



**St. PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE
DEPARTMENT OF PUBLIC HEALTH**

**FOOD HANDLING PRACTICE AND ASSOCIATED FACTORS
AMONG FOOD HANDLERS WORKING IN FOOD
ESTABLISHMENTS IN ADDIS ABABA, ETHIOPIA**

**PREPARED BY:
MISSGANAW TEMESGEN (BSc)**

**A THESIS SUBMITTED TO THE DEPARTMENT OF PUBLIC HEALTH,
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER'S OF PUBLIC HEALTH IN EPIDEMIOLOGY**

**MAY, 2021
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ABBREVIATION AND ACRONYMS

- AOR-----Adjusted Odds Ratio
- CI-----Confidence Interval
- CSA-----CentralStatistics Agency
- EPHI-----Ethiopia Public Health Institute
- FBD-----FOOD BORNE DISEASE
- FMHACA-----Food, Medicine and Healthcare Administration and
Control Authority
- IP-----INFECTION PREVENTION
- IRB-----INSTITUTION REVIEW BOARD
- MOs-----Micro-organisms
- OR-----Odds Ratio
- PPE-----PERSONAL PROTECTIVE EQUIPMENT
- SC-----SUB-CITY
- SPSS-----Statistical Package for the Social Sciences
- USA-----UNITED STATES OF AMERICA
- WHO-----WORLD HEALTH ORGANIZATION

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ABSTRACT

Background: Food can be subjected to contaminate with toxic substances and pathogenic organisms from production to services. Many of the food handlers working in food establishments have been subjected to poor food handling practice. Food-borne infections are major public health problems, which become a significant public health issue all over the world.

Objective: To assess food handling practice and associated factors among food handlers working in food establishments in Addis Ababa, Ethiopia, 2021.

Method: An Institutional-based cross-sectional study was conducted in Addis Ababa in February 2021. The sampled population was randomly selected food handlers who are working in selected food establishments in Addis Ababa. The required sample size of the study was 505 and data was collected by face-to-face interview technique using a structured questionnaire and observational checklist. Data was entered to a computer using Epi Info version 7 and was transferred to SPSS version 20 statistical software for analysis. Both bi-variable and multi variable logistic regression models were used to identify associated factors of food handling practice.

Result: From all interviewed food handlers, the overall good food handling practice was 282 (59%). Work experience between 1 to 5 years in food establishments (AOR = 3.26, 95% CI 1.29, 8.21), primary education (grade 1–8 grades) (AOR = 4.13, 95% CI 1.80, 9.48) and regular medical checkup (AOR = 1.71, 95% CI 1.06, 2.75) were significantly associated with good food handling practice.

Conclusion: This study reveals that relatively poor food handling practices was observed in the study areas. This study also indicates that food handlers had relatively poor knowledge and attitude towards food handling practices. Age, educational status, experience, training license, working hours and regular medical checkup were significantly associated with good food handling practice. Sanitary inspection should be performed regularly on the food handling practice of the food handlers.

Keywords: Food handling practices, Foodhandlers, Addis Ababa, Ethiopia.

1. INTRODUCTION

1.1. Background

Currently, because of changing lifestyle of the community and increase in number of working women has led to consumption of ready to eat foods. The individuals may be able to satisfy their taste and nutrition needs, but gives little attention to food hygiene and safety(1). Food handlers are anyone who works in a food establishments and who handles food, or contact with any equipment or utensils that are likely to be in contact with food, such as cutlery, plates, bowls, or chopping boards(2).

Food can be subjected to contamination with toxic substances and pathogenic organisms during production, transportation, preparation, storage and service(3). Food service establishments are sources of food borne illnesses(4) and food handlers, particularly working in public food establishments, are the primary responsible bodies to contaminate food by acting as either a biological or a physical carrier for many pathogenic organisms(5). Food handlers who harbor and excrete intestinal parasites and enteropathogenic bacteria may contaminate foods from their feces through their fingers, then to food, and finally to healthy individuals(6).

Food handlers have a major role in ensuring food safety in processing, storage, and preparation chain(2). Therefore, they play an important role in the transmission and, ultimately, prevention of food borne disease (FBD)(1). Food handlers with poor personal hygiene working in public food establishments could be potential sources of infections of many intestinal helminthes, protozoa, and pathogenic bacteria(7). One careless food handler or one human carrier of disease, preparing food at home will jeopardize the health of only a small number of persons, mainly members of the family. When one such person working in the kitchen of public food establishments where meals are supplied to many people, the numbers of potential victims are correspondingly greater.

FBDs can be caused by different pathogenic organisms (e.g. bacteria or viruses) that have contaminated them at some part of the food chain, between farm and fork(8). Food contamination mainly occurs through poor food handling practice which results in numerous FBDs which are the major causes of morbidity and mortality(5). Food-borne infections are major public health problems, which become a significant public health issue all over the world(9).

The consumption of contaminated foods that contains sufficient amount of pathogenic organisms and toxic substances will result in FBD(3). Ingestion of infected food can result in mild to severe illness, hospitalization or even death(7).

FBDs are associated with outbreaks and threaten global public health security and have got an international concern(10). BD is responsible for significant morbidity and mortality rates(10). Food handlers must be clean and practice hygienic habits. They are generally required to wear clean, washable over clothing and to wear head cover that confines the hair. Food handlers should be washing their hands after visiting a toilet. Food handlers who become infected who may transmit infection to food are excluded from handling food while they are in this condition or require all food handlers to undergo periodical medical examinations to determine that they are healthy and free from infection. If food handlers always handle food with clean hands and follow the proper hygienic procedures, they can prevent their clients from the risk of consuming contaminated food(11). FBDs are common in developing countries including Ethiopia because of the prevailing poor food handling and sanitation practices, inadequate food safety laws, weak regulatory systems, lack of financial resources to invest safer equipment, and lack of education for food handlers(3).

1.2. Statement of the Problem

Currently, changing lifestyle, breakdown of joint family system and increase the number of working women as food handlers has led to consumption of ready to eat foods(12). Individuals may be able to satisfy their taste and nutrition needs, but pays little attention to hygiene and food safety(12).Thousands of millions of people get ill as a result of eating unsafe food and in the prevalence of food borne disease many died due to low knowledge and practice on the part of food handlers(3).The transmission of FBD is aggravated by improper food handling practices of food handlers(13). Globally, more than 50% of the total food poisoning cases were attributed to improper food handling procedure(5). Current statistics on food borne illnesses in various developed countries show that up to 60% of cases may be caused by poor food handling practices, and by contaminated food served in food service establishments(14). In developing countries, approximately 10 to 20% of FBD outbreaks are because of contamination due to poor food handling practice of the food handlers(10).Although tremendous efforts have been made to improve public health problems in Ethiopia, including in the capital, Addis Ababa, the safety of food handling practices and procedures by food handlers remains a challenge(15).

Despite the food handlers being responsible to ensure food safety and hygiene in food establishments, little is known about their level of food handling practices and the associated factors among establishment workers in the study area. Few previous Ethiopian studies conducted in Arbaminch, Diredawa,Debarq town and Bole sub city revealed that the prevalence of good food handling practice was 32.6%, 52.4%, 40.1% and 27.4% respectively(16,15).

In Addis Ababa, there was little studies has been conducted on the practice of food handlers(17). According to studies conducted in Addis Ababa city and Bole sub city, good food handling practice among food handlers working in food establishments were 60.6% and 27.4% respectively(13,16). Because of these deviation, a significant number of customers of the food establishments have been exposed to different gastro-intestinal problems(17).Further studies will be needed to overcome the variation among the outcomes of the studies and insufficient amount of studies. Therefore, to filling the research gap, it is essential to conduct a study aiming at assessing food handling practice and associated factors among food handlers working in food establishments in Addis Ababa.

1.3. Significance of the Study

The finding of this study can assist to make sound decisions that target tackling the health problems of the food establishment customers and residents of the city. This study also has a significant input in the formulation of appropriate strategy for program planning and evaluation to improve the food handling practice. In addition, this study has an important contribution to solving community health problems arising from poor food handling practice to food handlers working in food establishments. The new results of this study may also be used by policy makers and other concerned bodies as a reference, on which to make decisions.

2. LITERATURE REVIEW

2.1. Food Handling Practices

Industrialization, urbanization and population growth have promoted people to migrate from rural to urban areas, forcing them to have their foods at anywhere. In urban areas, there is mushrooming of public food establishments due to increased demand. The lifestyles of the people also changed significantly that people experienced to eat foods outside their homes. When food is cooked in a large quantity, it may be handled by many food handlers and thus increasing the possibilities of contaminated the ready to eat food. Unintended contamination of food during large scale cooking, causing to food borne disease outbreaks can pose danger to the health of consumers and economic consequence for nations(19).

Different studies were conducted globally at large and in Ethiopia in specific focusing on the food handling practice and associated factor among food handlers in public food establishments. A study conducted in Brazil showed that the overall good food handling practice was 80.71% and 17.14% food handlers have stated that they always wash their hands with soap and water(20). A study done in Malaysia showed that the overall food handling practice was 59.3% and hand washing after visiting a toilet and proper hand washing with soap and water before handling foods were 75.4% and 60.0% respectively(21). Another study conducted in Turkey also showed that good food handling practice of food handlers was 48.4% and 47.8% have not received food hygiene training(22). A study done in Maharastra, India, indicated that hand washing practices among food handlers with water and soap was 58.33%. In the same study, only 20% of food handlers had a habit of hand washing after touching dirty materials and different body parts (hair, nose and ear) between handling of food items(23). The study conducted in a Rural Teaching Hospital in Wardha District of Maharashtra, India, 73.74% were having clean nails and 49.38% were washing hands with soap and water after using the toilet(1). A study conducted in Uganda; more than 90% of the study subjects were safe food handling practices. In the same study showed that wear hair cover, proper hand washing, wear clean and proper uniforms and short and clean fingernails were 25%, 85%, 25% and 67.5% respectively(24).

According to a study conducted in Zimbabwe; hand washing before handling food, fingernails kept clean and short and hair cover with hairnet was 97%, 98.0% and 87.1%

respectively(25).Another study done in Federal Capital Territory of Nigeria found that proper hand washing practice with soap and water was 30.4% and hand washing practice after visiting a toilet was 89.3%. In the same study, the regular medical check-up among food handlers was 71.4% and only 32.1% of the food handlers had undergone regular food hygiene training(26).

In Ethiopia, various studies were conducted focusing on food handling practice among food handlers in public food establishments in different parts of the country.

A study conducted in Arba Minch town, GamoGoffa, Ethiopia, showed that 32.6% had the overall good food handling practice and 67.4% have poor food handling practice towards food hygiene. This study also indicated that among food handlers who were worked in public food establishments 39.2% were clean gown, 28.5% wore head cover, 91.9% has short finger nail and 35.2% had previous medical checkup(3).In a study done in Dangila town, Northwest Ethiopia, found that 52.5% had good food handling Practice(2).A study conducted in Dire Dawa, Ethiopia found that 52.4% food handlers had satisfactory food safety practice and 51% of the respondents were wear hair cover and 63.5% were practice hand washing before food handling(31).Another study done in Debark town, Northwest Ethiopia, the overall magnitude of good food handling practice was 40.1% (5).

The study done in Chagni, Northwest Ethiopia, 63.8% used gown at work, 56.5% were washed their hands regularly before handling and preparing food, 12% were washed regularly after touching any body parts, 46% washed regularly after touching and handling any dirty material, and 90% did same after visiting toilets. Again, 70.3% trimmed finger nails, 18.3% reported to have medical check-ups for IP every 3 months, 22% checked in 6 months, and 59.7% every 9 month or above(2).According to a research done by Azanaw et al, 49.0% of participants had good food handling practice.Inthe same study, 51.5% food handlers use hair net during food preparation and 50.5% of food handlers attended routine medical checkups. About 63% of the respondents were wearing a uniform during handling and preparation of food(10).

According to a study conducted in Gondar city, Ethiopia; 30.3% of food handlers in food establishments exercise good food handling practice to prevent FBDs(27). Another study done in Addis Ababa, Ethiopia; good food handling practice was 60.6% and 79.8% of the food handlers had a practice of washing hands with soap and clean water before meal and after defecation. In the same study, 32.79% and 75.7% of the study participants were cut their nail and wear gown respectively(17).

2.2. Factors Associated with Food Handling Practice

A study done in Uganda, secondary and higher education were significant association with safe food hygiene practices(24).

The study conducted in Debark, Northwest Ethiopia, showed that work experience, secondary school and diploma and above education levels were factors associated with good food handling practice. The odds of performing good food handling practice among food handlers who had work experience in different public food establishments was two times higher as compared to those food handlers who had no experience of work in such institutions. The study also showed that the odds of performing good food handling practice among food handlers who attended secondary school was three times and those who had diploma and above was four and half folds higher as compared to those food handlers who were informally educated (illiterate and can read and write)(5). Another study done in Arba Minch town, GamoGoffa, Ethiopia indicated that medical check up was a significant factors associated with food handling practice(3).

The research done in Dangila town, Northwest Ethiopia revealed that marital status and monthly income were found to be significantly associated with food handling practices(7). According to Azanaw et al in Gondar city, marital status, training and routine medical checkup were the factors significantly associated with food handling practices(10).A study done in Gondar Town, Northwest Ethiopia, age, marital status, service year, monthly income and food hygiene and safety training were statistically associated with food safety practices(27).

According to the findings in Dessie town indicated that average monthly income of above \$21 US, availability of service training and medical checkup were significantly associated with good level of food hygiene and safety practices. The odds of having good food hygiene and safety practices were 5.2 times higher among food handlers that had received a medical checkup than food handlers who had not received medical checkup. It also found that the odds of having food hygiene and safety practices were 6.7 times higher among food handlers that had received service training on food preparation and handling than food handlers that had no training opportunity. Moreover, food handlers with average monthly income of >\$21 US had 3.2 times more likely to have good food hygiene and safety practices as compared to those with a lower monthly income(28).

A research done in Woldia town, age, education, service years, training received, and sanitary inspection visit were factors associated with food handling practices. The result revealed that

participants under 36–40years age had higher odds of good food handling practices as compared to participants under 15–20years age. Similarly, food handlers who had attained education up to grade twelve and above were 2.29 times likely to have good food handling practice than those who were illiterate. In addition, food handlers who had 6–10 years' experience had higher odds of good food handling practice than those who had served less than one year. Food handlers who had received food handling and preparation training had higher odds of good food handling practice than those who didn't received the training. Furthermore, food handlers who had inspected by regulatory personnel for the past six months had higher odds of good food handling practices than those who hadn't inspected(16).

A study conducted in Bole sub city showed that good knowledge and positive attitude were statistically associated factors with food handling practices. The odds of performing good hygiene practice among food handlers who had good knowledge towards good food hygiene practices were 3 times higher than compared to their counterparts. Similarly, the likelihood of performing good food hygiene practices among food handlers who had a positive attitude towards good food hygiene practices was 4 times higher when compared to those food handlers who had no positive attitude towards food hygiene practices(15).

2.3. Conceptual Framework

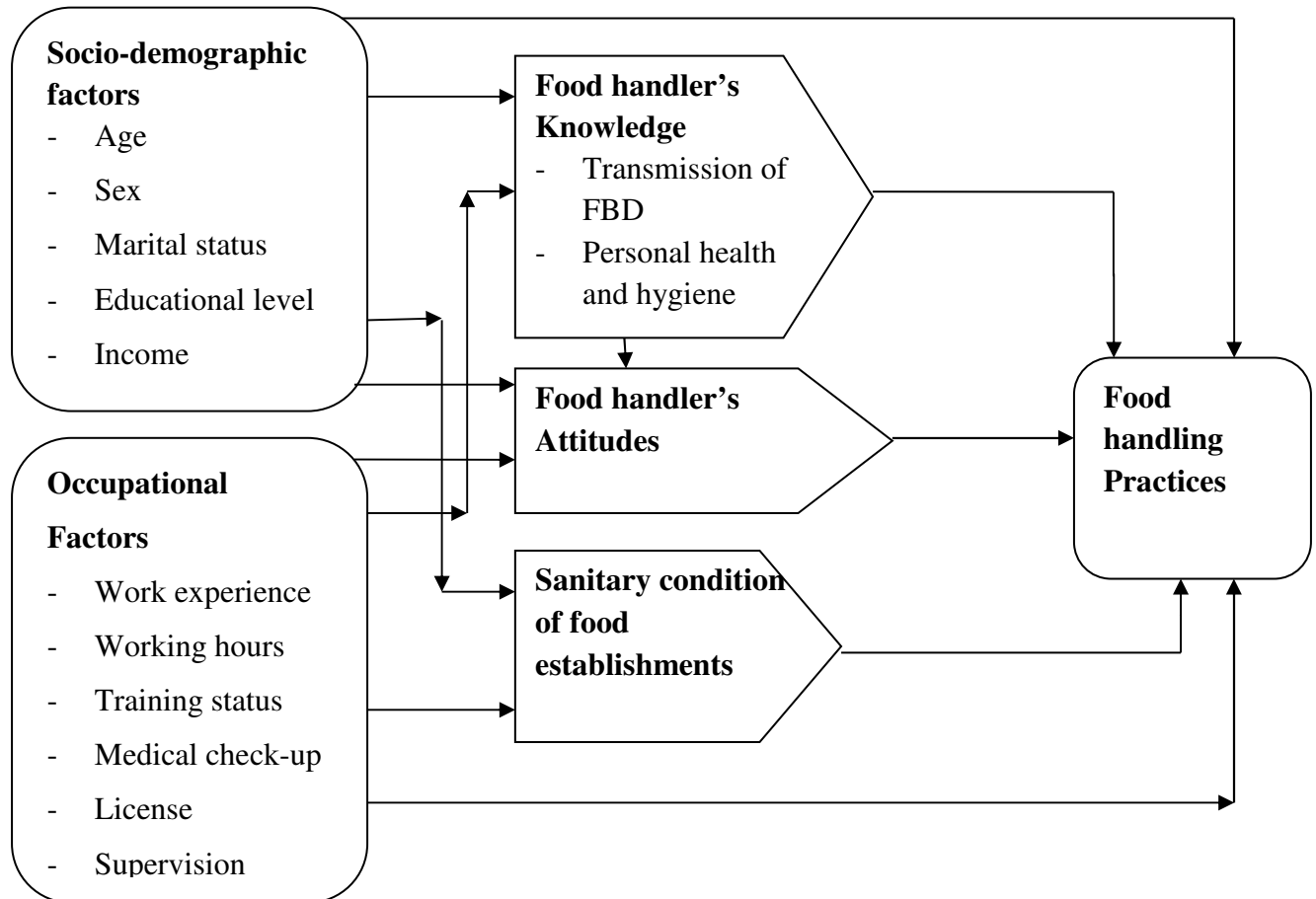


Fig 1: Conceptual framework of food handling practices

3. OBJECTIVE

3.1. General Objective

- To assess food handling practice and associated factors among food handlers working in food establishments in Addis Ababa, Ethiopia, 2021.

3.2. Specific Objectives

- To assess food handling practice among food handlers working in food establishments in Addis Ababa, Ethiopia, 2021.
- To determine the associated factors of food handling practice among food handlers working in food establishments in Addis Ababa, Ethiopia, 2021.

4. METHODS

4.1. Study Design, Area and period

A study was used both quantitative and qualitative study methods in the form of institutional-based cross-sectional study and observational study in Addis Ababa city in February 2021. Addis Ababa is the capital city of Federal Government of Ethiopia, with a population of 4,794,000 according to United Nation world population prospects. Addis Ababa city administration is divided into 10 sub cities and 121 woredas. According to Ethiopia Public Health Institute, the number of food and drinking establishments found in Addis Ababa was 13,155(29).

4.2. Source Population

Source population was all food handlers who are working in food establishments in Addis Ababa.

4.3. Study Population

The study population was all food handlers who are working in food establishments in three selected sub-cities of Addis Ababa.

4.4. Sampled Population

The sampled population was randomly selected food handlers who are working in selected food establishments in the three selected sub-cities of Addis Ababa.

4.5. Inclusion and Exclusion Criteria

4.5.1. Inclusion Criteria

Food handlers who have been working in food establishments in Addis Ababa at least for 6 months before the survey and who are 18 years of age and older were eligible to participate in the study.

4.5.2. Exclusion Criteria

Food handlers who had not direct contact with food and food contact surfaces were excluded from the study. Also seriously ill participants at a time of data collection were excluded.

4.6. Sample Size and Sampling Procedure

4.6.1. Sample Size Determination

The required sample size of the study (i.e. $n = 505$) was determined using single population proportion formula:

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

by considering good food handling practice of 27.4 % (0.274) (15) and taking the following assumption: the proportion marginal error (d) = 5%, confidence level = 95%, non – response rate 10% and design effect =1.5. Design effect was used to increase the sample size of the study to ensure the representativeness of the sample because of multistage cluster sampling method.

The second sample size was calculated for factors affecting food handling practices by using Epi info version 7, by taking Power= 80%, confidence level = 95% and odd ratio = 2.95. Factors which had significant association food handling practices in different literatures(18,31) by using double population proportion formula. The sample sizes for factors were talking the maximum number by adding 10% none response rate and 1.5 design effects and it became 396. By comparing the two methods, the single population proportion was higher number of sample size and the final sample size was **505**.

4.6.2. Sampling Procedure

Three stage cluster sampling method was used. Three sub-cities (Yeka, Lideta and AkakiKality sub cities) wererandomly (Lottery method)selected from 10 sub-cities of Addis Ababa city administration as a primary sampling unit.Seven woredaswere selected from the three sampled sub-cities by using proportional allocation as a secondary sampling unit andwith the same method; seven ketenas (clusters) were selected from the sampled woredas which are the final sampling units. All food establishments (Hotels, Restaurants, Cafés and Juice Houses) which are found in the selected ketenas (clusters) were investigated. From each food establishment located in the selected ketenas, twocookers from hotels, restaurants and cafésand one cooker from juice houses were selected randomly at a time of data collection as a study participant until the predetermined sample size was reached. The sampling procedure illustrated in figure 2 as follows.

ADDIS ABABA CITY

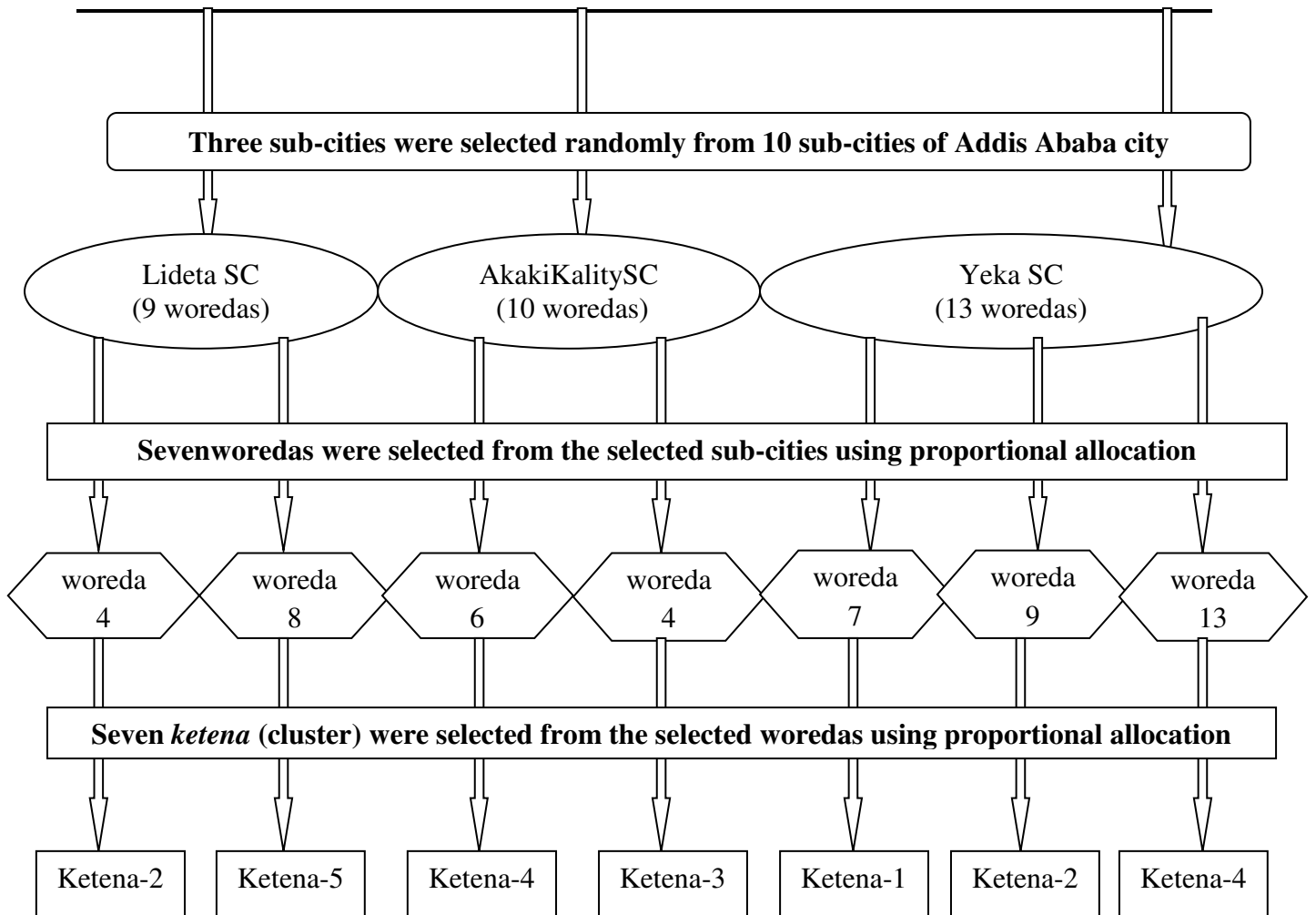


Fig 2: Schematic presentation of sampling procedure

4.7. Study Variables and Instruments

4.7.1. Dependent Variable

The dependent (outcome) variable was food handling practice.

4.7.2. Independent Variables

An independent variables (predictors) included; age, sex, marital status, educational level, work experience, medical checkup, working hours, training, income, knowledge, attitude, license and supervision.

4.7.3. Instruments

Data was collected using structured interviewer administered questionnaire and observational checklist. The data collection instrument contains the following major sections; socio-demographic factors, occupational factors, food handler's knowledge and attitude questions, personal practical questions, sanitary condition of the food establishments and observational checklist.

4.8. Data collection

Data was collected by face-to-face interview technique and by observation after obtaining written informed consent. Data collection procedures were interviewer-administered interview and observation. The questionnaire included socio-demographic information, food handler's practices and observation. The tool was originally prepared by English language and then translated to Amharic language and again translated it to the original language. Data was collected by two Environmental Health professionals after intensive training given on the objectives of the study, procedures, and tools. Data was collected in the afternoon at 3:00 PM on working days during which time eligible workers were expected to have free time for interview. Before actual data collection started, pre-test was conducted on 5% of the study participants found outside of the study area and modifications were made on the basis of the findings.

4.9. Data Quality Control

To ensure data quality, the original questionnaire which was in English language was translated into the local language which was Amharic and back translated to English by another person to check for its consistency. Data quality was also ensured through training of data collectors, supervisors, and pre-testing of questionnaires, using appropriate standard techniques and recruiting professionals to each activity. Supervisor was checking the data collection process on a daily basis. The principal investigator was ensuring the data completeness, accuracy and consistency by arranging a meeting with data collectors every day after completion of the daily data collection process.

4.10. Data Processing and Analysis

Data was entered to a computer using Epi Info version 7 and was transferred to SPSS version 20 statistical software for analysis. Descriptive analysis (Frequency distributions, percentages and tables) were performed for socio-demographic and other predictive factors. Both bi-variable and multi-variable logistic regression models were used to identify associated factors of food handling practices. The variables that were a significant association with food handling practice of food handlers were identified based on adjusted odds ratio (AOR) with 95% confidence level (CI) and p-value of less than 0.05.

4.11. Ethical Considerations

Ethical clearance was taken from Institution Review Board (IRB) of St. Paul's Hospital Millennium Medical College, Department of Public Health. Administrative permission was obtained from Addis Ababa Public Health Research and Emergency Directorate to the respective sub-cities and food establishments. All participants were given full information regarding the purpose of the research, what was expected from them and how long the interview was last. Volunteer subjects to participate in the study were included after signing a written informed consent. Written consent was obtained from all eligible food handlers that they have the right to withdrawal themselves from the study at any time.

4.12. Operational Definitions

Food handling practice level: respondents who were scored less than 75% of their response to the total food handling practice-related questions were considered as having “poor level of practices”. Those who were scored equal to or more than 75% were considered as having a “good level of practice”.

Food handling knowledge level: respondents who were scored less than 75% of their responses to the total food handling knowledge-related questions were considered as having a “poor level of knowledge”. Those who were scored equal to or more than 75% were considered as having a “good level of knowledge”.

Food handling attitude level: the respondents who were scored less than 75% of their responses to the total food handling attitude-related questions were considered as having a “poor level of attitude”. Those who were scored equal to or more than 75% will be considered as having a “good level of attitude”.

Food handler: - A person who was involved in the preparation and handling of food in a food establishment.

Food Establishments; Institutions that include Hotels, Restaurants, Cafes and Juice Houses which were serving ready to eat foods

5. RESULTS

Socio-demographic characteristics of the respondents

A total of 478 food handlers were participated in the study with a response rate of 94.7%. Among the participants, 127 (26.6%), 198 (41.4%), 74 (15.5%) and 79 (16.5%) food handlers were participated from Hotel, Restaurant, Café and Juice House respectively. Of the total participants, 21.5%, 25.8% and 20.7% were between the age group of 18 to 22, 28 to 32 and 33 to 37 years old respectively. According to this finding, the mean and median age of the respondents was 27.14 and 25 years respectively. In the current study, 399 (83.5%) of the participants were females. From the total participants, 170 (35.6%) and 118 (24.7%) had taken primary and secondary education respectively(**Table 1**).

Table 1: Socio-demographic characteristics of food handlers working in food establishments in Addis Ababa, Ethiopia, 2021

Variable	Categories	Frequency (n)	Percentage (%)
Type of food establishments	Hotel	127	26.6
	Restaurant	198	41.4
	Café	74	15.5
	Juice House	79	16.5
Age	18-22	103	21.5
	23-27	71	14.9
	28-32	171	25.8
	33-37	99	20.7
	>37	34	7.1
Sex	Male	79	16.5
	Female	399	83.5
Marital Status	Single	250	52.3
	Married	209	43.7
	Divorced	19	4.0
Educational Level	Illiterates	100	20.9
	Primary Level (1-8)	170	35.6
	Secondary Level (9-12)	118	24.7
	College Level and Above	90	18.8
Income	<1000	21	4.4
	1000-3000	370	77.4
	>3000	87	18.2

Occupational characteristics of the participants

Regarding work experience, 200 (41.9%) of the respondents had 1-5 years of work experience as food handlers. From the total participants, 280 (58.6%) didn't have food handling practice training license. Majority of the participants, 385 (80.5%) were supervised by the governmental health inspectors. Three hundred twenty three (67.6%) food handlers underwent their medical checkup in the last 6 months (**Table 2**).

Table 2: Occupational characteristics of food handlers working in food establishments in Addis Ababa, Ethiopia, 2021

Variable	Categories	Frequency (n)	Percentage (%)
Work experience	1-5	200	41.9
	6-10	198	41.4
	>10	80	16.7
Food handling training	Yes	222	46.4
	No	256	53.6
Food handling training license	Yes	198	41.4
	No	280	58.6
Supervision by governmental health inspectors	Yes	385	80.5
	No	93	19.5
Regular medical check-up (in last 6 months)	Yes	323	67.6
	No	155	32.4
Working hours	≤8	257	53.8
	>8	221	46.2

Knowledge of food handlers

Three hundred seven (64.2%) of respondents were found to have a good knowledge towards food handling practice. Majority of the study participants, 448 (93.7%) had a knowledge about hand washing after visiting a toilet. From the total participants, 402 (84.1%) had a knowledge regarding the dangerous habits of fingering a nose (**Table 3**).

Table 3: Knowledge characteristics of food handlers working in food establishments in Addis Ababa, Ethiopia, 2021

Variable	Categories	Frequency (n)	Percentage (%)
Raw food may have harmful microbes on the surface	Yes	308	64.5
	No	57	11.9
	I don't know	113	23.6
Asymptomatic food handler can cause illness by carrying germs to food	Yes	195	40.8
	No	139	29.1
	I don't know	144	30.1
You can prepare food with a wound on the hand if the wound is covered with a bandage	Yes	205	42.9
	No	257	53.8
	I don't know	16	3.3
After using the toilet, you should always wash hands with soap and water	Yes	448	93.7
	No	21	4.4
	I don't know	9	1.9
Habit of finger nose is dangerous	Yes	402	84.2
	No	38	7.9
	I don't know	38	7.9
Wearing clean uniform and cap while cooking or serving is necessary	Yes	446	93.3
	No	14	2.9
	I don't know	18	3.8
Food borne disease can result from storing raw and cooked foods in the same refrigerator	Yes	285	59.6
	No	107	22.4
	I don't know	86	18.0
Ready to eat foods (e.g. vegetables) can be prepared on the same cutting board to prepare meat	Yes	243	50.8
	No	201	42.1
	I don't know	34	7.1
Refrigeration kills all the bacteria that might cause food-borne illness	Yes	289	60.5
	No	103	21.5
	I don't know	86	18.0

Attitudes of food handlers

From the total participants, 303(63.4%) were found to have a good attitude towards food handling practice. Three hundred ninety three (82.2%) of the respondents were believed that temperature controls are an effective method of reducing the number of cases of food poisoning. Almost all study participants, 449 (94%) were believed that hand washing before handling food reduces the risk of contamination (**Table 4**).

Table 4: Attitudinal characteristics of food handlers working in food establishments in Addis Ababa, Ethiopia, 2021

Variable	Categories	Frequency (n)	Percent (%)
Food borne disease causing microorganisms found every where	Strongly agree	62	13.0
	Agree	150	31.4
	Neutral	102	21.3
	Disagree	164	34.3
	Strongly disagree	0	0.0
Temperature controls are an effective method of reducing the number of cases of food poisoning	Strongly agree	134	28.0
	Agree	259	54.2
	Neutral	40	8.4
	Disagree	45	9.4
	Strongly disagree	0	0.0
All food handlers should have a food safety training qualification	Strongly agree	82	17.2
	Agree	220	46.0
	Neutral	73	15.3
	Disagree	103	21.5
	Strongly disagree	0	0.0
Hand washing before handling food reduces the risk of contamination	Strongly agree	173	36.3
	Agree	276	57.7
	Neutral	23	4.8
	Disagree	3	0.6
	Strongly disagree	3	0.6

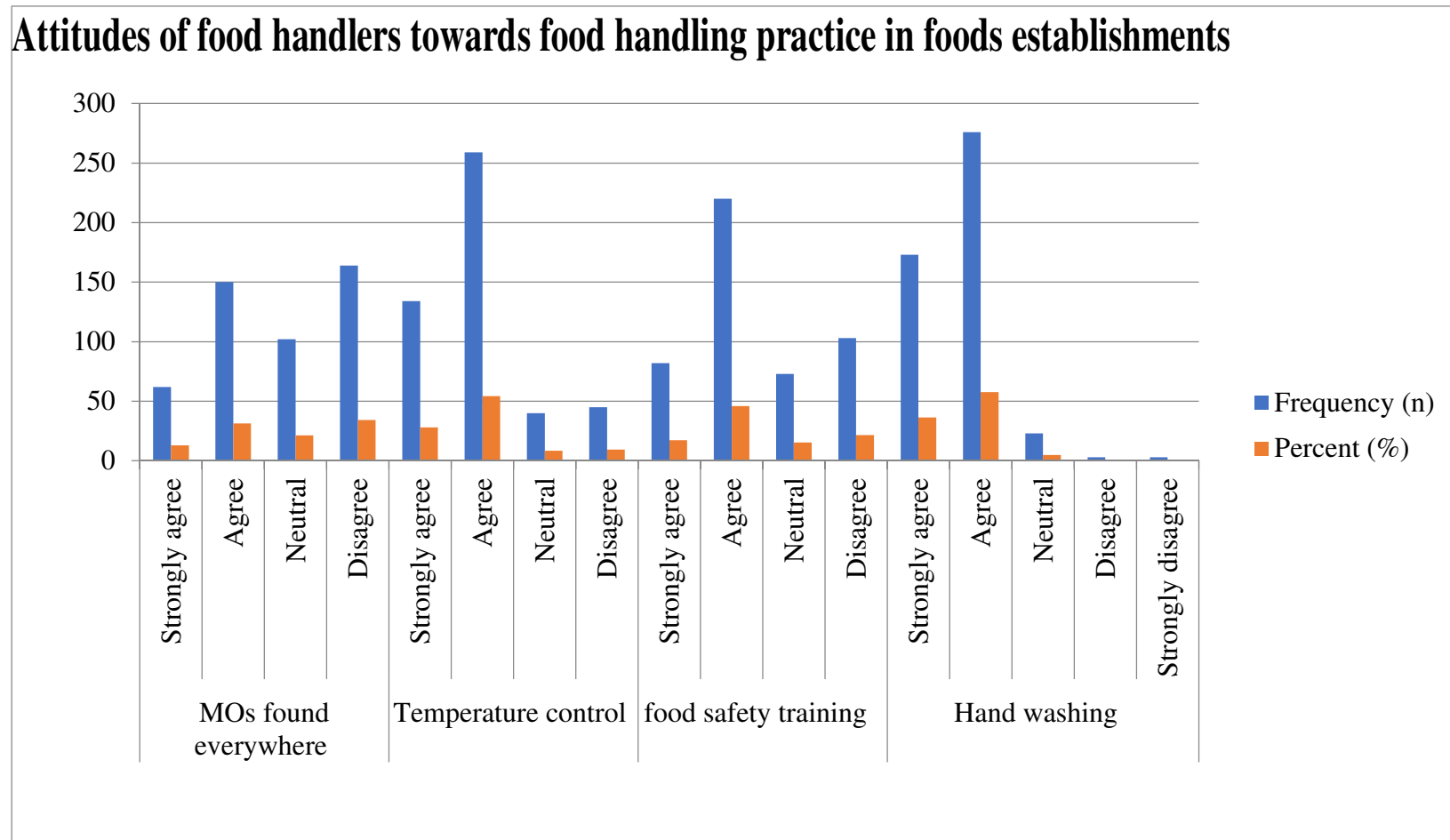


Figure 3: Attitudes of food handlers towards food handling practice in Addis Ababa city food establishments, 2021

Food handling practice (Interviewed)

The overall good food handling practice was 59% and 196 (41%) was poor practice towards food handling. Almost three-quarter (73.4%) of the participants were always cutting their finger nail. From all interviewed food handlers, 433 (90.6%) and 355 (74.3%) were worn gown and head cover respectively. Four hundred thirty-nine (91.8%) of food handlers were washed their hands after visiting a toilet (**Table 5**).

Food Handling Practices (Observed)

During the study period, two hundred twenty-one (46.2%) and 257 (53.8%) of the food handlers were followed a good and a poor practice of food handling respectively. Among the participants, 372 (77.8%) had short finger nails. Four hundred thirty-five (91.0%) and 327 (68.4%) of the study subjects were worn gown and hair cover as observed during the study period respectively (**Table 5**).

Table 5: Food Handling Practice of food handlers working in food establishments in Addis Ababa, Ethiopia, 2021

Variable	Categories	Frequency (n)	Percent (%)
Food Handling Practices (Interviewed)			
Do you cut your finger nail?	Always	351	73.4
	Sometime	127	26.6
	Never	0	0.0
Do you prepare food having discharge from nose or ear or eye or skin	Always	111	23.2
	Sometime	114	23.8
	Never	253	52.9
Do you wear hair cover while preparing food?	Always	355	74.3
	Sometime	105	22.0
	Never	18	3.8
Do you wear uniform while preparing food?	Always	433	90.6
	Sometime	43	9.0
	Never	2	0.4
Do you wash your hands before starting work?	Always	296	61.9
	Sometime	163	34.1
	Never	19	4.0
Do you wash your hands before handling ready to eat foods?	Always	309	64.6
	Sometime	141	29.5

	Never	28	5.9
Do you wash your hands after using the toilet?	Always	439	91.8
	Sometime	38	8.0
	Never	1	0.2
When you wash your hands, do you use soap with water?	Always	300	62.8
	Sometime	158	33.0
	Never	20	4.2
Do you store raw and cooked food separately?	Always	303	63.4
	Sometime	143	29.9
	Never	32	6.7
Do you cover cooked foods?	Always	339	70.9
	Sometime	117	24.5
	Never	22	4.6
Do you wash your hands after touching your body?	Always	248	51.9
	Sometime	169	35.4
	Never	61	12.7
Do you wash your hands after touching dirty materials?	Always	379	79.3
	Sometime	85	17.8
	Never	14	2.9
Food Handling Practices (Observed)			
Is food handler's fingers nail trimmed and cleaned?	Yes	372	77.8
	No	106	22.2
Any visible skin rash, cut, wound from food handler at a time of visit?	Yes	140	29.3
	No	338	70.7
Does food handler put on clean hair cover during visit?	Yes	327	68.4
	No	151	31.6
Does food handler wear gown during visit?	Yes	435	91.0
	No	43	9.0
Is the gown clean?	Yes	265	55.4
	No	213	44.6
Does the food handlers wash hands after touching his/her body parts?	Yes	231	48.3
	No	247	51.7
Does the food handler wash hands after touching dirty materials?	Yes	350	73.2
	No	128	26.8

Sanitary condition of food establishments

Almost all food establishments (97.7%) had a functional toilet. Four hundred forty-three (92.7%) of the food establishments had containers used for solid waste storage. Majority of the food establishments, 414 (86.6%) had a functional refrigerator in the kitchen (**Table 6**).

Table 6:Sanitary conditions of food establishments in Addis Ababa, Ethiopia, 2021

Variables	Categories	Frequency (n)	Percent (%)
Functional toilet facility available	Yes	467	97.7
	No	11	2.3
Separate toilet for food handlers	Yes	138	28.9
	No	340	71.1
Hand washing basin near the toilet	Yes	417	87.2
	No	61	12.8
Container for solid waste storage	Yes	443	92.7
	No	35	7.3
Liquid waste disposal	Yes	357	74.7
	No	121	25.3
Functional shower facility available	Yes	263	55.0
	No	215	45.0
Functional refrigerator in the kitchen	Yes	414	86.6
	No	64	13.4
Separate dressing room for food handlers	Yes	277	57.9
	No	201	42.1

Factors associated with food handling practices

In logistic regression analysis, each explanatory variable with outcome variable (food handling practice) were assessed for its association. Variables with P-value less than 0.3 were exported to multivariate analysis.

Multivariate logistic regression output showed that age groups between 18 to 22 and 23 to 27, primary educational level (1-8 grade), work experience (1 to 5 years), training license, working hours and regular medical checkup were found to be significantly associated with food handling practices in multivariate analysis with P-value <0.05.

The odds of performing good food handling practice among food handlers whose age groups between 18 to 22 (AOR = 0.28, 95% CI = 0.08 - 0.91) and 23 to 27 (AOR = 0.12, 95% CI=0.04 - 0.39) years were less likely have good practice on food handling as compared to their counter parts.

The odds of performing good food handling practice among food handlers who had work experience between 1 to 5 years in food establishments was three folds higher as compared to their counterpart (AOR = 3.26, 95% CI=1.29- 8.21).

The result also showed that the odds of performing good food handling practice among food handlers who attended primary education (grade 1–8 grades) was four times (AOR = 4.13, 95% CI=1.80=9.48) higher as compared to their counterpart.

The odds of performing good food handling practice among food handlers who was licensed for food handling practices was two times higher as compared to their counterpart (AOR = 2.36, 95% CI = 1.04, 5.31).

In addition, the odds of performing good food handling practice among food handlers who had regular medical checkup were 1.7 times (AOR = 1.71, 95% CI=1.06- 2.75) higher as compared to those food handlers who had no regular medical checkup.

Furthermore, the likelihood of performing good food handling practice among food handlers who was working less than or equal to 8 hours wereless likely have good practice on food handling as compared to their counter parts (AOR=0.63, 95% CI=0.41,0.70)(**Table 7**).

Table 7: A bi-variable and multi-variable logistic regression analysis outputs of associated factors with food handling practice in Addis Ababa, Ethiopia, 2021 (n = 478)

Variables	Food handling Practice		COR (95% CL)	AOR (95% CL)	P-value
	Good	Poor			
Age 18-22 23-27 28-32 33-37 >37	65 (13.60%)	38 (7.95%)	0.462 (0.210 , 1.013)	0.275 (0.083 , 0.907)	0.034
	47 (9.83%)	24 (5.02%)	0.403 (0.175 , 0.931)	0.123 (0.039 , 0.390)	0.001
	103 (21.55%)	68 (14.23%)	0.521 (0.248 , 1.096)	0.500 (0.190 , 1.317)	0.161
	52 (10.88%)	47 (9.83%)	0.714 (0.326 , 1.562)	0.602 (0.244 , 1.486)	0.271
	15 (3.14%)	19 (3.97%)			1
Educational Level College and Above Primary (1-8) Secondary (9-12) Illiterate	57 (11.92%)	43 (8.99%)	1.357 (0.826 , 2.231)	0.746 (0.339 , 1.643)	0.468
	84 (17.58%)	86 (17.99%)	0.760 (0.441 , 1.311)	4.132 (1.801 , 9.484)	0.001
	75 (15.69%)	43 (8.99%)	0.482 (0.261 , 0.889)	1.458 (0.663 , 3.205)	0.349
	57 (11.92%)	43 (8.99%)			1
Experience 1-5 6-10 >10	114 (40.4%)	86 (43.9%)	0.718 (0.427 , 1.207)	3.257 (1.292 , 8.207)	0.012
	129 (45.8%)	69 (35.2%)	0.509 (0.222 , 0.949)	0.681 (0.300 , 1.353)	0.273
	39 (13.8%)	41 (20.9%)			1
Training License Yes No	108 (22.60%)	90 (18.83%)	1.368 (0.945 , 1.980)	2.355 (1.044 , 5.310)	0.039
	174 (36.40%)	106 (22.17%)			1
Supervision Yes No	232 (48.54%)	153 (32.01%)	0.767 (0.486 , 1.210)	0.718 (0.393 , 1.310)	0.280
	50 (10.46%)	43 (8.99%)			1
Regular Medical Check up Yes No	183 (38.29%)	140 (29.29%)	1.352 (0.911 , 2.007)	1.708 (1.060 , 2.753)	0.028
	99 (20.71%)	56 (11.71%)			1
Working hours ≤8 >8	162 (33.89%)	95 (19.87%)	0.697 (0.483 , 1.005)	0.631 (0.411 , 0.696)	0.035
	120 (25.11%)	101 (21.13%)			1

6. DISCUSSION

Improper food handling practice is one of the major routes for food born disease transmission. An emphasis need to be given for food handling practice by the concerned bodies. Therefore, this study provides an insight on status of food handling practice on the study area.

This study revealed that good food handling practice was 59% and poor food handling practice was 41%. The result is consistent with the study conducted in Malayisa (59.3%)(21), Dangila (52.3%)(7) and Addis Ababa (60.60%)(17).

However, the finding is relatively lower than study conducted in Brazil (80.71%)(20)and Uganda (90.0%)(24). The difference might come across due to study settings, study periodandsample size. The study in Brazil was conducted in popular public restaurants only where as in Uganda the study was conducted in university. The sample size of both studies was much smaller than the current study. In fact, these institutions assumed to have adequate resources and suitable setup for food handling practice as compared to this study.

However, the result of this study is higher than other studies conducted in Turkey (48.4%)(22), Arba Minch Town (32.6%)(3), Debark (40.1%)(5), Bole sub city(27.4%)(15)and Gondar town (30.3%)(27). This might be due to difference in year of study and study areas. The study conducted in Arba Minch town got around 6 years long. Due to globalization, access of information improved from time to time and food handlers can develop good knowledge and positive attitude towards food handling practice so that they could perform good handling practice relatively better. Addis Ababa city has better access to different facilities than other town used for food handling practices. For example, access to getting training, medical checkup, knowledge and attitude about proper food handling practices might be differences.

In Arba Minch town, the respondents were mostly males (55.6%)(3)as compared to this study in which only 7.9% of males. This is because females had more experience even in their day to day home activity than males so that not liable to apply basic good food handling principles.

In Debark town, the participants had lower proportion of taking training (7%), having license (6.7%), supervision (47.8%) and medical checkup (14.2%)(5)as compared to this result which is having a training (46.4%), license (41.4%), supervision (80.5%) and medical checkup (67.6%). Food handlers having a good training, license, supervision and medical checkup are able to perform a good food handling practices.

Food handlers who were in age groups 18-22 years 0.28 (AOR=0.28, 95% CI=0.08-0.91) and 23-27 years 0.12 (AOR=0.12, 95% CI=0.04-0.39) were less likely have good practice on food handling as compared to their counterparts. This might be food handlers who are lower ages developed or acquired lesser experiences on food handling practice due to less repeated exposure of the work as compared to those who are older ages.

The odds of performing good food handling practice among food handlers who had primary education (1-8 grades) were 4.13 (AOR=4.13, 95% CI=1.80-9.48) times higher as compared to their counterparts. The result is supported by the studies conducted in Uganda(24), Debar town(5) and Woldia town(16). Food handlers who had attained primary education (1-8 grades) were 3.27 times more likely to have good food handling practices as compared to illiterates. This is because the depth of knowledge could affect food handler's food handling practices. In fact, education helps to improve knowledge thereby to develop skills of food handlers to work according to the standard procedures to maintain good food handling practices.

The current study showed that food handling practice was statistically associated with work experience of the food handlers. Food handlers who had 1-5 years' work experience had higher odds of good food handling practice than as compared to their counterparts (AOR = 3.26; 95% CI = 1.29-8.21). This might be when the food handlers become more experienced; they could be negligence of their works due to no visible changes of their life even their working experiences increased. It also might be they are not happy with their works, supervisors and working conditions. In other words, when food handlers become less experienced, they are giving attention to every aspects of food handling practices to avoid their faults and get appreciation from their supervisors.

Food handlers who had food handling training license 2.36 (AOR=2.36, 95%CI=1.04-5.31) times more likely have good food handling practice as compared to non licensed. This is because licensed could affect food handling practices of food handlers. In fact, food handling certified helps to enhance knowledge thereby to improve skills of food handlers to work according to the procedures to maintain good food handling practices.

Food handlers who have medical check up 1.71 (AOR=1.71, 95% CI = 1.06 - 2.75) times more likely have good food handling practice as compared to those who has no medical check up. This finding is in line with study done in Arba Minch(3), Gondar(27) and Dessie town(28). This is due to the fact that food handlers who were examining their health status had better

understanding about good food handling. In addition, this could be the health care workers gave advice for food handlers during medical checkup so these might be enhance their overall performance in good food handling practice.

Moreover, this study indicated that food handlers who are working less than eight hours (AOR=0.63, 95%CI=0.41-0.70) were less likely have good practice on food handling as compared to food handlers who are working more than and equal to eight hours. This is due to food handlers who are staying on their workmore hours make them to avoid their poor practice and develop their good food handling practices.

Limitations of the study

- The cross-sectional nature of the study might affect the cause and effect relationship.
- In addition, the study might be liable to social desirability, recall and observational bias.
- Moreover, parasitic and microbiological laboratory analyses were not considered in this study.

7. CONCLUSION AND RECOMMENDATION

7.1. Conclusion

This study reveals that relatively poor foods handling practices was observed in the study areas. More than one-third (35.8% and 36.6%) of the food handlers had poor knowledge and attitude towards food handling practices. Age, educational status, experience, license, regular medical checkup and working hours were significantly associated with good food handling practice. As observed, clean gown, hand washing after touching body parts and dirty materials were relatively low.

7.2. Recommendation

Employers, managers or owners of food establishments should continuously supervise the food handlers and establish personal hygiene rule and posted it on easily visible site. Recruiting trained and experienced food handlers should be mandatory to improve the practices towards food handling. Recruiting supportive supervisor for their facility should be considered for better and improved sanitation practice of food handlers.

Moreover, the authorized bodies should be conducting periodic inspection, design and implement food handling practice awareness creation program, establish rules on regular medical checkup and prepare food handling practice training manual, guideline and a certificate.

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ANNEX I

Informed Consent

English Version

**ST. PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE, DEPARTMENT OF
PUBLIC HEALTH**

Subject Information Sheet

Respondent's code number-----

Dear participant!

My name is _____. I am a data collector for this research. Now I will collect the data on “food handling practice and associated factors among food handlers working in food establishments in Addis Ababa”. For this study, you are selected randomly among food handlers who are working in food establishments in Addis Ababa city. As a participant and before getting your consent, you need to know all necessary information related to the study which will be detailed as follows.

Confidentiality: Your name will not be written in this form and any information you tell us will not be disclosed to third party. Your participation is completely voluntary and you are not obligated to answer any question you do not wish to answer. If you feel discomfort with the question, it is your right to drop it at any time you want. If you have questions regarding this study or would like to be informed of the results after its completion, please feel free to contact the principal investigator.

Address of the principal investigator: phone number: - +251-929-02-25-42

Email missganawt2004@gmail.com

Consent form

I confirmed my agreement with my signature after the detailed objective of the study has been explained to me in the language I understand well.

Signature (participant's) _____ Signature (collectors) _____

Date _____ Date _____

Amharic Version

**ቅዱስ ጳውሎስ ሆስፒታል ሚሊኒየም ህክምና ኮሌጅ የህብረተሰብ ጤና ትምህርት ክፍል
የአማርኛ መጠይቆች**

መለያ ቁጥር-----

የግለሰብ የስም ምነት ፎርም

ጤና ይስጥልኝ!

ስሜ _____ ይባላል። መረጃ ሰብሳቢ ስሆን የመጣሁበት ምክንያት በአዲስ አበባ ከተማ በሚገኙ የምግብ አገልግሎት ሰጪ ተቋማት ውስጥ በምግብ ዝግጅት በሚሰሩ ሰራተኞች ላይ ስለምግብ አያያዝ ተግባራትና ተዛማጅ ጉዳዮች ላይ መረጃ ለመሰብሰብና ጥናት ለመስራት ነው። ለዚህ ጥናት በአዲስ አበባ ከተማ በሚገኙ የምግብ አገልግሎት ሰጪ ተቋማት ውስጥ በምግብ ዝግጅት ከሚሰሩ ሰራተኞች መካከል እረስዎ ተመረጠዋል። ፈቃድዎን ከመስጠትዎና ተሳታፊ ከመሆንዎ በፊት ጥናቱን በተመለከተ ማወቅ ያለብዎትን ጠቃሚ መረጃዎች እንደሚከተለው እነግሮታለሁ።

ሚስጢር ንስሐ መጠበቅ፡

በዚህ ቅጽ ላይ የሚገኘውን መረጃ ለሌላ አካል ተላለፎ አይሰጥም። የእርስዎ ተሳትፎ ሙሉ በሙሉ በፈቃደኝነት ላይ የተመሰረተ ሲሆን መመለስ የማይፈልጉትን ጥያቄ እንዲመልሱ አይገደዱም። ጥሩ ስሜት የማይሰጥዎት ጥያቄ ካለ በማንኛውም ጊዜ አለመመለስ ወይም ማቋረጥ ይችላሉ። ስለዚህ ጥናት መጠየቅ የሚፈልጉት ጥያቄ ካልዎት ወይም የጥናቱን ውጤት ማወቅ ከፈለጉ ዋና አጥኝውን መጠየቅ ይችላሉ።

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የስም ምነት ፎርም

የጥናቱን አላማ በሚገባኝ ቋንቋ በሚገባ ስለተገለፀልኝ በጥናቱ ለመሳተፍ በፊርማዬ አረጋግጣለሁ።

የተሳታፊው ፊርማ _____ የመረጃ ሰብሳቢው ፊርማ _____

ቀን _____ ቀን _____

Questionnaires

English version questionnaires

St. Paul's Hospital Millennium Medical College Department of Public Health

Structured questionnaire on food handling practice and associated factors among food handlers working in food establishments in Addis Ababa, Ethiopia, 2020

Code	Part 1: Socio-Demographic factors	Responses	Skip
SD101	Type of food establishment?	1. Hotel 2. Restaurant 3. Café 4. Juice house	
SD102	How old are you?	-----years	
SD103	What is your sex?	1. Male 2. Female	
SD104	What is your marital status?	1. Single 2. Married 3. Divorced 4. Widowed	
SD105	What is your educational level?	1. Illiterate 2. Primary level (1-8) 3. Secondary level (9-12) 4. College level and above	
SD106	What is your monthly income in Ethiopian Birr?	-----birr	
	Part 2: Occupational Factors		Skip
O207	How long have you been working in food establishment?	-----years	
O208	Have you ever been obtained food handling training?	1. Yes 2. No	
O209	Do you have a food handling training license?	1. Yes 2. No	
O210	Have you ever been supervise by government body?	1. Yes 2. No	
O211	Did you have a regular medical check-up in the last 6 months?	1. Yes 2. No	

O212	For how long do you work per a day?	-----hours	
	Part 3: Food handler's knowledge questions	Reponses	Skip
K313	Raw food may have harmful microbes on the surface	1. Yes 2. No 3. I don't know	
K314	Asymptomatic food handler can cause illness by carrying germs to food	1. Yes 2. No 3. I don't know	
K315	You can prepare food with a wound on the hand if the wound is covered with a bandage	1. Yes 2. No 3. I don't know	
K316	After using the toilet, you should always wash hands with soap and water	1. Yes 2. No 3. I don't know	
K317	Habit of finger nose is dangerous	1. Yes 2. No 3. I don't know	
K318	Wearing clean uniform and cap while cooking or serving is necessary	1. Yes 2. No 3. I don't know	
K319	Food borne disease can result from storing raw and cooked foods in the same refrigerator	1. Yes 2. No 3. I don't know	
K320	Ready to eat foods (e.g. vegetables) can be prepared on the same cutting board to prepare meat	1. Yes 2. No 3. I don't know	
K321	Refrigeration kills all the bacteria that might cause food-borne illness	1. Yes 2. No 3. I don't know	

	Part 4: Food handler's Attitudinal questions	Responses	Skip
A422	Food borne disease causing microorganisms found every where	1 Strongly Agree 2 Agree 3 Neutral 4 Disagree 5 Strongly Disagree	
A423	Temperature controls are an effective method of reducing the number of cases of food poisoning	1. Strongly Agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree	
A424	All food handlers should have a food safety training qualification	1. Strongly Agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree	
A425	Hand washing before handling food reduces the risk of contamination	1. Strongly Agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree	
	Part 5: Food Handler's Practical questions	Responses	Skip
P526	Do you cut your finger nail?	1. Always 2. Sometime 3. Never	
P527	Do you prepare food having discharge from nose or ear or eye or skin	1. Always 2. Sometime 3. Never	
P528	Do you wear hair cover while preparing food?	1. Always	

		2. Sometime 3. Never	
P529	Do you wear uniform while preparing food?	1. Always 2. Sometime 3. Never	
P530	Do you wash your hands before starting work?	1. Always 2. Sometime 3. Never	
P531	Do you wash your hands before handling ready to eat foods?	1. Always 2. Sometime 3. Never	
P532	Do you wash your hands after using the toilet?	1. Always 2. Sometime 3. Never	
P533	When you wash your hands, do you use soap with water?	1. Always 2. Sometime 3. Never	
P534	Do you store raw and cooked food separately?	1. Always 2. Sometime 3. Never	
P535	Do you cover cooked foods?	1. Always 2. Sometime 3. Never	
P536	Do you wash your hands after touching your body?	1. Always 2. Sometime 3. Never	
P537	Do you wash your hands after touching dirty materials?	1. Always 2. Sometime 3. Never	

	Part 6: Observational check-list OC6: Food handler's personal condition	Responses	skip
OC638	Is food handler's fingers nail trimmed and cleaned?	1. Yes 2. No	
OC639	Any visible skin rash, cut, wound from food handler at a time of visit?	1. Yes 2. No	
OC640	Does food handler put on clean hair cover during visit?	1. Yes 2. No	
OC641	Does food handler wear gown during visit?	1. Yes 2. No	
OC642	Is the gown clean?	1. Yes 2. No	
OC643	Does the food handlers wash hands after touching his/her body parts?	1. Yes 2. No	
OC644	Does the food handler wash hands after touching dirty materials?	1. Yes 2. No	
	OC6: Sanitary condition of food establishments (Observational)		
OC645	Is there functional toilet facility available?	1. Yes 2. No	
OC646	Is there a separate toilet for food handlers?	1. Yes 2. No	
OC647	Is there hand washing basin near the toilet?	1. Yes 2. No	
OC648	Is there a container for solid waste storage?	1. Yes 2. No	
OC649	Is there liquid waste disposal?	1. Yes 2. No	
OC650	Is there functional shower facility available?	1. Yes 2. No	
OC651	Is there functional refrigerator in the kitchen?	1. Yes 2. No	
OC652	Is there separate dressing room for food handlers?	1. Yes 2. No	

Amharic version questionnaires

ቅዱስጳውሎስሆስፒታልሚሊኒየምህክምናኮሌጅህብረተሰብጤናአጠባበቅትምህርትክፍል

መጠይቆች

መ.ቁ	ክፍልአንድ:- አጠቃላይየግለሰብመረጃ	መልስ	ማስፈንጠሪያ
አጠ101	የምግብአገልግሎትስጪተቋምዓይነት?	1. ሆቴል 2. ሪስቶራንት/ ምግብቤት 3. ካፌ 4. ጁስቤት	
አጠ102	እድሜ	-----ዓመት	
አጠ103	ፆታ	1. ወንድ 2. ሴት	
አጠ104	የጋብቻሁኔታ	1. ያላገባ 2. ያገባ 3. በፍችየተለዩ 4. በሞትየተለዩ	
አጠ105	የትምህርትደረጃ	1. መደበኛትምህርትያልተማሩ 2. የመጀመሪያደረጃ (1-8) 3. ሁለተኛደረጃ (9-12) 4. ኮሌጅናከዚያበላይ	
አጠ106	የወርገቢዎስንትነው?	-----ብር	
	ክፍልሁለት:- የስራሁኔታመረጃ	መልስ	ማስፈንጠሪያ
ስሁ-207	በምግብአገልግሎትስጪተቋምላይምንያክልዓመትሰሩ? ?	-----ዓመት	
ስሁ-208	ስለምግብአያያዝስልጠናወስደውያውቃሉ?	1. አዎ 2. የለም	
ስሁ-209	ስለምግብአያያዝየስልጠናየምስክርወረቀትአለዎት?	1. አዎ 2. የለም	
ስሁ-210	በመንግስትተቆጣጣሪአካልቁጥጥርተደርገውያውቃሉ?	1. አዎ 2. የለም	

ስሁ-211	ተከታታይ የሆነ የህክምና ምርመራ ባለፉት ወር ውስጥ አድርገው ያውቃሉ?	6	1. አዎ 2. የለም	
ስሁ-212	በቀን ለስንት ሰዓት ይሰራሉ?		-----ሰዓት	
	ክፍል 3: የግንዛቤ መጠይቆች		መልስ	ማስፈንጠሪያ
ግን313	ያለበሰ ለስጋ አደገኛ የሆኑ የበሽታ አምጭ ተህዋሲ ያን ሊይ ዝይችላል?		1. አዎ 2. የለም 3. አላውቃም	
ግን314	የበሽታ ምልክት የሌለው (Asymptomatic) ምግብ አዘጋጅ የበሽታ አምጭ ተህዋሲ ያንን ወደ ምግብ በማስተላለፍ ለበሽታ ምክንያት ሊሆን ይችላል?		1. አዎ 2. የለም 3. አላውቃም	
ግን315	እጅዎ ላይ ቁስል ቢኖር በፋሻሽ ፍነው ምግብ ሊያዘጋጁ ይችላሉ?		1. አዎ 2. የለም 3. አላውቅም	
ግን316	ከመፀዳጃ ቤት መልስ ሁል ጊዜ እጅዎ ትንበሳሙ ናናበው ሃ መታጠብ አለብዎት?		1. አዎ 2. የለም 3. አላውቅም	
ግን317	አፍንጫዎ ትንበ እጅዎ የመንካት ልምድ አደገኛ ነው?		1. አዎ 2. የለም 3. አላውቅም	
ግን318	ምግብ በሚያዘጋጁበት ጊዜ ንፁህ የስራ ልብስና ቆብ መልበስ አስፈላጊ ነው?		1. አዎ 2. የለም 3. አላውቅም	
ግን319	የበሰሉና ያለበሰሉ ምግቦችን በአንድ ማቀዝቀዣ ውስጥ ማስቀመጥ ምግብ ወለድ በሽታ ሊያስከትል ይችላል?		1. አዎ 2. የለም 3. አላውቅም	
ግን320	ለመመገብ ዝግጁ የሆኑ ምግቦችን (ለምሳሌ:-		1. አዎ	

	አትክልቶችን) እናስጋበአንድመክተፊያማዘጋጀት/መክተፍይቻላል?	2. የለም 3. አላውቅም	
ግን321	ማቀዝቀዣ ሁሉንም ለምግብ ወለድ በሽታ የሆኑ ባክቴሪያዎችን ይገድላል?	1. አዎ 2. የለም 3. አላውቅም	
	ክፍል 4: የአመለካከት መጠይቆች	መልስ	ማስፈንጠሪያ
አመ422	ለምግብ ወለድ በሽታ ምክንያት የሆኑ ተህዋሲያ ሁሉም ቦታ ይገኛሉ	1. በጣም እስማማለሁ 2. እስማማለሁ 3. ገለልተኛነኝ 4. አልስማማም 5. በጣም አልስማማም	
አመ423	የሙቀት ሰንሰለት የምግብ መመረዝን ለመቀነስ ውጤታማ ዘዴ ነው	1. በጣም እስማማለሁ 2. እስማማለሁ 3. ገለልተኛነኝ 4. አልስማማም 5. በጣም አልስማማም	
አመ424	ሁሉም የምግብ አዘጋጆች የምግብ ደህንነት ስልጣና የምስክርወረቀት ሊኖራቸው ይገባል	1. በጣም እስማማለሁ 2. እስማማለሁ 3. ገለልተኛነኝ 4. አልስማማም 5. በጣም አልስማማም	
አመ425	ምግብን ከመንካት ወይም በፊት እጅዎትን በመታጠብ የምግብ ብክለትን ይቀንሳል	1. በጣም እስማማለሁ 2. እስማማለሁ 3. ገለልተኛነኝ 4. አልስማማም 5. በጣም አልስማማም	
	ክፍል 5: የተግባራት መጠይቆች	መልስ	ማስፈንጠሪያ

ተግ526	የእጅጥፍርዎንይቆጥራሉ?	1. ሁልጊዜ 2. አንዳንድጊዜ 3. በፍፁም	
ተግ527	ከአፍንጫዎወይምከጀሮዎወይምከአይንዎወይምከቆዳዎፈሳሽእየፈሰስዎትምግብያዘጋጃሉ?	1. ሁልጊዜ 2. አንዳንድጊዜ 3. በፍፁም	
ተግ528	ምግብበሚያዘጋጁበትጊዜየፀጉርመሸፈኛይለብሳሉ?	1. ሁልጊዜ 2. አንዳንድጊዜ 3. በፍፁም	
ተግ529	ምግብበሚያዘጋጁበትጊዜየስራልብስይለብሳሉ?	1. ሁልጊዜ 2. አንዳንድጊዜ 3. በፍፁም	
ተግ530	ስራከመጀመርዎበፊትእጅዎትንይታጠባሉ?	1. ሁልጊዜ 2. አንዳንድጊዜ 3. በፍፁም	
ተግ531	የተዘጋጁምግቦችንከመንካትዎበፊትእጅዎትንይታጠባ? ?	1. ሁልጊዜ 2. አንዳንድጊዜ 3. በፍፁም	
ተግ532	ከመፀዳጃቤትመልስእጅዎትንይታጠባሉ?	1. ሁልጊዜ 2. አንዳንድጊዜ 3. በፍፁም	
ተግ533	እጅዎትንሲጣጠቡሳሙናከውሃጋርይጠቀማሉ?	1. ሁልጊዜ 2. አንዳንድጊዜ 3. በፍፁም	
ተግ534	የበሰሉናያልበሰሉምግቦችንለይተውያከማቻሉ?	1. ሁልጊዜ 2. አንዳንድጊዜ 3. በፍፁም	

ተግ535	የበሰሉምግችንይሸፍናሉ?	1. ሁልጊዜ 2. አንዳንድጊዜ 3. በፍፁም	
ተግ536	የሰውነትክፍሎችንከነሁበኋላእጅዎትንይጣጠባሉ?	1. ሁልጊዜ 2. አንዳንድጊዜ 3. በፍፁም	
ተግ537	የቆሽሹእቃዎችንከነኩበኋላእጅዎትንይጣጠባሉ?	1. ሁልጊዜ 2. አንዳንድጊዜ 3. በፍፁም	
	ክፍል 6: የምልከታቼክሊስት ምል6: የምግብአዘጋጆችየግልሁኔታ	መልስ	ማስፈንጠሪያ
ምል638	የምግብአዘጋጁየእጅጥፍርአጭርናንፁህነው?	1. አዎ 2. አይደለም	
ምል639	በጉብኝትጊዜበምግብአዘጋጁላይየሚታይሽፍታወይምቁስልይታያል?	1. አዎ 2. የለም	
ምል640	በጉብኝትጊዜምግብአዘጋጁንፁህየፀጉርመሸፈኛለብሷል?	1. አዎ 2. የለም	
ምል641	በጉብኝትጊዜምግብአዘጋጁየስራልብስለብሷል?	1. አዎ 2. የለም	
ምል642	የስራልብሱንፁህነው?	1. አዎ 2. የለም	
ምል643	የሰውነትክፍሎችንከነሁበኋላእጃቸውንይጣጠባሉ?	1. አዎ 2. የለም	
ምል644	የቆሽሹእቃዎችንከነኩበኋላእጃቸውንይጣጠባሉ?	1. አዎ 2. የለም	
	ምል6: የምግብተቋሙሁኔታ (ምልከታ)	መልስ	ማስፈንጠሪያ
ምል645	አገልግትየሚሰጥመፀዳጃቤትአለ?	1. አለ 2. የለም	
ምል646	ለምግብአዘጋጆችየተለየመፀዳጃቤትአለ?	1. አለ 2. የለም	
ምል647	ለመፀዳጃቤቱቅርብየሆነየእጅመታጠቢያአለ?	1. አለ 2. የለም	
ምል648	የደረቅቆሻሻማጠራቀሚያእቃአለ?	1. አለ 2. የለም	
ምል649	የፍሳሽቆሻሻማስወገጃአለ?	1. አለ 2. የለም	
ምል650	አገልግሎትየሚሰጥሻወርቤትአለ?	1. አለ 2. የለም	

ምል651	አገልግሎት የሚሰጥ ማቀዝቀዣ ምግብ ማዘጋጃ ክፍል ውስጥ አለ?	1. አለ	2. የለም	
ምል652	ለምግብ አዘጋጅ ችግር ተለየ የልብስ መቀየሪያ ክፍል አለ?	1. አለ	2. የለም	