earlier studies in Ghana (Akabanda et al., 2017; Annor and Baiden, 2011; Ababio and Lovatt, 2015) and elsewhere in Africa and Asia (Nkosi and Tabit, 2021; Okojie and Isah, 2019; Choudhury et al., 2019). The results highlight the need for continuous training, not only to

reinforce knowledge but also to cultivate a stronger sense of responsibility among vendors, coupled with infrastructural support that enables the translation of knowledge into practice.

5.2 Association Between Sociodemographic Characteristics and Hygiene KAP

The analysis of socio-demographic factors showed that while hygiene knowledge, attitudes, and practices varied across age, sex, marital status, education, and training, not all differences were statistically significant. Still, the observed patterns provide useful insights into how background characteristics may shape food vendors' approach to hygiene in the Lower Manya Krobo Municipality.

For knowledge, younger vendors generally demonstrated moderate awareness but had the lowest levels of high knowledge. By contrast, middle-aged vendors tended to score higher, while those above 45 years recorded more low knowledge responses. This suggests that although younger vendors are open to learning, they may lack the depth of experience needed to apply technical knowledge effectively, while older vendors may rely on long-standing habits that do not always align with current hygiene standards. Similar trends were reported by Akabanda et al. (2017) in senior high schools in Ghana, where younger vendors displayed better enthusiasm for hygiene but weaker mastery of technical details, while older vendors showed gaps that could be attributed to reliance on outdated practices.

Sex differences were also observed, with female vendors showing slightly higher levels of high knowledge compared with males, consistent with findings in South Africa by Nkosi and Tabit (2021), who noted that women often perform better in food safety knowledge due to their role in household food preparation. Education appeared to play a role, with tertiary-educated vendors performing better than those with only primary schooling, aligning with Annor and Baiden (2011), who found a positive link between higher education and food safety knowledge in Ghana.

Interestingly, however, formal training did not translate into significantly higher knowledge, and untrained vendors in some cases reported higher knowledge. This is a surprising outcome and contrasts with Ababio and Lovatt (2015) in Kumasi, who showed training was an important predictor of hygiene knowledge. It raises questions about the effectiveness and consistency of training programmes in the study setting, suggesting that quality of delivery matters more than mere attendance.

Attitudes showed stronger and more significant associations. Younger vendors, particularly those aged 18–25 years, were more likely to display poor attitudes, while positive attitudes were more common among older age groups, especially those above 45 years. This points to maturity and experience as important drivers of how vendors perceive hygiene and their responsibilities towards customers. Botha et al. (2023) made similar observations in South Africa, noting that younger vendors often underestimated their personal accountability for food safety. Sex differences were also notable: male vendors were more likely to report poor attitudes compared with females, who leaned towards fair or moderate attitudes. This aligns with wider evidence that women tend to be more responsive to hygiene expectations (Grace, 2015; Soon, Baines and Seaman, 2020). Still, the finding that female vendors recorded fewer positive attitudes than their male counterparts suggests that gender dynamics are complex and shaped by workload, time constraints, and the perception that maintaining hygiene is burdensome. Training in this case also revealed an interesting twist: vendors without formal training reported more positive attitudes than those who had been trained. This echoes Christiana Cudjoe et al. (2022), who noted that while training improved technical awareness, it did not always shift mindsets, especially if the training was short-term or compliance-driven rather than motivational.

When it comes to practices, age and marital status stood out as the strongest predictors. Middle-

aged and married vendors were more likely to report good hygiene practices, while younger and single vendors leaned towards fair or poor practices. This could reflect greater responsibility and the desire to maintain reputation among married and older vendors, compared to the more casual attitudes of younger groups. Ahiabor et al. (2024) similarly found that family-oriented food vendors were more likely to adopt protective hygiene behaviours, linking responsibility for dependents to safer practices. Sex was not a significant factor in this study, though males reported slightly better practices than females. This differs from findings in South Africa (Nkosi and Tabit, 2021), where female vendors adhered more consistently to safe practices, suggesting contextual differences between settings. Education and work experience also did not significantly shape hygiene behavior, supporting Mensah et al.'s (2016) argument that infrastructural and environmental barriers often outweigh personal background factors.

Perhaps most striking was that training did not significantly improve hygiene practices. In fact, untrained vendors showed better practices than those who had been trained. This reinforces the earlier observation that the content and method of training, rather than its mere presence, determine its impact. Canuto et al. (2024) in Brazil emphasized that compliance improves only when training is reinforced with regular supervision and supportive infrastructure. Without this, training may fail to shift behavior, or worse, create a false sense of competence.

Taken together, the results suggest that socio-demographic characteristics play an important role in shaping how food vendors understand and apply hygiene principles. Younger, single, and less-educated vendors tended to perform less well, while middle-aged and married vendors were more likely to demonstrate better practices. The inconsistent effect of training underscores the need to rethink the design and quality of food safety education. These findings mirror earlier Ghanaian studies (Akabanda et al., 2017) and align with international evidence from Africa and Asia (Nkosi

and Tabit, 2021; Choudhury et al., 2019; Soon et al., 2020). They highlight that while knowledge and attitudes are shaped by individual characteristics, achieving consistent safe practices requires not only effective training but also strong reinforcement and enabling environments.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

This study assessed the knowledge, attitudes, and practices (KAP) of food hygiene among food vendors in educational institutions within the Lower Manya Krobo Municipality (LMK). The findings revealed a generally high level of awareness of food hygiene concepts. Despite this, substantial gaps were identified in specific technical knowledge areas such as temperature control, safe reheating, and contamination prevention. Most food vendors expressed positive attitude toward food hygiene and recognized its importance for customer health and business reputation. However, over two-thirds of respondents considered hygiene maintenance to be time-consuming, and less than half accepted responsibility for customer illness.

Vendors performed relatively well in observable hygiene actions such as separating raw and cooked foods, checking expiry dates, and washing hands with soap and clean water. However, inconsistencies emerged in routine handwashing before food handling and in proper waste disposal, with fewer always washing hands before food preparation. Statistical analyses further showed that age and marital status significantly influenced hygiene practices. The study concludes that while food vendors in LMK Municipality have a sound understanding of hygiene principles, translating this knowledge into consistent practice is hindered by inadequate technical depth, weak accountability attitudes, limited sanitation infrastructure and irregular training.

6.2 Recommendations

1. The Lower Manya Krobo Municipal Health Directorate, in collaboration with the Environmental Health and Sanitation Department, should organize regular, hands-on education sessions focused on critical technical areas such as temperature regulation, safe reheating practices, cross-contamination prevention, and hygienic food storage. This will bridge the observed gaps in vendors' technical knowledge and ensure they can apply food hygiene principles effectively in their daily operations.
2. The Environmental Protection Agency should integrate behavior-change communication strategies should be integrated into training and monitoring programmes. These should emphasize personal accountability, customer safety, and the long-term business benefits of consistent hygienic practices.
3. The Municipal Assembly, working with school authorities and relevant partners, should ensure the provision and maintenance of essential infrastructure such as functional handwashing stations, covered waste bins, and accessible sanitary disposal points. Addressing these structural barriers will enable vendors to translate their hygiene knowledge into consistent practice.
4. Municipal environmental health officers should conduct periodic inspections of food vending sites within educational institutions. A structured monitoring and feedback system should be adopted to sustain compliance with hygiene standards and identify areas needing further support.
5. The Food and Drugs Authority (FDA), in collaboration with the Municipal Assembly, should make vendor certification and license renewal contingent on participation in approved food hygiene training programmes and demonstrable compliance with hygiene

protocols. This will institutionalize accountability and reinforce continuous improvement in food safety practices.

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APPENDICES

QUESTIONNAIRE

HYGIENE PRACTICES OF FOOD VENDORS IN EDUCATIONAL INSTITUTIONS IN LOWER MANYA KROBO MUNICIPALITY, EASTERN REGION, GHANA

SECTION A: BIOGRAPHICAL INFORMATION

1. What is your age?

2. What is your gender?
   [ ] Male
   [ ] Female

3. What is your highest level of education?
   [ ] No formal education
   [ ] Primary
   [ ] Junior High School (JHS)
   [ ] Senior High School (SHS)
   [ ] Tertiary (Diploma/Degree)

4. How many years have you worked as a food vendor?
   [ ] Less than 1 year
   [ ] 1–5 years
   [ ] 6–10 years
   [ ] More than 10 years

5. Have you received any formal training in food hygiene?
   [ ] Yes
   [ ] No

SECTION B: HYGIENE KNOWLEDGE

6. Can contaminated food cause diseases?
   [ ] Yes
   [ ] No

7. Which of these are symptoms of foodborne illnesses? (Select all that apply)
   [ ] Diarrhea
   [ ] Vomiting
   [ ] Fever
   [ ] Headache

8. What is the correct temperature for storing cooked food to prevent bacterial growth?
   [ ] Below 5°C

[ ] Above 60°C
[ ] Room temperature

9. How often should food handlers wash their hands?
[ ] Before handling food
[ ] After using the toilet
[ ] After touching money
[ ] All of the above
10. Can food be safely reheated multiple times?
[ ] Yes
[ ] No

11. Which of these can contaminate food? (Select all that apply)
[ ] Dirty hands
[ ] Flies
[ ] Uncooked meat
[ ] All of the above

12. Should raw and cooked food be stored separately?
[ ] Yes
[ ] No

13. Is it safe to use the same cutting board for raw meat and vegetables without washing?
[ ] Yes
[ ] No

14. How long can perishable food be left at room temperature before it becomes unsafe?
[ ] 1 hour
[ ] 2 hours
[ ] 4 hours

15. Does proper food hygiene reduce the risk of foodborne diseases?
[ ] Yes
[ ] No

SECTION C: HYGIENE ATTITUDE
16. Do you believe food hygiene is important for your customers' health?
[ ] Strongly agree
[ ] Agree
[ ] Neutral
[ ] Disagree

17. Do you think training in food safety would improve your hygiene practices?
[ ] Strongly agree
[ ] Agree

[ ] Neutral
[ ] Disagree

18. Is maintaining hygiene time-consuming?
[ ] Yes
[ ] No

19. Do you feel responsible if a customer falls ill after eating your food?
[ ] Yes
[ ] No

20. Should food vendors be regularly inspected for hygiene compliance?
[ ] Yes
[ ] No

21. Do you think wearing gloves while handling food improves hygiene?
[ ] Yes
[ ] No

22. Is it necessary to cover food to protect it from flies and dust?
[ ] Yes
[ ] No

23. Do you think customers care about food hygiene when buying from vendors?
[ ] Yes
[ ] No

24. Would you invest in better hygiene equipment if it improves sales?
[ ] Yes
[ ] No

25. Do you believe poor hygiene can harm your business reputation?
[ ] Yes
[ ] No

SECTION D: HYGIENE PRACTICES

26. Do you wash your hands before handling food?
[ ] Always
[ ] Sometimes
[ ] Never

27. How often do you clean your food preparation area?
[ ] After each use
[ ] Once a day
[ ] Occasionally

28. Do you use soap and clean water for handwashing?
[ ] Yes
[ ] No

29. Do you cover food to prevent contamination?
[ ] Always
[ ] Sometimes
[ ] Never

30. How do you store raw and cooked food?
[ ] Separately
[ ] Together

31. Do you check the expiry dates of ingredients before use?
[ ] Yes
[ ] No

32. How do you clean utensils?
[ ] With soap and water
[ ] Only water
[ ] Not regularly

33. Do you wear gloves/aprons while handling food?
[ ] Yes
[ ] No

34. How do you dispose of waste?
[ ] Covered bin
[ ] Open bin
[ ] On the ground

35. Do you reheat leftover food before selling?
[ ] Yes
[ ] No

36. Do you have a designated handwashing station?
[ ] Yes
[ ] No

37. Are your nails kept short and clean?
[ ] Yes
[ ] No

38. Do you have a food hygiene certificate?
[ ] Yes
[ ] No

INFORMED CONSENT FORM

GENERAL INFORMATION ABOUT THE RESEARCH

My name is Lillian Monica Adams, a Master of Public Health student at Ensign Global College, Kpong. I am carrying out a research study titled: **"**Hygiene Practices Among Food Vendors in Educational Institutions: The Case of Lower Manya Krobo Municipality**."** You have been selected to take part in this study because you are a food vendor working in or around a school in the municipality.

You will be asked to answer some questions related to your knowledge, attitudes, and practices about hygiene when selling food. You will choose the answers that best reflect your situation. The questionnaire has five parts: demographic information, hygiene knowledge, hygiene-related attitudes, hygiene practices, and factors that influence hygiene behavior. The interview will take around 15–20 minutes to complete.

Benefits/Risks of the Study

There are no known risks in taking part in this study. The only possible inconvenience may be the time it takes to answer the questions. You may not receive direct benefits, but the findings will help improve food safety policies and hygiene training for vendors in school settings. It may also help public health officials and school authorities better support food vendors like you.

Confidentiality

Everything you share in this study will be kept private and anonymous. We will not ask for your name or anything that can identify you personally. Your responses will be stored on a password-protected device that only the researcher and their supervisor can access. All data will be used only for academic purposes.

Compensation

Participation in this study is voluntary and unpaid. You will not receive any money or reward for taking part, but your time and input are sincerely appreciated.

Withdrawal from the Study

You are free to take part or not take part in this study. You may also stop answering questions or leave the study at any time without any penalty or negative consequence. You may ask questions now or at any point during the study.

PARTICIPANT AGREEMENT

If you agree to take part in this study, please sign below.

I have read (or had read to me) the information above. I understand that I will be asked questions about my hygiene knowledge and practices as a food vendor. I have had the chance to ask questions, and my questions have been answered clearly. I understand that I can choose not to take part or stop at any time. I agree voluntarily to be part of this study.

_____

Name of Participant

_____

Signature of Participant

_____

Date

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the above individual.

_____

Name of Person who Obtained Consent

_____

Signature of Person Who Obtained Consent

_____

Date

Emergency Contact:

Lillian Monica Adams

Email; lilian.adams@st.ensign.edu.gh

Phone; 0557251563

PERMISSION LETTER

REPUBLIC OF GHANA

GHANA EDUCATION SERVICE

LOWER MANYA KROBO MUNICIPAL

P. O. BOX 49
ODUMASE - KROBO
Digital Address: EL-0315-9671
In case of reply the number and date of this letter should be quoted

Ref. No. GES/ERLMKM/SR/2025/01

Date: 30TH JULY, 2025

LILLIAN MONICA ADAMS
ENSIGN GLOBAL UNIVERSITY
KPONG

RE-PERMISSION TO CONDUCT A RESEARCH IN SCHOOLS WITHIN THE LOWER MANYA KROBO MUNICIPAL

You have been granted permission to conduct your research on the topic ***"Hygienic Practices among Food Vendors in Educational Institutions in Ghana: The Case of Lower Manya Krobo Municipality"*** in the Municipality.

Kindly ensure that you follow all standard ethical practices during your research activities in the school.

Should you encounter any challenge with regards to your engagements with the school, contact

Mr. Evans Tamatey on **0246414166** for further assistance.

We are eager to know your findings and recommendations.

All the best.

SAMUEL KWESI TETTEY
MUNICIPAL DIRECTOR

MUN. DIRECTOR OF EDUCATION
LOWER MANYA
ODUMASE - KROBO, E/R.

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