

**SANITARY FOOD HANDLING PRACTICE AND ASSOCIATED
FACTORS AMONG FOOD HANDLERS IN LICENSED PUBLIC FOOD
ESTABLISHMENT IN TOWNS OF KOKKOSSA DISTRICT, OROMIA
REGION, SOUTHERN ETHIOPIA.**

MPH THESIS

BY: BADASO SHATURA (BSc)

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Sanitary Food Handling Practice and Associated Factors among Food Handlers in Licensed Public Food Establishment in Towns of Kokkossa District, Oromia Region, Southern Ethiopia.

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BY: BADASO SHATURA (BSc)

Major Advisor: Negga Baraki (MPH, Associate Professor)

Co- Advisor: Tesfaye Gobena (PhD, Associate Professor)

March, 2021

Haramaya University, Harar

STATEMENT OF THE AUTHOR

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BIOGRAPHICAL SKETCH

The author was born in 1990 in West Arsi Zone, Kofale District. I attended elementary School in Koriftu and Kuyera. I attended my Secondary school in Dodola, West Arsi. After completion of Secondary School, I joined Fiche Health Science College in 2008. At Fiche Health Science College I studied Clinical Nursing and graduated in September 2011. After graduation, I have assigned in Kokkossa woreda, West Arsi Zone, Oromia region on November 2011 till June 2014. Then I have joined Haramaya University in 2015 and studied Comprehensive Nursing and got my BSc degree in Nursing in September 2017. After graduation, I was assigned back to my woreda and I have been working there until I have joined Haramaya University School of Graduate study in July, 2018.

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ACRONYMS/ABBREVIATIONS

AOR	Adjusted Odds Ratios
CDC	Center for Disease Control and Prevention
CI	Confidence Interval
COR	Crude Odds Ratios
FAO	Food and Agricultural Organization
FBI	Food Born Illness
FDRE	Federal Democratic Republic of Ethiopia
FHs	Food Handlers
IHRERC	Institutional Health Research Ethics Review Committees
LPFEs	Licensed Public Food Establishments
MOH	Ministry of Health
OR	Odds Ratios
PI	Principal Investigator
WHO	World Health Organization
WTO	World Trade Organization

SUMMARY

Background: Safe food handling practice is an increasingly important public health issue to prevent food borne illnesses. Food can be contaminated from production up to consumption. Producers, shippers, processors, distributors and food handlers have the responsibility in ensuring the safety of food. Unhygienic food handling practice is critical issue in causing foodborne illness and more prevalent in both developing and developed countries. Its effect in terms of human life and suffering is enormous. Thousands millions of people fall ill and may die as a result of eating unsafe food. As far as the principal investigator's knowledge is concerned there is no similar study conducted on status of sanitary food handling practice and associated factors among food handlers in licensed public food establishment in towns of Kokkossa districts and also there has not yet been known information about the current status of sanitary food handling practice in licensed public food establishment in a study area.

Objective: To assess status of sanitary food handling practice and associated factors among food handlers in licensed public food establishment in towns of Kokkossa District, Oromia region, Southern Ethiopia from March 15 to April 15, 2020.

Methods: Facility based cross-sectional study design was used. A total of 422 food handlers were selected using stratified random sampling with proportional allocation to size of the establishments. A pre-tested and structured questionnaire was used to collect the data. Data were entered and cleaned using Epi Data Version 3.1. Bi-variates and multivariate data analysis was performed using SPSS version 20.0 software. All covariates that are significant at p-value < 0.25 in bivariate analysis were considered for multivariate analysis to control all possible confounders. The level of statistical significance was declared at p-value less than 0.05. **Results.** About a total of 415 food handlers have participated in the study with response rate of 98.3%. Of these 191 [46% 95% CI (41.2%, 50.8%)] had good sanitary food handling practice. An educational status of food handlers (AOR= 3.28, 95% CI 1.36, 7.93), knowledge on sanitary food handling (AOR= 1.59, 95% CI 1.04, 2.4), work experience in public food establishment (AOR= 1.66, 95% CI 1.07, 2.56) and availability of trained manager (AOR = 4.40, CI 1.24, 15.07) were factors statistically associated with good sanitary food handling practice.

Conclusion. More than half of the food handlers had no sanitary food handling practice in the study area. Low practices are observed in utilization of refrigerator, wearing clean gown, wearing of ring/ jewelry, hair cover, training of food handlers, availability of trained manager and shower facility. Ongoing sanitary inspection should be performed regularly on food handler's general personal hygiene, safe food handling practice and on environmental sanitation of food establishment.

1. INTRODUCTION

1.1 Background

Food safety is a broad term that refers to the assurance of food that will not cause harm to the consumer when it is prepared and/or eaten according to intended use. It is vital for creating and maintaining hygienic and healthy conditions for the production and consumption of the food that we eat (Grace, 2015). Safe food handling practice is an increasingly important public health issue to prevent food borne illnesses. An adequate supply of safe, wholesome and healthy food is essential to the health and well-being of humans (WHO, 2015).

Food handler is any person who handles either food or surfaces that are likely to be in contact with food such as cutlery, plates and bowls. They work at a place where food is cooked and served such as kitchens, restaurants, juice bars, street food vendors, snack bar, take away joints etc. (Auad et al., 2019). Food handlers can provide us with tasteful and safe food whereas on other hand they can also be source of contamination and compromise food safety. They are an important source for the transfer of microorganisms to the food (Madhup et al., 2017).

Unhygienic food handling practice is critical issue in causing foodborne illness and more prevalent in both developing and developed countries. Its effect in terms of human life and suffering is enormous. Thousands millions of people fall ill and may die as a result of eating unsafe food (Scott, 2003). Food borne illnesses (FBI) are an important public health problem with reports of outbreaks of FBI every year resulting in substantial costs to individuals, health care system and the country (Marami et al., 2018; Awol et al., 2019).

Ethiopia set food control regulation of the food supply industry and enforcement of food laws by national or local authorities. Its purpose is to provide consumer protection and ensure that all foods during production, handling, storage, processing and distribution are safe, wholesome and fit for human consumption. A food control system ensures that foods conform to safety and quality requirements and are honestly and accurately labeled, as required by law (FMOH, 2015).

1.2 Statement of the Problem

Food safety is a public health concern in both developed and developing countries. The global report by WHO shows that 600 million people suffer from foodborne illnesses worldwide. From this figure, death occurs to 420,000 people of whom 125,000 are children under the age of five (WHO, 2015). In another annual surveillance report by Center for Disease Control and Prevention indicate that 839 foodborne disease outbreaks were occurred in the United States and resulting in 14,259 illnesses, 875 hospitalizations, 17 deaths, and 18 food product recalls (CDC, 2016).

Joint statement by FAO, WHO and WTO indicates food safety systems in developing countries and Africa in particular are weak and unable to protect human health (FAO, 2019). In Ethiopia, food-borne diseases encompass a wide spectrum of illnesses and the leading causes of health care visits to their health institutions were due to all forms of diarrheal diseases and intestinal parasites which were directly or indirectly related to food (Ayana et al., 2015).

Foodborne diseases have been an issue for all societies since the beginning of humanity. Their occurrence is mainly because and that of the prevailing poor food handling and sanitation practices, inadequate food safety laws, weak regulatory systems, lack of financial resources to invest in safer equipment and lack of education for food-handlers (Eshetu et al., 2019). Food handlers play vital roles in ensuring food safety along the food chain. Improper food handling practices and lack of food safety knowledge among food handlers contributes to deterioration in food keeping quality and incidences of foodborne diseases (Bafa et al., 2019).

Federal Democratic Republic of Ethiopia Ministry of Health (FDRE MOH) sets food control regulation of the food supply industry and enforcement of food laws by national or local authorities. Food control covers all stages of production, processing and distribution of food. It covers controls on food that is produced or imported for consumption within the region and food that is exported outside the country. The principal goals of these controls are protection of public health by protecting consumers from unsafe, unwholesome, mislabeled or adulterated food (FMOH, 2015).

Nowadays different driving factors end up in rapid increase in urbanization, with the resultant increment in the number of business catering establishments especially restaurants, cafe, hotels. And the number of people eating outside their homes is expected to increase which in turn demands for more food establishments.

As far as principal investigator's knowledge is concerned there is no similar study conducted on status of sanitary food handling practice and associated factors among food handlers in licensed public food establishment in towns of Kokkossa districts and also there has not yet been known information about the current status of sanitary food handling practice in licensed public food establishment in a study area. Therefore, this study aimed to assess the status of sanitary food handling practice and associated factors among food handlers in licensed public food establishment.

1.3 Significance of the Study

The finding of the study shows status of sanitary food handling practice and associated factors among food handlers in licensed public food establishment. The result of this study directly help Kokkossa district health office and West Arsi zonal health department as an input and help in planning to enhance status of sanitary food handling practice among food handlers in licensed public food establishment.

Additionally, other researcher may use the finding of these study as base line when need to conduct similar study in the different area. Non-government organization may also use the finding of this study for future planning and intervention of the appropriate sanitary food handling practice and associated factors among food handlers in licensed public food establishment.

1.4 Objective

1.4.2 General Objective

To assess status of sanitary food handling practice and associated factors among food handlers in licensed public food establishment in towns of Kokkossa District, Oromia region, Southern Ethiopia from March15 to 15April, 2020.

1.4.2 Specific Objectives

- To assess status of sanitary food handling practice among food handlers in licensed public food establishment in towns of Kokkossa District.
- To identify factors associated with status of sanitary food handling practiceamong food handlers in licensed public food establishment in towns of Kokkossa District.

2. LITERATURE REVIEW

2.1 Status of Sanitary Food Handling Practice

Sanitary food handling is one of the important measures to ensure the safety. Food handlers play an important role in ensuring food safety (Madhup et al., 2017). Study conducted in different region of the world shows the status of sanitary food handling practice of food handlers. According to study conducted in China, Malaysia, India Maharashtra, Saudi Arabia, Brazil, India Odisha and Jordan good practice of sanitary food handling ranges from 26.7% to 89.4%. Of them poor sanitary handling practice in China and higher in Jordan (Ma et al., 2019; Key et al., 2017; Prabhu and Shah, 2014; Wafa et al., 2018; Souza et al., 2018; PATI et al., 2014; Sharif et al., 2013).

The study conducted in Africa also shows various range of good sanitary food handling practice across the continent. According to study conducted Sudan, Oweri Imo state Nigeria, Ghana, Ondo state Nigeria, Ogun state Nigeria and Kambawe Zambia good practice of sanitary food handling ranges from 33.2% to 71.6% which were poor sanitary handling practice in Sudan and higher in Zambia (Abdelrazig et al., 2017; Anthony et al., 201; Akabanda et al., 2017; Emmanuel et al., 2019; Oladoyinbo et al., 2015; ENNIE, 2014).

In Ethiopia the study finding at different parts of the country, good practice of sanitary food handling ranges from 32.6% to 72%. Among which 32.6% poor in Arba Minch town (Legesse et al., 2017; Mulugeta and Bayeh, 2012; Chekol et al., 2019; Kassa et al., 2017; Gebremariam et al., 2019; Azanaw et al., 2019; Dagne et al., 2019; Okugn and Woldeyohannes, 2018; Tessema et al., 2014; Derso et al., 2017; Admasu and Kelbessa, 2018) and highest in Dessie town (Adane et al., 2018).

2.2 Factors Associated With Status of Sanitary Food Handling Practice

2.2.1 Socio-demographic Characteristics

Many study conducted in different regions of the world shows that different socio-demographic factors have significant association with good sanitary food handling practice. Study conducted in Arba Minch town, Ethiopia reveals that age greater than 29-34 and ≥ 35 years were statistically associated with good practice of sanitary food handling AOR 3.457 (1.63, 7.35), 3.454 (1.78, 6.69) respectively (Legesse et al., 2017). Study in Kordofan-Sudan and Abobo district Ethiopia shows being female has significantly associated with good practice of sanitary food handling (Okugn and Woldeyohannes, 2018; Abdelrazig et al., 2017).

The study in Maharashtra India, Kambawe Zambia and Debarke Ethiopia shows Secondary School educational level has significant association with good practice of sanitary food handling (Prabhu and Shah, 2014; ENNIE, 2014; Dagne et al., 2019; Chekol et al., 2019). Another study conducted in Ondo state Nigeria, Ghana and different Parts of Ethiopia reveals that higher educational level has also statistical association with good practice of sanitary food handling (Emmanuel et al., 2019; Akabanda et al., 2017; Admasu and Kelbessa, 2018; Chekol et al., 2019; Derso et al., 2017).

According to study conducted in Ethiopia Debarke town and Gonder city among marital status, being divorced and single were significantly associated with good practice of sanitary food handling AOR 7.52 (1.45-38.97), 0.36 (0.05, 0.85) respectively (Chekol et al., 2019; Azanaw et al., 2019). Another study conducted in Dessie town Ethiopia showed those whose monthly income >700 Ethiopian Birr were statistically associated with good practice of safe food handling AOR 3.2 (1.3 \pm 7.7) (Adane et al., 2018).

2.2.2 Knowledge and Practice of Food Handlers on Food Safety

Study conducted in different regions of the world states knowledge and practice of food handlers affects food safety. Study in Saudi Arabia, Brazil, Kordofan Sudan, Oweri Imo State Nigeria and different parts of Ethiopia reveals knowledge of safe food handling has statistical association with good practice of sanitary food handling (Wafa et al., 2018; Souza et al., 2018; Abdelrazig et al., 2017; Anthony et al., 2017; Tessema et al., 2014; Azanaw et al., 2019). Another study done in Maharashtra India, Malaysia and different parts of Ethiopia shows those who have work experience >2 years were statistically significant with good practice of sanitary food handling (Prabhu and Shah, 2014; Key et al., 2017; Chekol et al., 2019; Derso et al., 2017).

With respect to food safety training and certificate, study in Odisha India, China, Malaysia, Nigeria and Ghana shows those who have food safety training and certified were practicing good sanitary food handling (PATI et al., 2014; Ma et al., 2019; Key et al., 2017; Anthony et al., 2017; Emmanuel et al., 2019; Akabanda et al., 2017). Another study in different parts of Ethiopia also shows having food safety training and certification statistically significant association with good sanitary food handling practice (Admasu and Kelbessa, 2018; Azanaw et al., 2019; Adane et al., 2018; Derso et al., 2017; Mulugeta and Bayeh, 2012; Legesse et al., 2017).

Study Conducted in Nigeria and different parts of Ethiopia shows those who have regular supportive supervision and inspection by regulatory body have good practice of sanitary food handling (Emmanuel et al., 2019; Admasu and Kelbessa, 2018; Kassa et al., 2017; Gebremariam et al., 2019; Azanaw et al., 2019; Legesse et al., 2017).

Another study conducted in Zambia, Sudan, Nigeria and different parts of Ethiopia shows those who have regular and periodic medical checkup statistically significant association with good sanitary food handling practice (ENNIE, 2014; Abdelrazig et al., 2017; Emmanuel et al., 2019; Azanaw et al., 2019; Adane et al., 2018; Legesse et al., 2017).

2.2.3 Working Environment and Institutional Factors

Study conducted in different regions of the world states working environment and institutional factors have paramount effect on sanitary food handling practice. Study in China and Ethiopia indicates having legal license by establishment has statistical association with sanitary food handling practice (Ma et al., 2019; Gebremariam et al., 2019; Mulugeta and Bayeh, 2012). Another study conducted in Sudan and Dessie town Ethiopia shows presence of clean working garments and wearing gown during food handling has positive association with sanitary food handling practice (Abdelrazig et al., 2017; Adane et al., 2018).

Study conducted in Ethiopia, Dangila town shows presence of shower facility and separate dressing room has statistically significant association with sanitary food handling practice (Tessema et al., 2014). Another study conducted in India and different parts of Ethiopia indicates that availability of functional hand washing facility, three compartment dish washing and use of refrigerator have statistically associated with good sanitary food handling practice (Prabhu and Shah, 2014; Chekol et al., 2019; Derso et al., 2017).

Cross sectional study conducted in Ethiopia; Addis Ababa, Abobo district and Adwa town shows that training of institution manager on food hygiene and safe handling practice, availability of liquid waste disposal system and distance between toilet and kitchen were the identified significant factors associated with good sanitary food handlers practice (Kassa et al., 2017; Gebremariam et al., 2019; Okugn and Woldeyohannes, 2018).

2.3 Conceptual frame Framework

The conceptual framework shows that socio-demographic characteristics like food handler’s age, sex, educational level, marital status and income status may influence and enhance food handling knowledge. And educational level may directly influence and enhance food handling practice. In turn sanitary food handling knowledge may influence and enhance working environmental/institutional factors or may directly related to sanitary food handling practice. Lastly, environmental/institutional factors may directly influence and enhance sanitary food handling practice. In short, the above distal, intermediate and proximal factors for sanitary food handling practice were summarized in the following figure.

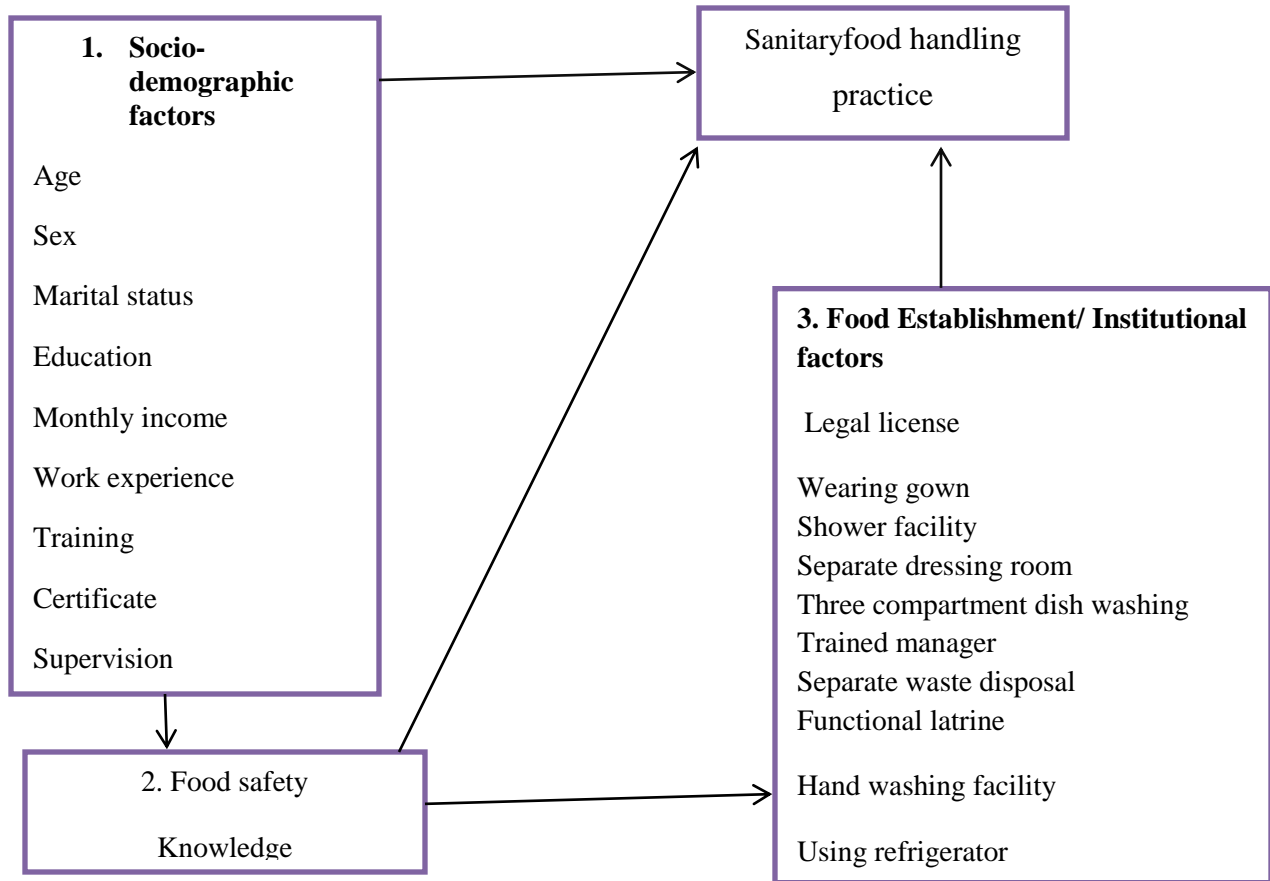


Figure 1: Conceptual framework on sanitary food handling practice and associated factors among food handlers in licensed public food establishment

Source: Adapted and modified from (Admasu and Kelbessa, 2018) sanitary food handling practice and associated factors

3. METHODS AND MATERIALS

3.1 Study area and Period

The study was conducted in Oromia Region, West Arsi Zone, in towns of Kokkossa district from March 15 to 15 April, 2020. Kokkossa district is one of the 13 districts of West Arsi Zone that found on the distance of 367 km from Addis Ababa and 117 km from Shashamane zonal town. It's bounded by Dodola, Nansabo, Kofale and Arbagona districts in East, South, North and West direction respectively. According to projection made by population and housing census in 2007 the number of population in the district estimated 2012 were 200772 (100386 male and 100386 female) out of this 19673 urban and 181099 are rural dwellers. Districts has 7 towns with total of 1223 licensed public food and drinking establishment and 759 licensed hotels, cafés, restaurants and butcher shops specifically (from towns trade and industry office). Majority of the ethnicities are Oromo. Concerning infrastructure woreda have 22 health posts, 7 health centers, 41 elementary, 4 high schools and 1 preparatory school. The livelihood of more than 85 % of the district population is based on farming (from District social office, 2012).

3.2 Study Design

Facility based cross sectional study design was used

3.3 Population

3.3.1 Source Population

All food handlers working in towns of Kokkossa district licensed public food establishments

3.3.2 Study Population

Food handlers working in selected licensed public food establishments of Kokkossa district

3.4 Inclusion and Exclusion Criteria

3.4.1 Inclusion Criteria

Food handlers that participated in food preparation, serving and cleaning of utensils without considering of their prior employment status was included in the study.

3.4.2 Exclusion criteria

Food handlers those who was on annual leave and absent during the data collection time were excluded from the study.

3.5 Sample Size Determination and Sampling Procedure

3.5.1 Sample Size Determination

For First Objective

The sample size is computed using a single population proportion formula with 95% CI, 5% marginal error (d) and p = 49% proportion of food handlers having good food handling practice from the previous study (Azanaw et al., 2019).

$$n = n = \frac{(Z_{\alpha/2})^2 \cdot P(1-P)}{(D)^2} = \frac{(1.96)^2 * 0.49(0.51)}{(0.05)^2} = 384$$

$$(D)^2(0.05)^2$$

Where, n = sample size

P = estimated percentage based on the past study, 49%

1-P = 51%

D = margin of error (5%)

Z $\alpha/2$ = critical value at 95% confidence level of certainty (1.96)

Therefore, the total calculated sample size = 384 and

Adding 10% of non-response rate, the final sample size was = 422

For objective 2: Factors associated with status of sanitary food handling practice

The sample size is calculated for some of the factors associated with status of sanitary food handling practice among food handlers obtained from different kinds of literature by using the statistical calculation of Epi Info software version 7 with the following assumption. By taking assumption of power 80%, 95% CI and ratio of unexposed to expose is 1

Table 1: Sample size calculation for the second objective of factors associated with status of sanitary food handling practice among food handlers in licensed public food establishment in towns of Kokkossa district, Southern Ethiopia 2021

Factors	Good sanitary food handling practice		Sample Size with Contingency (10%)	Reference
	Yes	No		
Work experience in different PFE*	69.3%	86.6%	275	(Derso et al., 2017)
Supervision by regulatory body	69.3%	35.5%	86	(Azanaw et al., 2019)
Training on safe food handling	25%	79%	35	(Legesse et al., 2017)

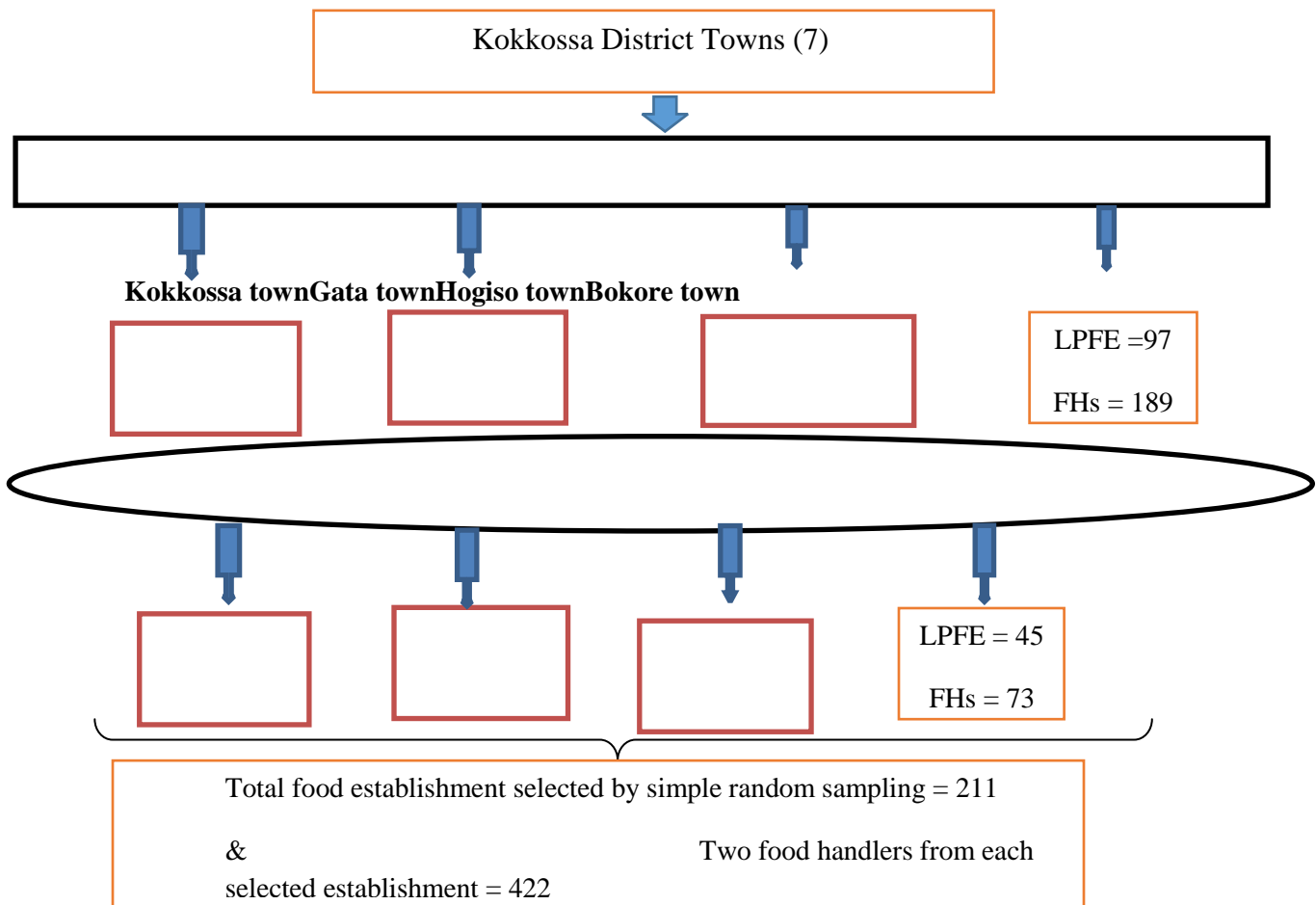
NB

PFE* indicates Public Food Establishments

Sample size is calculated for first and second objectives, and the largest sample size is 422 from objective one. Therefore, the final sample size for the study was 422 food handlers in licensed food establishments in towns of Kokkossa districts.

3.5.2 Sampling Procedure and Sampling technique

Stratified random sampling method was used to draw sample for the study. First, from the seven towns of Kokkossa district, four towns were selected by simple random sampling. Next, based on the total number of licensed establishments in selected towns (data from town trade and industry office), food establishment were selected using proportional allocation to sample size from each towns. Finally, the required sample size of food establishment was selected by simple random sampling and two food handlers were interviewed from each food establishment. If more than two food handlers were found in one establishment, two of them were selected by simple random sampling and included in the study.



LPFE= Licensed Public Food Establishments, FHs= Food Handlers

Figure 2: Schematic presentation of sampling procedure on status of sanitary food handling practice and associated factors among food handlers in licensed public food establishment in towns of Kokkossa district

3.6 Data Collection Method

3.6.1 Data Collection Instruments

Data were collected using the structured questionnaire that is adapted and developed from relevant literature and similar studies after reliability was checked using Chronbach`s Alpha (0.7). The questionnaire is prepared in English and it was translated to local language Afan Oromo to make sure for respondent understanding and after that back translated to English to maintain consistency well. It consists of information on socio-demographic characteristics of food handlers, institutional characteristics, food handling practice and factors associated with food handling practice.

3.6.2 Data Collectors and Data Collection Procedure

Data was collected by interview techniques while observation of practice using the prepared questionnaire from food handlers of randomly selected towns. Questionnaire was pretested on Kofale district which is outside of actual study area for completeness and consistency in all aspect. Totally Four diploma nurses were assigned for data collection and two BSC Environmental health professionals for supervisor after training was given by Principal investigator. Principal investigator and supervisors were follow the overall activities every day to make sure the completeness of the questionnaires and also they were responsible for overall data collection process.

3.7 Study Variables

3.7.1 The dependent variable

Sanitary food handling practice

3.7.2 The independent variables

- Socio-demographic variables: age, sex, educational level, marital status, monthly income, work experience, training, certificate, supervision/inspection
- Knowledge on food safety
- Working environment/Institutional characteristics: License status of establishment, wearing gown, shower facility, separate dressing room, three compartment dish

washing, trained manager, separate waste disposal, functional latrine, hand washing facility, using refrigerator.

3.8 Operational Definitions

- **Clean garments/gowns:** Working cloth for food handlers that is visually neat and appropriate to the size and height of food handlers (Chekol et al., 2019; Derso et al., 2017).
- **Food:** Any edible substance, beverage, or ingredient used or intended for use or sale in whole or in part for human consumption.
- **Food handler:** persons who work in selected types of food establishments and who handles packaged/unpackaged food, food equipment and utensils or food contact surfaces.
- **Hand washing facility:** Facility of any kind that have clean water from clean container with hand washing soap (Chekol et al., 2019).
- **Licensed food establishment:** Food catering establishments that has legal permission from town trade industry and registered i.e. Hotels, Restaurant, Cafe and Butcher shop (Derso et al., 2017).
- **Sanitary food handling:** Discipline of serving, handling, preparation and storage of food in ways that it's safe, sound, wholesome, fit for human consumption and prevent food-borne illnesses (Admasu and Kelbessa, 2018).
- **Sanitary food handling knowledge:** participants will asked 11 Sanitary food handling knowledge related questions from the questionnaire; those who scored $>$ the mean (average of the question) value were considered as having good knowledge and those who scored \leq the mean value were considered as having poor knowledge (Legesse et al., 2017).
- **Sanitary food handling practice:** participants will asked 14 Sanitary food handling practice related questions from the questionnaire; those who scored $>$ the mean (average of the question) value were considered as having good practices and those who scored \leq the mean value were considered as having poor practice (Legesse et al., 2017).
- **Three compartment dish washing:** Food establishment that use warm water with detergent and brush (in washing or compartment one), warm water only (in rinsing or compartment two) and hot water for sanitizing (in compartment three) of dish separately (Chekol et al., 2019).
- **Work experience:** The service related to sanitary food handling practice by food handlers in public food establishment provided in years (Chekol et al., 2019).

3.9 Data Quality Control

Totally four diploma nurses were assigned for data collection and two BSc Environmental health professionals for supervision after training was given by Principal investigator. Principal investigator and supervisors were follow the overall activities every day to make sure the completeness of the questionnaires and also they are responsible for overall data collection process. Training was given for data collectors and supervisors for two days by principal investigator. The concepts of training mainly includes impartiality of interviewers, responsibility of data collectors, right of respondents, pre-tests on 5% of sample outside of study area at Kofale town 42Km apart from study area on content of questionnaire, words and language understanding before actual data collection time. Data was also checked for completeness on daily basis by investigator before analysis.

3.10 Method of Data Analysis

After data collection is completed and processing quality was checked for completeness, clarity and consistency, data was entered and cleaned using Epi Data version 3.3.1 and analyzed by SPSS version 20 statistical software and was presented using descriptive and inferential statistics such as binary and multiple logistic regression models. Bi-variable logistic regression analysis was done to see association between dependent variable and each independent variable. The collinearity effect was checked and non-collinear covariates are included in the independent final binary logistic regression model to assess the possible association of outcome variables. Covariates that are statistically significant at bivariate level p -value <0.25 will be entered into multivariate logistic regression to control the effect of confounding variables. The result was presented as Proportion, output of logistic regression as Odd ratio to show the strength of association between associated factors and outcome variable and Adjusted Odd ratio to show the relationship between independent variable and the dependent variable by controlling the effect of confounders with 95% confidence intervals. The level of statistical significance was declared at p -value less than 0.05. The fitness of the model was tested by Hosmer-Lemeshow goodness of fit test for status sanitary food handling practice among food handlers. During analysis the knowledge and practice question was recoded into the

different variables and coded as (yes = 1 and no = 0) to make variable dichotomous, then the coded response was computed to get mean response of 11 knowledge and 14 practice questions, after that the mean response of knowledge and practice questions will be computed to get the overall mean response of knowledge and practice questions, then those who responded above the mean was coded as (1 for good and 0 for poor knowledge and practice respectively).

3.11 Ethical Considerations

Ethical clearance was obtained from institutional health research ethics review committee (IHRERC) of college of health and medical sciences, Haramaya University and also permission letter was obtained from district health office. Information was given for all study participants about the study before data collection on risks, benefits, confidentiality, privacy, as its informed, voluntary, written and signed consent was obtained and as their names was not recorded.

4. RESULTS

4.1 Socio-demographic characteristics of food handlers

From 422 total sample, size 415 food handlers were participated in the study making response rate of 98.3 %. The mean (\pm SD) age of respondent was 23.13 years (\pm 6.975 SD). Majority of respondents were females 292(70.4%) and regarding marital status more than two-third 313(75.4%) were single and majority 206(49.6%) of participants educational status were primary school level (1-8). Concerning to their work experience about 284(68.4%) were >2 years. Majority 241(58.1%) were regularly supervised by different body and only about 85(20.5%) had trained on safe food handling. Among food handlers only about 31(8.9%) had certificate of training (Table2).

Table2. Socio-demographic characteristics of sanitary food handlers working in licensed public food establishment in towns of Kokkossa district, Southern Ethiopia 2021

Variables	Category	Frequency (n)	Percent (%)
Age	<18 years	107	25.8
	18-21 years	99	23.9
	22-25 years	103	24.8
	>25 years	106	25.5
Sex	Male	123	29.6
	Female	292	70.4
Marital Status	Single	313	75.4
	Married	91	21.9
	Divorced	8	1.9
	Widowed	3	0.7

Educational Status	Unable to read and write	31	7.5
	Able to read and write	59	14.2
	Primary school 1-8	206	49.6
	Secondary school 9-12	92	22.2
	Higher >12	27	6.5
Monthly income	500–1000	164	39.5
	1001–1500	177	42.7
	> 1500	74	17.8
Work experience (years)	≥2	284	68.4
	<2	131	31.6
Supervision by different Body	Yes	241	58.1
	No	174	41.9
Food safety training	Yes	85	20.5
	No	330	79.5
Certification	Yes	37	8.9
	No	378	91.1

4.2 Level of sanitary food handling practice

This study found that overall practice of good sanitary food handling was 191(46%). About half 206(49.6%) food handler had wear gown and 158(38.1%) cover their hair. Study showed that 292(70.4%), 329(79.3%), 322(77.6%), and 360(86.7%) of food handlers have trimmed their fingernail, wear ring/jewelry, clean work surface after each activity and use soap/detergent for dishwashing respectively. Study also revealed that about 202(48.7%) of food handlers were use separate utensils for each food and 277(66.7%) had store raw and cooked food separately. More than two-third 294(70.8%) of food handlers reports that as they always come to work while having illnesses/sick (Table3).

Table3.Level of sanitary food handling practice of food handlers working in licensed public food establishment in towns of Kokkossa district, Southern Ethiopia 2021

Practice Questions	Food handling practice	
	Poor (%)	Good (%)
Wear gown/uniform during visit		
Yes	162(78.6)	44(21.4)
No	62(29.7)	147(70.3)
Cleanness of outer garments		
Yes	101(85.6)	17(14.4)
No	123(41.4)	174(58.6)
Hair covered while working in food service establishments during visit		
Yes	131(82.9)	27(17.1)
No	93(36.2)	164(63.8)
Finger nail short& trimmed during visit		
Yes	193(66.1)	99(33.9)
No	31(25.2)	92(74.8)
Wear any jewelry or ring on hand at time of visit		
Yes	197(59.9)	132(40.1)
No	27(31.4)	59(68.6)
Clean and sanitize work surfaces after each task		
Yes	193(59.9)	129(41.1)
No	31(33.3)	62(66.7)
Use soap/detergent for washing dishes		
Yes	213(59.2)	44(80)
No	11(20)	

Wash cutting surfaces/knife/with soap/detergent after using it for cutting raw meat or other food		
Yes	148(71.2)	60(28.8)
No	76(36.7)	131(63.3)
Wash his/her hands with soap and water before working with food		
Yes	193(60.1)	128(39.9)
No	31(33)	63(67)
Wash his/her hands with soap and water after visiting toilet		
Yes	213(57.9)	155(42.1)
No	11(23.4)	36(76.6)
Food utensils free of dust particles, finger paint and other marks		
Yes	135(62.5)	81(37.5)
No	89(44.7)	110(55.3)
Use a separate clean utensil for each food item		
Yes	128(63.4)	74(36.6)
No	96(45.1)	117(54.9)
Store raw food item in an area separate from cooked food		
Yes	191(69)	86(31)
No	33(23.9)	105(76.1)
Work while having illnesses/sick		
Yes	188(63.9)	106(36.1)
No	36(29.8)	85(70.1)
Overall practice of safe food handling (food safety)		
Good	191(46)	
Poor	224(54)	

4.3 Factors associated with sanitary food handling practice

4.3.1 Food safety related knowledge of food handlers

From the total of 415 food handlers, less than half 169 (40.7%) have good food handling knowledge with mean score of ≥ 14.71 . Majority 359(86.5%) of food handlers had heard about food borne diseases and mass media was the most common 223(53.7%) source of information. Majority of food handlers 298(71.8%) respond that food borne diseases are caused by germs. Study shows that majority of food handlers 298(71.8%), 368(88.7%) and 360(85.7%) know the causes of foodborne diseases, transmission of foodborne diseases and reason for food contamination respectively. About 387(93.3%), 297(71.6%) and 313(75.4%) food handlers responds that raw meat, milk and vegetables can cause and transmit food borne diseases respectively. Nevertheless, the study indicates that vast proportion 383 (92.3%) of food handlers in licensed public food establishment in towns of Kokkossa district were not aware of the correct temperature for a refrigerator to keep the food safer and healthier (Table 4).

Table 4. Food safety knowledge of sanitary food handlers working in licensed public food establishment in towns of Kokkossa district, Southern Ethiopia 2021

Knowledge questions	Frequency (n)	Percent (%)
Ever heard about food borne disease		
Yes	359	86.5
No	56	13.5
Source of information about food borne disease		
Health workers inspection team	192	46.3
Mass media	223	53.7
Other	0	0
Cause of food borne disease		
Germs	298	71.8
Chemical	117	28.2

Food borne disease is transmitted by contaminated food, water and vectors Yes No	368 47	88.7 11.3
Know food contamination by dirty hands, dirty working area, contaminated water, dirty utensils and infected food handlers Yes No	360 55	86.7 13.3
Know correct temperature for refrigerator is 1–5 °C Yes No	32 383	7.7 92.3
Know danger temperature zone for refrigerator is 5-60 °C Yes No	24 391	5.8 94.2
Know raw meat transmit disease Yes No	387 28	93.3 6.7
Know w milk transmit disease Yes No	297 118	71.6 28.4
Know raw vegetables transmit disease Yes No	313 102	75.4 24.6
Know personal hygiene of food handler can prevent food borne disease Yes No	391 24	94.2 5.8
Knowledge safe food handling(food safety) Poor Good	246 169	59.3 40.7

4.3.2. Working environment and institutional characteristics

Nearly all 393(94.7%) of food handlers were working in licensed public food establishments with about 232(58.6%) and 376(90.6%) separate solid and liquid waste disposal and functional latrine respectively. This study revealed that gown were prepared for more than half 250(60.2%) of food handlers. Majority of food handlers 404(97.3%) and 259(62.4%) were working in public food establishments that have availed with functional hand washing and thee compartment dish washing facility respectively. However, more than two-third food handlers were working in public food establishments that no refrigerator and separate functional shower facility(Table5).

Table 5. Working environment and institutional characteristics of sanitary food handling practice among food handlers working in licensed public food establishment in towns of Kokkossa district, Southern Ethiopia 2021

Variables	Category	Frequency (n)	Percent (%)
Legal working license	Yes	393	94.7
	No	22	5.3
Separate solid and liquid waste disposal (Both waste disposal at the same time)	Yes	243	58.6
	No	172	41.4
Availability of functional latrine	Yes	376	90.6
	No	39	9.4
Preparing gown for food handlers	Yes	250	60.2
	No	165	39.8
Functional hand washing facility	Yes	404	97.3
	No	11	2.7
Trained manager	Yes	98	23.6
	No	317	76.4

Functional shower facility	Yes	317	76.4
	No	98	23.6
Functional refrigerator	Yes	89	21.4
	No	326	78.6
Separate dressing room for food handler	Yes	80	19.3
	No	335	80.7
Three compartment dish washing	Yes	259	62.4
	No	156	37.6

4.3.3 Results of bi-variables and multivariate logistic regression analyses on factors associated with sanitary food handling practice

After Univariate (descriptive) analysis for examining the distribution of each individual variable was done, bivariate analyses that describe association between pairs of only two variables and multivariate analysis to examine the relationship between multiple independent variables & a dependent variable were performed. During bi-variable logistic regression analyses the factors associated with sanitary food handling practice at $p < 0.25$ were educational status, work experience, supervision, training, knowledge, separate waste disposal, prepare gown, trained manager, shower facility, refrigerator and three compartment dish washing. However, in multivariable logistic regression analysis educational status, knowledge, work experience and trained manager were significantly associated with sanitary food handling practice at $p < 0.05$. The finding of this study revealed that food handlers those who able to read and write were 3.3 times (AOR= 3.28, 95% CI 1.36, 7.93) higher in performing good sanitary food handling practice compared to those unable to read and write. In addition, the likelihood of performing good sanitary food handling practice among food handlers those who have good knowledge were 1.6 times (AOR= 1.59, 95% CI 1.04, 2.45) higher than those who have poor knowledge on safe food handling. Similarly, the likelihood of performing good sanitary food handling practice among food handlers who had work experience ≥ 2 years in different public food establishments were about 1.7 times (AOR= 1.66, 95% CI 1.07, 2.56) higher than those who have less experience. Furthermore, performing of good sanitary food handling practice among food handlers who had trained manager were four fold (AOR = 4.40, CI 1.24, 15.07) higher as compared to those food handlers who had no trained manager (Table 6).

Table 6. Factors associated with sanitary food handling practice among food handlers working in licensed public food establishment in towns of Kokkossa district, Southern Ethiopia 2021

Variables	Sanitary food handling practice		COR(95%CI)	AOR(95%CI)
	Good (%)	Poor (%)		
Educational status*				
unable to read & write	23(74.2)	8(25.8)	1	1
able to read & write	168(43.8)	216(56.2)	3.70(1.61-8.47)	3.28(1.36-7.93)**
Work experience				
≥ 2 years	121(42.6)	163(57.4)	1.55(1.02-2.34)	1.66(1.07-2.56)**
< 2 years	70(53.4)	61(46.6)	1	1
Supervised by different body				
Yes	100(41.5)	141(58.5)	1.57(1.04-2.29)	***
No	91(52.3)	83(47.7)	1	1
Training on safe food handling				
Yes	30(35.3)	55(64.7)	1.75(1.07-2.86)	***
No	161(48.8)	169(51.2)	1	1
Knowledge on safe food handling				
Poor	98(39.8)	148(60.2)	1	1
Good	93(55)	76(45)	1.85(1.24-2.75)	1.59(1.04-2.45)**
Separate solid and liquid waste disposal				
Yes	102(42)	141(58)	1.48(1.01-2.20)	***
No	89(51.7)	83(48.3)	1	1

Preparing gown for food handlers				
Yes	105(42)	145(58)	1.50(1.02-2.23)	***
No	86(52.1)	79(47.9)	1	1
Availability of trained manager				
Yes	33(33.7)	65(66.3)	1.96(1.22-3.14)	4.39(1.23-15.07)**
No	158(49.8)	159(50.2)	1	1
Availability of functional shower facility				
Yes	36(36.4)	62(63.3)	1.65(1.04-2.63)	***
No	155(48.9)	162(51.1)	1	1
Availability of functional refrigerator				
Yes	30(33.7)	59(66.3)	1.92(1.12-3.13)	***
No	161(49.4)	165(50.6)	1	1
Three compartment dish washing				
Yes	109(42.1)	150(57.9)	1.53(1.02-2.27)	***
No	82(52.6)	74(47.4)	1	1

NB

Educational status* indicates educational level was computed and dichotomized into unable & able to read and write based on their mean (below and above mean)

**indicates variable significantly associated in multivariate analysis at (p<0.05)

*** indicates variables removed from the model (not significant) in the multivariate analysis

Hosmer and Lemeshow test = 0.500 showed that the model fitted well (p>0.05)

5. DISCUSSION

Unsanitary food handling practices are among the major problem that causes food born disease transmission. Thus this study provides an insight on status of sanitary food handling practice and associated factors among food handlers in the area. The finding of the study shows that good sanitary food handling practice was 46%. Furthermore educational status of food handlers, knowledge on sanitary food handling, work experience in public food establishment and availability of trained manager were factors that significantly associated with sanitary food handling practice. This finding was consistent with the study conducted in different parts of Ethiopia; Adwa town in 2019 (47.7%), Debarq town in 2019 (49.6%) on food safety practice and its associated factors among mothers, Abobo district in 2018 (51%) and Dangila town in 2014 (52.5%) (Gebremariam et al., 2019; Dagne et al., 2019; Okugn and Woldeyohannes, 2018; Tessema et al., 2014).

On another way, the good sanitary food handling practice in this study was higher compared with study conducted other parts of Ethiopia; Arba Minch town in 2017 (32.6%), Bahir Dar town in 2012 (33.6%) and Debarq town in 2019 (40.1%) on food handling practice and associated factors among food handlers in public food establishments (Legesse et al., 2017; Mulugeta and Bayeh, 2012; Chekol et al., 2019). The finding was also higher than study conducted in China (26.7%), Kordofan-Sudan (33.2%), Oweri Imo State Nigeria (37%) and Ghana (39.3%) food safety practice and knowledge (Ma et al., 2019; Abdelrazig et al., 2017; Anthony et al., 2017; Akabanda et al., 2017). Possible explanation for these discrepancies might be difference in sample size, year of study and cut off points used to decide as poor and good practice.

However, the good sanitary food handling practice in this study was lower when compared with study conducted in Ethiopia; Bahir Dar town in 2017 (67.6%), Asosa town 2018 (67.8%) and Dessie town in 2018 (72%) town (Derso et al., 2017; Admasu and Kelbessa, 2018; Adane et al., 2018). And also it's lower compared with study conducted different parts of Africa; Ondo state Nigeria in 2019 (56.6%), Ogun state Nigeria in 2015 (69.5%) and Kambawe Zambia in 2014 (71.5%) (Emmanuel et al., 2019; Oladoyinbo et al., 2015; ENNIE, 2014). Again the finding is lower when compared with study conducted different parts of the world; India Marashtra in 2014 (62%), Saudi in 2018 (69.6%), Brazil in 2018 (75.4%), Odisha India in 2014 (77%) and Jordan in

2013 (89.4%)(Prabhu and Shah, 2014; Wafa et al., 2018; Souza et al., 2018; PATI et al., 2014; Sharif et al., 2013). Possible explanation for these discrepancies might be the heterogeneity nature of food handlers, difference in socio-demographic (socio-economic) status, geographical variation, difference in inspection, regulatory systems and training.

This study shows that the odds of good sanitary food handling practice were 3.3 times higher among food handlers who were able to read and write compared to those unable to read and write. This was supported by study conducted in Ethiopia; Debarq, Bahir Dar, Asosa town(Chekol et al., 2019; Derso et al., 2017; Admasu and Kelbessa, 2018) and study in Ghana, Ondo state Nigeria, Kambawe Zambia and Maharashtra India (Akabanda et al., 2017; Emmanuel et al., 2019; ENNIE, 2014; Prabhu and Shah, 2014). This may be due to education helps to acquire knowledge, read and understand written information thereby to develop skill on safe food handling practice.

Similarly, the probability of performing good sanitary food handling practice among food handlers with good knowledge was 1.6 times higher compared to those with poor knowledge. This finding was supported with study conducted in Dangila town, Gonder City, Kordofan Sudan, Oweri Imo State Nigeria, Saudi and Brazil (Tessema et al., 2014; Azanaw et al., 2019; Abdelrazig et al., 2017; Anthony et al., 2017 ; Wafa et al., 2018; Souza et al., 2018). This might be due to knowledge enable food handlers in improving skills in safe handling practice, enhances food handlers' awareness on food borne diseases.

Additionally, the likelihood of performing good sanitary food handling practice among food handlers who had work experience ≥ 2 years in different public food establishments were about 1.7 times higher than those who have less experience. This finding was also supported with study conducted in Debarq town, Bahir Dar town, Malaysia and Saudi(Chekol et al., 2019; Derso et al., 2017; Key et al., 2017; Wafa et al., 2018). This might be due the experience can change behavior toward safe food handling as the fact that behaviors can be learned through repeated practice, hence food handlers are in better position to acquired skills on food hygiene.

Moreover, performing of good sanitary food handling practice among food handlers who had trained manager were four fold higher as compared to those food handlers who had no trained manager. This finding also had supported with study conducted in Addis Ababa city and Adwa town (Kassa et al., 2017; Gebremariam et al., 2019). This might be due to trained manager give advice for food handlers and the owners and relatively conduct focused follow up for food handlers that in turn enable food handlers to better understand and fulfill their responsibilities.

This study had the following limitations; the study used participant interview about food handling practice may leads to social desirability bias. This is minimized by probing their responses with observations while interviewing practice questions. Food handlers working only in licensed types of food establishments are considered due to the fear that it's difficult to get base line information to calculate sample size since their number were unknown and they may also not cooperative to respond for interview. Other issue is the inherent nature of cross-sectional study design that can't determine sequence of the cause and effect relationship.

6. CONCLUSION AND RECOMMENDATION

6.1 Conclusion

More than half of the food handlers had no sanitary food handling practice in the study area. Low practices are observed in utilization of refrigerator, wearing clean gown, wearing of ring/jewelry, hair cover, training of food handlers, availability of trained manager and shower facility in relative to other study conducted in different areas. Ongoing sanitary inspection should be performed regularly on food handler's general personal hygiene, safe food handling practice and on environmental sanitation of food establishment.

6.2 Recommendation

Based on the finding from the study the following recommendations are forwarded for district health office, health workers and health extension worker.

- ✓ District health office need to improve better inspection and regulatory systems for better food handlers' knowledge on safe food handling practice.
- ✓ District health office need to improve collaborative work with other sector in order to enforce and apply rules and regulation on sanitary food handling practice consistently.
- ✓ District health office also need to encourage public food establishments on fulfill all necessities for safe handling and serving of food in their facilities need to be improved
- ✓ Environmental health professionals` need to strength trainings and follow up for food handlers, owners and manager for regular updating and alerting on general personal hygiene practice and environmental sanitation of food establishment.
- ✓ Urban health extension workers need to facilitate and arrange for experience sharing program of those who best performs with low performers.

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8. APPENDICES

Appendices 8.1. Establishments' Head/Manager Information Sheet and Informed, Voluntary Consent Form (English Version)

My name is _____. I am working as data collectors for the study being conducted in this town by Badaso Shatura who is studying his Master's Degree at Haramaya University College of Health and Medical Sciences. I kindly request you to lend me your attention to explain you about the study and being selected as the study establishment.

Study Title

Status of sanitary food handling practice and associated factors among food handlers in licensed public food establishment in towns of Kokkossa district, Oromia region, Southern-Ethiopia in March 15 to April 15, 2020.

Purpose of the Study

The finding of this study to assess status of sanitary food handling practice and associated factors among food handlers in licensed public food establishment in towns of Kokkossa district, Oromia region, Southern-Ethiopia. Finding had paramount input for the Kokkossa district and West Arsi zonal health office to plan strategies that can improve sanitary food handling practice of food handlers and prevention of food born disease from unhygienic food handling. More, the aim of this study is to write thesis as a partial requirement for the fulfillment of Master's Degree Program in Public Health Nutrition for the principal investigator.

Procedure and Duration

I will be interviewing food handlers using a questionnaire to provide me with pertinent data helpful for the study. There are 44 questions to answer which will take 25 to 30 minute.

Risk and Benefit

The risk of being participating in this study is very minimal, but can take food handlers' time. There will not be any direct payment for participating in this study. But indirectly the finding of this study may reveal important information that will be used by local health planners.

Confidentiality

The information they will provide us was confidential. There will be no information that will identify food handlers and the establishment in particular. The finding of the study will be general for all establishments and will not reflect any thing particular of individual food handlers or establishment.

Rights

Participation in this study will be on voluntary basis. The establishment and food handlers have right to participate or withdraw from study. They have also right to not answer question if they won't.

Contact Address

If there are any question and idea about stud, they can contact at the following address.

Principal investigator: Badaso Shatura, E-mail: harmee1198@gmail.com

Mobile phone: +251-910414459/943356903/945998359

Haramaya University College of Health and Medical Science Institutional Research Review Committee: Office phone: 0254662011, P.O.Box: 235, Harar, Ethiopia

Declaration of informed Voluntary Consent

I have read/ was read to me the participants' information sheet. I have clearly understand that the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participants and the contact address for any questions. As information that I have, you have right to withdraw from the study at any time or not to answer any question that you do not want. Therefore, I declare my voluntary consent to conduct study in this food establishment with my signature as indicated below.

Name and Signature of head/manager of establishment: _____ Date _____

Name and Signature of data collector _____ Date _____

Appendices 8.2: English Version for Participant Information Sheet and Informed, Voluntary Consent Form

My name is _____. I am working as data collectors for the study being conducted in this town By Badaso Shatura who is studying his Master's Degree at Haramaya University College of Health and Medical Sciences. I kindly request you to lend me your attention to explain you about the study and being selected as the study participant.

Study Title

Status of sanitary food handling practice and associated factors among food handlers in licensed public food establishment in towns of Kokkossa district, Oromia region, Southern-Ethiopia in March 15 to April15, 2020.

Purpose of the Study

The finding of this study to assess status of sanitary food handling practice and associated factors among food handlers in licensed public food establishment in towns of Kokkossa district, Oromia region, Southern-Ethiopia. Finding will have paramount input for the Kokkossa district and West Arsi zonal health office to plan strategies that can improve sanitary food handling practice of food handlers and prevention of food born disease from unhygienic food handling. More, the aim of this study is to write thesis as a partial requirement for the fulfillment of Master's Degree Program in Public Health Nutrition for the principal investigator.

Procedure and Duration

I will be interviewing you using a questionnaire to provide me with pertinent data is helpful for the study. There are 44 questions to answer which will take 25 to 30 minute.

Risk and Benefit

The risk of being participating in this study is very minimal, but can take your time. There will not be any direct payment for participating in this study. But indirectly the finding of this study may reveal important information that will be used by local health planners.

Confidentiality

The information you will provide us will be confidential. There will be no information that will identify you in particular. The finding of the study will be general for the community and will not reflect any thing particular of individual food handlers.

Rights

Participation in this study will be on voluntary basis. You have right to participate or withdraw from study. You have also right to not answer question if you won't.

Contact Address

If there are any question and idea about study, you can contact at the following address.

Principal investigator: Badaso Shatura, E-mail: harmee1198@gmail.com

Mobile phone: +251-910414459/943356903/945998359

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Committee: Office phone: 0254662011, P.O.Box: 235, Harar, Ethiopia

Declaration of informed Voluntary Consent

I have read/ was read to me the participants' information sheet. I have clearly understand that the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participants and the contact address for any questions. As information that I have, I have right to withdraw from the study at any time or not to answer any question that I do not want. Therefore, I declare my voluntary consent to participate in this study with my signature as indicated below.

Name and Signature of Participant _____ Date _____

Name and Signature of data collector _____ Date _____

Appendices 8.3.Afan Oromo Version of Establishments' Head/Manager Information Sheet and Informed, Voluntary Consent Form

Waraqaa ragaa fi walii galtee namoota manneen nyaataa ummataa keessatti qabiinsa nyaataa irratti hojjatan wajjiin godhamu.

Kabajamoo hirmaattotaa maqaan koo_____jedhama. Ani kanan hojjedhu ragaa funaanuudha. Kunis qorannoo (Riiserchii) obbo Badhaasoo Shaturaa barnoota isaanii digirii lammaffaaf Yuunivarsiitii Haramayaa, Koollejji Fayyaa fi Meedikala. Dursee kanan isin gaafadhu waa'ee qorannichaa waanan isiniif ibsuuf yaadaan akka na dhaggeeffattaniifii irratti hirmaattan isiniin jedha.

Mata Duree Qorannichaa

Haala qabiinsa qulqullina nyaataa namoota manneen nyaataa ummataa keessatti hojjatanii fi sababoota kanaan wal-qabatan irratti.

Kaayyoo Qorannichaa

Bu'aan qorannoo kanaa kan fayyadus Waajjira Eegumsa fayyaa Aanaa Kokkssaa yoo ta'u, waajjirri kun haala qabiinsa nyaataa namoota manneen nyaataa ummataa keessatti hojjatanii fi sababoota kanaan wal-qabatan beekaniif akka irratti hojjetaniif kan gargaaru ta'a. Kan biroo kaayyoon qorannoo kanaa eebba barnoota digrii lammaffaa geggeeffamaa jiruufi. Adeemsaa fi Yeroo qorannichaa Ani gaaffilee adda addaa waanan si gaafadhuuf raga dhugaa irratti hundaa'eeffii qorannichaaf gargaaru akka naa laattaniifi. Kanan si gaafachuuf deemu hanga gaaffii 44 yoo ta'u walii galatti hanga daqiiqaa 25 hanga 30 fudhata, kanaaf yeroo kee akka naaf laattuuf kabajaan si gaafadha.

Miidhaa fi Faayidaa Qorannichaa

Qorannoo kana keessatti hirmaachuu isaaniitiif faayidaan kallattiin isaaniif kennamus hinjiru akkasumas miidhaan isaanirra gahu baay'ee xiqqaadha kunis yeroo qaban keessaa daqiiqaa 20 hanga 25 kennuun alatti kan hinjirre ta'uu hubachuu qabda. Garuu bu'aan qorannoo kanaa namoota naannawa sanarratti hojjatanii fi karoora baasaniif galtee barbaachisaa ta'a.

Iccitii

Ragaalee isaan naaf kennaniif iccitiin isaanii kan eeggamu ta'a. Ragaan kamuu addatti baasee waa'ee isaanii ta'ee kan nama dhuunfaa ibsu hin jiraatu. Gaaffileen gaafataman lakkoofsa addaa kennamneefii waan jiruuf maqaan isaanii hin barbaachisu. Ragaan isaan qorannoo wajjiin addatti baasee ibsu tokkollee hin jiraatu.

Mirga

Hirmaattonni qorannoo kanaa hundi hirmaachuu kan danda'an mirga isaaniin ta'a. Hirmaachuudiduuf mirga qabu. Yoo hirmaachuuf murteessan, gaaffii fi deebii kennan yeroo barbaadanitti addaan kutuu danda'u, kana jechuun faayidaan ala tahan jechuu miti. Gaaffii fi deebii keessatti gaaffii hin barbaadneef deebii kennuu diduu ni danda'u jechuudha malee..

Karaa ittiin qaama dhimmi ilaaluun wal qunnamtu

Yoo gaaffiis ta'ee komii tokkollee qabaatan yeroo barbaadanitti lakkoofsa bilbilaa armaan gadiin bilbilanii wal-qunnamuu dandeessa.

Maqaa Qorataa: Badhaasoo Shaturaa, E-mail: harmee1198@gmail.com

Lakk Bilbilaa: +251-910414459/943356903/945998359

Dhaabbata: Yuunvarsitii Haramayaatti kolleejjii saayinsii fayyaa fi Meedikaalaatti koree qorannoo fayyaa fi seera qabeessummaa isaa hordofu.

Lakk bilbilaa waajjiraa: 0254662011, P.O.Box: 235, Hararii, Itoophiyaa.

Walii galtee hirmaattota qorannichaa waliin geggeeffamu

Ani waraqaa ragaa hirmaattotaa dubbisee/ naaf dubbifamee jira. Ifatti kaayyoo qorannichaa, adeemsa, miidhaa fi bu'aa, icciti, mirgaa fi lakkoofsa yeroo rakkoon uumamee fi gaaffiin jiraate ittiin qunnamu argeen jira. Carraa gaaffii isaaniif hin galle yeroo kamittuu gaafachuu danda'uu fi yeroon barbaadanitti qorannicha keessaa itti bahuu danda'u naaf himamee jira. Kanaaf, ani walii galteen qorannicha mana nyaataa kana keessatti akka gaggeessuu danda'an hayyamuu mallattoo kootiin akka armaan gadiitti nan mirkaneessa.

Maqaa fi Mallattoo hoogganaa/abbaa manaa _____ Guyyaa _____

Maqaa fi mallattoo ragaa funaanaa _____ Guyyaa _____

Appendices 8.4.AfanOromo Version for Participant Information Sheet and Informed, voluntary Consent Form

Waraqaa ragaa fi walii galtee namoota manneen nyaataa ummataa keessatti qabiinsa nyaataa irratti hojjatan wajjiin godhamu.

Kabajamoo hirmaattotaa maqaan koo_____jedhama. Ani kanan hojjedhu ragaa funaanuudha. Kunis qorannoo (Riiserchii) obbo Badhaasoo Shaturaa barnoota isaanii digirii lammaffaaf Yuunivarsiitii Haramayaa, Koollejji Fayyaa fi Meedikala. Dursee kanan isin gaafadhu waa'ee qorannichaa waanan isiniif ibsuuf yaadaan akka na dhaggeeffattaniifii irratti hirmaattan isiniin jedha.

Mata Duree Qorannichaa

Haala qabiinsa qulqullina nyaataa namoota manneen nyaataa ummataa keessatti hojjatanii fi sababoota kanaan wal-qabatan irratti.

Kaayyoo Qorannichaa

Bu'aan qorannoo kanaa kan fayyadus Waajjira Eegumsa fayyaa Aanaa Kokkssaa yoo ta'u, waajjirri kun haala qabiinsa nyaataa namoota manneen nyaataa ummataa keessatti hojjatanii fi sababoota kanaan wal-qabatan beekanii akka irratti hojjetaniif kan gargaaru ta'a. Kan biroo kaayyoon qorannoo kanaa eebba barnoota digrii lammaffaa geggeeffamaa jiruufi. Adeemsaa fi Yeroo qorannichaa Ani gaaffilee adda addaa waanan si gaafadhuuf raga dhugaa irratti hundaa'eefii qorannichaaf gargaaru akka naa laattaniifi. Kanan si gaafachuuf deemu hanga gaaffii 45 yoo ta'u walii galatti hanga daqiiqaa 25 hanga 30 fudhata, kanaaf yeroo kee akka naaf laattuuf kabajaan si gaafadha.

Miidhaa fi Faayidaa Qorannichaa

Qorannoo kana keessatti hirmaachuu keetiif faayidaan kallattiin siif kennamus hinjiru akkasumas miidhaan sirra gahu baay'ee xiqqaadha kunis yeroo qabdu keessaa daqiiqaa 20 hanga 25 kennuun alatti kan hinjirre ta'uu hubachuu qabda. Garuu bu'aan qorannoo kanaa namoota naannawa sanarratti hojjatanii fi karoora baasaniif galtee barbaachisaa ta'a.

Iccitii

Ragaalee ati naaf kennituuf iccitiin isaa kan eeggamu ta'a. Ragaan kamuu addatti baasee waa'ee kees ta'ee kan nama dhuunfaa ibsu hin jiraatu. Gaaffileen gaafatamtu lakkoofsa addaa kennammeefii waan jiruuf maqaan kee hin barbaachisu. Ragaan si qorannoo wajjiin addatti baasee ibsu tokkollee hin jiraatu.

Mirga

Hirmaattonni qorannoo kanaa hundi hirmaachuu kan danda'an mirga isaaniin ta'a. Hirmaachuudiduuf mirga qabda. Yoo hirmaachuuf murteessite, gaaffii fi deebii kennitu yeroo barbaaddetti addaan kutuu dandeessa, kana jechuun faayidaan ala taate jechuu miti. Gaaffii fi deebii keessatti gaaffii hin barbaadneef deebii kennuu diduu ni dandeessa.

Karaa ittiin qaama dhimmi ilaaluun wal qunnamtu

Yoo gaaffiis ta'ee komii tokkollee qabaatte yeroo barbaaddetti lakkoofsa bilbilaa armaan gadiin bilbiltee wal-qunnamuu dandeessa.

Maqaa Qorataa: Badhaasoo Shaturaa, E-mail: harmee1198@gmail.com

Lakk Bilbilaa: +251-910414459/943356903/945998359

Dhaabbata: Yuunvarsitii Haramayaatti kolleejjii saayinsii fayyaa fi Meedikaalaatti koree qorannoo fayyaa fi seera qabeessummaa isaa hordofu.

Lakk bilbilaa waajjiraa: 0254662011, P.O.Box: 235, Hararii, Itoophiyaa.

Walii galtee hirmaattota qorannichaa waliin geggeeffamu

Ani waraqaa ragaa hirmaattotaa dubbisee/ naaf dubbifamee jira. Ifatti kaayyoo qorannichaa, adeemsa, miidhaa fi bu'aa, icciti, mirgaa fi lakkoofsa yeroo rakkoon uumamee fi gaaffiin jiraate ittiin qunnamu argadheen jira. Carraa gaaffii naaf hin galle yeroo kamittuu gaafachuu danda'uu fi yeroon barbadetti qorannicha keessaa itti bahuu danda'u naaf kennamee jira. Kanaaf, ani walii galtee qorannicha keessatti ittiin hirmaadhu mallattoo kootiin akka armaan gadiitti nan mirkaneessa.

Maqaa fi Mallattoo hirmaattuu/Hirmaataa _____ Guyyaa _____

Maqaa fi mallattoo ragaa funaanaa _____ Guyyaa _____

Appendices 8.5. English Version of Data collection instruments

You are kindly requested to provide your attitude towards food handling practice and associated factors by responding to this brief questionnaire, which should take no more than twenty five minutes. Your name and specific identifying information is not required and confidentiality is guaranteed. Thank you for your valuable time.

Name of town _____ Code of town _____

Name of Data Collector: _____ Signature _____ Date: _____

Name of Supervisor: _____ Signature _____ Date _____

SECTION A: Biographic Data

1. Socio-demographics characteristics of food handlers

S.no	Questions	Response
101	What is your age?	_____ years old
102	Sex	a) Male b) Female
103	What is your current marital/relationship Status?	a) single b) Married c) Divorced d) Widowed
104	What is your educational level	a) Unable to read and write b) Able to read and write c) Primary school (1-8 grade) d) Secondary school(9-12) e) Higher (>12)
105	What is your average monthly income?	_____ birr
106	What is your work experience in public Food establishments?	a) ≥ 2 year b) < 2year

107	Have you supervised by government/ Owner / manager?	a) Yes b) No
108	Have you trained on food safety and Safe handling of food?	a) Yes b) No
109	If you have trained, have you certificate of training (certified)?	a) Yes b) No

2. Food safety (Hygiene) knowledge of food handlers

201	Have you ever heard about food borne disease?	a) Yes b) No
202	Who is your source of information about Food borne diseases?	a) Sanitarian inspection b) Mass media c) Other(specify)
203	What is the cause of food borne disease?	a) Germs b) Chemicals c) Other(specify)
204	Do you know as food borne disease is transmitted by contaminated food, water and vectors?	a) Yes b) No
205	Do you know the reasons for food contamination?	a) Yes b) No
206	Do you think the correct temperature for refrigerator is 1–5 °C	a) Yes b) No
207	Do you know the temperature danger zone for potentially hazardous food is 5–60 °C	c) Yes d) No
208	Does raw meat transmit disease?	a) Yes b) No
209	Does raw milk transmit disease?	a) Yes b) No
210	Do raw vegetables transmit disease?	a) Yes b) No

211	Personal hygiene of food handler can prevent food borne disease?	a) Yes b) No
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3. Food hygiene practice among food handlers

301	Does the food handler wear outer garments/ Gown during visit?	a) Yes b) No
302	Is outer garment/ gown clean and appropriate size to food handlers when seen visually	a) Yes b) No
303	Does the food handlers hair covered while working in food service establishments during visit?	a) Yes b) No
304	Does the food handler's finger nail short trimmed And clean at time of visit?	a) Yes b) No
305	Does food handler wear any jewelry or ring on hand At time of visit?	a) Yes b) No
306	Does food handler clean and sanitize work surfaces after each task?	a) Yes b) No
307	Does food handler use soap/detergent for washing dishes?	a) Yes b) No
308	Do you wash cutting surfaces/knife/with soap after using it for cutting raw meat or chicken?	a) Yes b) No
309	Do you wash your hands with soap and water before working with food?	a) Yes b) No
310	Do you wash your hands with soap and water after visiting a latrine?	a) Yes b) No
311	Does the food utensils free of dust particles, finger paint and other?	a) Yes b) No

312	Do you use a separate clean utensil for each food item?	a) Yes b) No
313	Do you store raw food item in an area separate from cooked food?	a) Yes b) No
314	Do you work when you are sick (flu, cold, diarrhea, coughing, etc.)?	a) Yes b) No

4. Working environment and Institutional characteristics of food handling practice among food handlers working in public food establishments

401	Have you legal working license?	a) Yes b) No
402	Is there separated waste disposal system for solid and liquid?	a) yes b) No
403	Is there functional latrine available?	a) Yes b) No
404	Is working cloth/ gown prepared for workers and wore during food handling?	a) Yes b) No
405	Is there functional hand washing facility available?	a) Yes b) No
406	Is institution manager ever trained on food safety and Proper handling?	a) Yes b) No
407	Functional shower facility available?	a) Yes b) No
408	Is functional refrigerator available & used in the kitchen?	a) Yes b) No

409	Separate dressing room for food handler?	a) Yes b) No
410	Three compartment dish washing available?	a) Yes b) No

Thank for giving your valuable time!!!!

Appendices 8.6. Afan Oromo Version of Data Collection Instruments

1. Gaafilee Afaanii Hirmaattota waliin Godhamu

Maqaa magaalaa _____ Koodii magaalaa _____ Koodii hirmaataa _____
 Maqaa nama ragaa funaanuu: _____ Mallattoo _____ Guyyaa _____ Maqaa
 too'ataa _____ Mallattoo _____ Guyyaa _____

Kutaa 1. Gaafilee hawaasummaa, diinagdee fi maatii waliin walqabatu

T.L	Gaafilee gaafataman	Deebii
101	Umriin keessan waggaadhaan meeqa?	Waggaa _____
102	Saala	a) Dhiira b) Dhalaa
103	Hariiroon fuudhaa fi heerumaa keessan maal fakkaata?	a) Hin fuune/ heerumne b) Fuudheera/ heerumeera c) Wal-hiikneerra d) Kan irraa du'e/ duute
104	Sadarkaan barnoota keessan meeqa?	a) Barreessuuf dubbisuu hin danda'u b) Barreessuuf dubbisuu nan danda'a c) Sadarkaa 1ffaa (Kutaa 1-8) d) Sadarkaa 2ffaa (Kutaa 9-12) e) Sadarkaa olaanaa (>12)
105	Galiin g/galeessaan ji'atti argattan meeqa?	Qarshii _____
106	Mana nyaataa ummataa keessatti yeroo hammamiif tajaajiltan?	a) Waggaa ≥ 2 b) Waggaa < 2
107	Qaama dhimmi ilaaluun too'uu fi hordoffiin isiniif taasifamee beekaa?	a) Eeyyen b) Lakki

108	Haala qabiinsaa fi qulqullina nyaataarratti leenjii fudhattanii beettuu ?	a) Eeyyen b) Lakki
109	Leenjii fudhattan yoo tahe, waraqaa raga qabduu?	a) Eeyyen b) Lakki

2. Gaafilee Beekkumsa Qabiinsaa fi Qulqillina Nyaata Ilaallatu

201	Waa'ee dhukkuboota nyaataan dhufanii dhageettee beettaa ?	a) Eeyyen b) Lakki
202	Eessaa/ eenyurraa dhageesse?	a) Too'attoota qulqullinnaarraa b) Miidiyaarraa
203	Dhukkuboota nyaataan dhufan maaltu fiduu danda'a?	a) Jermiiwwan b) Keemikaalota addaddaa
204	Dhukkuboonni nyaatarraa nama qaban bishaan, nyaata faalamee fi ilbiisotaan akka tahe beektuu?	a) Eeyyen b) Lakki
205	Sababoota nyaanni faalamuu danda'uuf bektuu?	a) Eeyyen b) Lakki
206	Firiijii keessatti tempireecharri sirrii nyaata keessa ol kaayan 1–5°C ta'uu beektuu?	a) Eeyyen b) Lakki
207	Firiijii keessatti tempireechara 5–60 °C keessa nyata ol kaayuun hedduu balaafamaa tahuu beektuu?	a) Eeyyen b) Lakki
208	Foon dheedhiin dhibee nama qabsiisuu danda'aa?	a) Eeyyen b) Lakki
209	Aannan hin dafqin dhibee nama qabsiisuu danda'aa?	a) Eeyyen b) Lakki
210	Kuduraa fi muduraan dheedhiin dhibee nama qabsiisuu danda'aa?	a) Eeyyen b) Lakki

211	Qulqullinni dhuunfaa namoota qabiinsa nyaata irratti hojjatanii dhibee nyaataan dhufan ni ittisaa ?	a) Eeyyen b) Lakki
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3. Gaafilee haala shaakala qabiinsa nyaata ilaalchisee

301	Yeroo ragaan funaannamu namoonni qabiinsaa nyaataarratti dalagan huccuu hojjii/gaawoni uffataniiruu?	a) Eeyyen b) Lakki
302	Huccuun hojii uffatame yeroo ilaallamu qulqullina kan qabuu fi nama uffateef qixa isaatii?	a) Eeyyen b) Lakki
303	Yeroo ragaan funaannamu namoonni qabiinsa nyaataarratti dalagan rifeensa isaanii haguuganiiruu?	a) Eeyyen b) Lakki
304	Yeroo ragaan funaannamu namoonni qabiinsa nyaataarratti dalagan qeensi qubaasaanii kan gabaabsamee fi qulqulluu dha?	a) Eeyyen b) Lakki
305	Yeroo ragaan funaannamu namoonni qabiinsaa nyaataarratti dalagan qubeelaa fi faaya harka biroo kaayatani jiruu?	a) Eeyyen b) Lakki
306	Namoonni qabiinsa nyaataarratti dalagan meeshaa/iddoo irratti hojjatan erga hojjatanii booda qulqulleessuu ?	a) Eeyyen b) Lakki
307	Namoonni qabiinsa nyaataarratti dalagan bishaan saamunaa, miiccaa fi qulqulluu fayyadamuun meeshaa ni qulqulleessuu?	a) Eeyyen b) Lakki
308	Erga foonii fi nyaata dheedhiin murtee booda ablee fi iddoo irratti murte sana saamunaadhaan ni qulqulleessituu?	a) Eeyyen b) Lakki

309	Erga nyaata tokko hojjattanii booda harka keessan saamunaa fi bishaaniin ni dhiqattuu?	a) Eeyyen b) Lakki
310	Erga mana fincaanii fayyadamtanii booda harka keessan saamunaa fi bishaaniin ni dhiqattuu?	a) Eeyyen b) Lakki
311	Yeroo ilaallamu meeshaalee fi iddoon nyaanni itt hojjatamu awwaara, dhukkee, qalama qubaa fi ka biroorraa bilisaa?	a) Eeyyen b) Lakki
312	Meeshaa qulqulluu gosa nyaatataatiin kophaa kophatti ni fayyadamtuu ?	a) Eeyyen b) Lakki
313	Gosa nyaata dheedhii fi kan bilchaate kophatti addaan baastanii keettuu?	a) Eeyyen b) Lakki
314	Yeroo isin dhukkube (utaaloo, qufaa, baasaa fi kkf) hojjii ni hojjattuu?	a) Eeyyen b) Lakki

4.Gaafilee Naannoo Hojii fi Mana Nyaataatiin Wal Qabatee Qophaaye

401	Hayyama daldalaa qabduu?	a) Eeyyen b) Lakki
402	Iddoo balfaa jajjaboo fi dhangala'aa addatti qophaayee jira?	a) Eeyyen b) Lakki
403	Manni fincaanii seera qabeessa tahe ni jiraa?	a) Eeyyen b) Lakki
404	Uffata hojii isiniif qopheessuu?	a) Eeyyen b) Lakki
405	Iddoon harka dhiqannaa seeraan qopaaye jiraa?	a) Eeyyen b) Lakki
406	Hoji gaggeessaan mana nyaataa kanaaa dhimma qabiinsaa fi qulqullina nyaataarratti liinji'ee beekaa?	a) Eeyyen b) Lakki

407	Mana nyaata kana keessatti iddoon qaama dhiqanna qophaayee jiraa?	a) Eeyyen b) Lakki
408	Firiijiin ykn qorrisiiftuun jiraa/ itti fayyadamtuu?	a) Eeyyen b) Lakki
409	Iddoon uffata itti jijjiirattan kophatti kophaayee jiraa?	a) Eeyyen b) Lakki
410	Bishaan bifa 3n (saamuunaa, miiccaaf qulqulleessuuf) meeshaa dhiquuf ni fayyadamtuu/qophaayeeraa?	a) Eeyyen b) Lakki

Yeroo Qaalii Keessan Nuuf Kennitaniif Galatoomaa!!!

Appendices 8.7 Principal Investigator Curriculum Vitae

Personal Information

Name Badaso Shatura Wabe

Nationality Ethiopian

Date of birth 20/10/1990 G.C

Place of birth West Arsi, Oromia region

Marital status Single

Contact details Mobile phone number: +251910414459/943356903

E-mail address: Harmee1198@gmail.com

1. Educational Background

Koriftu Elementary School (1-4) from 1998-2001 G.C

Kuyera Elementary School (5-8) from 2002-2005 G.C

Dodola Senior Secondary School (9-10) 2006-2007 G.C

Fiche Health Science College 2008-2011 G.C..... Clinical nurse

Haramaya University 2013-2017 G.CBSc. Nurse

2. Language Proficiency

S.N	Language	Language Skills			
		Hearing	Writing	Reading	Speaking
1	AfanOromo (mother tongue)	Excellent	Excellent	Excellent	Excellent
2	Amharic	Excellent	Very good	Very good	Excellent
3	English	Excellent	Excellent	Excellent	Excellent

3. Employment

- ❖ I have been assigned by Oromia Regional Health Bureau on 01 November 2012 to West Arsi Zone Kokkossa District and I have been working there till now.

4. Academic Qualification

- Clinical Nursing from Fiche Health Science College on September 30, 2011
- BSc in Nursing from Haramaya University on September 30, 2017

5. Work Experience

- ❖ One and half year experience at Kokkossa Woreda Ararso Cluster
- ❖ One year experience at Kokkossa Woreda Garba Hurufa /Center
- ❖ Four and Half years' experience at Kokkossa Woreda Kokkossa H/Center
- ❖ Cumulative Seven years' experience at government institution

I Have Been Trained On the Following Areas of Health Services

- SAM training by Save the Children International
- Dermatology training by FMOH/ALERT Hospital
- TB/Leprosy training by CDC
- VCT Training by ORHB
- Comprehensive EPI training by IFHP
- IMNCI training by IFHP
- CBNC by IFHP
- CAC training by IPAS Ethiopia
- IECW/TT Surgery training by FHF
- STI training by CDC
- HMIS training by Zonal Health Department
- IP training by PCH Transform
- Transformation Agenda training by PCH Transform

6. Personal and Computer Skill

- ❖ Excellent computer skill and familiar with MS Windows, MS Word, MS Excel
- ❖ Energetic and dynamic approach to problem solving
- ❖ Excellent communication skill: work well in group with others at various levels.
- ❖ Excellent in written and spoken English language.
- ❖ Wonderful experience in team work.
- ❖ Motor riding skill

7. Reference

- Muhammad Gamachu (Wondo Busa H/C Head).....0910047948

- Dakabo Kadiro (Kokkossa WHO SURE Coordinator....0913374465

