



FOOD SAFETY PRACTICE AND ITS ASSOCIATED FACTORS AMONG FOOD HANDLERS WORKING IN PUBLIC FOOD ESTABLISHMENTS OF JIMMA TOWN, 2022

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FOOD SAFETY PRACTICE AND ITS ASSOCIATED FACTORS AMONG FOOD
HANDLERS WORKING IN PUBLIC FOOD ESTABLISHMENTS OF JIMMA TOWN: CROSS
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ABSTRACT

Background: Illness and death from diseases caused by contaminated food are a constant threat to public health. Food borne diseases are more critical and involves a wide range of diseases in developing countries for various reasons. Food safety practice is the first method used to reduce the prevalence of food borne disease. In Ethiopia, data on food safety issue and its factors were not adequate and under reported.

Objective: The aim of this study was to assess the food Safety Practice and its Associated Factors among Food Handlers Working in Public Food Establishments of Jimma town from 25 May to 1 July, 2022.

Method: An institution based cross-sectional study conducted among (330) food handlers work in public food establishments in Jimma town from 25 May to 1 July, 2022. Participants were selected using simple random sampling method. Data were collected using structured questionnaire via face-to-face interview and observational checklist. Data cleaned and entered in to Epi data version 3.1 and analyzed by SPSS version 23. Summary of descriptive statistics conducted on variables. Bi-variable and multivariable logistic regression model used to identify factors associated to food safety practice. The degrees of association between dependent variable and independent variables assessed by using AOR at 95% CI with p-value less than 0.05.

Result: From 330 participants, 160 (48.5%) of them had satisfactory food safety practice. Being female [AOR = 1.81, CI 95%. (1.03, 3.21)], managers/supervisor being relatives [AOR =0.26, CI 95 % (0.07, 0.90)], Attitude towards food safety practice [AOR=2.45, 95%CI (1.30, 4.70)] Distance between sink and meat or food preparation place being ≤ 1 m [AOR=1.90, 95%CI (1.07, 3.39)] were independent predictors of food safety practice.

Conclusion: the result of this study was low and only about half of the food handlers had satisfactory safety practice. Sex, managers being relatives, attitude of food handlers and Distance between sink and meat or food preparation place less than or equal to one meter were statistically associated with food safety practices. So strong strategies targeted at improving the safety practice of food handlers are important.

Key words: food safety practice, food establishments, food handlers, Jimma, Oromia, Ethiopia

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LIST OF ABBREVIATIONS AND ACRONYMS

AOR	Adjusted Odd Ratio
COR	Crude odd ratio
BOD	Barden of disease
CI	confidence interval
DALY	Disability Life Years
FAO	food and agriculture organization
FBD	food born disease
IRB	Ethical Review Board
KAP	knowledge, attitude and practice
NTS	Non-typhoidal Salmonella enterica
SARS	CoV-2: severe acute respiratory
SD	standard deviation
SPSS	Statistical Package for Social Science
SSA	sub-Saharan Africa
UI	Uncertainty interval
USFDA	unit state food and drug administration
WHO	World health organization

CHAPTER ONE: INTRODUCTION

1.1. Background

Food safety is assurance that food is will not cause adverse effect to consumer when it is prepared and eaten according to it intended to use (1). And is about producing, handling, storing and preparing food in a manner that prevent diseases and retains enough nutrients for a healthy diet (2). And Food handler is a person who directly engages in the handling, preparations and likely to come in to contact food in the food business (3).

As WHO report, estimates of the global burden of FBD in 2015, the most frequent causes of foodborne illness were diarrheal disease agents, particularly *Campylobacter* spp. and norovirus. Causes 230, 000 (95% UI 160,000–320,000) deaths, particularly non-typhoid *Salmonella enterica* (NTS) which causes diarrheal and invasive disease. Other main causes of FBD deaths were *Taenia solium*, *Salmonella Typhi*, hepatitis A virus and aflatoxins, and cause 40% burden among under 5 age children. Worldwide, 18 (95% UI 12–25) million DALYs were attributed to foodborne diarrheal disease agents (4).

Foodborne illness (FBD) occurs when someone eats contaminated food. Food can be contaminated in a number of way such as when vegetable crops are irrigated with contaminated water or when food is handled improperly in a restaurant (5). Burden of disease (BOD) is the prevalence of morbidity, disability, mortality and associated incidence with manifestations of acute and chronic foodborne diseases, a huge burden on the economy of individuals and countries directly and indirectly (6,7). The most common clinical symptoms of food borne illnesses are diarrhea, vomiting, abdominal cramps, headache and nausea (8).

Food safety practice is the most important way in improving issue of public health in order to control FBD. In preventing the spread of foodborne illnesses, governments around the world are increasing their energies to promote food safety (9). Admittance to sufficient and safe food is a basic human requirement and vital for creating a world without hunger and poverty. Although, everyone is expose himself to foodborne hazards and other serious consequences include liver and kidney failure, brain and neural syndromes, reactive arthritis and cause death. Non-communicable diseases, especially cancer triggered by Chemical contamination food (10).

Retailers are aware of hygiene requirements when handling food. Staff who need to handle food should wear and change gloves frequently or wash their hands frequently (11) to practice personal hygiene and control the transmission of food borne disease, including, COVID 19 which can be spread during the close contact between people through the respiratory droplets and by actions such as coughing, sneezing, shouting, singing and speaking (12).

Food borne diseases are more critical and involves a wide range of diseases in developing countries including Ethiopia for various reasons. Such as; use of contaminated water for cleaning and processing of food, poor food production processes and food handling, lack of adequate food storage infrastructure, inadequate enforced regulatory standards, prevailing poor food handling and sanitation practices, lack of financial resources and lack of education. The tropical climate also favors the spread of pests and naturally occurring toxins and raise parasitic diseases including worm infestations (4,13).

Owing to increasing FBD related to food safety issues; there is still no adequate evidences on practices of food safety and its factors associated in different corners of the country which necessitates further study like this study which help for advocacy. Therefore, aim of this study was to assess the food safety practice and its associated factors among food handlers working in Public Food Establishments in Jimma Town, Southern Ethiopia.

1.2. Statement of problem.

Globally, approximately 600 million cases of illness caused by the 31-foodborne hazards, infectious agents that cause diarrheal diseases accounted for the massive majority 550 million, Causes 230, 000 deaths and around 40% burden among under 5 age children. Worldwide, 18 million DALYs were attributed to foodborne diarrheal disease agents(4). Illness and death from diseases caused by contaminated food are a constant threat to public health and a significant barrier to socio-economic development worldwide (14).

The cost of FBD includes the long-term medical costs, psychological toll and associated costs to victims and communities, lost productivity and premature deaths (15). Every year in the US, an estimated of 48 million illnesses, 128,000 hospitalizations, and 3,000 deaths are due to FBD and It was approximated that annually FBD in retail foodservice operations expenses consumers \$6 billion for healthcare costs(16). And diarrheal disease is the leading cause of morbidity worldwide, particularly in developing countries, WHO estimates that in 2004 there were 2.2 million deaths caused by diarrheal disease among all age groups, 1.8 million in low-income countries alone, of whom 1.5 million were children under 14 years (17).

Food safety practices are unsatisfactory among food handlers over worldwide and differ from country to country and vulnerability to food safety threats is a major problem for the more than one billion people living in sub-Saharan Africa (SSA). The African continent as a whole faces the world's highest foodborne disease burden per capita, with the microbial and chemical contamination of food resulting in an estimated 137,000 deaths and 91 million acute diseases in every year (18).

Magnitude of impact FBDs related with food safety are missing in several developing countries. Despite the increased international awareness of FBD, food safety has marginalized as significant risks to social and social development. There are major obstacle to dealing with food safety concerns: the absence of detailed data on the amount and cost of FBD that allow policy makers to identify public health priorities and resource allocation (4).

In Ethiopia, 60% of burden of disease is related to sanitation and personal hygiene problem (19). Approximately 10 to 20% of FBD outbreaks are due to contamination by the food handler. More

than 200 FBD could be transmitted through foods. Microorganisms are the main cause of quality and safety problems. Any sectors should have a responsibility to keep food as much safe as possible (20) because FBDs are critical to public health's (21).

In 2013 study at Jimma University study conducted, about half food handlers tested positive for one or more possible bacterial-borne bacterial contaminants and assessing of institutional facilities were identified as gap of this study (22). There are different factors that associated with food safety practice; Lack of training of food handlers, lack of knowledge and attitude towards food safety, lack of establishments' facilities; handwashing facility, availability of guidelines, availability of facility for personal hygiene, availability of light and ventilation are associated to food safety practice.

Hence assessing the safety practice with associated factors among food handlers may help as to estimate the prevalence of food borne disease. Since studies have not been conducted on food safety practices and associated factors among food handlers working in public food establishments in Jimma town. Therefore, this study tried to assess food safety practice and its associated factors among food handlers working in public food establishments in the town of Jimma through a cross-sectional study.

1.3. Significance of the Study

Foodborne illnesses are critical in developing countries for various reasons, such as unsafe water use, poor food production and processing, lack of an adequate food storage facility, and insufficient regulatory standards. To overcome these diseases, the practice of food safety is the first method used to reduce the prevalence of FBD. Therefore, conducting this study is important for everyone to provide information about status of food safety practice, increases motivation on how to reduce foodborne illness and its effects on health. This study will also help various organizations interested in working on food safety and help them to predict whether food borne disease were increased or decreased. In addition, this document also might help as a reference for planning, intervention purposes, for students and researchers in their work.

CHAPTER TWO: LITERATURE REVIEW

2.1. Overview of Food safety practice.

A cross-sectional study done in Bangladesh, to evaluate food safety of food vendors in two hundreds food vendors, 0.5% had practice on food safety (23). Other cross-sectional study conducted among 119 food handlers, in 2016 on Knowledge and personal hygiene practice in public university campus indicate 71.4% of the food handlers had poor practice (24).

A 2013 cross-sectional study conducted in Iran among 141 food handlers on the knowledge, attitude and practice of food safety in restaurant showed that Majority (92.9%) of the respondents stated that prepared food was safe for customers and almost all of workers were aware of the critical role of general sanitary practices at the work place, (25).

A cross-sectional study of 158 street food vendors on factors associated with knowledge, attitude and practice of food safety among street food vendors in Taunggyi Township in 2020 indicates that 58.9% scored equal to or lower than the median value practices of food safety (26). Another cross-sectional Study conducted in West Kordofan-Sudan in 2017 on Hygienic Practices among 40 food handlers in Restaurants showed that 33.21% of them were good, 47.57% poor and 27.71% bad practice (20).

As cross-sectional study done in Ethiopia, Batu Town, in 2020 among 305 on Food handler's safety practices and related factors in the public food establishments, the percentage of food safety practice was 58%. (27). Another cross-sectional study conducted by the in 2017 on Food Hygiene Practices and Associated Factors Among 394 Food Handlers Addis Ababa, showed that only 27.4% had good practices of food hygiene. Shortages of water supply at food establishments, poor knowledge, unfavorable attitude towards food hygiene practice of food handlers were contributing factors which associated with poor food hygiene practice (28).

A cross-sectional Study conducted in 2019, on food safety awareness and practices among 120 food handlers in cafes and restaurants of ambo, revealed that food safety awareness and attitudes of the managers were satisfactory; however, their practice were sensational. This study concludes that food handlers' food safety awareness, practices and attitudes were not an efficient food safety practice (8).

Another cross-sectional study conducted in Bahirdar in 2012 on hygienic conditions in catering establishments and on food safety knowledge and practices among 455 food workers showed that 33.6% had a waste collection bin solids adequate and statistically a significant association was found between the sanitation conditions and the licensing status of the facility. In particular, a lack of knowledge regarding hygiene and food handling observed. Furthermore, there was a statistically significant difference between trained (professional) and untrained operators in food hygiene practices(29). In a 2017 cross-sectional study in Arba Minch, Ethiopia, 32.6% of 383 respondents scored well on food hygiene and 39.2% had clean clothes, 28.5% had a hair cover and 91.9% had short nails, 35.2% medical checkup. Wearing clean gowns and hat, nail trimming, and medical screening observed (30).

A cross-sectional study don on 355 food handlers in 2018 on food safety knowledge, handling practice and associated factors in hotels / restaurants in Asosa town, Ethiopia, indicates that the general practice of food handling food safety among food handlers was 67.8%(31). In addition, a cross-sectional study conducted in Jimma town of 80 food handlers in 2017, indicates that most food handlers have poor personal hygiene. Approximately 65%, 55%, 50%, 50% did not wear a suit, did not have a hair cover, wore a dirty suit and a hair cover, and did not have their nails trimmed, respectively (32).

2.2. Factors associated with food safety practice

2.2.1. *Socio demographic and economic factors*

Study done in Nigeria in 2018 showed that majority of market food handlers reported good practice of food hygiene. Education level, gender and food hygiene practices were statistically significant(33).

A studies conducted in parts Ethiopia, woldia town, in 2017, among288 food handlers , education, service year were positively associated with food handler's food handling practices (34). Another study in Gondar town in 2018, indicated that Marital status was the factors significantly associated with food handling practices (35) and another study done in 2019 in Gondar University, Showed , 46.7% of the study subjects had good self-reported food hygiene practice. Being male , educational status (being primary or secondary), having >2 years' experience, 2044–4867ETB monthly incomes, were predictors of food safety practice (36). Study conducted in Arba Minch Town, Ethiopia, aged over 29-34 and ≥ 35 years, respectively(30), owners and relatives managers

statistically significant with hygienic practice (37). In study conducted Gonder city, Trained food handlers were 4.01 times more likely to have good food handling practice than un-trained (38)

2.2.2. Knowledge of food safety

Study conducted in Yogyakarta City, on Factors Associated with Food Safety Practices on level of knowledge level of knowledge participants associated with food safety practice. In addition, study conducted in Padawan, Sarawak on Factors Associated with Food Hygiene Practices among Street Food Vendors, showed food handlers those who have poor knowledge towards food safety was 77% less likely than those who have good knowledge (39).

Study conducted in west Arsi zone in 2019 Ethiopia, showed that food handlers those who had good knowledge of food handling is three times more compared with those who has poor knowledge to wards food handling practice (40). Study conducted in Dire Dawa City in 2017 showed that food handlers with adequate knowledge about food safety practice were 2.823 times more likely towards satisfactory food safety practices (41) and study conducted West Gojjam Zone, in 2021 indicated that poor knowledge food handlers 47% less likely to have food safety than counterparts (42).

Other conducted in Gondar city showed that Knowledgeable food handlers are 2.92 times more likely than unknowledgeable one to have good practices of food safety (38). Another study conducted in Shashemane town, in 2019, indicates that having good Knowledge was predictor of good food handling practice(43) and study done in Batu Town, Ethiopia, in 2020 indicates those who had good knowledge on food safety practice had 3.90 times higher odds of practice than those who had poor knowledge (27).

2.2.3. Attitude toward on food safety

Study conducted in Malaysia in 2018, on determinants of self-reported food safety practices among youths indicate that youths with positive attitudes for food safety were 7.5 times more likely to practice good food safety measures compared to those have negative attitudes towards food safety (44).

Across sectional study conducted in Gondar, Ethiopia, in 2014 on food safety practice and associated factors among food handlers, showed that those who had positive attitude were 7 times likely more food safety practice than those who had negative attitude (45). According to Meta-analysis done at Dilla university, food handlers who have a positive attitude toward safe food

handling practice have 3.28 times higher chance of using hygienic food handling than those who have a negative or fair attitude (46).

2.2.4. Institutional factors

The kitchen design can affect the food safety practice when long distance between sink and food preparation area or whether the sink is inside or outside the kitchen. Finding conducted in Europe in 2020, showed that consumers who had a sink inside the kitchen were more than twice as likely to wash their hands with soap and water frequently during cooking towards food safety practice than those who did not (47).

Across sectional study done among 355 handlers in Somali region Ethiopia indicates presence of hand washing facility for food handlers statistically factors associated with food safety practice (2). Other cross-sectional study conducted among 845 food handlers, showed availability of personal protective equipment, presence of a supervisor, separate dressing room were significantly associated with food hygiene practice (48).

2.3. Conceptual framework

There are many factors associated with food safety practice. Multiple and interrelated factors were involved in why it affects practice of food safety. The below conceptual framework shows these factors associated with food safety practice. For this study, the conceptual framework is adapted from several similar literatures. As food safety practice affected by many factors, there is no specific factor on the framework of food safety practice; rather, many factors considered when describing the food safety practice.

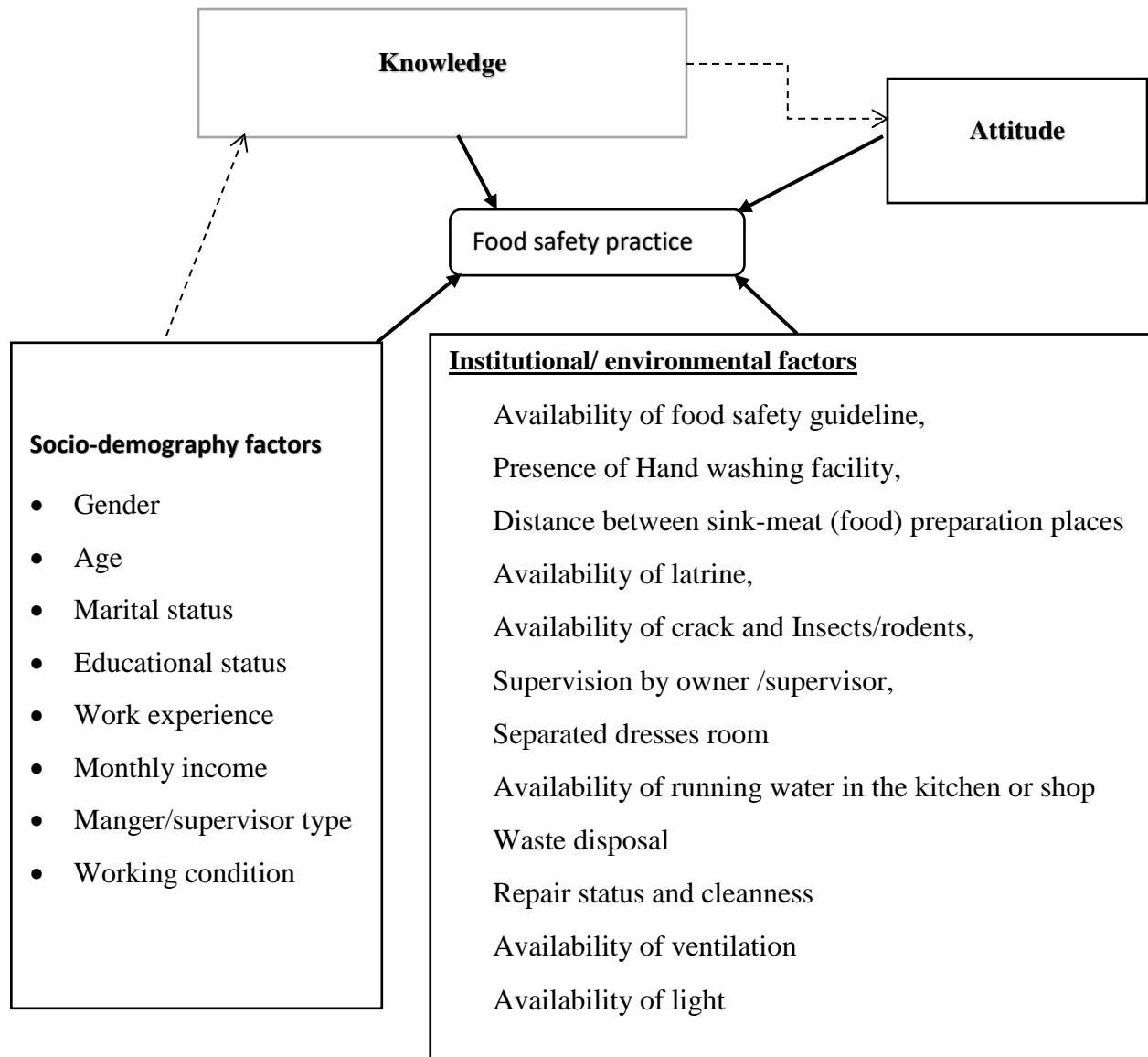


Figure 1 Diagrammatic presentation of factors that affect food safety practice in jimma town, Ethiopia 2022 ,adapted from (2,3,27,31,36,48).

CHAPTER THREE: OBJECTIVE OF STUDY

3.1. General objective

To assess the magnitude of food safety practice and associated factors among food handlers workers in public food establishments Jimma town, south western Ethiopia, 2022

3.2. Specific objectives

To determine magnitude of food safety practices among food handlers in Jimma town

To identify factors associated with food safety practice among food handlers in Jimma town

CHAPTER FOUR: METHODS AND MATERIALS

4.1 study area and period

This study conducted in the town of Jimma, in the Oromia region of southwest Ethiopia. Jimma Town is located in the Jimma area. The city of Jimma is located 355 km from the capital of Ethiopia, Addis Ababa. According to the 2015 National Urban System Study, the city's population was 199,575, while the city administration claims more than 200,000, including 100,347 men and 99,229 women. Its geographical coordinates are between 7.40 north latitude and 36.50 east longitude, Jimma lies between 1718-2012 m above sea level. The highest place (2012m) is known as Jireen, the place where the ancient local kings had built their palace and still exists. The lowest altitude (1718m) is around Jimma Towns Aba Jifar Airport. Jimma town has 17 kebeles. There are 514 public food establishments in Jimma Town. There are 162 hotels, 184 bars and restaurants, 37 cafeterias, 131 butchery shops and registered and regulated by the Jimma town health office in 2021 and 2022. There are about 7000 food handlers. The data collected from 25 May to July 2022



Figure 2 map of jimma town

4.2. Study design

Institutional based cross-sectional study carried out on food handlers' work in public food establishments

4.3. Source population

All the food handlers who work in the public food establishments in Jimma town were my source of population

4.4. Study population

All food handlers who were on work in selected food establishments during the data collected.

4.5. Inclusion criteria

Food handlers who have the potential come into contact with food and food containers in selected food establishments were included during the data collection.

4.5. Exclusion criteria

Food handlers who were had mental illness and unable to hear were excluded during my study

4.6. Sample size determination

4.6.1 Sample size for general objective

Sample size was determined using single population formula and assuming that the proportion of overall practice of food handlers in Asosa town, Benashangul gumuz region was (Prevalence of satisfactory food safety practice = 67.8%(31) and assuming 95% confidence level, margin of error $d= 5%$ and 10% non-response rate, the sample size for general objective was calculated as follows.

Therefore, sample size was determined as follows:

$$n = \frac{z_{\alpha/2}^2 \times p(1-p)}{d^2}$$

Where:

$Z_{\alpha/2}=1.96$ at 95% confidence level

$p=0.678$

$d= 0.05$

$n= 335$ and with 10 % of non-response rate sample size 368

Since, the source population was less than 10,000, a correction formula used and the final sample size calculated by $nf = \frac{n}{1+n/N}$. Therefore, final sample size was 350

4.6.2. Sample size for specific objectives

Variable	Magnitude (%)		Power, CI level	AOR	S. size	Ref
	Exposed	Unexposed				
Attitude	28.09	70.89	80,95%	3.67	101	(9)
Knowledge	26.47	57.01	80,95%	2.49	205	(9)
Safety training	39.64	72.48	80,95%	4.01	90	(35)

Table 1 Sample size calculation for specific objectives

Because of sample size for specific objectives were less than sample size of general objectives, the final sample size for this study determined was 350.

4.7. Sampling procedure and techniques

Food establishments (350) selected from each types by computerized simple random sampling from lists of registered public food establishments and recorded. Then one food handler selected as a participant by lottery method from those who were on working from each of the selected Establishments after reached the location of institution.

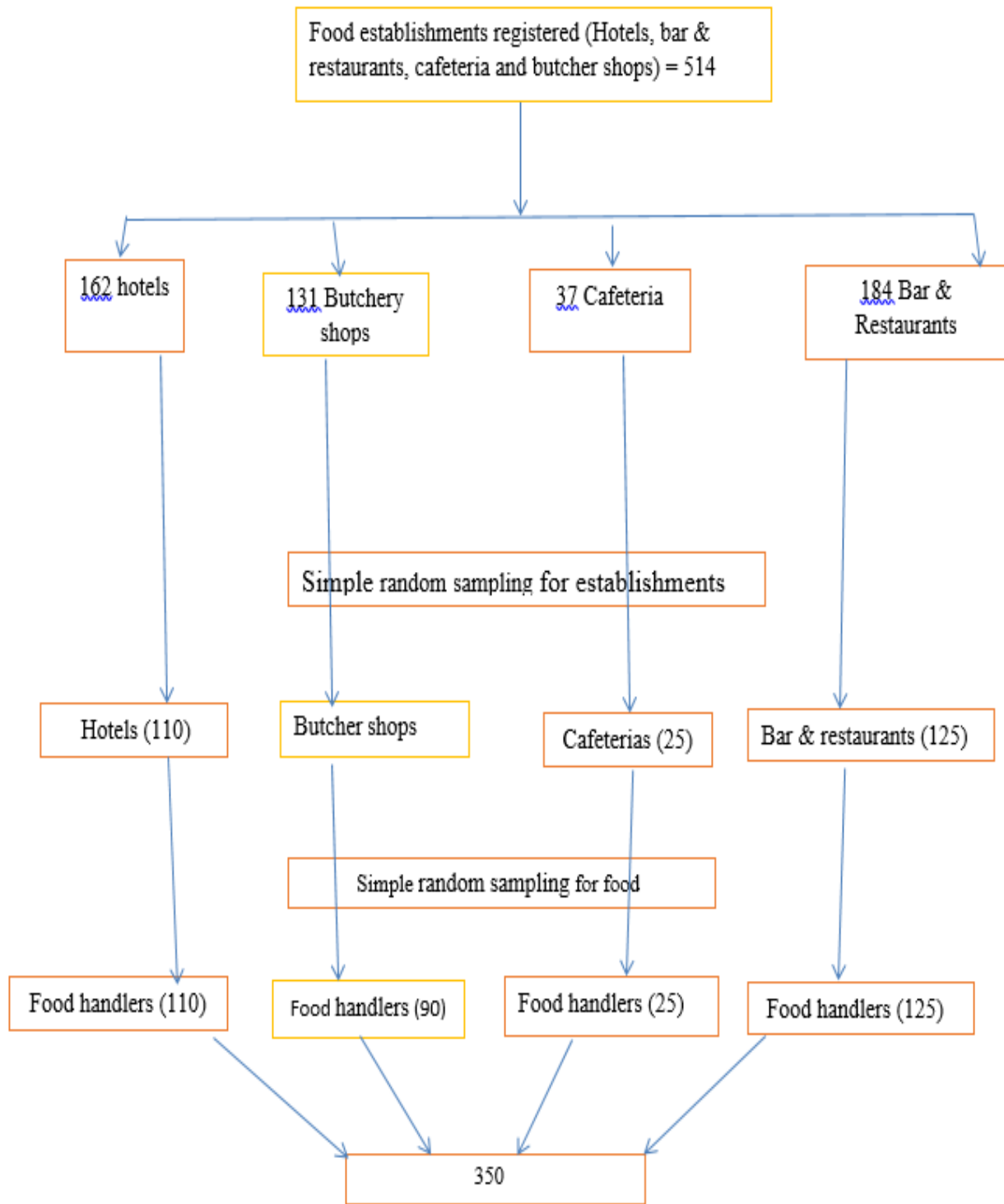


Figure 3 Schematic presentation of sampling procedure to select study participants from food establishments

4.8. Data collection methods and Tools

4.8.1. Instrument

Data were collected using structured questionnaire developed from published studies with certain modification (2,3,31,48). There was minor modification of questioner to fit local situation and current of the study area. The questionnaires were first prepared in English then translated in to Amharic and Afaan Oromo language and then translated back to English for consistency. The questionnaires contain of five parts as the basic socio-demographic characteristics, food safety practice related to food safety knowledge, food safety attitude, food safety practice and Institution facilities observation checklists towards food safety practice.

4.8.2. Observation checklist

The checklists were used for observation which was developed from published studies (2,31,48) with certain modification. Checklists used for overall facility and sanitary status. The observation checklists focused on assessing (observing) information on food premises physical condition. Availability of guideline, Presence of Hand washing facility, Distance between sink and food preparation place, available of latrine, Availability of crack and Insects/rodents, Supervision by owner /supervisor, Separated dress room, Availability of running water in the kitchen, waste disposal facility Repair status and cleanness, Availability of ventilation and Availability of light facility (2).

4.8.3. Data collectors

Three diploma nurses assigned as data collectors and two environmental health professionals along with the principal investigator as supervisors. Data collectors and supervisors are fluent in the local Afan Oromo and Amharic languages and are familiar with local customs. For data collectors and the supervisor two days of training given on the purpose and content of the questionnaire, on how the data were collected.

4.8.4. Data collection Method

Data collected by face-to-face interviews methods using structured questionnaires. Data collection started by informing the participants about the purpose of the research and the time that would took (Max, of 15-25 minutes). Once their consent obtained, participants asked if it was the right time to conduct the questionnaire interviews. Data collectors during data collection and after completing all questionnaires, they made sure that all required parts filled. Subsequently, the data collector expressed their appreciation for their participation. In addition, quantitative observation

data on selected food establishment done to evaluate food safety practices by complete the observation list.

4.9. Study variable

4.9.1. *Dependent variable*

Food safety Practice

4.9.2. *Independent variables*

Socio Demographic factors:

- Gender
- Age
- Marital status
- Educational status
- Work experience
- Monthly income
- Manger/supervisor owners
- Having training
- Working condition

Knowledge on food safety

Attitude on food safety

Establishment factors/observational

- availability of guideline
- Presence of Hand washing facility
- Distance between sink and food preparation place
- Availability of latrine
- Availability of crack and Insects/rodents
- Supervision by owner /supervisor
- Separated dresses room
- Availability of running water in the kitchen or meat shop
- Repair status and cleanness

- Availability of ventilation
- Availability of light

4.10. Operational definition

Food safety: assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to intended use (1).

Practice status: The reported food handling practice among food handlers in terms of food safety (satisfactory and unsatisfactory) (31).

Satisfactory practice: if respondents score for food safety/hygiene practice related questions was greater than or equal to 70% (31).

Unsatisfactory practice: if respondents score for food safety/hygiene practice related questions was less than 70 % (31).

Food safety Knowledge: Those respondents who know the four critical food safety factors (food borne diseases, contamination/cross contamination, personal health and hygiene and temperature control(31).

Food handler: is a person who directly engages in the handling, preparations and likely to come in to contact food in the food business (3).

Adequate knowledge: if respondent's knowledge score is 70% and above for critical food safety factor related questions (31,41).

Inadequate knowledge: If respondent's knowledge score was below 70% for critical food safety factor related questions (31,41).

Positive attitude: if respondents score for attitude related questions is above 70%) (31).

Negative attitude: if respondents score for attitude related questions is below (70 %) (31).

4.11. Data processing and analysis

The data entered in to Epi data version 3.1 computer software and exported to the SPSS version 23-computer software for analysis. Descriptive statistics used to check for any missing values. Summary of descriptive statistics such as frequencies, percentages, means and standard deviation used to describe socio demographic characteristics. Tables and figures were prepared to report the

frequency of socio-demographic characteristics of food handling workers, knowledge of food safety practices of food handlers, attitude regarding food safety practices, food safety practices. To determine the status of knowledge, nine knowledge related questions were used which contain three options, correct, incorrect and I do not know, for the appropriate answer one was given and the remaining score given zero. Food safety attitude is measured using Five Likert scale based on 5 attitude related question which was strongly disagree (0) to strongly agree (4) and the total score obtained from respondents were converted to percentages in order to measure status of attitude. Finally, food safety practice assessed based on 16 questions related to food safety practices that contained yes / no options. For correct answer 1 and 0 for incorrect answer given. Bi-variable analysis used to see the association between each independent variable and the outcome variable with 95% CI. Independent variables with p-value of ≤ 0.25 included in multi-variable analysis to control for all possible confounders and identify factors associated with dependent variables. Then outliers checked by standardized residuals out of the interval (-3, 3) were excluded from the multivariable analysis. Multi-collinearity also checked to see the correlation among the independent variables by tolerant test < 0.1 or variance inflation factor > 10 . Hosmer Lemeshow goodness of fit tests used to check for model fitness by looking cut of point > 0.05 . Finally, multivariable analysis used to see whether there were association between dependent and independent variables. In this study level of statistical significance were declared at p-value less than 0.05.

4.12. Data quality control

Two days training given for data collectors and supervisors on data collection tools and data collection procedure. The questionnaires were prepared in English then translated in to the local language Afan oromo and national languages and translated back to English to check for its consistency. Prior to the actual data collection, questionnaire sample was pretested on 5% of the sample size out of actual study area. Based on comments and inputs obtained, the questionnaire tools modified before the main study started. During the actual data collection, supervisors and the principal investigator committed continues supervision and closely monitor.

4.13. Ethical considerations

Ethical letter obtained from Ethical Review Board (IRB) of Institute of Health Science of Jimma University. An official letter submitted to the Jimma town health office and the town Regulatory coordinators office, a permission letter received from the Jimma town of health office and a copy

of the obtained letter given to all data collectors. Before data collections started, all trained data collectors briefly explained the purpose of the study, issue of confidentiality for all participants and assure them that their responses were not be used to harm them and as their name not be recorded or not be written on the questionnaire, but only identification which help to obtain their consent. After consent had reached from both manager and participant, the data collectors encouraged study participants to give honest responses and conducted interviews in open places to avoid disturbances. Hence, the data collected in a way that did not harm the participant's well-being and carried in privacy.

4.14. Plan for dissemination of result.

The result of this study will submitted to Jimma University, Institutes of Health science, Faculty of public health, and department of Human Nutrition and dietetics. The findings of this study will also presented to the seminar as a graduation thesis. Additionally, the results of this finding will summited to Jimma Town Health Office and organizations who work on the food safety. In addition, it will presented on stages organized by Town health office to disseminate the findings for all concerned body exists in the Jimma town. Lastly, great efforts will made to publish in peer-review scientific journals.

CHAPTER FIVE: RESULTS

This study conducted among 330 of food handlers, which incorporated food handlers, those who have chance of contact with food and food containers during working and had a 94.3% of response rate. The results of this study has two categories food safety practice status and associated factors.

5.1. Socio-demography and economic factors

From a total, three hundred thirty public food establishments used and one food handler selected from each establishments. Out 330 food handlers participated, 176 (53.3%) were males and 154 (46.7%) were females. The mean age of the respondents was 24.88 ± 4.99 in years. About participants' marital status majority of respondents 207 (62.7%) were single. Looking educational status 157 (47.6%) of them had primary education. From all the participants, only 30.3% have food safety training. Looking working condition of participants 329 (99.7%) of participants were permanently employed for the establishments.

Table 2: description of socio-demographic characteristics of food handlers and establishments characteristic's (n=330)

<u>Variable</u>	<u>Frequency (%)</u>
Age	
17-24	175 (53)
25-32	126 (38.2)
≥ 33	29 (8.8)
Sex	
Male	176 (53.3)
Female	154 (46.7)
Marital status	
Single	207 (62.7)
Married	120 (36.4)
Divorced	2 (0.6)

Widowed	1 (0.3)
Educational status	
No formal education	12 (3.6)
Primary education	157 (47.6)
Secondary education	140 (42.4)
Diploma and above	21 (6.4)
Work experience	
=<2 years	88 (26.7)
3-5 years	147 (44.5)
=>6 years	95 (28.8)
Monthly income	
=< 1000	101 (30.6)
1001-2000	174 (52.7)
>2000	55 (16.7)
Who is managers or supervisor	
Owner	160 (48.5)
Relative	140 (42.4)
Other	30 (9.1)
Do you have safety training	
Yes	100 (30.3)
No	230 (69.7)
Working condition	
Permanent	329 (99.7)
Contract/daily	1 24(.3)

5.2. Knowledge of Food Handlers on food safety practice

Based on nine food safety knowledge related questions, 83.9% of food handlers had adequate knowledge

Table 3: scores of food handlers' knowledge on Food Safety practice

<u>variables</u>	<u>knowledge scores</u>
Food with enough pathogens to make you sick may look, smell, or taste good	
Correct,	123 (37.3)
Incorrect,	196 (59.4)
I don't know,	11 (3.3%)
Really fresh food can cause food poisoning if it is not properly handled	
Correct,	326 (98.8)
Incorrect,	3 (0.9)
I don't know,	1 (0.3)
Fresh meat always has microbes on the surface	
Correct,	190 (57.6)
Incorrect,	128 (38.8)
I don't know,	12 (3.6)
Health people can cause illness by carrying germ to food	
Correct,	241 (73.0)
Incorrect,	72 (21.8)
I don't know,	17 (5.2)
Lettuce and other raw food might have harmful microbes	
Correct,	327 (99.1)
Incorrect,	3 (0.9)
I don't know,	-
Food can be contaminated with microbes by coming in contact with unsafe foods	
Correct,	325 (98.5)
Incorrect,	5 (1.5)
I don't know,	

Ready to eat foods (e.g. vegetables) can be prepared on the same cutting board that was used to prepare meat

Correct,	34 (10.3)
Incorrect,	295 (89.4)
I don't know,	1 (0.3)

Cutting boards, meat slicers and knives should be disinfected after each use

Correct,	307 (93)
Incorrect,	23 (7)
I don't know,	-

Refrigeration kills all the bacteria that might Cause food-borne illness

Correct,	199 (60.3)
Incorrect,	106 (32.1)
I don't know,	25 (7.6)

Over all knowledge

Adequate	277 (83.9)
Inadequate	53 (16.1)

5.3. Attitude of participants on food safety practice

Based on five food safety attitude related questions, 75.2% of food handlers positive attitude

Table 4: scores of food handlers on attitude of food safety practice

<u>Variables</u>	<u>Attitude scores</u>
Temperature Controls are an effective method of reducing the number of cases of food poisoning.	
Strong Disagree N (%)	1 (0.3)
Disagree N (%)	12 (3.6)
Neutral N (%)	26 (7.9)
Agree N (%)	119 (36.1)
Strongly agree N (%)	172 (51.1)

All food handlers should have a food Safety training qualification

Strong Disagree N (%)	1 (0.3)
Disagree N (%)	8 (2.4)
Neutral N (%)	38 (11.5)
Agree N (%)	112 (33.9)
Strongly agree N (%)	171 (51.8)

Lack of food safety training affects Safe food Handling.

Strong Disagree N (%)	6 (1.8)
Disagree N (%)	18 (5.5)
Neutral N (%)	7 (22.4)
Agree N (%)	98 (29.7)
Strongly agree N (%)	134 (40.6)

Unavailability of food handling guideline can affect food safety

Strong Disagree N (%)	5 (1.5)
Disagree N (%)	17 (5.2)
Neutral N (%)	79 (23.9)
Agree N (%)	100 (30.3)
Strongly agree N (%)	129 (39.1)

Lack of supervisor commitment affects Safe food handling.

Strong Disagree N (%)	2 (0.6)
Disagree N (%)	29 (8.8)
Neutral N (%)	64 (19.4)
Agree N (%)	77 (23.3)
Strongly agree N (%)	158 (47.9)

Over all attitude

Positive	248 (75.2)
Negative	82 (24.8)

5.4. Practice of Food Handlers' on Food Safety

The practice of food handlers towards food safety assessed using sixteen food safety related questions. This study showed that only 160 (48.5%) of the study participants had satisfactory food safety practice.

Table 5: scores of food handlers' practice on food safety

Variables	Number of respondent
Do you wash your hands with soap and hot water before starting your Work?	
yes	257 (77.9)
No	73 (22.1)
Do you wash your hands before touching Cooked foods?	
yes	284 (86.1)
No	46 (13.9)
Do you wash your hands with hot and soap after touch nonfood material like money	
yes	42(12.2)
No	288(87.3)
Do you wash your hands with soap after using toilet all the time	
yes	242 (73.3)
No	88 (26.7)
Do you eat or drink when you working?	

yes	42 (12.7)
No	288 (87.3)

Do you wear uniform when serving food?

yes	221 (67)
No	109 (33)

Do you smoke during your normal work of food handling?

yes	-
No	330 (100)

Do you come to work when ill like upset Stomach or diarrhea or communicable disease

yes	145 (43.9)
No	185 (56.1)

Do you wear a hat or head covering when Serving Food?

yes	70 (21.2)
No	260 (78.8)

Do you wear facemask while Serving Food?

yes	5 (1.5)
No	325 (98.5)

Do you use handkerchief when you cough or sneeze during food serving

yes	144 (43.60)
No	186 (56.4)

Do you wear jewelry when serving food?

yes	37 (11.2)
No	293 (88.8)

Do you disinfect utensil after each use?

yes	241 (73)
No	89 (27)
Do you make your nail long and unclean	
yes	47 (14.2)
No	283 (85.8)
Do you chew gum during food serving?	
yes	49 (14.8)
No	281 (85.2)
Do you wash your cloth regularly	
yes	113 (34.2)
No	217 (65.8)
Food safety practice status (satisfactory/un satisfactory status)	
satisfactory practice	160 (48.5)
Unsatisfactory practice	170 (51.5)

5.5. Institution facility and materials inspection/ observation

Observation was conducted on 330 public food establishments after data as soon as data collected from food handlers from 110 hotels, 120 bar and restaurants, 24 cafeterias and 76 butchery shop. Almost all 325 (98.5%) of institution had no food safety guideline for practice of food safety. About more than three over four (3/4) 254 (77%) of institution had hand washing facility for food handlers and about 32% had had ≤ 1 m distance of sink-to-meat share or food preparation area.

Table 6: Institutional Facilities Observed in Food Establishments in Jimma twon 2022 (n=330)

<u>Checklist</u>	<u>Institutional facility</u>
Availability of guideline for food establishments	

Yes N (%)	5 (1.5)
No N (%)	325 (98.5)
Presence of Hand washing facility	
Yes N (%)	254 (77)
No N (%)	76 (23)
Distance between sink and meat or food preparation place <= 1m	
Yes N (%)	106 (32)
No N (%)	224 (67.8)
Availability of latrine with soap and water	
Yes N (%)	90 (27.3)
No N (%)	240 (72.3)
Availability of separate latrine for worker	
Yes N (%)	122(37)
No N (%)	208 (63)
Availability crack and Insects/rodents	
Yes N (%)	273 (82.7)
No N (%)	57 (17.3)
Supervision by owner /supervisor	
Yes N (%)	290 (87.9)
No N (%)	40 (12.1)
Separated dress room	
Yes N (%)	286 (86.7)
No N (%)	44 (13.3)
Availability of running water in the kitchen or preparation area or in meat shop	
Yes N (%)	214 (35.4)
No N (%)	116 (64.8)
Availability of waste disposal	
Yes N (%)	283 (85.8)

No N (%)	47 (14.2)
Repair status & Cleanliness status	
Yes N (%)	198 (60)
No N (%)	132 (40)
Availability of ventilation	
Yes N (%)	20 (6.1)
No N (%)	310 (93.9)
Availability of light	
Yes N (%)	328 (99.4)
No N (%)	2 (0.6)

5.6. Factors Associated with food Safety Practice

Logistic regression analyzes was performed to identify factors associated with food safety practice. The descriptive statistics used to check for data completeness and missing value of the data. Then after, all of the variables with a p-value less than 0.25 conducted in binary logistic regression to control potential confounding used in multivariable logistic regression model.

Twelve variables were selected in the bi-variable logistic regression; gender, education, monthly income, manager/supervisor owner, Presence of hand washing facility, distance between sink and meat or food preparation place to be less than or equal to one meter, availability of toilet with soap and water. Availability of cracks and insects/rodents, availability of running water in kitchen or meat shop, availability of waste disposal, repair status/Cleanliness status, attitude status towards food safety at p-value less than 0.25 exported in multivariable logistic regression.

After potential confounders reduced, four variables sex, manager owners, distance between sink and meat or food preparation place is being less than or equal to one meter and attitude status of food handler at p-value 0.05 were significantly associated with food safety practice of food handlers.

The odds of having food safety practice among respondents those who were females had 1.81 times higher as compared to those who were males with AOR= 1.81,95% CI (1.03,3.21).

The odds of food safety practice toward satisfactory among food handlers those who were working in establishments whose who their managers were relative with establishment's owners had 74% less likely to have satisfactory practice of food safety as compared to those employer with AOR =0.26, 95% CI (0.07,0.90).

The odds of food safety practice toward satisfactory among food handlers those who had positive attitude towards food safety practice were 2.49 times higher as compared to those who were not have positive attitude on food handlings practice with AOR=2.45, 95% CI (1.30,4.70).

The odds of food safety practice toward satisfactory food safety practice among food handlers those who work in institution which have distance between sink and meat or food preparation place is less than or equal to one meter were had 1.81 times higher as compared to their counterparts with AOR=1.90, 95% CI (1.07,3.39). Table 7 (n=330).

Table 7: Results of multivariable analysis of Food Safety Practice among food handlers of jimma town 2022

<u>Variables</u>	<u>food safety practice</u>		COR	AOR	p-value
	satisfactory	Unsatisfactory			
Sex of respondent					
Male	66 (20)	110 (33.3)	1	1	
Female	94 (28.5)	60 (18.2)	2.61 (1.67,4.08)*	1.81(1.03,3.21)**	0.041
Educational Status					
no formal ed	3 (0.9)	9 (2.7)	1		
Primary school	78 (23.6)	79 (23.9)	3(0.77,11.45)*	1.97(0.36,10.62)	0.431
2ndry school	67 (20.3)	73 (22.1)	2.75(0.72,10.60)*	1.82(0.34,9.761)	0.48
College & above	12 (3.6)	9 (2.7)	4.00(0.84,19.16)*	1.24(0.17,8.99)	0.83

Monthly income

=<1000	57 (17.3)	44 (13.3)	1		
1001-2000	74 (22.4)	100 (30.3)	0.57 (0.35,0.94)*	0.87(0.46, 1.65)	0.67
>2000	29 (8.8)	26 (7.9)	0.86(0.44, 1.67)	0.99(0.41,02.45)	0.99

Who is Manager or supervisor

Owner	80 (24.2)	80 (24.2)	0.36 (0.15,0.87)*	0.39(0.11,1.36)	0.14
Relative	58 (17.6)	82(24.8)	0.26 (0.11,0.62)*	0.26(0.07,0.90)**	0.033
Other	22 (6.7)	8 (2.4)	1	1	

Attitude

Positive	51 (15.5)	109 (33)	2.10 (1.26,3.50)*	2.45(1.30,4.70)**	0.007
Negative	31 (9.4)	139 (42.1)	1	1	

Presence of hand washing facility

Yes	140 (42.4)	114 (34.5)	3.44 (1.95,6.06)*	0.63(0.31,1.271)	0.20
No	20 (6.1)	56 (17)	1		

Distance between sink and meat or food preparation place < =1m

Yes	71 (21.5)	35 (10.6)	2.32 (1.38,3.90)*	1.90 (1.07,3.39)**	0.03
No	107 (32.4)	117 (35.5)	1	1	

Availability of latrine with soap and water

Yes	58 (17.6)	32 (9.7)	2.45 (1.49,4.05)*	1.50(0.78,2.91)	0.23
No	102 (30.9)	138 (41.8)	1	1	

Availability crack and Insects/rodent

Yes	127 (38.5)	146 (44.2)	0.63 (0.36,1.13)*	0.69(0.32,1.47)	0.33
No	33 (10)	24 (7.2)	1		

Availability of running water in the kitchen or preparation area or in meat shop

Yes	128 (38.8)	86 (26.1)	3.91 (2.39,6.38)*	1.70(0.85,3.41)	0.13
No	32 (9.7)	84 (25.5)	1		

Availability of waste disposal

Yes	145 (43.9)	138 (41.8)	2.24 (1.16,4.32)*	1.58(0.66,3.79)	0.30
No	15 (4.5)	32 (9.7)	1		

Repair status & Cleanness status

Yes	114 (34.5)	84 (25.5)	2.54 (1.61,4.00)*	1.62(0.88,2.95)	0.12
No	46 (13.9)	86 (26.1)	1		

NB *: Significant variable at bi-variable at p-value 0.25, ** significant on the multivariable at p-value 0.05 and Hosmer Lemeshow goodness of fit tests 0.38

The word “Other” in this table was specified as employer

CHAPTER SIX: DISCUSSION

The current study revealed the status of food safety practice and associated factors among food handlers working in public food establishments. Depending on this study, from 330 food handlers 48.5% food handlers had satisfactory status on food safety practice. Factors like sex, manager/supervisor being relatives with the establishment's owners, having positive attitude of food handlers towards food safety practice and Distance between sink-to-meat or food preparation place to be less than or equal to one meter were statistically significant with food safety practice at multivariable logistic regression model.

The satisfactory food safety practice of food handlers on food safety 48.5% CI (43.1,53.9) in this study was similar with study conducted in East and west, Northwest Ethiopia 48.8%, university of Gondar(49.0%) and Debarq town (46.7%) and Woldia (46.5) Ethiopia (34–36,49). This might be due to the training status of food handlers. However, lower than with studies conducted in Batu town(58%) (27), Debra markos(54%) (50),Asosa town (67.8) (31) and Malesia(96.05%) (51). The variation might be due to socio demography of food handlers and study setting. The Current study was higher than studies conducted in Godey town (20.9), Nigeria (37%) and Sudan (33.21%) (2,20,52). This might be due to that attitude of food handlers, having good behavior towards food safety important for food safety practice and different in training on food safety. Also higher than studies conducted in Bole sub city and Gonder 27.4%,30.3 respectively (28,45) . This deviation of the results might be due from knowledge status of food handles and food handlers those who working in public food establishments of jimma town, majority of them had adequate knowledge. However, small knowledge status of food handlers had obtained from Both Bole's (28) and Gonder town's (49.5).

This study showed that gender of food handlers was statistically associated with food safety practice. Those food handlers who were female had 1.81 higher as compared with those who were male to have satisfactory. This is in line with a studies conducted regarding food safety practice in Jordan university, University Kebangsaan Malaysia, Kombolcha town, Gambella region (53–56). This might be due to work experience, the attitude status of female food handlers and intention of females on work towards food safety practice. But in other study males had better food hygiene practice than females(36). In addition, in some studies sex not show significance to wards food

safety (23,31,41,45). The possible explanation for this reason might be due to other factors such as training and work role that could predict the food safety practice than gender.

In this study, manager/supervisor being relative with establishments' owner was statistically associated variable with food safety practice. Food handlers who their manager/supervisor were being relative with food establishments' owners were 74% less likely to have satisfactory practice towards food safety as compared with those who were employer. This is in line with a study conducted regarding food safety practice in Mekele town (37). This might be due to managers being relatives with establishments' owners may be problem on applying the rule and guide line, might be due to lack of enough health education and lack of continues supervision from health professionals.

The current study also showed that food handlers those had positive attitude were 2.45 higher as compared to those who were not have positive attitude towards food safety practice. This study was supported by other findings conducted in Nigeria, Malaysia, Gonder, Addis Ababa Bole city, northern Ethiopia, Debra markos (28,50,52,55,57,58) and also supported by Meta-analysis done on sixteen articles(59). This might be due to food handlers those have good knowledge; positive attitude and work in institution that have enough facilities help them to show positive actions towards food safety practice,

In addition, sink-to-meat or food preparation distance was less than one meter was statistically significant with food safety practice. Food handlers who work in establishments which have a sink-to-meat distance or food preparation place was less than or equal to one meter was 1.90 higher as compared to food handlers who work in establishments with sink-to-meat distance or food preparation which have greater than one meter towards satisfactory food safety practice. This study is supported by other findings conducted in Europe (47,60). This similarity might be food handlers those who were work in establishments that have short distance of food preparation place from sink may have a chance of washing their hands frequently than their counterparts in order to reduce cross contamination. And might be due to work experience, training status and having good attitude towards food safety practice might encourage them to keep their personal hygiene.

Strength of this study

In this study, more than 50% of establishments used from registered establishments. In addition, the new variable had studied in this finding.

Limitation of this study:

The study has a limitation because of self-report bias might be included that underestimated some of the findings and the result of this finding was based on only four types of establishments.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATION

7.1. Conclusion

Only about half of the food handlers had satisfactory safety practice. However, majority of food handlers had adequate knowledge and positive attitude. Sex, managers being relatives, Distance between sink-to-meat or food preparation place less than or equal to one meter and attitude of food handling workers were statistically associated with food safety practices.

7.2. Recommendations

These recommendations given to the following bodies based on the findings of this study:

To Jimma town health and regulatory office: there should be continuous support and facilitate inspection, education and rigorous trainings to establishment's owners, managers and food handlers to increase awareness of food handlers on how to practice food safety

To environmental health professions: there should be regular inspection and support with provision of necessary materials to keep environmental hygiene and continuous inspection to fulfill better food safety practice of food handlers.

To establishments: there should be enough had washing facility which have short distance from food preparation place in order to make comfortable for food handlers to wash their hands frequently, filling important materials for food handlers.

For food handlers: male food handlers should given targeted exercises to fill better food safety practice.

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ANNEX I: English questioner

Participant Information Sheet and Informed Voluntary Consent Form for Food Handlers

My name is ----- I am working as a data collector for the study being conducted in food establishments on food handlers by Abeya Terefa who is studying his Master's degree at Jimma University in human nutrition and dietetics. I kindly ask that you pay attention to me. So that I can explain, the study and you selected as his study participant.

The study title:

Food Safety Practice and Its Associated Factors among Food Handlers Working In Public Food Establishments of Jimma Town

Aim of the study:

The findings of this study can give a clue to both the food handlers and the intervening authority to take good note of food safety practice and pose a solution based on the gap identified in food safety practice and associated factors. In addition, the aim of this study is to write a thesis as a partial requirement for the fulfillment of Master's Program in Human nutrition and dietetics for the principal investigator.

Procedure and duration:

I will interviewing you using a questionnaire to provide me with pertinent data that is helpful for the study. There are five parts with 54 questions to answer where I will fill the questionnaire by interviewing you. The interview will take about 15- 20 minutes, so I kindly request you to spare me this time for the interview.

Risks and Benefits:

The risk of being participating in this study is minimal, only taking few minutes from your time. There would not be any direct payment for participating in this study. However, the findings from this research may reveal important information to Health Bureau and authority bodies on food safety inspection.

Confidentiality:

The information you will provide us will be confidential. There is no information that will identify you in particular. The findings of this study are general for the study community and will not reflect any thing particular of individual or establishments. The questionnaire will be coded to exclude showing names. No reference will made in oral or written reports that could link participants to the research.

Rights:

Participation for this study is voluntary. You have the right to declare to participate or not in this study. If you decide to participate and withdraw from the study at any time and this will not label you for any loss of benefits, which you otherwise are entitled. You do not have to answer any question that you do not want to answer.

Declaration of informed voluntary consent

I have read and ready to be participant of information or to fill this consent form. I have clearly understood the purpose of the research the procedure the risk, the benefit and the issue of Confidentiality. I will informed that I have the right to withdraws from the study at any time. Therefore, declare my voluntary consent to participate in this study with my signature.

Participant name ----- signature -----date-----/-----/2022

Manager name -----signature-----date-----/-----2022

Interviewers name -----signature-----date-----/-----/2022

English version of the study questioner

Type of establishment's _____

Name of the interviewer_____

Checked by supervisor; Name-----

Signature _____

Date of interview-----

Questionnaires Id no_____

Part I: socio demographic characteristics.

s/no	Variable	Response	Skip
1	Age	-----	
2	Sex	1, male 2, female	
3	Marital status	1, Single 2, Married 3, divorced 4, widowed	
4	Education status	1) no formal education 2) Primary education 3) Secondary education 4) college or more	
5	Work experience	-----	
6	Monthly income (ETB)	-----	
7	Managers / supper visor owners	1,Owner 2,Relatives 3, other	
8	Do you have food safety training?	1,Yes 2,No	If ans. 2 jump the next
9	if yes where did you get the training	1. from worada health office 2. from the establishment it self 3.cultural and tourism bureau 4.other	
10	Types of establishment	1, Hotel. 2, Bar& Restaurant 3,Cafeteria 4,Butchery shop	
11	Working condition	1 Permanents 2. Contracts/daily	

PART II. FOOD SAFETY KNOWLEDGE

12	Food with enough pathogens to make you sick may look, smell, or taste good.	1) correct 2) incorrect 3) I don't know
13	Really fresh food can cause food poisoning if it is not properly handled	1) correct 2) incorrect 3) I don't know
14	Fresh meat always has microbes on the surface	1) correct 2) incorrect 3) I don't know

15	Health people can cause illness by carrying germ to food	1) correct 2) incorrect 3) I don't know
16	Lettuce and other raw food might have harmful microbes.	1) correct 2) incorrect 3) I don't know
17	Food can contaminated with microbes by coming in contact with unsafe foods.	1) correct 2) incorrect 3) I don't know
18	Ready to eat foods (e.g. vegetables) can be prepared on the same cutting board that was used to prepare meat	1) correct 2) incorrect 3) I don't know
19	Cutting boards, meat slicers and knives should be disinfects after each use	1) correct 2) incorrect 3) I don't know
20	Refrigeration kills all the bacteria that might Cause food-borne illness.	1) correct 2) incorrect 3) I don't know

PART III: FOOD SAFETY ATTITUDE

21	Temperature Controls are an effective method of reducing the number of cases of food poisoning.	0) Strongly Disagree. 1)Disagree, 2) Neutral 3) Agree, 4)strongly agree
22	All food handlers should have a food Safety training qualification	0) Strongly Disagree. 1)Disagree, 2) Neutral 3) Agree, 4)strongly agree
23	Lack of food safety training affects Safe food Handling.	0) Strongly Disagree. 1)Disagree, 2) Neutral 3) Agree, 4)strongly agree
24	Unavailability of food handling guideline can affect food safety	0) Strongly Disagree. 1)Disagree, 2) Neutral 3) Agree, 4)strongly agree
25	Lack of supervisor commitment affects Safe food handling.	0) Strongly Disagree. 1)Disagree, 2) Neutral 3) Agree, 4)strongly agree

PART IV: FOOD SFETY PRACTICE

26	Do you wash your hands with soap and hot water before starting your Work?	1)Yes 2) No
27	Do you wash your hands before touching Cooked foods?	1)Yes 2) No
28	Do you wash your hands with hot and soap after touch nonfood material like money	1)Yes 2) No

39	Do you wash your hands with soap after using toilet all the time	1)Yes 2) No
30	Do you eat or drink when you working?	1)Yes 2) No
31	Do you wear uniform when serving food?	1)Yes 2) No
32	Do you smoke during your normal work of food handling?	1)Yes 2) No
33	Do you come to work when ill like upset Stomach or diarrhea or communicable disease	1)Yes 2) No
34	Do you wear a hat or head covering when Serving Food?	1)Yes 2) No
35	Do you wear a facemask while Serving Food?	1)Yes 2) No
36	Do you use handkerchief when you cough or sneeze during food serving	1)Yes 2) No
37	Do you wear jewelry when serving food?	1)Yes 2) No
38	Do you disinfect utensil after each use?	1)Yes 2) No
39	Do make your nail long and unclean?	1)Yes 2) No
40	Do you chew gum during food serving?	1)Yes 2) No
41	Do you wash your cloth regularly	1)Yes 2) No

PART V: INSTITUTION FACILITY AND MATERIALS INSPECTION/ OBSERVATION

42	Availability of guideline for food establishments	1)Yes 2) No	
43	Presence of Hand washing facility	1)Yes 2) No	If ans. 2 jump the next
44	Distance between sink and meat or food preparation place $\leq 1m$	1)Yes 2) No	
45	Availability of latrine with soap and water	1)Yes 2) No	
46	Availability of separate latrine for worker	1)Yes 2) No	
47	Availability crack and Insects/rodents	1)Yes 2) No	
48	Supervision by owner /supervisor	1)Yes 2) No	
49	Separated dress room	1)Yes 2) No	
50	Availability of running water in the kitchen or preparation area or in meat shop	1)Yes 2) No	
51	Availability of waste disposal	1)Yes 2) No	
52	Repair status & Cleanness status	1)Yes 2) No	

53	Availability of ventilation	1)Yes 2) No	
54	Availability of light	1)Yes 2) No	

ANNEX II: Afan oromo questioner

Unka waa’ee odeeffannoo fi walii galtee hojjetoota dhaabbata nyaataa keessaa hojjetan irratti qophaa’e bara 2014 A.L.I tti

Maqaan koo-----n jedhama. Hojjetoota dhaabbata nyaataa jimmaa keessatti argaman irraa Odeeffaannoo funaanuuf kan na erge barataa Abbayya Tarrafaa kan jedhamu, barnoota isaa digirii 2ffaa universitii jimmaa irraa muummee soorata namaa “ human nutrition” kan baratuudha. Kanaf himmaataa/ hirmaattuu qorannaa kanaa tahuu dhaan akka nu gargaartan jaalalaaf kabajaan isin gaafadha.

Mata-duree qorannoo

shaakala faayyummaa nyaataa eeguuf hojjetoonni mana nyaataa godhanii fi wantoota fayyummaa nyaataa eeguuf hariiroo qaban manneen nyaataa magaalaa jimmaa keessatti argaman (kaaffee, hoteelaa fi baarii fi restorantii) irratti

Kaayyoo qorannoo kanaa

Qorannoon kun hojjetoota mana nyaataatiif, qaamota rakkoo faayyummaa nyaataa fidanii fi wantoota fayyummaa nyaataa irratti dhiibbaa uumaan furuu kan danda’aniif odeeffannoo tahuu danda’a. dabalataanis, kaayyoon qorannoo kanaa argannoo abban qorannoo kanaa barnoota isaa digirii lammaffaa ittin eebbifamuuf muummee saayinsii soorata namaa irraa ittin eebbifamuuf isa barbaachisuudha.

Adeemsaa fii yeroo fudhatu

Gaaffiilee abbaan qorannoo kanaa odeeffannoo qorannoo isaaf funaanuuf kutaa shan kan qabu natti kenne kana irratti hundaa’een, gaaffilee 54’n kana guuta. Daqiiqaa isin gaaffii kana deebisuuf gootan giddu galeessaan 15-20 kan ta’uudha. Kanaaf yeroo keessan irraa daqiiqaa kana akka naaf laattaniif jaalala obbolumman isin gaafadha.

Miidhaa fi fayidaa

Miidhaan qorannoo kanatti hirmaachuu keessanii xiqqoodha, innis yeroo muraasa isin gaaffii kana deebisuuf naaf laattaniidha. Gaatiin biraa namaaf kennamus galataan alatti hin jiru. Garuu bu'aan qorannoo kanaa, biiroo fayyaaf akkasumas qaamota fayyaa soorataa qorataniif odeeffannoo tahuu danda'a.

Ofitti amanamummaa

Odeeffannoo isin nuuf laattan ofitti amanamummaan tahuu qaba. Odeeffannoo isin nuuff lattaniif dhiibaan isinirra gahu tokkollee hin jiru. qorannon kun nama dhuunfaa tokko yookin immoo dhaabbata tokko qofa kan ilaallatu osoo hin taane hawwaasa hundumaa hirmaachisa. Gaaffiileen gaafatamtan maqaa keessan dhiisuudhaan koodiin itti godhama. Afaniinis tahee, barreffamaan qaama hirmaate/tte rageeffachuun hin danda'amu.

Mirga

Qorannoo kanatti kan hirmaatu fedhiidhani. Mirga hirmaachuus, dhiisuus qabdu! Yoo itti hirmaachuuf ykn dhiisuuf murteessitan namni dirqamaan akka isin itti hirmaattaniif isin diqisiisu hin jiru. Gaaffii deebisuu hin barbaannes dhiisuuf mirga qabdu.

Unka Walii galtee keessan ibsu

Kan armaan olii dubbisee odeeffannoo kennufis itti walii galuukoo nan mirkaneessa. Fayidaa , miidhaa, adeemsa fi itti gafatamummaan akka narra jirus hubadheera. Odeeffannoo hanga xumuraatti ykn gidduutti dhiisee ba'uuf mirga akkan qabuus hubadheera. Kanaaf fedhiidhaan itti hirmaachuukoo mallattoo kootiinan mirkaneessa.

Maqaa hirmaataa-----mallattoo-----guyyaa----/-----2022

Maqaa to'ataa-----mallattoo-----guyyaa----/-----2022

Maqaa gaafataa-----mallattoo-----guyyaa-----/-----2022

Gaaffilee Afaan oromoo

Maqaa dhaabbata nyaataa-----

Maqaa isa gaafatuu-----

Maqaa isa gaafatu to'atuu-----

Mallattoo-----

Guyyaa gaaffiin geggeeffame-----

Lakkofsa waraqaa gaaffii-----

Kutaa 1ffaaa : gaaffii ibsa eenyummaa

Tartii ba	Waan gaafatamu	Deebii	Kan irra darbamu
1	Umurii	-----	
2	Saala	1, dhi 2, dha	
3	Haala Gaa'ila	1.Hinfuune/hinheerumne 2.fuudheera/ herumeera 3.hiikeera 4.gursummaa	
4	Sadarkaa barnootaa	1. ideelee hinqabu 2. sadarkaa 1ffa 3.Sadarkaa 2ffaa 4. sadarkaa ol-aanaa	
5	Muuxannoo	-----	
6	Galii ji'aa (ETB)	-----	
7	Akaakuu to'ataa	1, Kan ofii 2,Fira 3, gara biraa	
8	Fayyummaa nyaataa irrati leenjii qabdaa?	1.Eeyyee 2.Lakki	Yoo 2 filattan kan itti aanu irra darbaa
9	Yoo eeyyee jette eenyuu irraa fudhattan	1. waajjira fayyaa aanaa2. mana nyaataarraa 3. biiroo aadaaf tuurisimii4.gara biraarraa	
10	Gosa dhaabbata nyaataa	1, Hotel, 2. Baarii fi Restorantii 3, Kaafteeri'aa 4,Mana fonii	
11	Haala hojii	1 dhaabbataa 2 kontoraata/ guyyaan	

Kutaa 2ffaa. Beekumsa waa'ee fayyummaa nyaataa irratti

12	Sooratni faalame bifa, foolii fi dhamdhama gaarii qabaachuu danda'a.	1.sirridha 2.sirrii miti 3.hin beeku
13	Nyati ho'aan sirnaan qabamuu baannaan summa'uu danda'a	1.sirridha 2.sirrii miti 3.hin beeku

14	foonni ho'aan(haaraan) yeroo hundaa orgaanisimii xixiqqoo ofirraa qaba	1.sirridha 2.sirrii miti 3.hin beeku
15	Namni fayyaan jarmoota soorataatti daddabarsuudhaan dhukkuba fiduu dandaa.a	1.sirridha 2.sirrii miti 3.hin beeku
16	Baala nyaatamuu fi nyaati utuu hin bichaatin nyaatamu orgaanisimoota xixiqqoo miidhaa geesisuu danda'an ofirraa qabaachuu danda'a	1.sirridha 2.sirrii miti 3.hin beeku
17	nyaatni orgaanisimii xixiqqoodhan faalamuu danda'a yoo nyaata faalameen walitti bu'e	1.sirridha 2.sirrii miti 3.hin beeku
18	Nyaata utuu hin bilchaatin nyaataman kan akka kuduraa qodaa foonni irratti ciramu irratti ciranii qopheessuun ni danda.ama	1.sirridha 2.sirrii miti 3.hin beeku
19	qodaa foonni irratti ciramu fi haaduu erga itti fayyadamnee keemikaalaan qulleessuun barbaachisaadha	1.sirridha 2.sirrii miti 3.hin beeku
20	Diilalleessun bakteeriya dhibee nyaatarraan namatti dhufan danda'aan ni balleessa	1.sirridha 2.sirrii miti 3.hin beeku

Kutaa 3ffaa: ilaalcha hojjetaan mana nyaataa fayyummaa nyaataa irratti

21	Ho'isuun ykn diilalleessuun wantoota nyaata summeessuu danda'an baayyee sirriitti to.achuu danda	0. sirriitin morma 1.nan morma 2. giddu galeessa 3. ittin walii gala 4. sirriittan itti walii gala
22	Hojjetaan mana nyaataa hundi fayyummaa nyaataa irratti leenjii fudhachuun qaba	0. sirriitin morma 1.nan morma 2. giddu galeessa 3. ittin walii gala 4. sirriittan itti walii gala
23	Leenjii dhabuun fayyummaa nyaataa miidhuu danda'aa	0. sirriitin morma 1.nan morma 2. giddu galeessa 3. ittin walii gala 4. sirriittan itti walii gala
24	Qajeelcha akkaataa qabiinsa soorataa irratti dhabuun fayyummaa nyaataa ni miidha	0. sirriitin morma 1.nan morma 2. giddu galeessa 3. ittin walii gala 4. sirriittan itti walii gala

25	to'ataan Hirmaachuu yoo baate qabiinsa fayyummaa nyaataa irratti dhiibbaa qaba	0. sirriitin morma 1.nan morma 2. giddu galeessa 3. ittin walii gala 4. sirriittan itti walii gala
----	--	--

Kutaa 4ffaa: shaakala fayyummaa soorataa eeguuf godhamu

26	Samunaadhaaf bishaan ho'aadhaan utuu hojii hin jalqabin harka ni dhiqattaa?	1.Eeyyee 2.Lakki
27	Soorata nyaataaf qophaa'e utuu hin xuqiin harka ni dhiqattaa?	1.Eeyyee 2.Lakki
28	Harka kee samunaaf bishaan hoo'aadhaan erga wantootata soorata hin ta'in kan akka qarshiifaa... xuqtee ni dhiqattaa?	1.Eeyyee 2.Lakki
29	Yeroo mana fincaanii fayyadamtee deebitu harkakee samunaa fayyadamtee ni dhiqattaa?	1.Eeyyee 2.Lakki
30	Yeroo hojii hojjettu nyaataaf dhugaatii ni fayyadamta	1, Eeyyee 2.Lakki
31	Yeroo hojiitti uffata yuunifoormii ni uffattaa?	1.Eeyyee 2.Lakki
32	Yeroo hojiitti ni haarsitaan	1.Eeyyee 2.Lakki
33	Yeroo dhukkubni daddarboon si qaban kan akka teesisa, garaa ciniinnaa... iddoo hojii ni dhuftaa?	1.Eeyyee 2.Lakki
34	Yeroo hojiitti mataa kee ni aguugdaa?	1.Eeyyee 2.Lakki
35	Yeroo hojiitti aguuggii fuulaa (face mask) ni godhattaa?	1.Eeyyee 2.Lakki
36	Yeroo qufaatuuf axxiffattu maarramaa ni fayyadamtaa?	1.Eeyyee 2.Lakki
37	Yeroo hojitti Meeshaalee faayaa ni godhattaa?	1.Eeyyee 2.Lakki
38	Meeshaa irratti nyaata ciran erga itti fayyadamtanii keemikaalaan ni qulleessituu	1.Eeyyee 2.Lakki
39	Qeensa keessan dheeraaf xurii ni gootuu?	1.Eeyyee 2.Lakki
40	Yeroo hojiitti aancaa ni nyaattatta?	1.Eeyyee 2.Lakki
41	Uffata keessan yeroo hundaa ni miicuu?	1.Eeyyee 2.Lakki

Kutaa 5ffaa: wantoota dhaabbata nyaataa keessa jiran daawwachuu

42	Qajeelchi mana nyaataa keessa jiraachuu	1.Eeyyee 2.Lakki	
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43	Bakka harka itti dhiqatan jiraachuu	1.Eeyyee 2.Lakki	Yoo 2 filattan kan itti aanu irra darbaa
45	Fageenyi meetira tokkoof isaa gadi ta'e iddoo itti nyaata qophessaniif harka itti dhiqatan mana ittoo ykn suuqii foonii keesa jiraachu	1.Eeyyee 2.Lakki	
45	Manni fincaanii bishaniif sanunaa qabu jiraachuu	1.Eeyyee 2.Lakki	
46	Manni fincaanii adda ba' e hojjetootaaf jiraachuu	1.Eeyyee 2.Lakki	
47	Qaawwi (huraan) ilbiisota seensisuu fi ilbiisonni jiraachuu	1.Eeyyee 2.Lakki	
48	Namni to'atu jiraachuu	1.Eeyyee 2.Lakki	
49	Uffata iddoo itti jijjiran adda ba'e	1.Eeyyee 2.Lakki	
50	Bishaanni yaa'u mana ittoo ykn suuqii foonii keessa jiraachuu	1.Eeyyee 2.Lakki	
51	Iddoon itti balfa kuusan jiraachuu	1.Eeyyee 2.Lakki	
52	Haaromsaafii qulqullina ijaarsa dhaabbatichaa	1.Eeyyee 2.Lakki	
53	Kan qilleensa galchu manicha keessa jiraachuu	1.Eeyyee 2.Lakki	
54	Ibsaa ga'aan jiraachuu	1.Eeyyee 2.Lakki	

ANNEX III: Amharic questioner

ለምግብ አዘጋጅ የተሳታፊ መረጃ ወረቀት እና በመረጃ የተደገፈ የፈቃደኝነት ስምምነት ቅጽ

ስሜ ----- ለጥናቱ መረጃ ሰብሳቢ ሆኜ እየሰራሁ ነው። በጅም ዩኒቨርሲቲ የማስተርስ ድግሪውን እየተማረ ያለው አበያ ተራፋ በምግብ ተቋማት በምግብ አዘጋጆች ላይ ጥናት እያካሄደ ነው። ስለ ጥናቱ በተመለከተአብራራልሁ ትኩረት እንድትሰጡኝ በትህትና እጠይቃለሁ።

የጥናት ርዕስ:

በጅም ከተማ የህዝብ ምግብ ማቋማት ውስጥ የሚሰሩ የምግብ አዘጋጆች የምግብ ደህንነት ተግባር እና ተያያዥ ምክንያቶች

የጥናቱ ዓላማ:

የዚህ ጥናት ግኝቶች የምግብ አዘጋጆች ሆኑ የምግብ ተቆጣጣሪ ባለስልጣን በምግብ ደህንነት አሰራር ላይ ይህን የመሰለ ጥሩ ማሳሰቢያ እንዲሰጡ እና በምግብ ደህንነት አሰራር ላይ ክፍተት እና ተያያዥ ምክንያቶች ላይ በመመስረት መፍትሄ እንዲሰጡ ፍንጭ ሊሰጥ ይችላል። በተጨማሪም፣ የዚህ ጥናት አላማ ለዋና ተመራማሪ ማስተር ነፍግራምን በሰው አመጋገብ እና በአመጋገብ ጥናት ለማሟላት እንደ ከፊል መስፈርት ተሰብ መፃፍ ነው።

ሂደት እና ቆይታ:

ለጥናቱ አጋዥ የሆኑ ተዛማጅ መረጃዎችን ለመስጠት መጠይቁን በመጠቀም ቃለ መጠይቅ አደርግልዎታለሁ። እርስዎን በመጠየቅ መጠይቁን የምሞላበት 54 ጥያቄዎች ያሉት አምስት ክፍሎች አሉ። ቃለ-መጠይቁ ከ15-20 ደቂቃ ይወስዳል፣ ስለዚህ ለቃለ መጠይቁ በዚህ ጊዜ እንድትቆጥቡልኝ በአክብሮት እጠይቃለሁ።

አደጋዎች እና ጥቅሞች:

በዚህ ጥናት ውስጥ የመሳተፍ አደጋ ዕድሉ አነስተኛ ነው፣ ከጊዜያዊ ጥቂት ደቂቃዎችን ብቻ ይወስዳል። በዚህ ጥናት ውስጥ ለመሳተፍ ምንም አይነት ቀጥተኛ ክፍያ አይኖርም። ነገር ግን ከዚህ ምርምር የተገኙት ግኝቶች ጠቃሚ መረጃዎችን ለጤና ቢሮ እና ለምግብ ደህንነት ቁጥጥር ባለስልጣን ሊያሳዩ ይችላሉ።

ሚስጥራዊነት:

የምታቀርቡልን መረጃ ሚስጥራዊ ይሆናል። በተለይ እርስዎን የሚላይ መረጃ የለም። የጥናቱ ግኝቶች ለጥናት ማህበረሰብ አጠቃላይ ናቸው እና የትኛውንም የግለሰብ ወይም የድርጅት የተለየ ነገር አያንጸባርቁም። መጠየቂያው ስሞችን ለማሳየት በኮድ ይገለጻል። ተሳታፊዎችን ከጥናቱ ጋር ሊያገናኙ የሚችሉ የቃል ወይም የጽሁፍ ዘገባዎች ማጣቀሻ አይደረግም።

መብቶች:

የዚህ ጥናት ተሳትፎ በፈቃደኝነት ነው። በዚህ ጥናት ለመሳተፍም ሆነ ላለመሳተፍ የማወጅ መብት አልዎት። በማንኛውም ጊዜ ለመሳተፍ ከወሰኑ እና ከጥናቱ ለመውጣት ከወሰኑ እና ይህ እርስዎ ለሚያግኙት ጥቅማጥቅሞች ኪሳራ አያደርግልዎትም ። መመለስ የማትፈልገውን ማንኛውንም ጥያቄ መመለስ የለብህም።

በመረጃ ላይ የተመሰረተ የፈቃደኝነት መግለጫ

አንብቤያለሁ እናም ተሳታፊ ለመሆን ወይም ይህን የፈቃድ ቅጽ ለመሙላት ዝግጁ ነኝ። የጥናቱ ዓላማ የሂደቱን አደጋ፣ ጥቅም እና የምስጢርነት ጉዳይ በግልፅ ተረድቻለሁ። በማንኛውም ጊዜ ከጥናቱ የመውጣት መብት እንዳለኝ አሳውቃለሁ። ስለዚህ በዚህ ጥናት ውስጥ ለመሳተፍ በራሴ ፊርማ በፈቃደኝነት መስማማቴን አውጅኩ።

የተሳታፊ ስም ----- ፊርማ -- ቀን --2022

የአስተዳዳሪ ስም -----ፊርማ-- ቀን--2022

የጠያቂዎች ስም -----ፊርማ -- ቀን --/2022

አማራጭ ጥያቄ

የድርጅት አይነት _____ የጠያቂው ስም _____ በተቆጣጣሪው የተረጋገጠ; ስም-----ፊርማ
 _____ የቃለ መጠይቁ ቀን -----

መጠይቆች መታወቂያ ቁጥር _____

ክፍል አንድ:- ስነ-ሕዝብ እና ማህበራዊ

ተ.ቁር	ቫሪያብል	ምላሽ	ዝላል
1	እድሜ	-----	
2	ጾታ	1.ወንድ 2. ሴት	
3	የጋብቻ ሁኔታ	1.ያላገባ 2. አግብተዋል 3. የተፋታ 4. ምስቱ/ባል የሞተ	
4	የትምህርት ደረጃ	1.መደበኛ ትምህርት የለም 2. የመጀመሪያ ደረጃ ትምህርት 3.የሁለተኛ ደረጃ ትምህርት 4. ኮሌጅ የበለጠ	
5	የስራ ልምድ	-----	
6	ወርሃዊ ገቢ (ኢ.ቲ.ቢ.)	-----	
7	አስተዳዳሪዎች/ተቆጣጣሪ ባለቤቶች	1.ባለቤት 2.ዘመዶች 3. ሌላ	
8	የምግብ ደህንነት ስልጠና አለህ?	1. አዎ 2. አይ	መልስ2.ከ ሆነ የሚቀጥለውን ይዝለሉ
9	አዎ ከሆነ ስልጠናውን ከየት አገኙት	1.ከወራዳ ጤና ጥበቃ ጽ/ቤት 2 ከአራሱ ከተቋሙ 3. የባህል እና ቱሪዝም ቢሮ 4. ሌላ	
10	የመቋቋሚያ ዓይነቶች	1. ሆቴል 2. ባር እና ሬስቶራንት። 3. ካፌቴሪያ 4. ሲጋ ቦት	
11	የ ሲራ ሁኔታ	1 ቋሚ 2 ጊዛዊ/ በ ቀን	

ክፍል II. የምግብ ደህንነት እውቀት

12	እርስዎን ለመታመም በቂ በሽታ አምጪ ተህዋሲያን ያለው ምግብ ሊመስል፣ ሊያሸት ወይም ጥሩ ጣዕም ሊኖረው ይችላል።	1.ትክክል 2.ትክክል ያልሆነ 3. አላውቅም
13	በትክክል ትኩስ ምግብ በአግባቡ ካልተያዘ የምግብ መመረዝን ሊያስከትል ይችላል	1.ትክክል 2.ትክክል ያልሆነ 3. አላውቅም
14	ትኩስ ስጋ ሁልጊዜም በላዩ ላይ ተህዋሲያን አሉት	1.ትክክል 2.ትክክል ያልሆነ 3. አላውቅም
15	የጤና ሰዎች ጀርም ወደ ምግብ በመሸከም በሽታ ሊያስከትሉ ይችላሉ።	1.ትክክል 2.ትክክል ያልሆነ 3. አላውቅም
16	ሰላጣ እና ሌሎች ጥሬ አትክልቶች ጎጂ የሆኑ ተህዋሲያን ሊኖራቸው ይችላል	1.ትክክል 2.ትክክል ያልሆነ 3. አላውቅም
17	ምግቦች ደህንነቱ ያልተጠበቀ ምግብ ጋር በመገናኘት በተህዋሲያን ሊበከሉ ይችላሉ።	1.ትክክል 2.ትክክል ያልሆነ 3. አላውቅም
18	ለመብላት ዝግጁ የሆኑ ምግቦችን (ለምሳሌ አትክልት) ስጋን ለማዘጋጀት ጥቅም ላይ በዋለው መከተፊያ ውይም አቃ ላይ ሊዘጋጅ ይችላል	1.ትክክል 2.ትክክል ያልሆነ 3. አላውቅም
19	መከተፊያ የስጋ ቢላዎች ከእያንዳንዱ አጠቃቀም በኋላ ከተህዋሲያን ምጽዳተ አለባቸው	1.ትክክል 2.ትክክል ያልሆነ 3. አላውቅም
20	ማቀዝቀዣ ፍሪጅ ምግብ ወለድ በሽታ ሊያስከትሉ የሚችሉትን ባክቴሪያዎችን በሙሉ ይገድላል።	1.ትክክል 2.ትክክል ያልሆነ 3. አላውቅም

ክፍል ሶስት: የምግብ ደህንነትን የተመለከተ አመለካከት

21	የሙቀት መቆጣጠሪያዎች የምግብ መመረዝ ቁጥር ለመቀነስ ውጤታማ ዘዴ ናቸው	0. በጣም አልስማማም 1. አልስማማም, 2. ገለልተኛ 3. እስማማለሁ፣ 4. በጥብቅ ይስማማሉ
22	ሁሉም ምግብ ሰሪዎች የምግብ ደህንነት ስልጠና ብቃቶች ሊኖራቸው ይገባል	0. በጣም አልስማማም 1. አልስማማም, 2. ገለልተኛ 3. እስማማለሁ፣ 4. በጥብቅ ይስማማሉ
23	የምግብ ደህንነት ስልጠና እጥረት ደህንነቱ የተጠበቀ ምግብ አያያዝ ላይ ተጽእኖ ያሳድራል።	0. በጣም አልስማማም 1. አልስማማም, 2. ገለልተኛ 3. እስማማለሁ፣ 4. በጥብቅ ይስማማሉ
24	የምግብ አያያዝ መመሪያ አለመኖሩ የምግብ ደህንነትን ሊጎዳ ይችላል	0. በጣም አልስማማም 1. አልስማማም, 2. ገለልተኛ 3. እስማማለሁ፣ 4. በጥብቅ ይስማማሉ

25	የተቆጣጣሪ ቁርጠኝነት ማጣት ደህንነቱ የተጠበቀ ምግብ አያያዝ ላይ ተጽዕኖ ያሳድራል።	0. በጣም አልስማማም 1. አልስማማም, 2. ገለልተኛ 3. እስማማለሁ፣ 4. በጥብቅ ይስማማሉ
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ክፍል IV: የምግብ ደህንነት ልምምድ

26	ስራ ከመጀመርዎ በፊት እጅዎን በሳሙና እና በሙቅ ውሃ ይታጠባሉ	1. አዎ 2. አይ
27	የበሰለ ምግቦችን ከመንካትዎ በፊት እጅዎን ይታጠባሉ	1. አዎ 2. አይ
28	እንደ ገንዘብ ያሉ ምግብ ነክ ያልሆኑ ነገሮችን ከነኩ በኋላ እጅዎን በሙቅ እና በሳሙና ይታጠባሉ	1. አዎ 2. አይ
29	ሽንት ቤት ከተጠቀሙ በኋላ እጅዎን በሳሙና ይታጠቡ?	1. አዎ 2. አይ
30	በሚሰሩበት ጊዜ ይበላሉ ወይም ይጠጣሉ?	1. አዎ 2. አይ
31	ምግብ ሲያቀርቡ ዩኒፎርም ይለብሳሉ?	1. አዎ 2. አይ
32	በተለመደው የምግብ አያያዝ ያጨሳሉ?	1. አዎ 2. አይ
33	እንደ ሆድ ወይም ተቅማጥ ወይም ተላላፊ በሽታ ሲታመሙ ወደ ሥራ ይመጣሉ	1. አዎ 2. አይ
34	ምግብ በምታገለግሉበት ጊዜ ኮፍያ ወይም የራስ መሸፈኛ ታደርጋለህ?	1. አዎ 2. አይ
35	ምግብ በምታገለግሉበት ጊዜ የፊት ማስክ ትለብሳለህ?	1. አዎ 2. አይ
36	በምግብ ወቅት በሚያስሉበት ወይም በሚያስነትሱት ጊዜ መሀረብ ይጠቀማሉ	1. አዎ 2. አይ
37	ምግብ በሚያቀርቡበት ጊዜ ጌጣጌጥ ያረጋሉ?	1. አዎ 2. አይ
38	ከእያንዳንዱ አጠቃቀም በኋላ እቃውን በፀረ-ተባይ ይያዛሉ?	1. አዎ 2. አይ
39	ጥፍሮትን ያረዝማሉ እናም ይቆሽሻል ?	1. አዎ 2. አይ
40	በምግብ አገልግሎት ጊዜ ማስቲካ ታኝካለህ?	1. አዎ 2. አይ
41	ልብስህን አዘውትረህ ታጥባለህ	1. አዎ 2. አይ

ክፍል 5: ፋሲሊቲዎች እና የቁሳቁስ ቁጥጥር/ምልከታ

42	ለምግብ ተቋሙ መመሪያ መኖሩ	1. አዎ 2. አይ
43	የእጅ መታጠቢያ ቦታ መኖሩ	1. አዎ 2. አይ
44	በማጠቢያ እና በስጋ ወይም በምግብ ዝግጅት ቦታ መካከል ያለው ርቀት <=1m	1. አዎ 2. አይ
45	የመጻዳጃ ቤት ከሳሙና እና ውሃ ጋር መኖሩ	1. አዎ 2. አይ
46	የተለየ ሽንት ቤት ለስራተኛ መኖር	1. አዎ 2. አይ

47	ስንጥቅ እና ነፍሳት/አይጦች መኖሩ	1. አዎ 2. አይ
48	በባለቤት/በተቆጣጣሪ ቁጥጥር መደረጉ	1. አዎ 2. አይ
49	ልብስ ቂያራ ክፍል	1. አዎ 2. አይ
50	በኩሽና ውይም ሲጋ ቤት ውስጥ የቧንቧ ውሃ መገኘት	1. አዎ 2. አይ
51	የቆሻሻ ማስወገጃ መገኘቱ	1. አዎ 2. አይ
52	የጥገና ሁኔታ እና የጽዳት ሁኔታ	1. አዎ 2. አይ
53	የአየር ማናፈሻ መገኘቱ	1. አዎ 2. አይ
54	የብርሃን መገኘት	1. አዎ 2. አይ

ANNEX IV: Result of bivariable analysis

Variable	Category	COR 95% CI	P-values
Age	17-24	1	
	25-32	0.82 (0.52,1.30),	0.409
	>=33	0.79 (0.36, 1.73)	0.548
Sex	Male	1	
	Female	2.61 (1.67,4.08	0.00
Marital status	Single	1	
	Married	0.931 (0.59,1.46)	0.757
	Divorce	1.029 (0.06,16.68)	0.984
	Widowed	0.0	1
Educational status	No formal education	1	
	Primary education	2.96 (0.77, 11.45)	0.113
	Secondary education	2.75 (0.72,10.60)	0.141
	Diploma and above	4.00 (0.84, 19.16)	0.083
Work experience	=<2 years	1	
	3-5 years	0.853 (0.503, 1.447)	0.556
	=>6 years	0.755 (0.422, 1.351	0.344
Monthly income	=< 1000	1	
	1001-2000	0.57 (0.35, 0.94)	0.027
	>2000	0.86 (0.44, 1.67)	0.656
Manager/supervisor owners	Owner	0.36 (0.15,0.87)	0.022

	Relative	0.26 (0.11, 0.62)	0.002
	Other	1	
Do you have safety training	Yes	1.03 (0.64, 1.66)	0.907
	No	1	
From Where training received	Woreda health office	1	
	Establishments	0.70 (0.28, 1.77)	0.452
	Cultural and tourism	1.26 (0.37, 4.26)	0.71
	Other	2.70 (0.48, 15.20)	0.260
Working condition	Permanent	00	1
	Contract/daily	1	
Knowledge status	Yes	0.72 (0.39, 1.30)	0.269
	No	1	
Attitude status	Yes	2.10 (1.26, 3.50)	0.005
	No	1	
Availability of guideline for food establishments	Yes	1.605 (0.265, 9.73)	0.607
	No	1	
Presence of Hand washing facility	Yes	3.44 (1.20, 6.06)	0.000
	No	1	
Distance between sink and meat or food preparation place <= 1m	Yes	2.32 (1.38, 3.90)	0.001
	No	1	
Availability of latrine with soap and water	Yes	2.45 (1.49, 4.05)	0.00
	No	1	
Availability of separate latrine for worker	Yes	1.287 (0.82, 2.02)	0.269
	No	1	

Availability crack and Insects/rodents	Yes	0.63 (0.36, 1.13)	0.12
	No	1	
Supervision by owner /supervisor	Yes	0.93 (0.48, 1.81)	0.838
	No	1	
Separated dress	Yes	1.42 (0.72, 2.71)	0.282
	No	1	
Availability of running water in the kitchen or preparation area or in meat shop	Yes	3.91 (2.39,6.38)	0.00
	No	1	
Availability of waste disposal	Yes	2.24 (1.16, 4.32)	0.016
	No	1	
Repair status &Cleanness status	Yes	2.54 (1.61, 4.00)	0.00
	No	1	
Availability of ventilation	Yes	1.64 (0.65, 4.13)	0.292
	No	1	
Availability of light	Yes	0.94 (0.58, 15.17)	0.966
	No	1	

NB- the word “others” for question about manager/ supervisor type specified as **employ**

- The word “others” for question about place of training received specified as **school**

ANNEX V: Assurance of principal investigator

The undersigned agrees to accept responsibility for the scientific ethical and technical. Conduct of the thesis and for provision of required progress reports as per terms and conditions of the Faculty of Public Health in effect at the time of grant forwarded as the result of this application.

Name of the student: Abeya Terefa

Date: ----- **Signature** -----

APPROVAL OF ADVISORS

Name of the advisors

1, Mr MELESE SINAGA (Ass. professor) **Date**----- **Signature**-----

2, Mr BEAKAL ZINAB (PhD follower) **Date**----- **Signature**-----

ANNEX VI: Declaration

The undersigned thesis is my original work in partial fulfillment of the requirement for the degree of Master of Science in Human Nutrition & dietetics, and all sources of materials used for the paper duly acknowledged.

Name of student: Abeya Terefa

Signature: -----Date -----

Submission to: Department of Nutrition and Dietetics Faculty of Public Health, Institute of Health, Jimma University.

Date Submission: -----

The thesis has been approved for submission by:

Name of Supervisors: Signature Date

1. Mr. MELESE SINAGA (Ass. professor) **Date:** _____ **signature** _____

2. Mr. BEAKAL ZINAB (PhD follower) **Date:** _____ **signature** _____