BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCES

DEPARTMENT OF ENVIRONMENTAL SCIENCES

an assessment of health risks and food safety among street food vendors. highfield lusaka, harare.

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF A BACHELOR OF ENVIRONMENTAL SCIENCE HONORS DEGREE IN SAFETY, HEALTH, AND ENVIRONMENTAL MANAGEMENT

SUBMISSION DATE:

DEDICATION

I dedicate this research to my family, who are giving up so much for me to realize my dream.

DECLARATION

I Jinga Primrose, **(B193663A)** declare that this research study is my work and has not been submitted to any university for any reward.

Signature  ……. Date 30/05/2024

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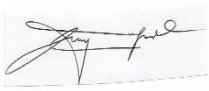
Research study supervisor declaration

For approval, the research study has been presented with my approval to Mr E. Chiboyiwa as the research study supervisor in the Environmental Science department.

Signature…  …… Date 30/05/2024

Chairman's signature

…  ……

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- Above all, I would like to express my profound gratitude to God Almighty for his wisdom and fortitude in facing every challenge during my study time. Without him, nothing would have been possible.
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ABSTRACT

To satisfy the dietary needs of urban residents, the street food business is crucial in the cities and towns of many emerging nations, including Zimbabwe. Every day, a vast array of reasonably priced and conveniently obtainable foods are provided to millions of individuals. Due to its lack of legal legitimacy, the industry functions dangerously, representing African street life. The primary objective of this study was to assess the food safety and hygiene practices of street food vendors in Harare, Highfield, Lusaka, and Musika. A cross-sectional study design was employed to collect data at a certain point in time. The sample included both fixed and mobile retailers to ensure representation. The sample size for the study consisted of 74 street food vendors. To satisfy the dietary needs of urban residents, the street food business is crucial in the cities and towns of many emerging nations, including Zimbabwe. Every day, a vast array of reasonably priced and conveniently obtainable foods are provided to millions of individuals. Due to its lack of legal legitimacy, the industry functions dangerously, representing African street life. The primary objective of this study was to assess the food safety and hygiene practices of street food vendors in Harare, Highfield, Lusaka, and Musika. A cross-sectional study design was employed to collect data at a certain point in time. The sample included both fixed and mobile retailers to ensure representation. The sample size for the study consisted of 74 street food vendors. According to the study's preliminary findings, a significant portion of street food sellers had very little knowledge of recommended practices for food safety. The results revealed that 73% of vendors covered their food, 59.5 percent separated raw food from cooked food, and 36.5% of sellers lacked access to clean water. Furthermore, it was found that 14.9% of vendors had food safety medical certificates, 89.2% employed staff without such certificates, and 29.7% of them failed to utilize color-coded chopping boards. To lessen the health risks connected with street food selling, this emphasizes the need for better working conditions, access to basic utilities, and food education and enforcement. To improve vendors' awareness and encourage safe food handling procedures, more laws and training programs might be put in place. Establishing and implementing proper policies and procedures requires cooperation between government agencies, health organizations, and vendors. Creating awareness among consumers about the significance of selecting safe and hygienic street food vendors; conducting routine inspections to ensure compliance with food safety standards and identify areas requiring improvement; implementing regular training programs to educate street food vendors about proper food handling, hygiene practices, and food safety regulations; and, finally, encouraging collaboration between government authorities, health agencies, and street food vendors to develop and enforce effective regulations and guidelines. By implementing these suggestions, street food sellers' food safety procedures can be improved, health risks can be decreased, and the general public can be guaranteed to have access to wholesome and safe street food. Collaboration between governmental organizations, health organizations, and vendors is necessary to establish and execute appropriate policies and guidelines. educating street food vendors through ongoing training programs about safe food handling techniques, hygiene standards, and food safety laws; conducting routine inspections to verify compliance with food safety standards and pinpoint areas in need of improvement; raising consumer awareness of the significance of selecting hygienic and safe street food vendors; and, finally, encouraging cooperation between government agencies, health organizations, and street food vendors to create

and enforce efficient rules and guidelines. By implementing these suggestions, street food sellers' food safety procedures can be improved, the public's access to healthy and safe street food can be ensured, and health hazards can be decreased.

Keywords: street food, vending, health and safety, hygiene and hygiene.

LIST OF ABBREVIATIONS AND ACRONYMS

HACCP	**Hazard Analysis Critical Control point**
W.H.O	**World Health Organization**
PPE	**Personal Protective Equipment**
SPSS	**Statistical Package for the Social Sciences**

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CHAPTER 1: INTRODUCTION

1.1 Background of the study

Vending is a well-known economic activity that provides necessities to a large percentage of the populace. According to Reed (2019), street vendors play a crucial role in urban economies by providing convenient access to a diverse array of goods and services in public areas. Providing daily necessities to individuals who rely on easily accessible and competitively priced commodities is crucial in both rural and urban regions. Nowadays, a large number of Zimbabweans rely on it to survive (Simango, 2017; Moyo, 2019). The economic crisis in Zimbabwe has caused the informal sector to expand and become the largest employer in the nation (Njaya, 2014; Nani, 2020; Mutsaka, 2020). It is believed that 75% of people who are employed earn a living within this expansion of the unofficial sector (Zimbabwe National Statistics Agency, 2020). Poverty, unemployment, and difficult economic conditions have been the primary drivers of street vending (Ratisai, 2018; Skinner and Balbuena, 2019). However, there is little awareness of the health and safety problems linked with vending practices. Food safety, hygiene, and health hazards must be considered when vending because they have a direct impact on the well-being of both vendors and customers.

Food and drink items that are sold in public areas, along with possibly some other items, are referred to as vending street food (Bhattacharya and Reang 2014). The sale of street food is usually done informally and without official regulation by any relevant authorities (Samupundo et al., 2016). Due to its easy access to low-cost, reasonably priced meals, street vendor food encourages dietary diversity among many people working in the unorganized sector (Alimi, 2016).

Food safety, hygiene, and health risks are important considerations in vending as they directly impact the well-being of vendors and consumers. Inadequate food handling, poor hygiene practices, and non-compliance with regulations can result in foodborne illnesses, contamination, and other health hazards. Food contamination is a concern in certain areas where bare hands are used to serve ready-to-eat meals. (Dannikuu et al, 2015). These risks are particularly concerning in settings where proper infrastructure, resources, and training may not be readily available. Access to hygienic facilities, good hygiene habits, and clean running water are necessities (Hill, 2016; Samapundo et al., 2015).

Samapunto et al. (2015) claim that most street food vendors have no formal education and lack basic food safety knowledge and skills. Food contamination may result from vendors' handling and preparation of food in violation of food safety laws (Noor, 2016). The bulk of street food vendors, according to Farahat et al. (2015), have access to suitable equipment resources, such as electricity, potable water, and refrigerators. It is challenging to follow safe food practices and exposes food to contamination and decomposition when there are insufficient resources available, such as dirty water and poor electricity (Monney et al., 2013).

Njaya (2014) asserts that the informal sector contributes to closing the employment gap that the government is unable to close for all people and that the average income from this sector is on a level with that of skilled workers in the official sector. These days, this industry is boosting the economy by supplying markets with goods made in both large- and small-scale sectors.

More so, vending activities can have environmental impacts like pollution, waste generation, and resource depletion. Proper waste management, sustainable practices, and adherence to environmental regulations are said to be crucial to minimize negative environmental challenges associated with vending.

According to Sowane (2017), street vending is associated with challenges like traveling and working for a long time for a long time so they hardly get enough time to rest and relax, due to increased traffic their mobility on the main street is hampered, get harassed by local authorities or policemen during vending and they do not have market amenities like safe and clean water, toilet, storage facilities shades and waste disposal to mention a few.

Assessing the health risks, food safety practices, regulatory compliance, consumer perspectives, and environmental impacts of vending is crucial for the well-being of both consumers and vendors. This research aims to fill the knowledge gap through systematic evaluation and understanding of these aspects; by providing evidence-based insights, the goal of this research is to aid in the creation of efficient interventions, regulations, and systems of assistance that encourage healthier, safer, and more environmentally friendly vending practices.

1.2 Problem statement

Since there was a recent cholera outbreak in Harare, Highfield has raised concerns about the general hygiene and food safety procedures in the region. 150 cases were confirmed as of November 23, 2023, and 15 deaths, 123 cases, and 12 fatalities were reported in mid-November 2023 and 21,835 cholera cases and 487 deaths were reported by January 31, 2024, just to mention a few cases reported. Cholera primarily spreads through contaminated water or food sources, WHO, (2022). Contaminated food or water is thought to have contributed significantly to the disease's spread during the outbreak. In light of this outbreak, it is critical to assess the food safety and hygiene practices of food businesses in Harare, Highfield. Conducting a research study on this topic becomes crucial as it aims to identify potential gaps or weaknesses in the system that might have contributed to the contamination. By evaluating current practices, the study seeks to shed light on the specific areas or practices where improvements are needed to prevent future outbreaks.

1.3 Justification

In providing essential goods and services, vending plays a significant role for a large portion of the population in Zimbabwe. It is crucial to protect public health by assessing risks associated with vending. Through the identification of potential hazards like contamination, foodborne illnesses, and unsanitary practices, interventions can be developed to mitigate these risks and ensure consumer safety.

For access to affordable goods and services, consumers rely more on vending. Assessing health risks that are associated with vending ensures consumer protection. Identifying potential health hazards like unsafe food handling, inadequate labeling, unregulated products, and interventions can be developed to promote consumer safety and informed choices.

Despite the importance of vending, there is a lack of comprehensive research on the health risks and safety concerns associated with vending practices. This research will help to fill the knowledge gap, providing evidence-based insights on the health implications, environmental sustainability, and regulatory compliance of vending. This information can guide vendors, stakeholders, and policymakers in making decisions and implementing effective interventions.

In addition, vending activities can also result in environmental impacts like pollution, waste generation, and resource depletion to mention a few. Assessing the environmental risks that are associated with vending provides an opportunity to develop strategies for waste management,

recycling, and promoting sustainable practices within the sector. It can also contribute to the development of more environmentally sustainable vending in the country.

Vending is a prominent informal economic activity in the country that provides livelihoods for a lot of people. Understanding health risks and safety problems associated with vending practices is essential for ensuring the well-being and occupational health of vendors. This research can provide evidence-based insights to improve working conditions, hygiene practices, and occupational safety for vendors.

Last but not least it is crucial to assess compliance of vending practices using existing regulations and guidelines to ensure adherence to food safety standards and environmental regulations. This research can identify gaps in compliance and also help in developing appropriate regulations and policies to enhance safety, hygiene, and environmental sustainability within the vending sector. Therefore, this research will contribute to the well-being of both consumers and vendors, as well as guide the stakeholders, and policymakers in developing appropriate regulations and support mechanisms for the vending sector.

1.4 Main objectives

i) To evaluate and identify the potential health risks associated with vending practices

ii) To assess food safety practices employed by food vendors.

iii) To assess the degree to which vending procedures adhere to current rules and requirements.

1.5 Research questions

i) What are the common health risks that are associated with vending practices, for example, foodborne illness, inadequate hygiene, and contamination?

ii) How do vendors in Harare, Highfields Lusaka, handle, store, and prepare food products, and what are the potential risks to consumers concerning food safety, hygiene, and health risks associated with vending?

iii) what effective strategies and interventions can be implemented to enhance the safety, healthfulness, and sustainability of vending practices in Highfield, Lusaka, Harare.

CHAPTER 2

LITERATURE REVIEW

2.1 Overview of vending

It is astounding how common street vending is, particularly in underdeveloped nations. Progressive industrialization has caused a large-scale urban migration in the Global South, with people moving from rural to urban areas in quest of greater economic opportunities nearer commercial centers (Recchi, 2020). These working-class individuals are drawn to the informal economy because they lack formal education; this sector is characterized by improvisation, long work hours, little to nonexistent regulation, and spontaneity. It refers to the creation and selling of goods and services in urban public areas that are housed in temporary buildings and are not formally governed by the law. In non-permanent physical structures, vending has expanded in prominence. It has both positive and negative effects, contributing to overall disorderliness, congestion, and pollution while also providing low-cost solutions for pressing market shortages (Recchi, 2020).

Street food vendors in Sudan are mostly women, with 72% having just completed elementary school and 48% being illiterate, according to research by Abdalla et al. (2009). According to Chukuenzi (2010), when Nigeria investigated the food safety and hygiene practices of Owerri street vendors, they discovered that 66.7% of the vendors were women, 23.8% of them prepared food in an unhygienic way, 42.86% of them did not wear aprons, and 61.9% of them accepted payment from customers while serving them food. Munjaya et al. (2011) investigated the knowledge, behaviors, and risk factors that affect street food vendors in Uganda. The primary findings indicated that 87.6% of street vendors were women with little or no formal education.

In addition, Monney et al. (2013) examined the hygienic practices of food vendors in Ghanaian educational institutions and discovered that 52% of the vendors used appropriate personal protective apparel, 63% of the vendors had high hygiene, and all of the vendors were serving food correctly. Apanga et al. (2014) investigated the knowledge and practices of street food vendors regarding food safety in rural Northern Ghana and discovered that 96% of vendors cleaned their hands after major activities, 13% did not use soap, and 71% of vendors underwent medical screening despite having a high level of knowledge about food safety. Blaise (2014)

conducted a study on food handling and hygiene standards in Cameroon and discovered that 83% of food sellers in Nakuru, Kenyans maintained a tidy workstation, 54% handled cash and food irresponsibly, 44% had dust bins, 73% seldom ever covered their hair while handling food.
In Tamale Metropolis, Ghana, Dannikuu (2015) investigated the hygienic practices of street vendors and discovered, among other things, that women dominated the street food industry, most vendors were in their 20s and 30s, pit latrines were available to all vending areas, and fewer people participated in the medical examination. The understanding and application of food safety and cleanliness among street vendors was also examined by Afolaranmi et al. (2015). When Pokhrel and Sharma (2016) investigated food sellers' knowledge and practices regarding food safety in Guwahati's urban and semi-urban districts, they discovered that 82% of them had trash cans, 62% of them used tap water, and food items were improperly covered by 75% of the sellers.

Aluh and Aluh (2017) looked at the practices, knowledge, and behavior of food hygiene among mobile food vendors in rural communities in Nigeria. They found that women-owned 94.1% of the vending business and that there was a strong correlation between attitudes and knowledge about food hygiene. Eighty percent of street food vendors lacked food safety training, and just fifty percent had completed high school. Alamo-Tnolada et al. (2018) looked at the hygienic aspects of food vending venues and the food handling practices used by street vendors. They discovered that the majority of street food vendors are women, accounting for 60% of the total.

2.2 Vending in Zimbabwe

Njaya, (2014) claims that street vending, a type of informal trade, has spread throughout Zimbabwean cities. In Zimbabwe's urban centers, street vending has grown during the last few decades. Street vending is prohibited by law in Zimbabwe in areas designated as such, including pavements, streets, and traffic crossroads. It is suggested for those who plan to engage in vending activities to apply to the municipal council for space allocation in the authorized vending locations. The daily operation charge for the approved vending locations is US$1 for vegetable and newspaper sellers and US$3 for the flea markets. Any foreign items that do not have the necessary documentation to demonstrate that the duty has been paid are not allowed at any vending sites and will be seized by law enforcement. Furthermore, street searches are frequently conducted by municipal authorities to curb the increasing number of violations of established statutory

instruments. When someone is caught and finds they cannot afford the fine, their belongings are seized and eventually destroyed. Captured individuals are released after paying the fine.

2.3 Types of activities done in vending

In Zimbabwe, small-scale enterprises and a variety of informal trade are involved in the common economic activity of vending. Street vending, a common type of vending where people put up makeshift stalls or sell things directly on the streets, is one of the activities carried out under the vending category in Zimbabwe. According to Njaya (2014), vendors sell a variety of goods, such as apparel, electronics, footwear, home goods, fruits and veggies, decorations, and cellphone repair. All of these activities, all types of street vending—take place on sidewalks and in public spaces. According to Graaff and Ha (2015), street vendors are movable in the sense that they frequently relocate and are not permanent residents.

Vendors transact in both restricted and unrestricted regions (Njaya, 2014). There is also food vending, which involves the selling of cooked food, snacks, and beverages in public open spaces. Food vendors will be preparing and selling popular dishes like sadza which is a stable food, roasted maize, fried chicken, samosas, and various street food items. In addition, there is also vegetable and fruit vending, where vendors will be specializing in selling fresh farm fruits and vegetables. Vendors will set up stalls to display their produce in baskets along the streets or rather in designated areas. As per Njaya (2014), vendors conduct business in both restricted and unrestricted zones. The selling of prepared meals, snacks, and drinks in open areas is known as food vending. Popular foods like fried chicken, samosas, roasted corn, and sadza, a stable food in Zimbabwe, will be prepared and sold by food sellers. Plus, there will be fruit and vegetable sellers, with the focus being on selling fresh produce from farms. Instead of setting up shop in random spots, vendors will line the streets to showcase their produce in baskets. These merchants will be essential to the community's ability to obtain and afford fresh produce. In Zimbabwe, vending encompasses more than just selling tangible products; it also involves offering services. Services like photocopying, phone charging, mobile transfers, printing, and minor appliance or electronics maintenance are included in this.

2.4 Hazards associated with vending

Zimbabwe, like any other nation, has risks and difficulties associated with selling for both sellers and the general public. Food vendors are exposed to health risks because of things like the

unregulated nature of their business and the absence of infrastructure such as water, sanitation, and shelter (Gamieldien and van Niekerk, 2017). Health and sanitation problems are among the hazards connected with vending; these are brought on by subpar sanitation facilities and unsafe hygiene practices. When food vendors lack access to hygienic food handling practices, clean water, or sufficient food storage facilities, the risk of contracting foodborne illnesses is heightened. According to Kok and Balkaran (2014), dirty dishes and pots left near the service areas draw flies, leftover food exposed to dust and humid weather attracts rodents, and open trash cans attract insects and other vermin. The food sold by street vendors presents a serious risk to public health since it is of poor quality and because the neighborhoods where they operate lack basic infrastructure, according to Samapundo et al. (2015) and Sezgin and Sanlier (2016). One issue with decreasing the amount of water drained is the obstruction of drainage pipes, which is typically caused by plastics and vegetable litter. This results in flash floods that pose a risk to public health since they contaminate with garbage. When the public comes into touch with polluted water from flash floods caused by inadequate drainage systems, Hill (2016) and Samapunto et al. (2015) have shown that unprotected feet and legs can worsen micro infections, which can result in diseases like cholera and diarrhea. Similarly, unhygienic conditions in vending areas may result from improper waste management and disposal methods. Additionally, workplace safety is lacking. The nature of their business exposes vendors to hazards related to occupational health and safety. Ankle strains and other health issues can also result from heavy lifting, extended standing, exposure to severe weather, and limited access to personal protective equipment. Additionally, one other risk that suppliers must deal with is fire. Open flames, gas stoves, and other heating appliances that are used for cooking are frequently used by vendors, which increases the possibility of fire mishaps. Inadequate fire safety precautions, crammed vending spaces, and combustible goods can all raise the danger of fires, putting vendors and the neighborhood in jeopardy. Unofficial vending structures are made with subpar materials and construction norms, which increases the risk of structural failure. Accidents and injuries may also be caused by weak or unstable structures, particularly in inclement weather.

2.5 Risks associated with vending

Vending is an economic activity that carries inherent risks that vendors and the general public should be aware of. These risks vary depending on the specific context and location. Vendors face health and safety risks associated with their working conditions. These risks include physical

hazards such as slips, trips, and falls as well as exposure to harmful substances, fumes, or dust. Working hours and the smoke from cooking fuel are linked to a higher frequency of upper respiratory problems. In addition, they are subjected to air pollution from many sources such as industrial processes, automobile emissions, road dust, and other sources, which can lead to various respiratory health complications. Consequently, most vendors encounter environmental factors during trade (Ambat et al., 2015, Kushwah et al., 2019 Prabhu et al., 2019). According to a 2019 American Lung Association study, asthma episodes, poor lung function, early mortality, and cardiovascular disease-related deaths as well as cardiovascular morbidity in children are all brought on by traffic pollution.

Improper food handling procedures and poor hygiene when it comes to food vending can result in foodborne illnesses that can be dangerous for both vendors and customers. The weather can also represent a risk to sellers operating in outdoor settings. Extreme temperatures, heavy rains, or strong winds can all have an impact on the safety and feasibility of vending activities (Weigo, 2022; Prabhu et al., 2019). Extreme weather can harm vending machine structures, contaminate perishable commodities, and endanger people's safety. According to Samapunto et al. (2015), the majority of street food vendors don't have a formal education and frequently lack the abilities and information needed to guarantee food safety. Food contamination may result from sellers handling and preparing food without adhering to food safety rules (Noor, 2016). Vendors also run the risk of legal and regulatory issues. Vendors frequently operate without official licenses or permits, placing their business in regulatory gray zones. This will put them in danger of fines, having their belongings seized, or having the authorities evict them. For vendors, unclear legislation or uneven enforcement can lead to risk and uncertainty. According to Farahat et al. (2015), the majority of street food sellers have access to sufficient equipment, including refrigerators, portable water supplies, and electricity sources. It is challenging to adhere to safe food practices when there are limited resources, such as contaminated water and insufficient energy, as food is prone to contamination and decay (Monney et al., 2013).

CHAPTER 3: METHODOLOGY

3.1 Description of the study area

The survey was conducted in the bustling Lusaka neighborhood of Harare's Highfield area, which is well-known for its wide range of products and services. It is located to the south of the Central Business District. The GPS coordinates of Harare, Highfield are approximately, -17.8639°: latitude: and 31.0482°: longitude: It is a popular destination for residents of the area, as well as visitors from other parts of Harare and beyond. With a population of about 440,000, it's one of the biggest and densest suburbs of the city, with a high proportion of inhabitants living in high-density buildings. The Lusaka Market is a bustling hub of economic activity, with a large section of products and services offered. At the market you can find vendors selling fresh produce like fruits, vegetables, and herbs there are also some stalls selling handmade goods like textiles, jewelry, and artwork. Additionally, there are a variety of food vendors selling everything from traditional Zimbabwean dishes to international fare.

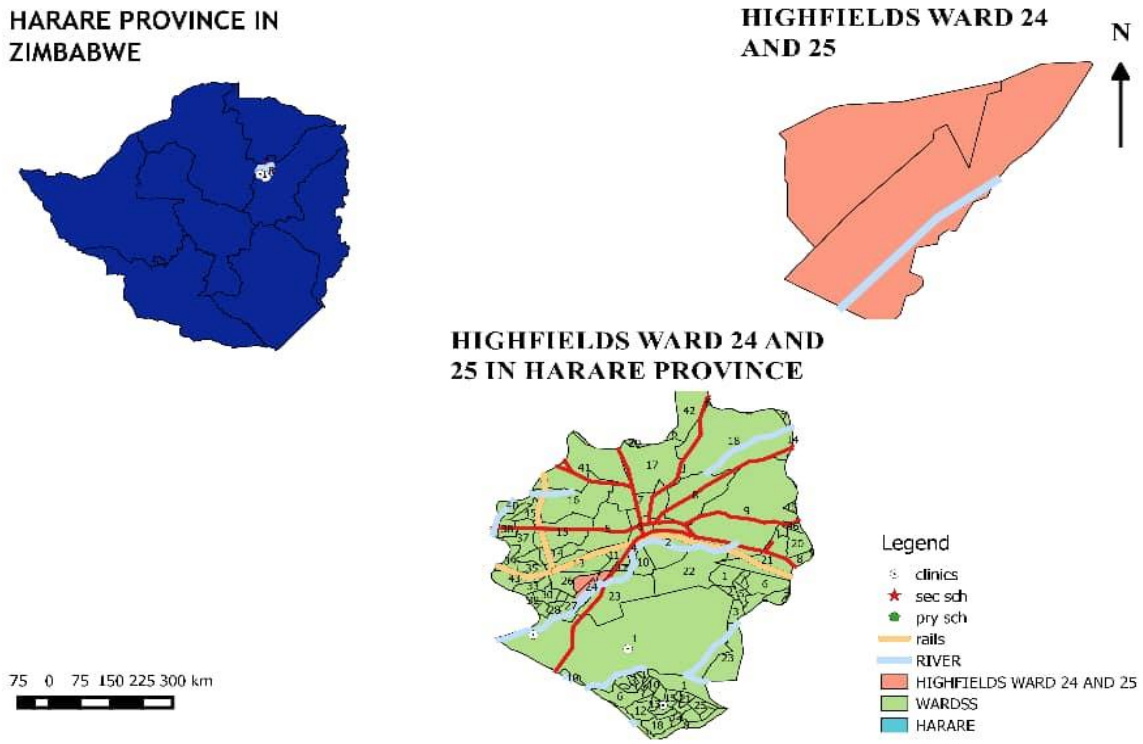

Figure 3.1: Showing Highfield study area

3.2 Research design

A cross-sectional research approach was used for this study because it provided information on the features and situation of the vendors at a particular moment in time, which made it perfect for evaluating food safety procedures and health hazards among vendors in Harare Highfield, Lusaka. A cross-sectional technique enables the researcher to quickly acquire an overview of the vendors' knowledge, attitudes, and behaviors regarding food safety as well as the most common health concerns without the need for lengthy longitudinal monitoring. This method is economical and efficient, making it possible to promptly collect pertinent data that will guide future interventions and policy suggestions. Moreover, a cross-sectional design facilitates the exploration of associations between the vendors' characteristics, their food safety practices, and the identified health risks, providing valuable insights that can guide efforts to improve food safety and reduce health hazards in the Harare Highfield market.

3.3 Sample and Sampling Procedures

3.3.1 Study population

The participants for this research comprised street food vendors operating in Harare, Highfield Lusaka section. On inclusion criteria, the following inclusion criteria were applied to define the study population that is, the street food vendors who possess valid permits and those authorized by the local municipal authorities to operate within the city limits, those who actively engage in street food vending during the study period and have a regular presence at their designated locations and lastly those vendors who offer a diverse range of food items commonly consumed by the local population, including snacks, meals, and beverages. The study excluded street food vendors who operate outside the designated city boundaries or in neighboring towns or districts, vendors who have temporarily ceased their operations due to personal reasons, seasonal factors, or other temporary closures during the study period, and vendors who specialize in non-food items that do not fall within the scope of traditional street food offerings.

3.3.2 Sample size

The following formula was used to calculate the sample size: n = (Z^2 * σ^2) / E^2. Where sample size (n) is Z = Z-score (e.g., 1.96 for 95% confidence) matching the desired

confidence level

σ = population standard deviation, or standard deviation estimate

E = desired margin of error (e.g., 0.05)

n = (1.96^2 * 0.5^2) / 0.05^2

n ≈ 73.77

3.3.3 Exclusion

Vendors who operate under the age of 18 years, and vendors who do not prepare or handle food on-site.

3.4 Data collection

Questions from interviews and the researcher's observational questionnaire were used to gather data. The food preparation, cooking, and storage areas were all observed by the researcher, along with the vending area. As a prelude to the actual data collection phase, the researcher also paid a visit to the stall as a regular person to check what each seller sold and to observe how they were positioned. Along with additional details about the study and the data collection process, consent letters were also issued to the suppliers.

3.4.1 Data collection tool

The main instrument used in this study to collect data was a structured questionnaire. The purpose of this questionnaire was to collect data on the various facets of food safety and sanitation methods used by street vendors. To guarantee that key dimensions and aspects were included in the questionnaire, the questionnaire creation process drew upon a thorough study of pertinent literature on street food safety and hygiene procedures. Again, the questionnaire was carefully aligned with the research objectives, aiming to capture data that addressed the research questions and provided insights into the specific areas of investigation. Last but not least, to enhance content validity, the questionnaire underwent expert review by professionals specializing in food safety and public health. This step ensured the clarity, relevance, and effectiveness of the questions in eliciting the desired information.

There were just closed-ended questions on the questionnaire. Predetermined response alternatives were provided by closed-ended questions, allowing for quantitative analysis. The questionnaire

covered a range of topics, including, food handling practices, personal hygiene measures, food storage and preparation methods, cleaning and sanitation procedures, and understanding and awareness of food safety regulations.

Data for this research was collected by the researcher herself, by personally giving the street food sellers the structured questionnaire. First and foremost, the researcher started with a self-introduction and explanation, this is where the researcher introduced the agenda of the research and its importance to the food vendors on the street. She provided a clear explanation of the questionnaire and its sections, ensuring that the vendors understood the nature of the questions. The questionnaires were distributed by the researcher to the food vendors on the street and guided them through the process of completing a questionnaire. She was available to address any queries or concerns raised by the vendors during the administration. Participants were reassured by the researcher that their answers would remain private. The researcher emphasized the anonymity of the data and took appropriate measures to protect the confidentiality and privacy of the participants' details. Lastly, the researcher closely monitored the data collection process to ensure data integrity and checked for completeness and accuracy of the responses, addressing any inconsistencies or missing information by contacting the vendors for clarification or completion if required.

3.5 Data Analysis

The data was entered into SPSS version 20, checked for errors, and then coded. Context-giving tables and graphs were employed in the analysis.

3.6 Moral considerations

3.6.1 Informed permission

An informational pamphlet about the study and a consent form to sign was sent to each responsible food vendor before they took part in it. The Dictionary of Epidemiology, 2014 defines informed consent as voluntary consent for study participation provided by the responsible proxy after being informed about the goals of the study, its procedures, methods, potential benefits and risks, and, if applicable, the level of uncertainty surrounding its results. The participant's involvement in the study is entirely optional, and the researcher informed them that they would not face any consequences should they choose to leave at any point.

3.6.2 Confidentiality

The data collected from the observations was protected and kept private. The hard drive, compact disk, hard copy, and other storage devices are only accessible to the researcher and the study supervisor.

3.6.3 Anonymity

The suppliers were not required to enter personal information such as names or identity numbers on the data gathering instrument to protect their anonymity. Rather than using participant identities, code names were employed.

3.6.4 Privacy

As part of the study, pertinent data such as age and gender will be requested. No photos were taken throughout the data collection process, and only individuals directly participating in the study will receive any information about it. During the data collection process, no recording devices of any kind were used to compromise privacy.

3.6.5 Benefits

Participants were not at all lured in by a researcher with the promise of rewards or incentives from merchants. The study's findings may help ensure that street sellers serve food that is both hygienic and safe. Since no food was gathered and no photos of the food vendors' stalls and activities were taken, there were no known threats to the vendors.

CHAPTER 4

DATA INTERPRETATION AND PRESENTATION

4.1 Demographic detail of the study.

Table 4.1 in the section below shows the participants' demographic data.

According to the data presented in Table 4.1, there are 41% of widowed respondents, 10.8% divorced respondents, 58.1% married respondents, and 27% single respondents. This demonstrated that married individuals may be in a more solid financial position and thus be able to invest in a vending business, or they may seek out vending as a secondary source of income due to a sense of familial obligation. 45.9% of the respondents in this research were between the ages of 21 and 40. This could be attributed to the youth demographic's domination in emerging countries without sufficient employment prospects. In light of the respondents' educational backgrounds, 44.6% of the vendors had completed secondary or high school, 18.9% had completed primary school, 21.6% had completed higher education, 4.1% had completed none, and 10.8% had completed advanced. Finally, 52.7% of the participants reported having worked as vendors for two to five years, and 44.6% reported having put in the most hours which is ten hours.

Table 4.1 presents the results of demographic data of study participants

VARIABLE	FREQUENCY	PERCENTAGE (%)
Gender		
-male	29	39,8
-female	45	60,8
Marital status		
_single	20	27
-married	43	58,1
-divorced	8	10,8
-widowed	3	4,1
Age		
- **< or = 20 years**	7	9.5
- **21-40 years**	34	45,9

- **40-60 years**	26	35,1
- **> or = 60 years**	6	8,1
Academic level		
-none	3	4.1
-primary	14	18,9
-secondary/ High school	33	44,6
-tertiary	16	21,6
-advanced	8	10,8
Working experience		
-1 year	16	21,6
-2-5 years	39	52,7
-6-10 years	10	13,5
-11-15 years	6	8,1
-> or = 20 years	3	4,1

Variable	Frequency	Percentage (%)
Working hours		
-5 hours	17	23
-10 hours	33	44,6
-15 hours	17	23
> or + 15 hours	7	9,5

4.2 Health risks associated with vendors.

The data in Figure 4.2.1 reveals health risks associated with street food vending. A significant 64.9%, (48 vendors) admit to coming to work while sick, putting customers at of illness transmission. Furthermore, vendors faced inconveniences caused by the City Council interventions, with 23%, (17 vendors) experiencing this once a week and 33.8% (25 vendors) experiencing it twice a week. Additionally, only 36.5%, (27 vendors) have access to safe water, while a majority of 63.5%, (47 vendors) have no access to safe water, posing a risk to food safety and public health.

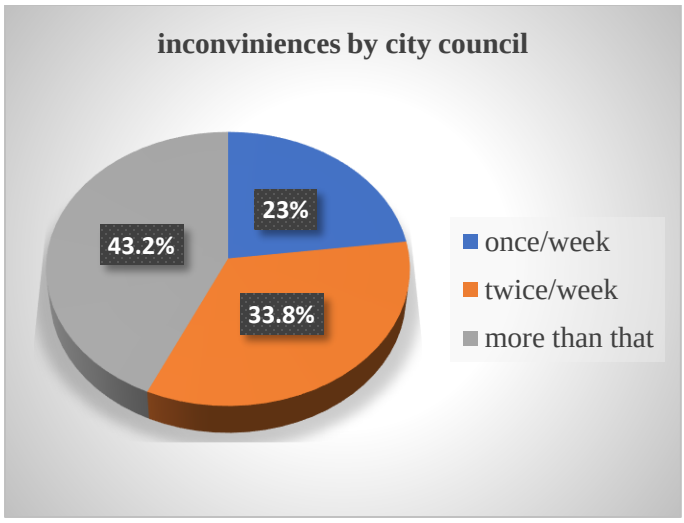

Figure 4.2.2: shows inconveniences caused by City Council

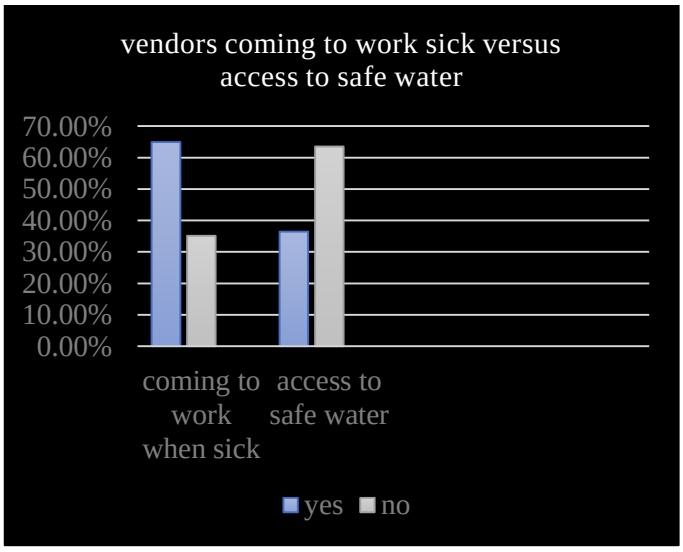

Figure 4.2.2: shows vendors coming to work when sick

4.3. Evaluation of street food sellers' food safety protocols.

A majority (73%), 54 vendors covered their food while a minority (27%), 20 vendors did not. Similarly, only 59.5% (44 vendors) separated their raw food from cooked food, while 40.5% (3

vendors) did not. Furthermore, 71.6%, (53 vendors) stored their food in safe conditions, but 28.4%, (21 vendors) did not.

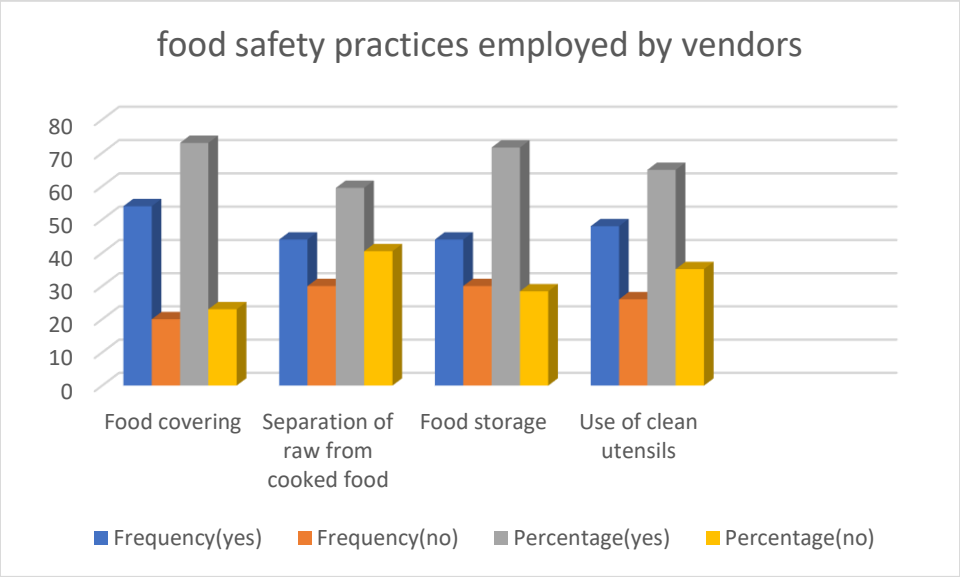

Figure 4.3.1 shows food safety practices employed by vendors

4.4. To evaluate the extent to which vending practices comply with existing regulations and guidelines.

The data in Table 4.4.1 below shows a trend among street food vendors, only 14.9% (11 vendors) have undergone food medical tests, while a staggering 85.1% (63 vendors) have not. Furthermore, 10.85% (8 vendors) hired workers without ensuring they had a food safety medical certificate. Additionally, the use of color-coded chopping boards is lacking, with only 29.7% (2 vendors) utilizing them, while 70.3% (52 vendors) do not.

Table 4.4.1 shows the compliance of vendors with food safety regulation

		Frequency	Percentage
Presence of vendors with food safety medical certificates	**Yes**	**11**	**14.9**
	No	63	85,1
Hiring of workers without medical certificates	**Yes**	**8**	**10,8**
	No	66	89,2
Use of color-coded chopping boards	**Yes**	**22**	**29,7**
	No	52	70,3

CHAPTER 5: DISCUSSION OF RESULTS

5.1 Introduction

This chapter's interpretation and discussion served as the foundation for the findings in Chapter 4.

5.2 The risks to one's health that come with vending

The results show that a significant majority (64.9%) of street food vendors reported coming to work while sick, while 35.1% reported not doing so. This is a concerning finding, as working while sick can have several serious consequences for the vendors' and the customer's health. Food handlers who work while sick can potentially transmit illnesses to customers, leading to foodborne outbreaks. These findings are consistent with those of Rahman et al. (2022), who found that 60% of street food vendors in Bangladesh claimed they were forced to work when ill due to a lack of paid sick leave and financial constraints. In a similar vein, Nyamathi et al., (2020) research revealed that 55% of American street food vendors admitted to working when ill out of concern for losing clients and money. The high percentage of vendors reporting that they come to work while sick (64.9%) suggests that this is a widespread issue that needs to be addressed through policy changes and education. Apart from mitigating the likelihood of foodborne infections, educating customers and suppliers about food safety and hygiene practices can also protect their health and well-being.

About the complaints raised by the City Council, the results show that street food sellers experience these problems at varying frequencies. The majority (43.2%) of vendors reported experiencing inconveniences more frequently, while 33.8% reported experiencing them twice a week, and 23% reported experiencing them once a week. The researcher suggests that the City Council's actions are having a significant impact on the street food vendors, with many vendors experiencing frequent inconveniences. The high percentage of vendors experiencing more frequent inconveniences (43.2%) indicates that this is a widespread issue affecting a large proportion of vendors. According to research by Skinner (2018), in Johannesburg, South Africa found that 80% of street vendors reported being harassed or intimidated by city council officials, with 40% experiencing physical violence. These findings are concerning, as frequent inconveniences can harm the livelihoods of street food vendors, including financial losses, wasted time and resources, and increased stress and anxiety. The results highlight the need for the City Council to take steps

to reduce the frequency and severity of these inconveniences and create a more supportive environment for food vendors on the street.

The results show that although the majority of street food sellers (63.5%) stated they did not have access to clean water, 36.5% said they did. The availability of safe water is essential for food safety, as it is used for food preparation, cleaning, and sanitation. The low percentage of vendors reporting access to safe water (36.5%) is a concern, as this can lead to foodborne illnesses and other health problems. These findings are consistent with those of Li et al. (2019), who found that only 30% of Chinese street food vendors had access to clean water, and that 70% of them relied on untreated water sources. Comparably, a Musa et al. (2022) study discovered that 60% of Nigerian street food sellers reported utilizing contaminated water sources, whilst 40% of them had access to safe water. The necessity for initiatives to increase street food sellers' access to safe water is highlighted by the large percentage of vendors (63.5%) who report not having access to it. This can entail giving vendors access to sources of clean water, encouraging the use of water treatment and sanitation techniques, and teaching them about the significance of clean water for the safety of food.

5.3 Food safety practices employed by vendors.

The findings regarding food coverage indicate that while 23% of street food vendors did not use food covering, a vast majority (73%) did. This is a positive finding, as food covering is an important food safety procedure that can lower the chance of foodborne diseases and assist prevent contamination. The high percentage of vendors reporting the use of food covering (73%) suggests that many vendors are taking steps to protect their customers' health. These results are in line with those of Kumar et al. (2020), who discovered that 70% of Indian street food vendors said they covered their food to avoid contamination. In a similar vein, 75% of Nigerian street food vendors said they used food covering as a food safety precaution, according to research by Musa et al. (2022). Regarding street food vendors' food safety policies, the researcher notes that there is still an opportunity for improvement based on the comparatively low percentage of sellers reporting non-use of food coverings (23%). Education and training initiatives can help increase vendors' knowledge of and adoption of food safety protocols.

Moving on to the separation of raw food from cooked food, the results show that a majority (59.5%) of street food vendors reported separating raw and cooked foods, while 40.5% reported not doing so. This is a crucial food safety practice since keeping raw and cooked food separate can

lessen the chance of cross-contamination and foodborne infections The majority of vendors reporting separation of foods (59.5%) is a positive finding, indicating that many vendors are taking steps to protect their customers' health. However, the significant percentage of vendors reporting non-separation of foods (40.5%) is a concern, as this practice can lead to foodborne illnesses. Education and training programs can help to increase awareness and adoption of proper food handling and separation practices among vendors. These findings correspond with those of Li et al. (2019), who found that while 45% of Chinese street food sellers claimed they didn't keep cooked and raw food separate, 55% of them claimed to do so. Comparably, Patel et al.'s study from 2021 discovered that 40% of Indian street food vendors did not separate their dishes, whereas 60% said they did.

On food storage, the results show that a significant majority (71.6%) of street food vendors reported storing food properly, while 28.4% reported not doing so. Proper food storage is a critical food safety practice that helps prevent contamination and spoilage. The high percentage of vendors reporting proper food storage (71.6%) is a positive finding, indicating that many vendors are taking steps to protect their customers' health. However, the significant percentage of vendors reporting improper food storage (28.4%) is a concern, as this practice can lead to foodborne illnesses. Education and training programs can help to increase awareness and adoption of proper food storage practices among vendors. According to Musa et al. (2022), 70% of Nigerian street food vendors said they stored food properly, whereas 30% said they didn't. These results are in line with their findings. Nyamathi et al. (2020) reported similar results, indicating that 75% of street food vendors in the United States claimed to preserve food appropriately, whereas 25% did not.

The results show that a majority (64.9%) of street food vendors reported using clean utensils, while 35.1% reported not doing so. One of the most important food safety procedures that stop the spread of dangerous germs and other toxins is using clean utensils. It is encouraging to see that most vendors (64.9%) report using clean utensils, suggesting that many are taking precautions to ensure the health of their patrons. However, the significant percentage of vendors reporting non-use of clean utensils (35.1%) is a concern, as this practice can lead to foodborne illnesses. Education and training programs can help to increase awareness and adoption of proper utensil cleaning and sanitation practices among vendors. These findings are consistent with those of Kumar et al. (2020), who found that whereas 60% of Indian street food vendors claimed to use clean utensils,

40% did not. Similarly, a survey conducted in 2022 by Rahman et al. found that 35% of street food vendors in Bangladesh did not use clean utensils, while 65% claimed to do so.

5.4 Compliance of food vendors' practices with existing regulations and guidelines.

The final goal of the researcher's study was to find out how common food safety certification is among street food vendors. The findings indicate that a sizable majority (85.1%) of the vendors polled do not have a medical certificate for food safety, while just 14.9% of them do. This research reveals a substantial discrepancy in street food sellers' approaches to food safety, which may have detrimental effects on the general public's health. In a related study, Rahman et al. (2022) discovered that 81.8% of Bangladeshi street food sellers lacked a food safety certificate, compared to 18.2% who did. The authors suggested greater awareness and vendor training programs, citing the low fraction of certified merchants as a public health problem. In another survey, just 12.5% of street food vendors had received food safety training, while 87.5% had not, according to Musa et al. (2022) in Nigeria. To better protect consumers, the authors stressed the need for stronger food safety laws and enforcement. These studies show that street food sellers consistently have poor certification rates for food safety, which emphasizes the need for focused interventions to enhance food safety procedures and safeguard the public's health.

The researcher also sought to learn more about how street food vendors hire people who don't have food safety medical certificates. The results show that a small percentage (10.8%) of vendors reported hiring workers without medical certificates, while a significant majority (89.2%) do not. This finding suggests that most vendors prioritize food safety and comply with regulations by only hiring workers who possess the necessary medical certificates. However, the small percentage of vendors who do hire workers without certificates is still a concern, as it can compromise food safety and public health. In a related study, Kumar et al. (2020) discovered that 87.5% of Indian street food sellers made sure their employees had acquired the necessary training, whereas 12.5% of them employed individuals without any knowledge of food safety. To reduce foodborne infections, the authors stressed the significance of food safety standards and their enforcement. Li et al. (2019) conducted a study in China and discovered that although 90.8% of street food sellers prioritized food safety by only recruiting certified workers, 9.2% of them hired personnel without medical certifications. To improve food safety measures, the authors emphasized the necessity for

vendors to have greater awareness and education. These studies show a widespread dedication to food safety and public health, as seen by the low employment rates of personnel without medical certificates for street food vendors' food safety.

The results of the use of colored cutting boards show that a significant minority of merchants (29.7%) reported using colored cutting boards, despite the majority of vendors (70.3%) not using them. This study suggests that even though some vendors place a high priority on food safety and the separation of raw and ready-to-eat foods, a sizable percentage of sellers may be endangering food safety by not using color-coded chopping boards. In a related study, Nyamathi et al. (2020) discovered that whereas 64.9% of street food sellers in the US did not utilize color-coded chopping boards, 35.1% did. To avoid cross-contamination, the authors stressed the significance of using appropriate food handling and preparation procedures. In Bangladesh, another study by Rahman et al. (2022) discovered that while 74.4% of street food sellers did not use color-coded chopping boards, 25.6% did. Using this data, the researcher proposes that to enhance food safety procedures, vendors should be better informed and conscious of their responsibilities.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This study set out to assess the health risks and food safety practices used by street food vendors. About the potential health risks associated with providing street food, the poll reveals that a minor portion of vendors lack access to clean water, and a significant number of them stated they carried on with their operations despite health issues prompted by the local council. These findings highlight how crucial it is to provide vendors with improved working conditions and access to basic supplies. As part of their food safety protocols, the majority of vendors said they cover their food, keep cooked and raw food separate, store food correctly, and use clean tools. Nonetheless, many vendors lacked food safety medical certificates, and a lot did not utilize color-coded cutting boards. These results imply that although vendors were aware of fundamental food safety procedures, better instruction and enforcement of food safety laws are required. Enhancing street food sellers' and patrons' health and safety requires a multifaceted strategy. This entails addressing the working conditions and vendors' access to necessities, enhancing food safety enforcement and training, and raising consumer knowledge. Addressing these issues, we can create a safer and healthier eating environment and lower the health hazards connected to street food selling.

6.2 RECOMMENDATIONS

6.2.1 Street Food Vendor Associations

• Promote vendor demands and interests to local authorities;

• Encourage peer-to-peer learning and information exchange on food safety.

6.2.2 for local government / regulatory authority

- Enhance the availability of essential utilities and infrastructure, such as water, storage, and sanitary facilities;
- fortify and enforce food safety laws; and
- make food safety training programs for vendors a requirement.

6.2.3 Ministry of Health

- Develop and implement national food safety rules for the street food industry;
- Encourage public-private partnerships to strengthen food safety infrastructure; and
- Bolster systems for foodborne disease reporting and surveillance.

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