

The Relationship between Basic Sanitation Quality and Food Safety for Food Preparation in Restaurants at the Administrative Post Dom-Aleixo, Dili Municipality, 2025

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Abstract

Introduction: Food poisoning resulting from biological contamination and inadequate food handling practices is a significant global public health concern. In Timor-Leste, the high number of restaurants that do not meet hygiene standards represents a real threat to food safety, particularly in food preparation. **Objective:** This study aimed to analyze the relationship between basic sanitation quality and the implementation of five key food safety practices and the quality of food preparation in restaurants in the Dom-Aleixo Administrative Region, Dili Municipality, in 2025. **Method:** This study used a quantitative analytical design with a cross-sectional approach. A total of 35 restaurants were sampled using an accidental sampling technique. Data were collected through questionnaires, observations, and interviews, and analyzed using the chi-square test. **Results:** 71.4% of restaurants had good basic sanitation quality and implemented food safety practices in accordance with WHO standards. There was a significant relationship between sanitation quality and food preparation quality ($p < 0.001$). All restaurants with poor sanitation also demonstrated food preparation that did not meet standards. Human factors, such as the knowledge and attitudes of food handlers, are key determinants of the implementation of food safety practices. **Recommendation:** Restaurant owners are advised to provide regular training to staff on sanitation and food safety. Local governments also need to strengthen monitoring systems and provide regular training. Further research is recommended, including direct observation, to obtain more detailed and objective data.

How to Cite

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Introduction

Food poisoning is a common health problem worldwide. Food poisoning is characterized by nausea, vomiting, or diarrhea after consuming contaminated food. This contamination can be caused by germs or toxins ingested in the food. (Raya Marcela et al. 2023). Food preparation hygiene encompasses efforts to maintain food hygiene and safety, as well as actions taken to prevent contamination and foodborne illness. Hygiene includes cleaning hands, equipment, work surfaces, and the food preparation environment. Hygiene is an essential component of food sanitation, which aims to prevent food poisoning and related illnesses (Di et al. 2022).

According to data (WHO, 2024) Globally, every year, there are around 600 million cases of food poisoning and 420,000 deaths due to unsafe food. Nearly 1 in 10 people in the world fall ill after consuming contaminated food. Food poisoning is a global problem that causes morbidity and mortality, based on data from (Centers for Disease Control, 2024) In the United States, it is reported that factors contributing to food poisoning are pathogens that often cause cases of food poisoning infections originating from *Campylobacter* in unpasteurized milk, Norovirus originating from shellfish, *Escherichia coli*, and *Salmonella*. Based on findings in a study by (Sarmiento and Apritado 2022) Basic sanitation practices, such as clean restrooms, the use of clean work clothes, and food handling with utensils, directly contribute to food safety in restaurants. Some key points: High personnel hygiene (composite mean: 3.59) indicates awareness of contamination prevention, Pest-free service areas and clean cutlery support a safe environment for food preparation, Food handling using utensils such as spatulas and tongs received a very good rating (mean: 3.79), reflecting a commitment to food safety.

Basic sanitation is a crucial aspect of ensuring food safety in restaurants. According to (Noordianty et al. 2024) A sanitation system that encompasses a clean work environment, personal hygiene, and hygienic food handling significantly determines the quality of the food produced. Principles such as selecting fresh ingredients, storing food at safe temperatures, and maintaining clean equipment are fundamental elements that must be consistently applied. Human and environmental factors are key determinants of sanitation effectiveness. Food handlers who understand the importance of cleanliness and clean kitchen facilities will contribute to serving food that is safe to consume. By implementing good basic sanitation, the risk of contamination can be reduced, food quality can be maintained, and restaurant customer satisfaction can be increased.

Food poisoning is caused by food being contaminated by organisms such as bacteria, viruses, and parasites, or toxins such as exposure to chemicals and metals. This contamination can occur at any time, either during the initial production process, such as growing for distribution, or during processing for consumption. Here are some global statistics: 600 million cases, 420,000 deaths from unsafe food; also explaining behavioral causes such as poor storage, hand hygiene practices, and cross-contamination (Negassa, Ashuro, and Soboksa 2022). Not washing hands before cooking can increase the risk of contamination by up to 10 times, and the importance of washing cookware and sanitizing the cooking area (Abegaz 2022). According to research by (Aspiani and Rustiawan 2020) In the food preparation process in restaurants, basic sanitation quality plays a central role in ensuring food safety. Although research conducted in the Depok Beach tourist area showed that sanitation facilities do not necessarily correlate directly with food safety ($p=0.198$), the knowledge and attitudes of food handlers were shown to have a significant

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influence. Food handlers with a positive understanding and attitude towards hygiene procedures tend to produce safe and consumable food. This is reinforced by field observations that show still low sanitation practices, such as unwashed hands and food ingredients not being cleaned with running water. Therefore, increasing individual capacity through training and education is considered an important strategy in improving food safety standards in restaurants.

Food handler hygiene and sanitation practices are actions demonstrated by food handlers in an effort to maintain and protect personal hygiene, as well as control risk factors, including the origin of food ingredients, people, and equipment used to prevent food contamination, so that food consumption is safe. (Yogyakarta 2018). The concept of personal hygiene in everyday life is crucial and must be considered because it will impact a person's health. Hygiene itself is heavily influenced by an individual's values and habits. Factors that significantly influence this include culture, social status, family, education, and a person's perception of health (Rahmayani 2018).

The quality of hygiene and sanitation is influenced by two main factors: the food handler and the environment in which the food is prepared, including the available food processing facilities. Hygiene is a preventative health effort that focuses on individual health. Sanitation, on the other hand, is defined as disease prevention efforts by regulating environmental factors related to the chain of disease transmission. (Hikma, Amin, and Navianti 2023). The implementation of sanitation hygiene activities is one aspect of maintaining food safety that must be implemented in a structured and measurable manner with clear activities, targets, and performance measures, namely through the creation of Food Management Facilities that meet health requirements (Alverina 2020).

Food hygiene and sanitation efforts are crucial for maintaining public health. A hygiene and sanitation audit, or sanitation inspection, is an activity carried out to determine the level of hygiene and sanitation in food processing facilities. This involves observing and assisting directly on-site, measuring conditions, actions, or activities, and providing guidance or suggestions for improvement. The results of a hygiene and sanitation audit of food processing facilities can determine whether the food processing facility meets hygiene requirements. (Amalia, Rohaeni, and Muriawati 2015). Good knowledge of food hygiene and sanitation is crucial for food handlers in food preparation. Food handlers who have principles about the importance of maintaining health and cleanliness will support the realization of good hygiene and sanitation practices and the knowledge of handlers, in addition to directly influencing hygiene and sanitation practices in food handling. To produce quality food and beverages, one of the things that pays attention to food hygiene and sanitation is the attitude and behavior of people who handle food to prevent food contamination (Hartini et al. 2022).

According to (TATOLI Agência Noticiosa Timor-Leste, 2018), the Supervision and Inspection Authority for Economic Activities and Sanitation (AIFAESA) reported the temporary closure of 64 restaurants due to a lack of hygiene, expired permits, and some without permits and incorrect addresses. Because the decree law 28/2011 on hygiene states what must be done to be able to open a restaurant with good conditions to carry out activities. In Timor-Leste, foodborne illness is an underreported public health problem. According to a report from the, there were over 413 cases of food poisoning from 2014 to 2019. The biggest contributing factors are poor hygiene practices and knowledge of

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poisons in the education sector, as well as the need for robust national food safety guidelines for safe school meals.

According to the “*Konstituisaun Repúblika Demokrátika Timor-Leste (K-RDTL) Artigo 53*” on “Consumer Rights,” consumers have the right to receive quality goods and services and the right to know accurate information about those goods to protect their health, safety, and economic interests, as well as to remedy adverse situations. Based on the above issues, there is a need for supervision and control of places that provide food to the public, such as hotels, restaurants, homes, food stalls, catering establishments, canteens, and street vendors in urban and rural areas, including food companies, to improve what happens over time.

Food safety is significantly influenced by the quality of basic sanitation, particularly in food preparation in restaurants. Food contamination can be avoided by using equipment, maintaining a clean environment, and practicing personal hygiene. (Sarmiento and Apritado 2022). Overall food quality is also influenced by hygiene practices, such as selecting fresh ingredients and storing them at safe temperatures. (Noordianty et al. 2024) However, a quantitative study by (Aspiani and Rustiawan 2020) Found that sanitation facilities do not directly correlate with food safety, but the attitudes and knowledge of food handlers do. This synthesis highlights the importance of infrastructure and human resource education in a comprehensive approach to food safety.

Problem Identification

Based on the background above, the researcher identified the following research problems:

- 1) Foodborne illness is a public health issue, with a total of 413 cases of food poisoning reported in national statistics.
- 2) Food contamination and hygiene practices are factors associated with inadequate knowledge of food preparation hygiene.
- 3) During food preparation in the kitchen, food handlers do not use personal protective equipment for food processing.
- 4) There are no sanitation facilities in the restaurant, which do not meet sanitation criteria.

Problem Formulation

Based on the identification above, the author can formulate the following research problems:

- 1) What is the relationship between the quality of Basic Food Safety and sanitation food preparation at the Dom-Aleixo Administrative Restaurant Administration Office, Dili Municipality, in 2025?
- 2) What is the relationship between the five key food safety practices and food preparation at the Dom-Aleixo Administrative Restaurant Administration Office, Dili Municipality, in 2025?
- 3) What is the relationship between basic sanitation quality and the five main food safety practices related to food preparation in restaurants of the Dom-Aleixo Administrative Regional Office, Municipality of Díli, in 2025?

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Research Objectives

The purpose of this study is for researchers to understand three research objectives:

- 1) To determine the quality of basic sanitation and food safety for food preparation at the Dom-Aleixo Restaurant Administrative Office, Dili Municipality, in 2025.
- 2) To determine the five key food safety practices that influence safe and hygienic food preparation at the Dom-Aleixo Restaurant Administrative Office, Dili Municipality, in 2025.
- 3) To determine the relationship between the quality of basic sanitation and the implementation of the five key food safety practices for food preparation at the Dom-Aleixo Restaurant Administrative Office, Dili Municipality, in 2025.

Research Benefits

Theoretical Benefits

- 1) For the researcher, as information to broaden their knowledge in the field of public health.
- 2) As a reference, and for students conducting future research.
- 3) As a reference for the National Public Health Directorate, specifically the Department of Environmental Health, to support and implement plans for health-focused programs.

Practical Benefits

- 1) For Vendor/Restaurant Managers: This research can provide a better understanding of the importance of basic sanitation and the five key food safety practices, as well as how to improve food safety standards in restaurants.
- 2) For the Dili City Government: It is hoped that the results of this research can be used as a consideration in formulating more effective policies to improve sanitation and food safety, as well as food safety in the restaurant and healthcare sectors.
3. For environmental institutions: The results of this research are expected to serve as a reference for future research, particularly on environmental health.
- 3) For Researchers and Academics: This research can serve as a reference for further research on food security in Timor-Leste, particularly in the Dili area.

Definition of Food

In the context of health policy, functional foods explained by Temple in the article "A Rational Definition for Functional Foods: A Perspective" are new foods formulated with additives or live microorganisms at safe and effective concentrations, which have the potential to improve health or prevent disease. (Norman J. Temple, 2022) According to the WHO, food is a basic human need that is needed at all times and requires proper management to be beneficial to the body. This does not include water, medicines, and other substances used for treatment. (Wicaksana & Rachman, 2018).

Definition of Sanitation

This definition emphasizes that sanitation in the restaurant context includes not only the cleanliness of the premises, but also the completeness of facilities and practices that ensure the food served is free from the risk of contamination. (Herniwanti & Jayanti, 2022).

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The quality of basic sanitation in restaurants is crucial for maintaining the health and hygiene of food, as well as customer comfort. Basic sanitation encompasses several important aspects, such as cleaning equipment, cleanliness of food preparation areas, and the availability of sanitation facilities such as handwashing stations and toilets. Sanitation planning includes national sanitation roadmaps, provincial sanitation roadmaps, and district or city sanitation strategies (Adolph, 2016).

Understanding Restaurant Hygiene and Sanitation

Hygiene is the science of health and disease prevention. Hygiene emphasizes the health of business operators (those who come into direct contact with food and the integrity of the food itself), to prevent health problems and/or disease. (Suhaimi, 2019)

The definition of restaurant hygiene and sanitation, based on the FDA Food Safety Culture Systematic Literature Review, refers to food safety culture as a collection of attitudes, values, and beliefs learned and consistently shared in the food handling environment, which directly contribute to hygiene and sanitation behaviors. In the restaurant context, this reflects how the entire team, from management to kitchen staff, embodies a commitment to cleanliness, safe food handling, and sustainable sanitation practices as part of the daily work culture (Johnson et al., 2022)

Understanding Safe Food

Safe food is a requirement that ensures that food products are safe for consumption, free from disease-causing agents such as microbial contamination, toxic chemicals, and foreign matter. Regarding food, food safety is a condition and effort that must be taken to prevent food from possible biological, chemical, and physical contamination that can harm, disrupt, and endanger human health, and ensure that it does not conflict with religion, beliefs, and social constructs to maintain good health. (Tenggana et al., 2020).

Five Key Food Safety Practices

According to the article "Application of the WHO Keys of Safer Food to Improve Food Handling Practices of Food Vendors in a Poor Resource Community in Ghana," the five key food safety practices according to the WHO maintaining cleanliness, separating raw and cooked food, thoroughly cooking, maintaining food storage temperatures, and using safe water and raw materials have been implemented in evidence-based training for food vendors (Donkor et al., 2009)

Food Preparation in Restaurants

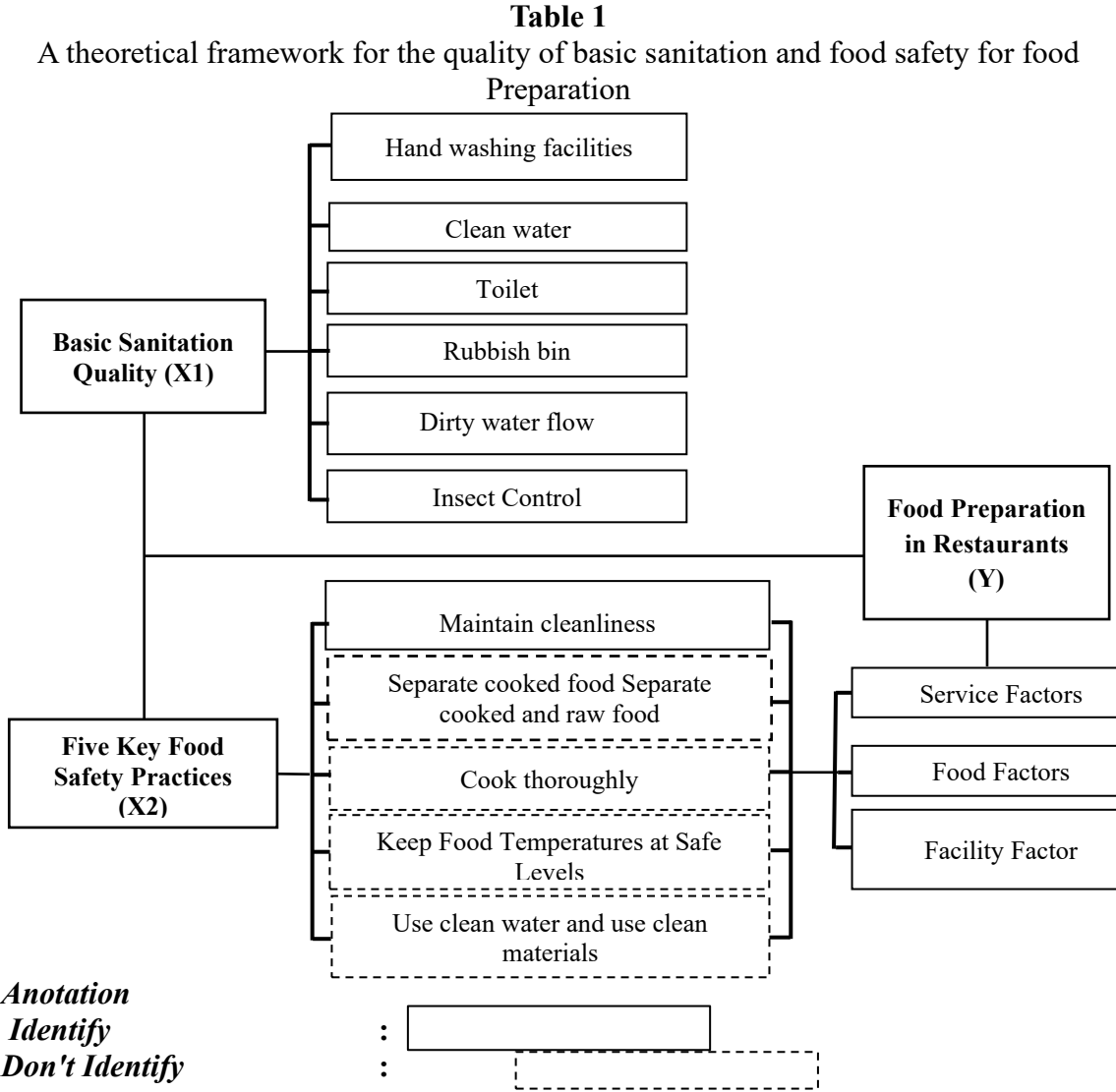
The hygiene status of restaurants and food handling services is evaluated by calculating general contamination and hygiene indicators. (Al-Ghazali et al., 2020). Surfaces used for food preparation, such as equipment or utensils, may appear clean, but this can be misleading. If preparation surfaces remain damp and contain food residue, this can allow microorganisms to adhere and potentially form microbial biofilms, complicating cleaning processes and increasing the risk of cross-contamination. (Rosiane et al., 2018). Despite preparing, serving, and handling high-risk foods (e.g., salads, eggs, meat, poultry, fish, and rice), none of the restaurants are HACCP and/or ISO 22000 certified (Ncube et al., 2020). Many restaurants handle high-risk foods without adequate implementation of international food safety standards. This indicates that the food

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preparation stage in restaurants urgently requires a strict monitoring system and training to prevent food contamination.

Theoretical Framework

A theoretical framework helps explain a phenomenon from a particular perspective and challenges and expands existing knowledge within the boundaries of that perspective. A theoretical framework is explicitly stated by an educational researcher. It shapes the types of questions asked, guides data collection and analysis methods, and informs the discussion of research findings. Theories are formulated to explain, predict, and understand phenomena, and in many cases, to challenge and expand existing knowledge within the confines of limited critical assumptions or behavioral predictions. A theoretical framework is a structure that can underpin or support the theory of a research study (Luft et al., 2022).



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Methods

This study employed a quantitative analytical method with a cross-sectional approach. This design allowed researchers to measure the relationship between the primary variables, namely the Relationship between Basic Sanitation Quality and Key Food Safety Practices Related to Restaurant Food Preparation. The study location was the Dom-Aleixo Administrative Office Restaurant, Dili Municipality, in 2025. The study population was restaurants located in the Dom-Aleixo administrative area, Dili Municipality. The sample consisted of chefs/waitresses, managers, and restaurant owners. Research Sampling Technique: Accidental sampling was used to meet respondents for interviews. The sampling technique was also based on inclusive and exclusive criteria. Data analysis in this study was univariate and bivariate, using chi-square tests or crosstabs, conducted using the SPSS version 21 computer program.

Table 2
Inclusive and Exclusive Criteria

Criteria	Description
Inclusive Criteria	1. Restaurants administratively located in the Dom Aleixo area of Dili Municipality. 2. Respondents were chefs, food servers, managers, or restaurant owners. 3. Respondents were present and willing to be interviewed during the visit. 4. Respondents were 18 years of age or older and able to provide relevant information.
Exclusive Criteria	1. Restaurants that were closed during the data collection period. 2. Respondents who refused or were unwilling to be interviewed. 3. Respondents who did not understand the interview language, and no interpreter was available. 4. Respondents who were unable to provide valid answers due to health conditions or cognitive impairments.

Results and Discussion

General Description of Research Locations

This research was conducted at several restaurants located in the Tasi-Tolu, Kampu Baru, UNPAZ, and Manleu areas. The distribution of restaurants in the research area shows that the area with the largest number of restaurants is UNPAZ with 12 restaurants (34.3%), followed by Tasi-Tolu and Manleu with 10 restaurants each (28.6%), and Kampu Baru with 3 restaurants (8.6%). This indicates that this study covers a representative sample of restaurants in the research area.

Table 3

Frequency Distribution of Restaurant Names studied by researchers

Restaurant Name	Frequency	Percentage (%)
CHE	5	14.3%
Duamar Lumar	5	14.3%
Warmindo	3	8.6%
Graciosas Pixina	6	17.1%
Cantin Biru	6	17.1%
Merkado Manleu	10	28.6%
Total	35	100%

Source: Primary data 2025

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Based on the results of the study of 35 restaurants, the following data was obtained: The restaurant name shows that the restaurant with the largest number is Merkado Manleu (28.6%), followed by Graciosas Pixina and Cantin Biru each with 17.1%, CHE and Duamar Lumar each with 14.3%, and Warmindo with 8.6%.

Table 4

Frequency General Distributor Respondent

Gender	Frequency	Percentage (%)
Male	5	14.3%
Female	30	85.7%
Total	35	100%

Source: Primary data 2025

Based on the results of research on 35 restaurants, the following data was obtained: The gender of respondents was dominated by women, 30 people (85.7%), while only 5 people (14.3%) were men.

Table 5

Frequency Distribution of Respondents by Age

Ages	Frequency	Percentage (%)
20–29 Years	24	68.6%
30–39 Years	9	25.7%
40–49	1	2.9%
≥50 Years	1	2.9%
Total	35	100%

Source: Primary data 2025

Based on the results of research on 35 restaurants, the following data were obtained: The majority of respondents were aged 20-29 years, namely 24 people (68.6%), followed by 30-39 years, namely 9 people (25.7%), while 40-49 years and ≥50 years each had only 1 person (29%).

Table 6

Frequency Distribution of Respondents' Positions in Restaurants

Restaurant Position	Frequency	Percentage (%)
Management	8	22.9%
Chef	21	60.0%
Owner	6	17.1%
Total	35	100%

Source: Primary data 2025

Based on the results of research on 35 restaurants, the following data were obtained: The most respondents' positions in restaurants were Chef, namely 21 people (60.0%), Manager, namely 8 people (22.9%), and Owner, namely 6 people (17.1%).

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Table 7
Frequency Distribution of Service Duration

Work Duration	Frequency	Percentage (%)
<1 Hour	7	20.0%
1–2 Hour	21	60.0%
3–5 Hour	6	17.1%
>5 Hour	1	2.9%
Total	35	100%

Source: Primary data 2025

Based on the results of research on 35 restaurants, the following data was obtained: The length of service of respondents showed that the majority of service periods were 1-2 years, amounting to 21 people (60.0%), <1 year 7 people (20.0%), 3-5 years 6 people (17.1%), and >5 years only 1 person (2.9%).

Table 8
Frequency Distribution of Education Level

Education Level	Frequency	Percentage (%)
Pre-Secondary	2	5.7%
Secondary	25	71.4%
D3	1	2.9%
Bachelor's Degree	6	17.1%
Master's Degree	1	2.9%
Total	35	100%

Source: Primary data 2025

Based on the results of research on 35 restaurants, the following data were obtained: The respondents' education level was dominated by Secondary Education 25 (71.4%), Bachelor's Degree 6 (17.1%), Pre-Secondary Education 2 (5.7%), D3 1 (2.9%), and Master's Degree (2.9%).

Table 9
Frequency Distribution of Training Related to Food Hygiene and Safety

Training	Frequency	Percentage (%)
Not participated in the training	30	85.7%
Participated in the training	5	14.3%
Total	35	100%

Source: Primary data 2025

Based on the results of research on 35 restaurants, the following data were obtained: Training related to hygiene and food safety was very low, where 30 people (85.7%) had never attended training, and only 5 people (14.3%) attended training.

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Crosstab and Chi-Square Results

Table 10

A consistent relationship between basic restaurant sanitation

Crosstab Restaurant Food Preparation Factors	Basic Sanitation Quality Factors		
	Poor Sanitation	Adequate Sanitation	Total
Poor Preparation	10 (28.6%)	0 (0.0%)	10 (28.6%)
Sufficient Preparation	0 (0.0%)	20 (57.1%)	20 (57.1%)
Good Preparation	0 (0.0%)	5 (14.3%)	5 (14.3%)
Total	10 (28.6%)	25 (71.4%)	35 (100%)

The crosstab analysis revealed a consistent relationship between basic restaurant sanitation and food preparation methods. Of the 35 restaurants sampled in this study, 10 (28.6%) exhibited a combination of poor sanitation, inadequate menu handling, and substandard food preparation. None of the restaurants with poor food preparation had adequate basic sanitation, indicating a negative consistency between the two variables. Conversely, the 20 (57.1%) restaurants with adequate food preparation also had good basic sanitation. Similarly, all five (14.3%) restaurants in the good food preparation (food care) category also had good basic sanitation. These findings indicate that basic restaurant sanitation is significantly related to food preparation practices. The higher the basic sanitation quality of a restaurant, the better its food preparation practices. This relationship aligns with the basic principles of food safety management, where clean, safe, and standardized work environment sanitation significantly impacts operational habits and procedures in food preparation (WHO, 2020). Therefore, the results of this study emphasize the importance of interventions in basic sanitation as an integral part of improving food safety in the food service sector. Efforts to increase the capacity of restaurant operators to meet basic sanitation standards not only contribute to a clean physical environment but also have a direct impact on improving the quality of food processing and serving.

The results of this study indicate a very strong relationship between Basic Sanitation Quality Factors and food preparation factors in restaurants. Crosstab data revealed that all restaurants with low basic sanitation (10 restaurants, 28.6%) also demonstrated poor food preparation quality. Conversely, all restaurants with good sanitation (25 restaurants, 71.4%) also implemented better food preparation methods, including those rated (adequate) and (good). This phenomenon indicates that good sanitation practices in restaurant environments not only reflect adherence to hygiene standards but also play a key role in creating hygienic and safe work practices in food handling. This aligns with the Sanitation Barrier theory proposed by Feachem et al. (1983), which emphasizes the importance of implementing sanitation barriers to prevent cross-contamination and the transmission of pathogens through food.

Table 11

Crosstab Analysis Reveals a Clear Relationship between the quality of food Preparation

Crosstab Restaurant Food Preparation Factors	Key Practice Factors for Food Safety According to WHO		
	Bad Practices	Good Practice	Total
Poor Preparation	10 (28.6%)	0 (0.0%)	10 (28.6%)
Sufficient Preparation	0 (0.0%)	20 (57.1%)	20 (57.1%)
Good Preparation	0 (0.0%)	5 (14.3%)	5 (14.3%)
Total	10 (28.6%)	25 (71.4%)	35 (100%)

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Source: Primary data 2025

This crosstab analysis reveals a clear relationship between the quality of food preparation processes in restaurants and the implementation of safe food handling practices based on World Health Organization (WHO) standards. Of the 35 restaurants studied, all 10 (28.6%) with poor food preparation were found to be implementing poor food handling practices. Conversely, none of the restaurants with poor food preparation implemented safe practices. The majority of restaurants with fair food preparation 20, 57.1%) implemented excellent food handling practices according to WHO standards. Furthermore, all restaurants with good food preparation, 5 restaurants or 14.3% also adopted safe food handling practices. These findings demonstrate a positive and significant relationship between the quality of food preparation processes and the implementation of WHO-recommended food safety practices.

This reinforces the notion that the implementation of food safety principles, such as maintaining cleanliness, separating raw and cooked ingredients, processing at appropriate temperatures, and safe storage, significantly determines the overall quality of food preparation in restaurants. Furthermore, these results align with the “Hazard Analysis and Critical Control Points” (HACCP) theory, which emphasizes the importance of identifying and controlling critical points in the food production chain to prevent contamination and health risks (Codex Alimentarius, 2020). Restaurants that successfully implement good food safety practices generally demonstrate better food preparation standards, potentially reducing the risk of food poisoning and foodborne illness. Therefore, this study underscores the importance of improving education, training, and supervision of restaurant operators in implementing safe food handling practices according to WHO guidelines as an effective strategy to improve food quality and protect public health.

Table 12
Interpretation of Chi-Square

	Chi-Square Tests		
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	35.000 ^a	2	.000
Likelihood Ratio	41.879	2	.000
Linear-by-Linear Association	24.480	1	.000
N of Valid Cases	35		

Interpretation of Chi-Square Test Results

A Chi-Square test was conducted to examine the relationship between the Food Preparation Factor in Restaurants and the Food Safety Practices (Food Handling Practices according to WHO standards). The Pearson Chi-Square test showed a statistical value of 35.000 with 2 degrees of freedom (df) and a significance value (Asymp. Sig.) of 0.000 ($p < 0.001$). The Likelihood Ratio was 41.879 with $df = 2$ and a significance value of 0.000. The Linear-by-Linear Association also showed a significant value of 24.480 with $df = 1$ and $p = 0.000$. The number of valid cases in this analysis was 35. The p-value (Asymp. Sig.) was well below 0.05 ($p < 0.001$), indicating a highly statistically significant relationship between the quality of food preparation in restaurants and the implementation of safe food handling practices according to WHO standards. This means that the null

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hypothesis, stating that there is no relationship between the two variables, is rejected. In other words, the quality of food preparation is strongly associated with the food safety practices implemented in restaurants. This result confirms previous descriptive findings that restaurants with good food preparation tend to implement safe food handling practices, while restaurants with poor preparation do not implement such practices. This finding emphasizes the importance of focusing on improving sanitation and food safety practices as part of efforts to control public health risks in the food service sector.

The Relationship Between Basic Sanitation Quality, Food Preparation, and Food Safety Practices.

This study aims to analyze the relationship between basic restaurant sanitation quality factors, food preparation factors, and key food safety practices based on World Health Organization (WHO) standards. Crosstab data and Chi-Square tests were used to examine the relationship between these variables, with a total of 35 restaurants as the units of analysis.

Relationship between Basic Sanitation Quality and Food Preparation

The crosstab results show that of all restaurants with poor basic sanitation (menu sanitation), 100% also had poor food preparation quality. Conversely, restaurants with good basic sanitation all demonstrated better food preparation quality, both in the adequate and good categories. This finding indicates a direct relationship between restaurant environmental conditions and the quality of food processing. Theoretically, this finding can be explained using the Environmental Health Risk Framework approach, which states that inadequate sanitation is a major risk factor for cross-contamination and the emergence of foodborne illnesses. Poor sanitation conditions, such as the lack of clean water, inadequate waste management systems, and unhygienic handwashing facilities, have the potential to significantly disrupt the safe and hygienic food preparation process.

Relationship between Food Preparation and Food Safety Practices

The second cross-sectional study showed that 100% of restaurants with poor food preparation (lack of food preparation) employed unsafe food handling practices. In contrast, all restaurants with adequate and good food preparation employed excellent food handling practices in accordance with WHO guidelines. This indicates that technical quality in food preparation is closely related to knowledge and application of food safety principles. This finding is reinforced by the WHO Five Keys to Safer Food theory (2006), which explains that safe food handling encompasses five key aspects: maintaining hygiene, separating raw and cooked food, thoroughly cooking, maintaining food at safe temperatures, and using clean water and raw materials. Restaurants that do not understand or apply these principles are highly vulnerable to food contamination.

Conclusion

Based on the results of a study of 35 restaurants in the study area, it can be concluded that most restaurants have implemented good basic sanitation (71.4%) and excellent basic food safety practices (71.4%). However, 28.6% of restaurants still have poor food preparation quality, potentially lowering hygiene standards and increasing the risk of food contamination. The results of the Pearson Chi-Square statistical test indicate

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a highly significant relationship between food preparation factors and basic food safety and food safety quality, with a Pearson Chi-Square value of 35,000 ($df = 2$, $p = 0.000$), a Likelihood Ratio of 41,879 ($p = 0.000$), and a Linear-to-Linear Association of 24,480 ($p = 0.000$). These figures indicate that the better the quality of food preparation, the better the basic sanitation and food safety practices implemented in the restaurant. Therefore, improving the quality of food preparation needs to be a primary focus to maintain hygiene and food safety standards as recommended by the WHO.

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