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COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCES

CENTER FOR FOOD SCIENCE AND NUTRITION

Food Handling Practices and Associated Factors among Food Handlers in Selected Food Establishments In Yeka Sub-City, Addis Ababa, Ethiopia.

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Declaration

I, The undersigned declare that this thesis is my original work and has not been submitted or presented for a degree in any other institution and that all sources of materials used for the thesis have been duly acknowledged.

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Table of content

Content

List of Tables

List of Figures

List of Abbreviations

AA	Addis Ababa
AOR	Adjusted Odds Ratio
CCPs	Critical Control Points
CI	Confidence Interval
COR	Crude Odds Ratio
CRBL	Commercial Registration and Business License
DC	Developing Counties
EFSA	European Food Safety Authority
EFDA	Ethiopian Food and Drug Administration Authority
EU	Europe
FAO	Food and Agriculture Organization
FBD	Food Borne Disease
FSE	Food Safety Education
FMHACA	Food, Medicine and Health Care Administration and Control Office
GAP	Good Agricultural Practice
GFHP	Good Food Handling Principles
GHP	Good Hygienic Practice
GMP	Good Manufacturing Practice
GSP	Good Storage Practice
HACCP	Hazard Analysis Critical Control Points
HICES	Ethiopian Household Consumption and Expenditure Survey
IS	International Standard
KAP	Knowledge, Attitude and Practice
Ppb	Parts Per Billion
TPCP	Trade Practice and Consumers Protection
USA	United States Of America
WHO	World Health Organization

ABSTRACT

Among other food value chains, poor food handling practice is key cause of foodborne diseases notably in developing countries like Ethiopia where, most cases of diarrheal disease due to consumption of contaminated foods. This study aimed to assess food safety knowledge, attitude and practice of food handlers in food establishments and determinants of safe food handling practice in selected part of, Addis Ababa, Ethiopia. We conducted institution based cross-sectional study among food handlers in Cafeterias, Restaurants and Hotels in Addis Ababa, Yeka sub city. A total of 284 food handlers: 69 from Cafeterias, 89 from Restaurants and 126 from Hotels were enrolled in the study using stratified random sampling technique. Data were collected in observational checklist and through structured-questionnaire via face to face interview. A binary and multivariate logistic regression was used and adjusted for cofounders and covariates. A P-value of less than 0.05 was considered statistically significant.

The present study revealed that 42.6% of food handlers had good food handling practice. Food handling practice were significantly associated with sex (Adjusted odds ratio (AOR)= 2.63 CI= 1.15, 6.00), monthly income (AOR= 2.66 CI= 1.16, 6.12), availability of functional pipe water supply (AOR= 3.54 CI= 1.34, 9.34), availability of soap or detergents (AOR= 2.03 CI= 1.17, 3.50) and presence of insects or rodents (AOR= 0.28 CI= 0.11, 0.70).

The food handlers in the study area were executing in a poor food handling practice, as most of them were not knowledgeable as needed. In fact, revising the salary of food handlers based on their work load is valid, as there is existing worldwide economic and cost of life inflation. Likewise enhancing the water supply in each food establishments and dispatching sufficient soaps and detergents coupled with eradicating insects and rodents are key. Furthermore there is a call for action for regulatory bodies which to giving license for the establishment while address all the basic criteria's based on official guideline/checklist, and also need regular inspection by authority which would augment the safety and hygiene practice of the food handlers and establishment to protect the public health and maximize food safety.

***Keywords**: Food safety, Food handling practice, Food handlers, Food establishments, Addis Ababa*

1. INTRODUCTION

1.1 Background

Compared to two to three decades, currently food establishments such as restaurants, cafeterias and hotels are become increasingly common in both developed and developing countries with the rise in urbanization. (Gebremariam *et al.*, 2019, Kumie & Zeru., 2007) There has been increasing proportion of eating away home (Minten *et al.*, 2017), is the increased eating outside trend come about due to time pressure to prepare and eat at home(Osaili *et al.*, 2013). moreover the growing demand to maximize food palatability, taste, diversification and access.(Isoni Auad L *et al.*, 2019) This is also becomes trendy in Ethiopia, according to reanalysis data of Ethiopian Household Consumption and Expenditure Survey (HICES) in 2011 eating out of home covered 16 % of the urban food budget (Minten *et al.*, 2017) and , according to reports of 2019 food consumed away from home is around 7% in Addis Ababa.(Wolle *et al.*, 2020) Food eating away can be a potential source of microbial exposure by which foods are high likely to be contaminated due to lengthy value chain a food passing such as in producers, transporters, processors, retailers, distributers and food handlers(Chekol *et al.*, 2019), this also could be the key sources for foodborne disease (FBD) outbreaks.(Panchal *et al.*, 2013) Worldwide, FBD causes greater health burden leading to high morbidity and mortality.(Garden-Robinson J.,2012). The World Health Organization (WHO) report has showed that, globally around 600 million (1 in 10 people) get sick every year after eating contaminated food. The organization has also indicated that the burden of FBD is mainly caused by 31 particular virulent agents from bacteria, viruses, parasites, toxins and chemicals. (WHO., 2015). In developing countries like Ethiopia approximately 70% of diarrheal disease cases are associated with consumption of contaminated

foods.(Kibret & Abera., 2012) According to Ayalew et al, .(Ayalew *et al.*, 2013) the annual incidence of FBD was 3.4-9.3% and median for five years (1985-1990) was 5.8% .

Given that, variety of foods are prepared in bulk, usually by large number of people in the establishments they have the synergetic effects for the high possibility of one time and/or recurring contamination (Kumie & Zeru., 2007, Odonkor *et al.*, 2020), due to unhygienic way of food preparation, inappropriate handling of food, holding temperatures, poor knowledge of personal hygiene are factors which could inflate the degree of food contamination. Legesse *et al.*, 2017 , Ghazali *et al.*, 2012 , Zanin *et al.*, 2017) Furthermore, attitude, practices, experiences and behavior of the food handler in the area of good food handling principles (GFHP), food safety, and good hygienic practices (GHP) has detrimental effect for routine contamination of foods.(Teffo *et al.*, 2020, Rebouças LT *et al.*, 2017, Lestantyo *et al.*, 2017) Protecting consumers from foodborne illness through routine inspection, giving need based capacity trainings for the handler's to enable adhere with good manufacturing practices, good hygienic practices, adapting food safety principles and practicing hazard analysis and critical control point (HACCP) are among vital means of maintaining food safety in the food establishments.(Marais *et al.*, 2007) In Ethiopia food safety professionals are only a few, and yet only one or two Universities giving courses in the area of food safety and food catering services, however enormous professionals have been graduated either in food science, nutrition, food technology, post-harvest technology, food engineering and others. This means, even the food regulatory bodies experience difficulty of accessing food safety qualified experts, coupled with low access of state of the art instruments for advanced microbial or analytical analysis parameters, thus quite often get challenging for the bodies to set the safety targets and activities in the food environment (Delesa *et al.*, 2017); in addition information concerning food safety

laws and regulations are scarce, though, there are two proclamations which is on Trade Practice and Consumers' Protection (TPCP) (proclamation 685/2010) and Commercial Registration and Business License (CRBL) (proclamation 686/2010) are available major in the country to ensure food safety.(Ayalew *et al.*, 2013).

1.2 Statement of the Problem

Nowadays, food safety is a vital issue that has to be taken into consideration when talk about public health (Shahid *et al.*, 2012). Because Food can be a potential source of infection and disease, right from the point of preparation to the point of consumption. Since, it's more likely in the food service establishments where mass food is prepared.

Globally, the major causes of FBD are poor sanitation facilities, inadequate safe water access, marginalized food handling practice (Nee & Sani., 2011, Mustaffa *et al.*, 2017)and purchasing of untraceable raw materials.(Teffo & Tabit ., 2020) Likewise, poor hygienic practices during food preparation, food servicing and lack of adequate trainings in food and food service management are main factors.(Gebremariam *et al.*, 2019) These problems are existing in most developing countries including Ethiopia, where poor food handling and sanitation practices, limited food safety laws and regulatory systems, inadequate financial resources to work on safer environment and equipment are familiar.(Ayana *et al.*, 2015, Meleko *et al.*, 2015) These problems could also inflate, due to lack of food establishment guideline and poor monitoring and evaluation system.(Chekol *et al.*, 2019) Food handlers working in food establishments are potential groups of people that are more likely to contaminate the foods with FBD, by carrying disease causing agents.(Panchal *et al.*, 2019).

Previous studies conducted in different parts of Ethiopia reported that poor hygiene practice of food handlers, inadequate sanitary facilities of food establishments, poor waste disposal services, lack of legal licensing and environmental hygiene were the major problems in food establishments (Meleko A *et al.*,2015 , Assefa T *et al.*, 2015 and Haileselassie M *et al.*, 2012). However data on food safety knowledge, attitude and practice of food handlers in different food establishments (restaurants, cafeterias and non-stared hotels) and factors associated with safe food handling practice in Yeka sub city, A.A, Ethiopia is scarce. But comparably outside home foods are mainly consumed, as it is the first biggest population density and second population size in A.A next to Kolfe Keranio, with very crowded business centers and food establishments.

Therefore, the aims of the present study is to assess the food safety knowledge, attitude and practice of food handlers in different food establishments and factors associated with food safety and food handling practice in Yeka sub city, A.A. The study done by critically observing the

food establishment (cooking kitchen and food serving area), checking and interviewing the food handlers about the handling practices and assessing their knowledge and attitude related to food safety and food handling.

1.3 Significance of the Study

The study will give information for researchers and students to fill the research gaps of how food is handled among food handlers in the food establishment and also how the food safety intervention is processed. The study will give a clue to both the food handlers take such a good notice on food handling practice since poor food handling practice may cost a life. And this research will generate data for policy makers and public health experts that will be valuable to set public health priorities and allocate resources to assure safe food handling practice and also it give awareness not only to the handlers but also the food consumers too. and it may use as a benchmark for other future studies.

1.4 Objective of the Study

1.4.1 General Objective

- To assess Food Handling practices among food handlers in a food establishment's (cafeteria, hotel & Restaurants) in Yeka Sub-City, Addis Ababa, Ethiopia.

1.4.2 Specific Objective

- To investigate level of knowledge, attitude and Practice on food safety of food handlers..
- To assess the physical environment of the establishment.
- To examine the effect of factors associated with food handlers.

1.5 Research Question

- What is the status of knowledge, Attitude and Practice of food handlers in Yeka sub-city?
- What are the assoiciated factors for poor food handling practice?

2. LITREATURE REVIEW

2.1 Overview Of Food Handling Practice

Safe food is defined as foods that do not contain any physical, chemical, or microbiological contaminants that could cause any health problems after consumption. (Barjaktarović-Labović *et al.*, 2018) . There are some food safety risks that are possible in the period from the production of foods to the consumption. these risks include biological risks such as bacteria, viruses, parasites, prions, algae, molds, and yeast), chemical risks such as pesticides, fertilizer residues, veterinary medicines, poly acrylic aromatic hydrocarbons, heavy metals, polychlorinated biphenyls, dioxins, traces from packaging materials, detergent or disinfectant residues, food additives, and allergens) and physical risks glass particles, stone/wood/metal/plastic parts, bone, hair, nail, cigarette ash, flies, and insects. (Artık *et al.*, 2017). In addition, there are studies suggesting that these risks are due to personal hygiene, physical area and equipment hygiene, and food production processes.(Wu, *et al.*, 2018).

Food hygiene or safety incorporates all conditions and measures necessary to ensure safety and rightness of food at all stages of the chain of food production, that is, the process of handling, preparation, and storage of food to prevent foodborne illness.(Mendagudali *et al.*, 2016).

A food handler is the one who works in a food and drink 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 (Scallan *et al.*, 2011). Therefore it is the prime responsibility of food handler to make sure the safety of food and storage and to enhance their knowledge to prevent any kind of poisonous cases due to improper food handling.(Osaili *et al.*, 2018).

Food handlers have a crucial role in the transmission of food-borne pathogens; their education in food safety has been recognized but underutilized preventive publichealth issue that prevents the emergence of a large number ofdiseases of different etiology (Mastrantonio *et al.*, 2014)

The attitude of a food handler is a crucial factor that may influence food hygiene behaviour and practices (Al-shabi *et al.*, 2016). That's why food handlers especially in the food supply chain are recognized as the heart of foodsafety systems in the last decade.(Ovca *et al.*, 2018).

Food service establishment is a place where food is prepared and planned for individual portion service and includes the site at which the individual portions are provided, whether consumption occurs on or off the premises. (Boro *et al.*, 2015). And establishments of food handlers must have skills and knowledge in food safety and food hygiene for the meal they prepare. Researchers have attributed these food safety handling errors to a lack of adequate food safety knowledge (Jenkins *et al.*, 2004). Moreover good personal hygiene practices are an essential part of providing safe food to your customers.(Admasu & Kelbessa., 2018)

2.2 Factors Affecting Food Handling Practices

In the present world many people eat food from restaurants and street vendor food establishments where proper food hygiene practices are usually not implementd and so the consumer is at risk of infections (George *et al.*, 2018), and According to various studies, poor knowledge and practice of hygiene and sanitation, lack of basic sanitary facilities/infrastructures in food service establishments, and negligence in safe food handling are some of the major causes of poor sanitary conditions of food and drinking establishments (Angulo *et al.*, 2007).

2.2.1 Poor Food Safety Knowledge

Safe food is important in preventing food borne diseases (Agyei-Baffour *et al.*, 2013) and Behavior change regarding food safety has been described as the least concern problem in public health. (Blumenthal-Barby *et al.*, 2015).

Food safety education is an important part because it targeted the education of consumers and the food handler as a goal for preventing food-borne illnesses. (Onyeneho *et al.*, 2013). And lack of food safety practices among food handlers and unhygienic premises will pose a health risk to consumers and food safety knowledge gaps among restaurant food handlers may place restaurant consumers at risk for food poisoning (Panchal *et al.*, 2013).

In Malaysia, it is an obligation under the Food Act 1983 for all food handlers to attend and complete the safe food handling course established by the Malaysian government, and they need to be vaccinated against typhoid since this disease is endemic in Malaysia (Lee, *et al.*, 2017).

A study conducted in a Chicago, USA and Switzerland, a low proportion (7%) of food handlers knew that improperly cooked raw beef may lead to hospitalization and even death. More

specifically, 31% of the food handlers did not know that consuming not enough cooked ground meat may result in bloody diarrhea,(Panchal *et.al*., 2013).

According to (Onyeneho *et al*., 2013) a study conducted in Nigeria, One of the factors impacting food handlers' and managers' on safe food preparation practices were lack of food safety education and training. And a reduction in the incidence of food-borne illnesses is strongly influenced by the attitudes of food-handlers towards the implementation of food safety plans. Food safety education is most effective when the transfered messages are targeted toward changing behaviors most likely to result in foodborne illness. (Onyeneho *et al*., 2013).

According to (Neme *et al*., 2017) a study conducted in Jimma town showed that However, the result had showed more than half of food handlers had no knowledge about food borne disease, causes, transmission and reason for the contamination. The reason is that the majority (87.5%) of the food handlers were not taken any training related to food hygiene.

2.2.2 Poor Personal Hygiene

Foods can get contaminated from plant surfaces, animals, water, sewage, air, soil or from food handlers during handling and processing. It can be transmit disease from person to person as well as serve as a growth medium for bacteria that can cause food poisoning (Maiyo *et al*., 2017). Several foods borne disease outbreaks are associated with poor personal hygiene of people handling foods. (Neme *et al*., 2017).Though there are so many sources of food and drinking contamination methods, food handlers serve as the main ones (Gezehegn *et al*., 2017). So, personal hygiene is important if, food contamination is likely to be prevented. If food handlers practice poor hygienic behavior, they could become carriers of pathogens (Kuchenmüller *et al*., 2013).

Food safety issues in Africa are mostly focused on illnesses that are which is linked to poor hygiene but food hygiene in homes, schools and markets also another issues that that needs to be get an attention.(Onyeneho *et al*., 2013).

Hands should be washed before handling food and often during food preparation and also after eating, drinking, smoking, chewing gum, after visiting the toilet, chewing tobacco, coughing, using a handkerchief or tissue, and other times when hands have become soiled or contaminated.

So that in order to minimize the chance for transmitting disease (Addo *et al.*, 2014; People, H, 2013).

The hands of food service employees can be vectors in the spread of food borne diseases because of poor personal hygiene (Kibret *et al.*, 2015). Hands contamination of food handlers can be used as an indicator of their behavior regarding food-related practice and personal hygiene (Allam *et al.*, 2016) and hand hygiene is the most basic yet critical criterion for ensuring safe food handling practice by food handlers (Lee *et al.*, 2017).

Wrong dishwashing practices contribute to the transmission of various diseases such as Tuberculosis, influenza, typhoid and other feco-oral diseases. One of the most widely used and accepted methods of food utensil washing method is the three compartment sink or washing basin, which can be used to wash, rinse and sanitize food utensils and equipment's (Mendedo et al., 2017).

Food handlers should have to wear gown and aprons during food preparing and serving time to prevent food contamination and also dirty clothing could also be a source of microorganisms. Food workers who inadvertently touch their dirty clothing may contaminate their hands (Meleko *et al.*, 2015).

2.2.3 Cross Contamination

Food is only a means for virus and parasite transmission to a new host. However, for many bacteria, food offers an opportunity to grow exponentially to infectious levels. Some bacteria, such as Staphylococcus aureus and Bacillus cereus, will produce toxins while growing in food, resulting in foodborne intoxications (often called food poisoning). And in developing countries, up to 70% of cases of diarrheal diseases are associated with the consumption of contaminated foods. (Kibret & Abera, 2012).

Food safety is defined by the FAO/WHO as the assurance that when food is consumed in the usual manner does not cause harm to human health and wellbeing (WHO, 2002)

Cross contaminations which refers to the transfer of germs from one food item to another occurs mainly in the kitchen because of contact between cooked food & contaminated hands and also other equipment's (Agyei-Baffour *et al.*, 2013). Chemical contamination of foodstuffs, including

methyl mercury, lead, arsenic, dioxins and aflatoxins (among others) may cause acute and chronic health effects such as neuro-developmental disorders, cardiovascular disease, cancers and renal disease (Havelaar *et al.*, 2013). For example using one chopping board and is an indication of possible cross contamination (Osaili *et al.*, 2013).

Contamination from the food handler hand is the most common way the microorganism is transmitted into food (Ismail *et al.*, 2016). Although public health workers advise that food handlers not work while sick, many food handlers continue to work, for several reasons (Panchal*et al.*, 2014). Food handlers in small restaurants may be encouraged to come to work even if not feeling well because restaurants may need to close if they are short handed.

2.2.4 Temperature Abuse

Preparation of meals long before their consumption and storing them at ambient temperature were identified as key factors in the handling of meals that contribute to food poisoning (WHO, 1989). On the other hand, food-handlers were less familiar with time and temperature abuse and its effect on food safety (Akabanda *et al.*, 2017). While improper food safety practices related to insufficient temperatures needed for cooking and holding foods have led to several foodborne outbreaks. (Panchal *et al.*, 2013). Proper cooking will eliminate most microbial hazards. Studies have shown that cooking or serving foods at a temperature of 60 to 70°C or above can help ensure that it is safe for consumption.

Microorganisms can multiply very quickly if food is stored at room temperature. By holding at temperatures below 5°C or above 60°C, the growth of microorganisms is greatly slowed or stopped (WHO, 2010).For example refreezing a completely thawed food can impose a serious health risk, as this process leads faster growth of contaminating bacteria. Freezing food only slows bacterial growth and does not necessarily kill the pathogens (Akabanada *et al.*, 2017). According to (Ehiri *et al.*, 2001) showed that during cooking, all foods attained temperatures capable of destroying vegetative forms of foodborne pathogens but there is a risk of contamination during storage at ambient temperature, insufficient heating and addition of uncooked to cooked food.

2.2.5 Lack of Basic Sanitary Facility

Poor sanitary conditions of food and drinking establishments are the major causal effect for the occurrence of food borne illness. (Mendedo *et al*., 2017).Good public health safety requires the establishments to fulfill basic sanitation pro-visions. (Kumie *et al*., 2002)Food safety in restaurants involves the application of standard practices in a standardized set-up, which when violated could result in foodborne illnesses (Osei-Tutu, 2018).

Sanitation facilities are physical facilities and equipment used to maintain the quality of the environment or controlling the physical environmental factors that can harm human health such as clean water, latrines, sewer line, hand washing, garbage bins, bathroom, wardrobe, prevention equipment against flies, rats and other animals as well as hygiene kits(Hasyim., 2014).

Unsafe water, unsafe waste disposal and exposure of food to insects and dust, undercooked food, and prolonged storage of cooked food without refrigeration are the main influencing factors. To control and prevent food hygienic environment at the food establishments, most food contamination could be prevented by keeping the vending units and locations clean (WHO, 2012).

Unsafe water used for the cleaning and processing of food, poor food production processes and food handling (including inappropriate use of agricultural chemicals); the absence of adequate food storage infrastructure; and inadequate or poorly enforced regulatory standards–these all contribute to a high risk environment. (WHO., 2015)**.**

2.3 Consequences of Improper Food Handling Practice

Since, food is essential to life people have the right to expect that the food they eat is safe and sensorial and ethically suitable for consumption. If the food is abused or contaminated it can cause illness and even death; Thee are also other economic and social consequences.

Food spoilage is wasteful, costly and can adversely affect trade and consumer confidence. The globalization of the food trade offers many benefits to consumers. At the same time, these changes present new challenges to food safety. A single source of contamination may become

widespread, with global consequences. And food borne diseases not only significantly affect people's health and well-being, but they also have economic consequences for individuals, families, communities, businesses and countries. (WHO, 2013)

2.3.1 Food Borne Disease

Food is an essential for the survival of creatures in the planet. Food borne diseases (FBD) have emerged as a major public health problem worldwide and encompass a wide range of illnesses caused by ingestion of foodstuffs contaminated with microorganisms or chemicals (Ameme, *et al.*, 2016). And unconditional contamination of food during large scale cooking, leads to food-borne disease outbreaks which can cause danger to the health of consumers and economic consequence for nations (Annor *et al.*, 2011). Even Though this disease can be prevented FBD, remain an important cause of morbidity and mortality, resulting a major public health challenge throughout the world. (Byrd-Bredbenner *et al.*, 2013).

In developed countries, the percentage of the population suffering from food borne diseases annually has been reported to be up to 30%.The population in developing countries is more susceptible to suffer from food borne illnesses because of multiple reasons, including lack of access to clean water for food preparation; inappropriate transportation and storage of foods; and lack of awareness regarding safe and hygienic food practices (WHO, 2014). And the most common FBD are acute food poisoning, typhoid, cholera, helminthiasis etc. having the most common symptoms which range from mild gastritis, bloated abdomen, loose stools, vomiting, ever to complications like severe dehydration , intestinal perforation even death.(George *et al.*, 2018).

Country	**Commodity**	**Hazard**	**Portion of Unsafe food**
Ethiopia	Vegetables	Heavy metals	Average lead concentration> limits
Ghana	Vegetables	Fecal bacteria	100% > limits
Chile	Leafy Vegetables	Pesticides	27% > limits

Country	Commodity	Hazard	Portion of Unsafe food
Ethiopia	Milk	Aflatoxins	92% > EU Standards
Cote d'ivoire	Milk	Specific microbes	30% >IS
India	Milk	Coliforms	100% > IS
India	Pork	Entero bacteriaceae	89% > IS
Nigeria	Beef	Total aerobic count	98% >IS
Kenya	Maize	Aflatoxins	51% > Kenya limit (20 ppb outbreak year 16 % normal in year
Ghana	Weaning Food	Aflatoxins	83% < Ghana limit(ppb)

Table 1 Example of hazard surveys in DC

Source: Food safety in developing countries research gaps & opportunities

2.3.2 Food Waste

Although it is difficult to clearly identify and put the extent to which the foodservice industry contributes to food waste, its part is undoubtedly significant. As the hospitality and food service industry develops, more and more food waste is produced.

Food waste, which is defined as the loss of food managed at the level of the foodservice industry and households (Gustavsson *et al.*, 2011). The European Commission estimates that between one-third and one-half of all food produced in the world is lost or wasted (i.e., up to 2 billion tonnes of food).

This proves that the foodservice produces about 12% of total food waste (53% households, 19% food industry). It has been estimated that Italian restaurants are the source of about 21% of total food waste. in Western Australia, hotels generate 4377 tons of food waste per day. Food waste in foodservice establishments is generated during storage and processing in the cooking facilities,

in the dispatch section (buffet), and in the consumer room in theform of so-called leftovers (Bilska *et al.*, 2020).

The foodservice sector is subject to increasing controls related to food management and, in particular, food waste, due to the disposal of large quantities of food during preparation and storage and the impossibility to reuse prepared but unsold food (Betz *et al.*, 2015, Hall *et al.*, 2013 & Silvennoinen *et al.*, 2015). According to Parfitt et al. (Parfitt *et al.*, 2010), the focus should be on avoidable hospitality food waste as food becomes waste due to improper transport, storage, or preparation techniques (Heikkilä *et al.*, 2016).

In general food waste in the foodservice industry is significant in terms of its scale, its financial losses and its negative impact on the global ecosystem (Hu *et al.*, 2013). Indeed, a reduction of this phenomenon is necessary, but also extremely difficult.

2.3.4 Economic Loss

The potential impact of food safety outbreaks on a food business or a company can be overwhelming. A single event of a foodborne disease outbreak can bring unimaginable economic losses. (Hussain *et al.*, 2013). Economic analysis of food safety related costs showed that it is much cheaper for a producer to invest in preventing events of foodborne outbreaks than the cost after an event (Ribera *et al.*, 2012).

There are many reasons for these companies to improve the safety of their products:

- To avoid financial loss due to loss of business.
- To avoid unexpected expenses on recalls, disposal, and penalties.
- To avoid legal costs due to foodborne outbreaks.
- To maintain the reputation of the company.
- To maintain consumer's confidence and loyalty.
- To meet government regulations and standards.
- To ensure supply of safe food products.

It is important that small producers understand the need to have a risk assessment and a plan of how they will handle such an incident/ food outbreaks

Year	Contamination/Food Product	Estimated Economic Loss	Region/Country
2013	Clostridium botulinium/whey concentrate	Unknown	New Zealand
2009	Salmonella/Peanut products	$70 million	USA
2008	Salmonella/Tomatoes	$250 million	USA
2008	Mad cow disease/Peanut butter	$117 million	USA
2007	Salmonella/Peanut butter	$113 million	USA
2006	E.coli/Spinach	$350 million	USA
1992	E.coli/Hamburgers	$ 160 million	USA

Table 2 World examples of some expensive food outbreaks

The economic implications of an outbreak are very serious and may cause the closure of an individual company and long lasting damage to a particular sector of the food industry therefore it is important the food companies promoting food safety by working with governmental agencies.(Hussain & Dawson ., 2013).

2.4 Food Safety Methodologies

The World Health Organization (WHO) indicated that each year as many as 600 million people in the world fall ill of which 420,000 die after consuming contaminated food (Adane *et al*., 2018). Pathogens may appear in food, for instance, through unsafe farm practices, contamination during manufacturing, packaging, or distributing, or contamination in stores (Insfran-Rivarola *et al.,* 2020).

To fight the battle against foodborne diseases, governments have resorted to strategies including food regulations and laws to monitor compliance with food safety standards (Shea *et al.*, 2017). Additionally, food companies rely on food safety methodologies, including the food Good Manufacturing Practices (GMP), Good Hygienic Practices (GHP), the Good Agricultural Practices (GAP), Good Storage Practices (GSP), the Hazard Analysis and Critical Control Points (HACCP) system, and the ISO 2000 standard to assure the safety of their food products (Kotsanopoulos *et al.*, 2017)

2.4.1 Good Agricultural Practices

Today, increasing attention is focused upon the impact farming practices are having on the environment, and there is an increasing emphasis on more sustainable methods of crop production. Systems need to be adopted that are more sensitive to environmental issues, genetic diversity, wildlife and their habitats and in some cases the social structures of rural communities. Furthermore, consumers around the world are more sophisticated and critical 18 Significance, Prevention and Control of Food Related Diseases than in the past, demanding to know how and what has been used to produce their agriculturally derived products.(Uçar *et al.*, 2016).

Good Agricultural Practices (GAP) are defined "practices that address environmental, economic and social sustainability for on-farm processes, and result in safe and quality food and non-food agricultural products" by the FAO.(FAB., 2003) The aims of the GAP are as follows.

- Ensuring agricultural production harmless to environment, human and animal health
- Safety of natural resources,
- Ensuring traceability and sustainability in agriculture,
- Improving workers health and working conditions,
- Ensuring safety and quality of produce in the food chain.

Rising incomes, mobility and worldwide incidents involving food and agriculture have given rise to the demands to know how food is produced and to be assured of its safety and quality(Ko., 2010). And an integrated approach to controlling food safety throughout

the entire food supply chain from farm to table has become an important issue.(König., 2010 and Traill *et al*., 2010).

2.4.2 Good Manufacturing Practices

Good Manufacturing Practice standard provides the most basic requirements to ensure food safety through control of hygiene in the food establishment and these standard principles and practices are called good manufacturing practices (GMPs). They are sanitary and processing requirements applicable to all food processing establishments. Good manufacturing practices provide a set of regulations, codes and guidelines that control the operational conditions within the food establishment allowing a safe food production. These requirements cover design and facilities of the establishment, hygienic processing establishment of hygiene in the premises, personnel hygiene and health of employees, transportation, product information and documentation and food safety training.(Mendis., 2016).

Conformity with practice codes, norms, regulations, and legislation pertaining to the production, processing, handling, labeling, sale, transportation and distribution of food, issued by sec-torial, local, state, national, and international bodies to protect the public from diseases, product adulteration, and fraud (Lawrence *et al*., 2019).

2.4.3 Good Hygienic Practices

Hygiene is a set of practices performed for the preservation of health. Hygiene refers to conditions and practices that help to maintain health and prevent the spread of disease. Some regular hygienic practices may be considered good habits by a society while the neglect of hygiene can be considered disgusting, disrespectful or even threatening. Food hygiene is concerned with the hygiene practices that prevent food poisoning. Food hygiene consists of several principles adopted to ensure food safety and to protect food from any chemical, microbiological or other type of contamination that can render it unfit for human consumption, to prevent the spread of communicable diseases associated with food and food processing and also to ensure that consumers of food are not fraudulently treated(WHO., 2011).

All food handlers are legally obliged to comply with the health and hygiene requirements set out in the food safety standards. And all consumers have the right to expect safe, hygienically prepared and good quality food. Therefore GHP are the set of requirements to prevent contamination of food in order to provide safe food to the consumers.(WHO., 2013).

2.4.4 Good Storage Practices

Good Storage Practice consists of practical procedures and processes that ensure appropriate handling of foods, regarding implementation and control of product storage in accordance with a defined regime prior to their use. Food storage depends on the type of food to be stored. Foods that require no refrigeration or freezing should be stored in a place that is cool, dry, ventilated, clean, and at a distance of at least 15 cm (5.9 in) from the walls, ceiling, and ground level. Shelves and platforms should be used to support raw materials. All these measures help to prevent the occurrence of rodents and insects (Lawrence *et al.,* 2019).

2.4.5 Hazard Analysis Critical Control Point

A HACCP is a food process control system developed in the early 1970s to ensure the safety of foods for the United States space program. Since the 1970s HACCP has evolved into a recognized means to assure the safety of foods throughout the food industry both within the United States and elsewhere. Based on the principle of prevention rather than detection, HACCP has been extensively and successfully used in the low-acid canned food industry in the early 1970s. Since that time, HACCP has achieved greater prominence with a refinement of its principles and the application in other processes and products. And this system has been gazette as part of the food stuffs, cosmetics and disinfectants act which includes biological, chemical or physical hazards.

Rise in the number of occurrence of food borne diseases, media reporting of several food-related events undermining public trust, and increased concern on the importation of contaminated food and feed due to trade liberalization. As a result, many countries have reinforced their regulatory requirements and introduced new guidelines for food safety management based on Hazard Analysis Critical Control Points (Motarjemi, 2014).

Any company involved in the manufacturing, processing or handling of food products can use HACCP to minimize or eliminate food safety hazards in their product and This legislation covers 12 sectors and their categories of food-handling enterprises, including food preparation and catering (from caterers to restaurants) and street-vended foods. (Fuller, 2007).

The European Union introduced a regulation in January 2006 requiring all food businesses to implement a 'food safety system based on HACCP principles' in an attempt to eliminate individual national amendments. (Bas *et al.*, 2007) and this system can be applied throughout the food chain from primary production to final consumption and its implementation should be guided by scientific evidence of risks to human health. As well as enhancing food safety, implementation of HACCP can provide other significant benefits. In addition, the application of HACCP systems can aid inspection by regulatory authorities and promote international trade by increasing confidence in food safety (Walker *et al.*, 2003).

Although most developing countries have adopted HACCP approaches to food safety, which are considered best practice, they have only been able to implement these for exported food and (to a limited extent) in some larger, formal sector agro-industries. This is not surprising given the failure of most small and medium companies (Taylor 2008).

Principles of the HACCP System

The HACCP system consists of the following seven principles:

PRINCIPLE 1 Conduct a hazard analysis: - Identify potential hazards associated with a food and measures to control it. The hazard could be biological, such as a microbe; chemical, such as a toxin; or physical, such as ground glass or metal fragments.

PRINCIPLE 2 Determine the Critical Control Points (CCPs):- These are points in a food's production—from its raw state through processing and shipping to consumption by the consumer—at which the potential hazard can be controlled or eliminated. Examples are cooking, cooling, packaging, and metal detection.

PRINCIPLE 3 Establish critical limit(s):- Critical limits must be specified and validated for each Critical Control Point. In some cases more than one critical limit will be elaborated at a

particular step for a cooked food, for example, this might include setting the minimum cooking temperature and time required to ensure the elimination of any harmful microbes.

PRINCIPLE 4 Establish a system to monitor control of the CCP: - Monitoring is the scheduled measurement or observation of a CCP relative to its critical limits. The monitoring procedures must be able to detect loss of control at the CCP. Further, monitoring should ideally provide this information in time to make adjustments to ensure control of the process to prevent violating the critical limits.

PRINCIPLE 5 Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control: - for example, reprocessing or disposing of food if the minimum cooking temperature is not met.

PRINCIPLE 6 Establish procedures for verification to confirm that the HACCP system is working effectively: - for example, testing time-and-temperature recording devices to verify that a cooking unit is working properly.

PRINCIPLE 7 Establish documentation concerning all procedures and records appropriate to these principles and their application: - This would include records of hazards and their control methods, the monitoring of safety requirements and action taken to correct potential problems

For all types of food business, management awareness and commitment is necessary for implementation of an effective HACCP system. The effectiveness will also rely upon management and employees having the appropriate HACCP knowledge and skills. (Walker *et al.*, 2003).

2.4.6 ISO 22000

Food safety rules have a long track record. Food laws can be traced back to the earliest societies. Since the 1990s there has been an increase in food standards. Companies around the world are using quality assurance systems to improve their product and production processes

ISO was born from the union of two organizations – the ISA (International Federation of the National Standardizing Associations), established in New York in 1926, and the UNSCC (United Nations Standards Coordinating Committee), established in 1944. In

October 1946, delegates from 25 countries, meeting at the Institute of Civil Engineers in London, decided to create a new international organization, of which the objective was to "to facilitate the international coordination and unification of industrial standards." The new organization officially started to work on February 23, 1947 (ISO, 2009).

On national and international levels many government laws and regulations on quality and safety of food have also been established through public standards, which tend to focus primarily on risks due to food hazards (Trienekens and Zuurbier, 2008).

Food safety hazards can occur at any stage of the food chain, adequate control throughout the food chain is essential (Jevšnik *et al.*, 2008). Food safety is ensured only then through combined efforts, when all the parties are participating in the food chain (ISO 22000:2005,2005). The food chain consists of an entire sequence of stages and operations involved in the creation and consumption of food products. This includes every step from initial production to final consumption.

The food chain also includes organizations that do not directly handle food. These include organizations making feed for animals that produce food and for animals that will be used as food. It also includes organizations making materials that will eventually come into contact with food or food ingredients, such as equipment and package materials and cleaning agents (ISO 22000:2005, 2005).

ISO 22000 Standards are developed primarily with the aim of making the materials, products, procedures and services fit for purpose and it can help ensure the safety of its products, because it applies to all organizations in the food chain and it does not matter how complex the organization is or what size it is (ISO 22000:2005, 2005).

ISO 22000 defines the requirements for a FSMS that combines the following generally recognized key elements to ensure food safety along the food chain from production to consumption (ISO 22000:2005, 2005)

- Interactive communication
- System management;
- prerequisite programs;

- HACCP principles

The aim of this standard is to harmonize on a global level the requirements for food safety management for businesses within the food chain and to provide a practical approach to ensure the reduction and elimination of food safety hazards as a means to protect consumers. (ISO 22000:2005, 2005).

2.5 Other Food Safety Measurments

2.5.1 WHO Five Key's To Safer Food

As the food industry expands with its increased challenges related to globalization, urbanization, international travel, farming practices, environmental pollution, and emerging and reemerging pathogens, steps need to be taken to reduce food-borne disease outbreaks and curtail costs. (Thelwell-Reid *et al.*, 2014). The World Health Organization (2013) with an intended mission to prevent the incidence of foodborne illness provides a simple guide to follow when preparing and serving food to others. The steps known as the "Five Keys to Safer Food" are: Keep clean; Separate raw and cooked; Cook thoroughly; Keep food at safe temperatures; Use safe water and raw materials. (WHO., 2013). Nowadays, food safety is a vital issue that has to be taken into consideration when talk about public health (Shahid *et al.*, 2012).

Safety includes the processing and storage of food as well as knowledge, attitudes and practices of food handlers, regarding this aspect. (George *et al.*, 2018)

In 2001, WHO introduced the Five Keys to Safer Food.

1) Keep clean,

2) Separate raw and cooked food,

3) Cook food thoroughly,

4) Keep food at safe temperatures, and

(5) Use safe water and raw materials (WHO 2006).

The Five Keys to Safer Food promotes safe practices by all food handlers, including those in developing countries, and are adaptable for different target audiences around the world based on local situations

Figure 1 WHO five key to safer food

Source: food safety world Health Organization

2.5.2 Food Safety Training (education)

Restaurants have been associated with outbreaks of foodborne disease As a result; most public health agencies require food safety certification for restaurants as well as the workers. Certification is done by inspecting the food safety management systems employed in the operations of the restaurants. (Osei-Tutu., 2018). And Effectiveness of food hygiene training programs is generally measured by change in food safety knowledge, food hygiene practice, or food violations detected through observation/inspection.

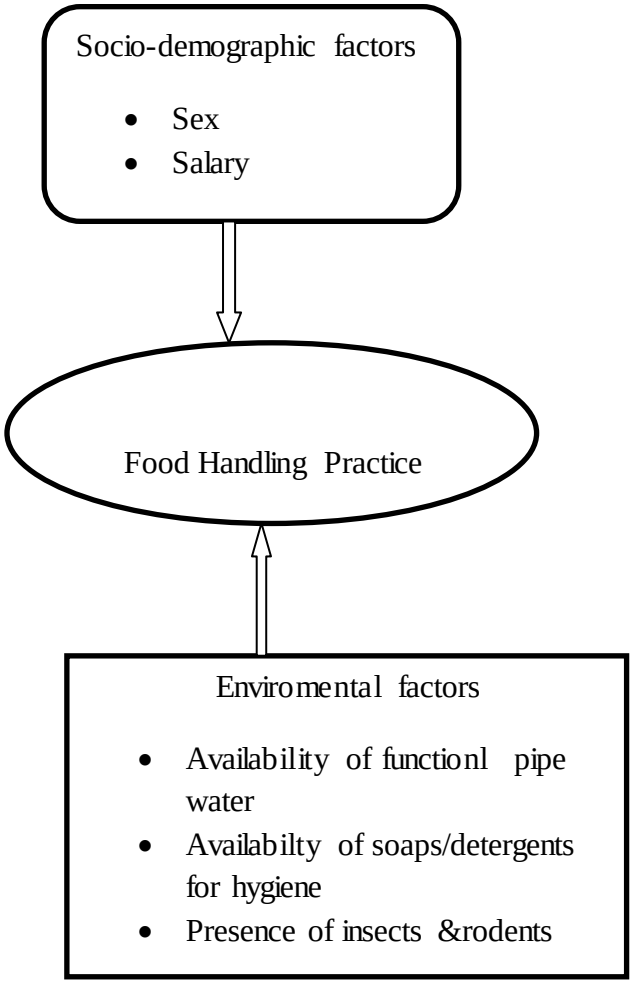
Food safety education (FSE) provided during routine inspections is also a primary approach to support safe food handling practices and compliance with regulations at FSEs Several studies have been conducted to test the effectiveness of these training programs. (Thelwell-Reid *et al*., 2014).Various studies showed that managers' knowledge and training about hygiene and sanitation have a direct influence on the overall sanitary condition of establishments. They play a vital role by ensuring availability and cleanliness of sanitary facilities, proper waste management and food safety practices (Olumakaiye *et al*., 2013; Boro *et al*., 2015).

2.5.3 Food Law & Regulation System

In developing countries, where there is a poor regulatory system for food hygiene, food handlers are appointed in food and drinking establishment centers without investigating their health status for the common intestinal parasitic infection (IPIs) (Mudey et al., 2010). Thus, investigating the presence of knowledge gap on food hygiene and safety among street food vendors and food handlers of food establishments is a key step for proper planning and implementation of targeted interventions (Adane *et al*., 2018). Although Food laws and regulations attempt to protect the health of consumers (Amaami *et al*., 2017) majority of the developing countries have limited capacity to implement rules and regulations regarding food safety. Also, there is lack of effective surveillance and monitoring systems for food borne illness, inspection systems for food safety, and educational programs regarding awareness of food hygiene (WHO, 2014). And Types of food safety enforcement may range from verbal and written warning to monetary fines and closure. (Lee, 2013).

2.6 Conceptual Framework

Figure 2: Food handling practice and its associated factors



3. Methods and Materials

3.1 Study Design

The study was institution based cross-sectional study which conducted in three food establishments (cafeteria, restaurants and non-stared hotels) in Yeka sub city, A.A.

3.2 Study Area

The study was conducted from May 21**,** 2019 to August 15, 2019 in Yeka sub city, A.A, Ethiopia. This sub-city is located in the North east part of the capital city, A.A which covers 85.98 km^2 of the total area. The total population of the sub city is and 368,418 and the sub city is comprised of a total of 13 woredas (Office of the Mayor, Addis Ababa (2017). Majority of the people live in the city are below standards (88%) (UN-HABITAT., 2003). According to Yeka Sub City Food, Medicine and Health Care Administration and Control Office there are 288 registered food establishments in Yeka sub city (70 cafeterias, 90, Restaurants and 128 non-stared hotels). The map of the sub-city in Ethiopia has shown in figure three below.

Figure 3 Map of Yeka Sub-City

3.3. Source of Population

By identifying the food handlers (main and assistant chefs) working in Cafeteria: 69, Restaurants: 89 and in non-stared Hotels: 126; therefore a total of 284 food handler in the sub city were used as a source population in Yeka sub city of A.A.

3.5 Study Population

All food handlers (main and assistant chefs) working in the three food establishments including, cafeterias (69 food handlers) restaurants (89 food handlers) and non-stared hotels (126 food handlers) from Yeka sub city were used as a source population.

3.6 Inclusion and Exclusion criteria

Inclusion

All Food handlers involved in food preparation (main and assistant chefs) who were available during the time of data collection and willing to participate, works in the food establishments (cafeteria, restaurants and non-stared hotels) in Yeka sub city, A.A were included in the study.

Exclusion

Food handlers who have worked less than 6 months in the food establishments were excluded from participation in the study.

3.7 Operational Definitions

Food handler: Is the one who works in a food and drink 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.

Food establishment: Is a place where food is prepared and intended for individual portion service and includes the site at which the individual portions are provided, whether consumption occurs on or off the premises.

Non-stared hotel: is an establishment rendering a bed room service other than serving foods, both alcoholic and non-alcoholic drinks, cakes and recreational facilities and it is below star.

Food safety knowledge level: respondents who scored less than 70% of their response to the total food safety knowledge related questions were considered as having a poor level of food safety knowledge. Those who score equal to or greater 70% were considered as having a good knowledge level.

Food handler's attitude level: respondents who scored less than 70% of their response to food handling attitude related questions were considered as having negative attitude and those who scored equal to as or more than be considered as having a positive attitude level.

Safe food handling practice level: respondents who scored less than 70% of their response to the total food hygiene practice-related questions were considered as having poor level of practices. Those who score equal to or more than 70% were considered as having a good practice level.

3.8 Variables

Dependent Variable: - Practice of Proper food handling

Independent Variable:-

- Sex
- Salary
- Availability of functional water pipe
- Availability of soap for hand washing
- Presence of insects/rodents

3.9 Sample Size Determination

The sample size was determined using single population proportion formula considering 0.05 margin of error, 78% proportion (P) of food handling practice in food establishments (food handlers who covered hair during food preparation) (Kibret M *et al*., 2012) and 10% of non-response rate.

$$n = \frac{(Z\alpha/2)2 * P(1-p)}{d^2}$$

Where:-

n is the total number of food handlers that are found in Yeka Sub-City

Z is the critical value for a given confidence interval (1.96)

d is the margin of error (5%)

P is the prevalence of The Sanitary Conditions of Food Service Establishments and Food Safety Knowledge and Practices of Food Handlers in Bahir Dar Town was 78%(0.787).

$$n = \frac{(1.96)^2\ 0.787(1-0.787)}{(0.05)^2}$$

n= 258

By adding 10% non-response rate = **26**

n=258+26

n=284

3.10 Sampling Technique

The total final sample size used in the study was 284. Food establishments were stratified into cafeterias, non-stared hotels and restaurants based on the service they provide for consumers, following Yeka Sub City Food, Medicine and Health Care Administration and Control Office, food establishment's classification system. The numbers of food handlers from each food establishments were proportionally allocated and 69, 89 and 126 from cafeterias, restaurants and non-stared hotels were enrolled in the study respectively. Simple random sampling was followed to reach 284 food handlers from each establishment.

Sample size for all establishments (SSE) = Total number of Establishment (TE)

? = from number of each establishment

Based on the above relations, number of food handlers (Sample size) for

Cafeteria =284*70/288=69

Restaurants=284*90/288=89

Hotels=284*128/288=126

.

3.11 Data Collection Procedure

The food safety knowledge attitude and practices of food handlers were collected using a pre-tested structured-questionnaire through face to face interview. The questionnaire was developed from previous studies conducted (Gebremariam B *et al*., 2019, Chekol FA *et al*., 2019, Akabanda F *et al*., 2017 and , Tessema AG *et a*l., 2014). Additionally, observation checklist was employed for collecting data on the food handling practice of food handlers and hygiene status of the food establishments. The questionnaire was first prepared in English, translated into local language Amharic and back translated into English to confirm the consistency of the data. Data was collected by,5 Bachelor of Science nurses/Food Science and Nutrition professionals who have experience in data collection and 2 supervisors of Master of Science in Food Science and Nutrition who daily checks the completeness of the questionnaires. A two day intensive training was conducted before the pretest. A pretest structured questionnaire was employed in 5% of the sample size in randomly selected sub city (not part of the study site).

The questionnaire was comprised of five parts, the first part assessed the socio-demographic characteristics of food handlers including age, sex, educational status, and work experience. The second part evaluated the food safety knowledge of food handlers which include knowledge on; transmission of food borne diseases, personal health and hygiene, cross-contamination and temperature control. The third and fourth part assessed attitude (using likert scale) and food handling practice of food handlers. Furthermore, the fifth part was observational checklist used to assess food handling practice of food handlers and hygiene status of the food establishments.

Respondents, who answered 70% and above out of 25 questions regarding for knowledge and 22 practice questions were considered as having good knowledge and practices but below 70 % were poor knowledge and practices respectively. Additionally, respondents who answered 80%

and above out of 8 questions administered for attitude were considered as having good attitude however, below 80% were poor attitude as described in Chekol *et al.* (Chekol FA *et al.*, 2019).

3.12 Data Management

The principal investigator was closely observed and coordinates the overall of the study and data quality was checked by regular supervision and reviewing the completeness and consistency of questionnaires on daily basis.

3.13 Data Analysis

Data were coded, entered in to Microsoft Excel sheet and exported for analysis using SPSS (Statistical Package for Social Sciences) version 20 software. Continuous variables were expressed as mean and standard deviation but, categorical variables were expressed in frequency and percentages. Additionally, determinants significantly associated with food handling practices of food handlers were analyzed using multivariate logistic regression using adjusted odds ratios (AORs) with 95% confidence intervals (CIs) at P less than 0.05. Binary logistic regression analysis were employed and factors with P value less than or equal to 0.25 were selected for multivariate logistic regression analysis.

3.14 Ethical Consideration

The study was conducted after obtaining ethical clearance from Institutional Review Board of College of Natural and Computational Sciences, Addis Ababa University (IRB-CNCSs, AAU) on May 14, 2019 with Reference number CNSDO/667/11/2019. Before starting the data collection the objectives, possible risks and benefits of the study for the food handlers and the rights and responsibilities of the participants were clearly described to obtain verbal informed consent.

4. RESULTS

4.1 Socio Demographic Characteristics Of Respondents

The socio-demographic characteristics of food handlers are presented in Table 1. From 284 food handlers, 195 (68%) were main chefs and 89 (31.3%) were assistant chefs. Regarding the food establishments 94 (33.1%) were cafeterias, 94 (33.1%) were restaurants and 96 (33.8%) were non-stared hotels with 100% response rate. From the total food handlers, 239 (84.2%) were females and 45 (15.8%) were males. It was observed that a mean age of the respondents were 26.01, ranging from 17 to 45 years. Most food handlers, 107 (37.7%) were in the age group 22-25, followed by 74 (26.1%) who were in the age group 26-29. However, respondent below 18 years was 1 (0.4%). Regarding the education status of the food handlers, most of them finalized primary education 117 (41.2%) and 31 (10.9%) were illiterate (they can read and write). However, only 114 (40.1%) had taken food safety training. The study result showed that mean work experience of food handlers were 1.81 years, nearly all 282 (99.3%) had worked below 10 years. The average monthly income (salary in Birr) of food handlers were 2070.42 and most of the food handlers earned more than 1500 birr per month. Concerning the marital status of food handlers, the study result revealed that most of food handlers were single 193 (68.0%).

Table 3 Socio demographic characteristics of the food handlers

Variables	Category	Frequency (n)	Percent (%)	Mean± SD
Sex	Male	45	15.8	
	Female	239	84.2	
Age (years)	<18	1	0.4	
	18-21	45	15.8	
	22-25	107	37.7	26.0 ± 5.01
	26-29	74	26.1	
	>29	57	20.1	

Variables	Category	Frequency (n)	Percent (%)	Mean± SD
Education	Illiterate	31	10.9	
	Primary	117	41.2	
	Secondary	86	30.3	
	Diploma	50	17.6	
Work experience (years)	<2	114	40.1	
	2-4	121	42.6	
	5-7	40	14.1	1.8 ± 0.8
	8-10	7	2.5	
	>10	2	0.7	
Marital status	Single	193	68	
	Married	85	29.9	
	Divorced	4	1.4	
	Widow/Widower	2	0.7	
Responsibility	Main chef	195	68.7	
	Assistant chef	89	31.3	
Monthly income (in Birr)	500-1000	49	17.3	
	1001-1500	50	17.6	2070.4±894.6
	>1500	185	65.1	
Food safety and hygiene	Yes	114	40.1	
training	No	170	59.9	
Type of food establishments	Cafeteria	94	33.1	
	Restaurant	94	33.1	
	Non-stared hotel	96	33.8	

4.2 Food Safety Knowledge of Food Handlers

Majority of respondents 261 (91.9%) knew that FBD caused by pathogens (bacteria, virus). However, 125 (44%) of food handlers did not know that healthy people can cause illness by carrying disease causing pathogens. Moreover, the study revealed that only half of the respondents, 143 (50.4%) knew about the presence of harmful microbes in canned food. Regarding food handlers' knowledge on personal hygiene, all food handlers 284 (100%) knew about washing hands after using toilet, touching of different body parts and sneezing is vital. However, most food handlers 238 (83.8%) didn't know that washing hands only with water after handling raw meat was not enough. Besides, 95 (33.5%) respondents didn't know handling of cooked food after handling of raw food if there is wearing of glove is not appropriate.

Concerning the food handlers' knowledge on cross-contamination, all food handlers 284 (100%) knew that utensils like cutting boards, meat slicers, and knifes needs to be sanitized before every use. However, 100 (35.25%) of food handlers didn't know foodborne disease can be caused by storing cooked and raw foods in the same refrigerator. Nearly all of food handlers 280 (98.6%) knew about unsafe food can be a cause of food contamination. The study also showed knowledge of food handlers towards temperature control. The present study showed that food handlers incorrectly answered that holding foods hot should be at 60° C or above were 95 (33.5%). Moreover, 60 (21.1%) food handlers did not know about temperature danger zone. Overall food handlers with good knowledge of food safety were poor 6 (2.1%), that means the proportion those who answered greater than or equal to 70% of the assessment in knowledge section.

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Table 4 Food safety knowledge of food handlers

Statements for knowledge assessment	Response n (%)		
	Correct	Incorrect	Don't know
Food borne disease can be caused by either by bacteria or virus	261 (91.9)	18 (6.3)	5 (1.8)
Raw meat always has microbes on the surface	137 (48.2)	62 (21.8)	85 (29.9)
Canned foods may have harmful microbes	143 (50.4)	52 (18.3)	89 (31.3)
Healthy people can cause illness by carrying germs to food	111 (39.1)	48 (16.9)	125 (44.0)
Lettuce and other raw vegetables might have harmful microbes	280 (98.6)	2 (0.7)	2 (0.7)
Cooked foods do not have microbes	97 (34.2)	13 (4.6)	174 (61.3)
You can prepare food with a wound on hand, given the wound is covered with a bandage	75 (26.4)	11 (3.9)	198 (69.7)
It is enough to wash the hands with water alone after handling raw meat	238 (83.8)	3 (1.1)	43 (15.1)
After using the toilet, we should always wash hands with soap and water	284 (100)	0 (0)	0 (0)
Hands should be washed if touching of body parts happen	284 (100)	0 (0)	0 (0)
When wearing gloves, you can handle cooked foods after handling raw meat	157 (55.3)	32 (11.3)	95 (33.5)
Wearing clean uniform and cap while cooking or serving is necessary	282 (99.3)	2 (0.7)	0 (0)
Hands should be properly washed after sneezing or blowing your nose	284 (100)	0 (0)	0 (0)
Foodborne disease can result from storing raw meat and cooked foods in the same refrigerator	89 (31.3)	95 (33.5)	100 (35.2)
Foods can be contaminated with microbes by coming in contact with unsafe foods	280 (98.6)	2 (0.7)	2 (0.7)
Dish drying towel can be a means for causing food borne disease	162 (57.0)	30 (10.6)	92 (32.4)
Ready to eat foods (e.g. FVs) can be prepared on the same cutting board used to prepare meat	250 (88.0)	2 (0.7)	32 (11.3)
Cutting boards, meat slicers and knifes should be sanitized after each use	284 (100)	0 (0)	0 (0)
Foods that need to be kept hot should be at 60° C or above	147 (51.8)	95 (33.5)	42 (14.8)
Leftovers should be reheated to a minimum temperature of 75°C	122 (43.0)	110 (38.7)	52 (18.3)
Foods should be cooled slowly at room temperature before storing in refrigerator	15 (5.3)	0 (0)	269 (94.7)
Refrigeration kills all bacteria that might cause foodborne illnesses	100 (35.2)	67 (23.6)	117 (41.2)
Frozen foods should not be thawed on the counter or in the sink	16 (5.6)	151 (53.2)	117 (41.2)
After thawing, meat should not be held for 5 hours at room temperature	85 (29.9)	73 (25.7)	126 (44.4)
Foods stored at 40°F are being held in the temperature danger zone	113 (39.8)	111 (39.1)	60 (21.1)

4.3 Attitude of Food Handlers towards Food Safety

Table 5 summarizes attitude of food handlers towards safe food handling. Most of food handlers had positive attitude to safe food handling. Likewise, 85 (29.9%) of the respondents did strongly agree on temperature controls as an effective means for reducing food poisoning. Regarding to food safety training, 182 (64.1%) food handlers agreed that food handlers should got food safety training. Moreover, 153 (53.9%) food handlers agreed that lack of food safety training affects food handling practices. Additionally, 168 (59.2%) food handlers agreed that lack of supervisor commitment affects safe food handling practice. In general, 246 (86.6%) of the food handlers had good attitude in safe food handling practice.

Table 5 Food handler's attitude on food safety

Statements for attitude assessment	Response n (%)				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Temperature controls are an effective method of reducing the number of cases of food poisoning	5 (1.8)	7 (2.5)	8 (2.8)	179 (63.0)	85 (29.9)
Checking the expiry date of ingredients should always be obligatory before preparing dish	0 (0)	0 (0)	3 (1.1)	170 (59.9)	111 (39.1)
All food handlers should have a food safety training qualification	0 (0)	4 (1.4)	5 (1.8)	182 (64.1)	93 (32.7)
Lack of food safety training affects safe food handling practice	8 (2.8)	24 (8.5)	13 (4.6)	153 (53.9)	86 (30.3)
Unavailability of food handling guideline can affect food handling practice	4 (1.4)	21 (7.4)	13 (4.6)	178 (62.7)	68 (23.9)

Insufficient dry and wet storage can affect food handling practice	2 (0.7)	8 (2.8)	2 (0.7)	198 (69.7)	74 (26.1)
Having one handmade (fabric) towel is enough for dish washing	111 (39.1)	144 (50.7)	1 (0.4)	27 (9.5)	1 (0.4)
Lack of supervisor commitment affect safe food handling practice	13 (4.6)	32 (11.3)	7 (2.5)	168 (59.2)	64 (22.5)

4.4 Safe Food Handling Practice of Food Handlers

Table 6 shows self-reported results of safe food handling practices of food handlers. Food handlers always practiced washing of hands after touching unwrapped or raw foods were 244 (85.9%). However, 125 (44%) food handlers never practiced washing hands after using gloves. The present study showed that, 200 (70.4%) food handlers never practiced checking of refrigerator temperature using thermometer. The study result also revealed that 201 (70.8%) of food handlers always practiced medical checkup assigned by the food establishments and 185 (65.1%) of the respondents always got sick leave for any sickness. Most food handlers practiced covering head by hair restraint when serving food 272 (95.8%) and most did not practiced wearing jewelers when serving food 258 (90.8%).

Table 6 Self-reported safe food handling practices of food handlers

Statements for safe handling practices assessment	Response n (%)		
	Always	Sometimes	Never
Do you wash your hands after touching un wrapped raw foods?	244 (85.9)	35 (12.3)	5 (1.8)
Do you use separate utensils when preparing raw and cooked foods	188 (66.2)	94 (33.1)	2 (0.7)
Do you not thaw frozen foods at room temperature	91 (32.0)	146 (51.4)	47 (16.5)
Do you check the expiry dates of all products	142 (50.0)	82 (28.9)	60 (21.1)
Do you use a thermometer to check temperature of refrigerator	33 (11.6)	51 (18.0)	200 (70.4)
Do you have medical checkup assigned by the food establishment	201 (70.8)	76 (26.8)	7 (2.5)
Do you get sick leave for any sickness	185 (65.1)	98 (34.5)	1 (0.4)
Do you use gloves when serving unwrapped food	60 (21.1)	97 (34.2)	127 (44.7)
Do you wash your hands before using gloves?	122 (43.0)	127 (44.7)	35 (12.3)
Do you wash your hands after using gloves?	146 (51.4)	13 (4.6)	125 (44.0)
Do you wash your hand before touching cooked foods	239 (84.2)	45 (15.8)	0(0)
Do you wear a hat or head covering when serving food	272 (95.8)	12 (4.2)	0(0)
Do you wear jewelry when serving food?	10 (3.5)	16 (5.6)	258 (90.8)
Do you disinfect cutting boards after each use	278 (97.9)	6 (2.1)	0(0)
Do you sanitize utensils after washing them	284 (100)	0(0)	0(0)

4.5 Hygiene Practices of Food Handlers, Sanitation and Hygiene Status of Food Establishments

Observed food safe food handling practices of food handlers revealed that 212 (74.6%) of food handlers had no long nails, 117 (41.2%) wear clean uniform, 250 (88%) did wear head cap. In addition, half of the respondents 142 (50%) did not wear jeweler, 276 (97.2%) did not sneeze/coughed over uncovered food, 115 (40.5%) washed hands before and after handling food, 269 (94.7%) did not work while having nose discharge (Table 7). However, 233 (82%) food handlers worked while having cut/skin problem and 84 (29.6%) used same chopping board for raw and cooked food without cleaning. Likewise, observed sanitation and hygiene status of food

establishments showed that 249 (87.7%) had have functional piped water for both food handlers and customers and 146 (51.4%) had available soap (detergents) for hand washing but, only 34 (12%) food establishments used three compartment dish washing system. Food establishments with separate dressing room for both women and men food handlers were 184 (64.8%). Regarding food safety/hygiene guideline, only 16 (5.6%) of food establishments had food safety/hygiene guidelines. Moreover, 265 (90.1%) of food establishments kitchen had insects/rodents. Concerning food establishments supervision, 187 (65.8%) of food establishments were supervised, either by the owner or by supervisor (Table 7).

Table 7 Observed safe food handling practices of food handlers and hygiene status of food establishments

Observational assessments	Responses (%)	
	Yes	No
Having long nails	72 (25.4)	212 (74.6)
Wearing clean uniforms	117 (41.2)	167 (58.8)
Wearing a head cap	250 (88.0)	34 (12.0)
Having jeweler while handling foods	142 (50.0)	142 (50.0)
Sneezing/ coughing over uncovered food	8 (2.8)	276 (97.2)
Washing hands after/ before handling food	115 (40.5)	169 (59.5)
Working while having discharge from the nose	15 (5.3)	269 (94.7)
Working while having cut/any skin problem	233 (82.0)	511 (8.0)
Using same chopping board for raw & cooked foods without cleaning	84 (29.6)	200 (70.4)
Have functional pipe water supply for food handlers and customers	249 (87.7)	35 (12.3)
Three compartment dish washing system	34 (12.0)	250 (88.0)
Separate dressing rooms available for food handlers	184 (64.8)	100 (35.2)
Soap or detergents available for hand washing	146 (51.4)	138 (48.6)
Food safety/hygiene guidelines available for food handlers	16 (5.6)	268 (94.4)
Availability of insects/rodents	256 (90.1)	28 (9.9)
Supervision by owner /supervisor	187 (65.8)	97 (34.2)

4.6 Factors Associated With Participants Practice Level towards Proper Food Handling

Factors associated with safe food handling practices of food handlers were analyzed using binary logistic regression analysis. Factors with P value < 0.25 including sex, educational status of food handlers, monthly income of food handlers, responsibility of food handlers (main and assistant chefs), availability of functional water pipe and soap, food establishments practicing three compartment dish washing, food establishments with no food safety guideline, presence of insects/rodents and food handlers with good attitude were exported to multivariate analysis. However, multivariate analysis revealed that only sex, monthly income of food handlers, availability of water pipe, presence of insects/rodents and availability of soap were significantly associated with safe food handling practices with P value < 0.05 at 95% CI (Table 8).

Table 8 Factors associated with safe food handling practice of food handlers

Variable	Category	Safe food handling practice n (%)		COR with 95% CI	AOR CI
		Good	Poor		
Sex	Male	33	12	4.72 (2.32-9.61)**	2.63 (1.15-6.00)*
	Female	88	151	1	1
Salary	500-1000	11 (9.1)	38 (23.3)	1	1
	1001-1500	15 (12.4)	35 (21.5)	1.48 (0.60-3.65)	1.38 (0.52-3.67)
	>1500	95 (78.5)	90 (55.2)	3.64 (1.76-7.57)*	2.66 (1.16-6.12)*
Availability of functional pipe water	Yes	114 (94.2)	135 (82.8)	3.38 (1.42-8.02)*	3.54 (1.34-9.34)*
	No	7 (5.8)	28 (17.2)	1	1
Availability of soaps/detergents for hygiene	Yes	80 (66.1)	66 (40.5)	2.87 (1.76-4.68)**	2.03 (1.17-3.50)*
	No	41 (33.9)	97 (59.5)	1	1

Variable	Category	Safe food handling practice n (%)		COR with 95% CI	AOR CI
		Good	Poor		
Presence of insects and rodents	Yes	18 (14.9)	10 (6.1)	1	1
	No	103 (85.1)	153(93.9)	0.37(0.17-0.84)*	0.28 (0.11-0.70)*

**Significant at p < 0.05; **Significant at p < 0.001; AOR=Adjusted odds ratio; COR= Crude odds ratio*

Male food handlers were 2.63 times less likely performing good safe food handling practices than females (AOR= 2.63 CI= 1.15, 6.00). In addition, food handlers with monthly income greater than 1500 Ethiopian birr had higher odds of good safe food handling practice than food handlers with monthly income between 500 and 1000 Birr (AOR= 2.66 CI= 1.16, 6.12). The odds of practicing good safe food handling practice were higher in food handlers who had functional pipe water supply (AOR= 3.54 CI= 1.34, 9.34). Besides, food handlers who had available soap or detergents for hand washing were more likely performing good safe food handling practice than food handlers who had no soap or detergent (AOR= 2.03 CI= 1.17, 3.50). Furthermore, food handlers working in establishments in the absence of insects or rodents were more likely performing good safe food handling practice than working in establishments in the presence of insects/rodents (AOR= 0.28 CI= 0.11, 0.70).

5. Discussion

The present study aimed to determine food handling practice of food handlers and determinants in different food establishments and the hygienic status of the establishments. The study result showed that 42.6% of food handlers had good safe food handling practice. This is in agreement with study conducted in Debark town, Northwest Ethiopia; good food handling practice was 40.1%. However, the study results lower than previous studies conducted in various regions of Ethiopia. These include 52.5% in Dangila (Tessema AG *et al.*, 2014), 46.5% in Woldia (Reta *et al.*, 2019), 78.7% in Bahir Dar (Kibret M & Abera B., 2012) and 49.0% in Gondar (Azanaw J *et al.*, 2019). Besides, studies conducted in Brazil and Malaysia reported that good food handling practice was found 76.0% and 50.0% respectively (Rebouças LT *et al.*, 2017, Asmawi UM *et al.*, 2018). On the contrary, studies conducted in Bole sub city, A.A, Ethiopia, good food handling practice was found 27.4% (Abdi AM *et al.*, 2020). Moreover, another study conducted in Gamo Gofa Zone, Ethiopia reported that, good food handling practice was 32.6% (Legesse D *et al.*, 2017). These contrasting findings might be due to, difference in the methodology (cutoff points used to classify knowledge, attitude and practice) the studies followed, disparity in food handlers educational background, socio-demographic status and environmental variation.

The current study revealed that sex and monthly income of food handlers were found to be significantly associated with safe food handling practices. Furthermore, availability of functional water pipe, presence of insects/rodents and availability of soap were determining factors associated with safe food handling practice ($P < 0.05$ at 95% CI). Our study highlighted that male food handlers who had good food handling practice were 33% but, among females were 88%. In which, the odds of having good safe food handling practice were 2.63 times less likely in males compared to females (AOR= 2.63 CI= 1.15, 6.00). This is supported by previous studies (Kibret M *et al.*, 2013, Nee SO *et al.*, 2011 and Rebouças LT *et al.*, 2017), the reason for this is that females are highly engaged in food handling activities. Given that they are traditionally accountable for and capable in food preparation and handling in addition to serving food for households (Isoni Auad L *et al.*, 2019).

The present study showed that food handlers whose monthly income >1500 Birr were more likely to have good safe food handling practice compared to whose monthly income between 500 and 1000 Birr (AOR= 2.66 CI= 1.16, 6.12). This is consistent with previous studies, since food handlers with higher monthly income has good handling practice due to having better educational status, work experience as well as knowledge on food handling practice (Tessema AG *et al.*, 2014, Reta *et al.*, 2019). The present study revealed that food handlers who were working in an establishment which had functional water pipe were 3.54 times more likely performing good safe food handling practice compared to their counterparts (AOR= CI= 1.34, 9.34). This is well substantiated with previous studies in which presence of water is highly related with having better personal hygiene and sanitation practice (Abdi AM *et al.*, 2020) and hence, it could prevent FBD (Girmay *et al.*, 2020).

Besides, the current study showed that food handlers having available soap/detergent for hand washing in an establishment were two fold more likely performing good safe food handling practice compared to their counterparts (AOR= 2.03 CI= 1.17, 3.50). This is in line with study conducted in a university student cafeteria (Meleko A *et al.*, 2015). Furthermore, the study revealed that those food handlers who were working in an establishment with no insects/ rodents had 0.28 times more likely the odds of performing good safe food handling practice compared to their counterparts (AOR= 0.28 CI= 0.11, 0.70). The reason could be food handlers working in establishments in the absence of insects/rodents are, more suitable to prevent their environment from contamination (Reta *et al.*, 2019).

6. Strength and Limitation of the Study

Strength of the study

- Besides, data collection the study includes observation both on the food handlers while they prepare food and the environment that they prepare food.

Limitation of the study

- The study was only considered mainly the chefs.

7. CONCLUSION AND RECOMMENDATION

Conclusion

In general, more than half (57.4%) of food handlers were performing poor safe food handling practice. The major determinants of good food handling practice were sex, salary of food handlers, and availability of functional pipe water, presence of soap and/or detergents and presence of ubiquitous insects/rodents in the food establishments. These call upon regulatory bodies to inspect food establishments, whether they are performing up to the guideline or assessment criteria to ensure the adhering with hygienic practices, improving hygienic status which could improve safe food handling practice of the food handlers.

Recommendation

Based on the findings of this study, the following recommendations were addressed to the following individuals, institutions and organizations.

To food handlers

- To attend/take food safety education by the legal institution.
- To be cautious on food safety measurements.
- To build up on positive attitudes/motivation to assistant food handlers.

To food establishment owner/manager

- To follow food safety guidelines in their establishment.
- To follow up their employer regarding food safety and hygiene.
- To put safety guidelines in their kitchen so that every food handlers can put in practice.

To Yeka Sub-City FMHCACO

- Training about the requirements, the proclamation and other laws and directives of food establishments for food establishment owners, regulatory body and other relevant

stakeholders shall be given by the the sub-city Food, Medicine and Health Care Administration and Control Office

- To implement appropriate & regular inspection on both the food handlers & the establishment.
- To have full information on the establishment level not only the establishment also the food handlers too. Which includes this office should have a list not only the type & numbers of food establishments but also on food handlers too.

To Consumers

- To consumer they can be cautious on what they eat/ drink on an establishment.

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9. ANNEX I Participant Information Sheet and Informed Voluntary Consent Form for Food Handlers

My name is ---------- I am working as a data collector for the study being conducted in food establishments on food handlers by _____ who is studying her Master's degree at Addis Ababa University_____. I kindly request you to lend me your attention to explain you about the study and being selected as the study participant.

The study title:

Assessment Food Handling Practices and its associated Factors among Food Handlers in a selected Food Establishments (Cafeteria, Hotels and Restaurants) In Yeka Sub-City, Addis Ababa, Ethiopia, 2019.

Purpose /aim of the study:-The findings of this study can give a clue to both the food handlers and the intervention authority to take such a good notice on food handling practice and put solution based on the gap identified on the food handling practice and associated factors. In addition, the aim of this study is to write a thesis as a partial requirement for the fulfillment of Master's Program in community nutrition for the principal investigator.

Procedure and duration:

I was interviewing you using a questionnaire to provide me with pertinent data that is helpful for the study. There are 56questions to answer where I will fill the questionnaire by interviewing you. The interview will take about 30 minutes, so I kindly request you to spare me this time for the interview.

Risks and Benefits:

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

Confidentiality: - The information you will provide us will be confidential. There was no information that will identify you in particular. The findings of the study were general for the study community and will not reflect anything particular of individual or establishment. The

questionnaire was coded to exclude showing names. No reference was made in oral or written reports that could link participants to the research.

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

Contact address:

If there are any questions or enquires any time about the study or the procedures, please contact in this address

Principal investigator: _____

Mobile phone, _____

Declaration of informed voluntary consent:

I have read to me the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risks, and benefits, issues of confidentiality, the rights of participating and the contact address for any queries. I have been given the opportunity to ask questions for things that may have been unclear. I was informed that I have the 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 initials (signature).

Name and signature of participant: ---------- Signature of data collector ----------

ተጨማሪ መግለጫ

ከምግብ እና ምግብ መገልገያ ቁሳቁሶች ጋር ቀጥተኛ ንክኪ ያላቸው የምግብ ቤት ሠራተኞች መረጃ መስጫ እና የተሳታፊዎች ፍቃደኝነት መጠየቂያ ቅፅ

የእኔ ስም ---------- ይባላል፡: የምሰራው መረጃ መሰብሰብ ሲሆን በተመረጡ የምግብ ተቋማት ላይ በሚደረገው ጥናት_____የማስተርስ ዲግሪዋን በምታጠናው_____ለሚሰራው ከምግብና ምግብ-ነክ መገልገያ ቁሳቁሶች ጋር ቀጥተኛ ንክኪ ያላቸው የምግብ ቤት ሰራተኞች ላይ የሚደረገውን ጥናት መረጃ ሰብሳቢ ነኝ፡፡አሁን ስለ ጥናቱ እና ስለ ተሳታፊዎች አመራረጥ የምገልፀው ስላለኝ በጥሞና እንዲያዳምጡኝ እጠይቃለሁ፡፡

የጥናቱ ርዕስ

በ2019 በአዲስ አበባ የካ ክፍለ ከተማ በተመረጡ የምግብ ተቋማት ላይ የሚሰሩ ከምግብ እና ምግብ መገልገያ ቁሳቁሶች ጋር ቀጥተኛ ንክኪ ያላቸው የምግብ ቤት ሰራተኞች የምግብ ደህንነት ትግበራ እና ተያያዥ ጉዳዮች ነው፡፡

የጥናቱ ዋና ዓላማ፡-በዚህ ጥናት የሚገኘው ውጤት ለአዲስ አበባ ከተማ አስተዳደር ጤናቢሮ፣ ለምግብ አቅራቢው እንዲሁም ለባለ ድርሻ አካላት በምግብ ደህንነት እና ተያያዥ ጉዳዮች ላይ ችግሮችን ለመቅረፍ ለሚያስቀምጡት የመፍትሄ እርምጃ ከፍተኛ አስተዋፅኦ ይኖረዋል፡፡ በተጨማሪም ይህ ጥናት ለአጥኝዋ በማህበረሰብ ኒዉትሪሽን የሳይንስ ማስተርስ ዲግሪ ለማግኘት የጥናትእና የምርምር ወረቀት ማሟያ ይሆናል፡፡

የጥናቱ አካሄድ እና የጊዜ ገደብ

ይህን መጠይቅ በመጠቀም የተለያዩ ጥያቄዎችን እጠይቆታለሁ፡፡የሚሰጡኝ ምላሽ ለጥናቱ በጣም አስፈላጊ ነው፡፡መጠይቁ የሚይዘው 56 ጥያቄዎችን ሲሆን የሚፈጀው ጊዜ ደግሞ 30 ደቂቃነው፡፡ስለዚህ ጊዜዎትን መስዋዕት አድረገው ምላሽ እንዲሰጡኝ በአክብሮት እጠይቃለሁ፡፡

በጥናቱ መሳተፍ ያለው ጥቅምና ጉዳት

በዚህ ጥናት ውስጥ መሳተፍ ያለው ጉዳት አነስተኛ ሲሆን ይሄውም ከስራ ሰዓትዎ ላይ የምወስደው ጥቂት ደቂቃዎች ብቻ መሆኑ ነው፡፡ በዚህ ጥናት መሳተፍ ቀጥተኛ የሆነ ክፍያ አይኖረውም ነገር ግን ከዚህ ጥናት የሚገኘው ውጤት በምግብ ደህንነት እና ቁጥጥር ዙሪያ ለሚሰሩ ባለሞያዎች ከፍተኛ አስተዋፅኦ ይኖረዋል/እንደግብአት ሊጠቀሙበት ይችላሉ፡፡

ሚስጥራዊነቱ

ለዚህ ጥናት የሚሰጡኝ ምላሽ በማንኛውም ሁኔታ ሚስጥራዊነቱ የተጠበቀ ሲሆን የእርሶንም ማንነት በፍፁም አይገለፅም፡፡ በጥናቱ የሚገኘው ውጤት በአጠቃላይ ህብረተሰቡን የሚመለከት ሲሆን የማንኛውንም ግለሰብ /የምግብ አቅራቢ ተቋምን የሚነካ አይሆንም፡፡እያንዳንዱ ጥያቄ የርስዎንስም /ማንነት በማይገልፅ ሁኔታ መለያ ይኖረዋል፡፡ማንኛውም የፅሁፍ ወይም የቃል ሪፖርት በሚቀርብበት ጊዜ የርስዎን ማንነት በጥናቱ ውስጥ በማያሳይ መልኩ ይዘጋጃል፡፡

መብቶች

በጥናቱ ላይ መሳተፍ በፍቃደኝነት ላይ የተመሰረተ ነው፡፡ስለዚህ በዚህ ጥናት ላይ የመሳተፍ ወይም ያለመሳተፍ መብት አለዎት፡፡ በዚህ ጥናት ላይ ለመሳተፍ ከወሰኑ፤ ቃለምልልሱ ከተጀመረ በኃላ በማንኛውም ሰዓት ያልተመቾት ሁኔታ ሲኖር ማቋረጥ ይችላሉ፡፡ይህን በማድረግዎ ምንም የሚደርስብዎት ችግር የለም፡፡ መመለስ የማይፈልጉት ጥያቄ ሲኖር በማንኛውም ሰዓት ያለመመለስ ይችላሉ፡፡

አድራሻ

ስለ ጥናቱ ያለዎትን ማንኛውም ጥያቄ በሚከተለው አድራሻ መጠየቅ ይችላሉ

የጥናቱ ባለቤት አድራሻ፡ - _____

ስልክ ቁጥር_____

ኢ. -ሜይል፡ - _____

ፍቃደኝነትን ስለማረጋገጥ

ከላይ የተዘረዘሩትን የመረጃ ቅፆች በሚገባ አንብቢያለው ወይም ተነቦልኛል፡፡በዚህም መሰረት የጥናቱ ዓላማ እና አካሄድ፤የሚያመጣው ጥቅምና ጉዳት፤ሚስጥራዊነቱን፤በጥናቱ የመሳተፍ ወይም ያለመሳተፍ መብት እንዳለኝ፤በቃለመጠይቁ ወቅት ያልተመቹኝ ነገሮች ሲኖሩ አቋርጬ መውጣት እንደምችል እና ያልተመቹኝ ጥያቄዎች ሲኖሩ ያለመመለስ መብት እ ንዳለኝ በሚገባ ተረድቻለሁ፡፡በተጨማሪም በቃለመጠይቁ ወቅት ግልፅ ያልሆኑልኝ ጥያቄዎች ሲኖሩኝ እንድጠይቅ እና ተጨማሪ ጥያቄዎች ሲኖሩኝ እንዲመለስልኝ አድራሻ ተሰቶኛል፡፡ስለዚህ በዚህ ጥናት ለመሳተፍ ሙሉ ፍቃደኝነቴን በፊርማዬ አረጋግጣለሁ፡

የተሳተፊው ስምና ፊርማ ----------የመረጃው ስብሳቢ ስምና ፊርማ ----------
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10 ANNEX II. ENGLISH VERSION QUESTIONNAIRE

QUESSTIONNAIRE CODE----------//----------

Facility Type _____

S/N	Part one:- Socio Demographic Characteristics		Skip
101	Sex	1 Male 2 Female	
102	Age	----------	
103	marital status	1 Single 2 Married 3 Divorced 4 Widowed 5 living together	
104	Education status	1 Illiterate 2 Primary education 3 Secondary education 4 college diploma 5 Degree or more	
105	Responsibility	1 Main Chef 2 assistant Chef 3 Other specify ------	
106	Work experience /service year	1 <2 Years 2 2-4 Years 3 5-7 Years 4 8-10 Years 5 >10 Years	
107	monthly income/salary/ in ETB	_____	
108	Did you attend food handling/hygiene training	1 yes 2 No	Skip to 201 if the Response is 2.
109	How did you acquire the training	1 Personally by training centers 2 By the food establishment	

		3 By health bureau 4 By cultural and tourism Bureau 5 Others specify ------	
Part two:- Reported food handling knowledge, attitude and practice Food handling knowledge of participants on Transmission of food borne diseases			
201	Food borne disease can be caused by either by bacteria or virus	1 Correct 2 Incorrect 3 Don't know	
202	Fresh meat always has microbes on the surface	1 Correct 2 Incorrect 3. Don't know	
203	Canned foods may have harmful microbes	1 correct 2 incorrect 3. Don't know	
204	Healthy people can cause illness by carrying germs to food	1 correct 2 incorrect Don't know	
205	Lettuce and other raw vegetables might have harmful microbes	1 correct 2 incorrect 3. Don't know	
206	Cooked foods do not have microbes	1 correct 2 incorrect 3. Don't know	
Part three:- Personal health and hygiene			
301	You can prepare food with a wound on the hand if the wound is covered with a bandage	1 correct 2 incorrect 3. Don't know	
302	It is enough to wash the Hands with water alone after handling raw meat	1 correct 2 incorrect	

		3. Don't know	
303	After using the toilet, we should always wash hands with soap and water	1 correct 2 incorrect Don't know	
304	Hands should be washed if touching of body parts happen	1 correct 2 incorrect 3 Don't know	
305	When wearing gloves, you can handle cooked foods after handling raw meat	1 correct 2 incorrect 3 Don't know	
306	Wearing clean uniform and hair restraint while cooking or serving is necessary	1 correct 2 incorrect 3 Don't know	
307	Hands should be properly washed after sneezing or blowing your nose	1 correct 2 incorrect 3 Don't know	
Part four:- Contamination/cross contamination			
401	Food-borne disease can result from storing raw meat and cooked foods in the same Refrigerator	1 correct 2 incorrect 3. Don't know	
402	Foods can be contaminated with microbes by coming in contact with unsafe foods	1 correct 2 incorrect Don't know	
403	Dish drying towel can be a means for causing food borne disease	1 Correct 2 Incorrect 3 Don't know	
404	Ready to eat foods (e.g., vegetables) can be prepared on the same cutting board that was used to prepare meat	1 correct 2 incorrect Don't know	
405	Cutting boards, meat slicers and knifes should be sanitized after each use	1 correct 2 incorrect	

		3 Don't know	
Part five :- Temperature control			
501	Foods that need to be kept hot should be at 60° C or above	1 correct 2 incorrect 3. Don't know	
502	Leftovers should be reheated to a minimum temperature of 75°C	1 correct 2 incorrect 3. Don't know	
503	Foods should be slowly cooled at room temperature	1 correct 2 incorrect 3. Don't know	
504	Refrigeration kills all the bacteria that might cause food-borne illnesses	1 correct 2 incorrect 3. Don't know	
505	Frozen foods should be thawed on the counter or in the sink	1 correct 2 incorrect 3. Don't know	
506	After thawing, meat might be held for 5 hours at room temperature	1 correct 2 incorrect 3.Don't know	
507	Foods stored at 40°f are being held in the temperature danger zone	1 correct 2 incorrect 3. Don't know	
Part six:- Food handling attitude			
601	Temperature Controls are an effective method of reducing the number of cases of food poisoning	0 Strongly Disagree 1 Disagree 2 Neutral 3 Agree 4 Strongly Agree	

602	Checking the expiry date of ingredients should always be obligatory before preparing dish	0 Strongly Disagree 1 Disagree 2 Neutral 3 Agree 4 Strongly Agree	
603	All food handlers should have a food safety training qualification	0 Strongly Disagree 1 Disagree 2 Neutral 3 Agree 4 Strongly Agree	
604	Lack of food safety training affects safe food Handling	0 Strongly Disagree 1 Disagree 2 Neutral 3 Agree 4 Strongly Agree	
605	Unavailability of food handling guideline can affect food handling.	0 Strongly Disagree 1 Disagree 2 Neutral 3 Agree 4 Strongly Agree	
606	Insufficient dry and wet storage can affect food handling practice.	0 Strongly Disagree 1 Disagree 2 Neutral 3 Agree 4 Strongly Agree	
607	Having one handmade (Fabric) towel is enough for dish washing.	0 Strongly Disagree 1 Disagree 2 Neutral 3 Agree 4 Strongly Agree	
608	Lack of supervisor commitment affect safe food handling	0 Strongly Disagree	

		1 Disagree 2 Neutral 3 Agree 4 Strongly Agree	
Part seven:- Food handling practice			
701	Do you wash your hands after touching Un wrapped raw foods?	1 Always 2 Sometimes 3 Never	
702	Do you wash your hands before touching cooked Foods?	1 Always 2 Sometimes 3 Never	
703	Do you use separate utensils when preparing raw And cooked foods?	1 Always 2 Sometimes 3 Never	
704	Do you thaw frozen foods at room temperature?	1 Always 2 Sometimes 3 Never	
705	Do you check the expiry dates of all products?	1 Always 2 Sometimes 3 Never	
706	Do you use a thermometer to check temperature?	1 Always 2 Sometimes 3 Never	
707	Do you use gloves when serving unwrapped food?	1 Always 2 Sometimes 3 Never	
708	Do you wash your hands before using gloves?	1 Always 2 Sometimes 3 Never	
709	Do you wash your hands after using gloves?	1 Always 2 Sometimes	

		3 Never	
710	Do you have medical checkup assigned by the food establishment?	1 Always 2 Sometimes 3 Never	
711	Do you get sick leave for any sickness?	1 Always 2 Sometimes 3 Never	
712	Do you wear a hair restraint when? Serving food?	1 Always 2 Sometimes 3 Never	
713	Do you wear jewelry when serving food?	1 Always 2 Sometimes 3 Never	
714	Do you disinfect cutting boards after each use?	1 Always 2 Sometimes 3 Never	
715	Do you sanitize utensils after washing them?	1 Always 2 Sometimes 3 Never	
Thank you for your cooperation!!!			

Part three Observation checklist

Observed Food hygiene practice of food handlers			
Having long nails	YES		
	NO		
Wearing clean uniforms	YES		
	NO		
Wearing hair restraint	YES		
	NO		
Having jeweler while handling foods	YES		
	NO		
Sneezing/ coughing over uncovered food	YES		
	NO		
Washing hands after/ before handing food	YES		
	NO		
Working while having discharge from the nose,	YES		
	NO		
Working while having cut/any skin problem	YES		
	NO		
Using same chopping board for raw and cooked food without cleaning	YES		
	NO		
Institution facilities and materials inspection/observation /			
Have functional piped water supply for food handlers and customers	YES		
	NO		
Practice three Compartment dish washing system	YES		
	NO		
Separate dressing rooms available for food handlers	YES		
	NO		
Soap or detergents available for hand washing	YES		
	NO		
Food safety/hygiene guidelines available for food handlers	YES		
	NO		
Availability of Insects/rodents	YES		
	NO		
Supervision by owner /supervisor	YES		
	NO		

11. ANNEX III. AMHRIC VERSION QUESTIONNAIRE

መጠይቅ ኮድ----------//----------

የተቋሙ አይነት ----------

ተ.ቁ	ክፍልአንድ፤ - የስነ-ህዝብ እና ማህበራዊ መጠይቆች		
101.	ፆታ	1. ወንድ 2. ሴት	
102.	እድሜ	----------	
103.	የጋብቻ ሁኔታ	1. ያላገባ/ች 2. ባለትዳር 3. የተፋታ/ች 4. ባለቤቷ/ቱ የሞተባት/ችበት 5. አብሬነው የምኖረው	
104.	የትምህርት ደረጃ	1. ያልተማረ 2. የመጀመሪያ ደረጃ 3. ሁለተኛ ደረጃ 4. የኮሌጅ ዲፕሎማ 5. ዲግሪ እና ከዛበላይ	
105.	የስራ ድርሻ	1. ዋና ምግብ አብሳይ 2. ረዳት ምግብ አብሳይ 3. ሌላ ካለ ይግለፁ ----------	
106.	እዚህ ስራ ውስጥ ምን ያህል ጊዜ ቆይተዋል	1 ከ2 ዓመት ያነሰ 2 ከ2-4 ዓመት 3 ከ5-7 ዓመት 4 ከ8-10 ዓመት	

		5 ከ10 ዓመት በላይ	
107.	የወር ደሞዝ		
108.	የምግብ ንፅህና/ደህንነት ስልጠና ሰልጥነው ያውቃሉ	1. አዎ 2. አላውቅም	መልሱ አላውቅም ከሆነ ወደ ጥያቄ 201 ይሂዱ
109.	ስልጠውን እንዴት አገኙ	1. በግል ስልጠና ማእከል በመሄድ 2. የምሰራበት ድርጅት 3. የጤና ቢሮ 4. የባህል እና ቱሪዝም ቢሮ 5. ሌላ ካለ ይግለፁ	
ክፍል ሁለት፡ - ተሳታፊዎች የምግብ ደህንነት ላይ ያላቸው እውቀት፤ ዝንባሌ እና ትግበራ			
የምግብ ወለድ በሽታዎች መተላለፍ/መዛመት			
201	የምግብ ወለድ በሽታ በባክቴሪያ ወይም በቫይረስ ሊከሰት ይችላል	1ትክክል 2 ስህተት 3 አላውቅም	
202.	ጥሬ ስጋ ላይ ሁልጊዜ ተዋሲያን ይገኙበታል	1. ትክክል 2. ስህተት 3. አላውቅም	
203	በታሸገ ምግብ ውስጥ ለጤና ጠንቅ ተዋሲያን ሊኖሩ ይችላሉ	1. ትክክል 2. ስህተት 3. አላውቅም	
204	ጤነኛ ሰዎች ጀርሞችን ወደ ምግብ በማስተላለፍ በሽታ ሊያስከትሉ ይችላሉ	1. ትክክል 2. ስህተት 3. አላውቅም	
205	ሰላጣ እና ሌሎች ጥሬ አትክልቶች	1. ትክክል	

	በውስጣቸው ለጤና ጠንቅ የሆኑ ተዋሲያን ሊኖራቸው ይችላል	2. ስህተት 3. አላውቅም	
206	የበሰለ ምግቦች በሽታ አምጭ ተህዋሲያን የላቸውም	1. ትክክል 2. ስህተት 3. አላውቅም	
ክፍልሶስት፡- የግል ጤና እና ንፅህና			
301	በእጅዎ ላይ ቁስለት ቢኖርቦትም ቁስሉ ከታሸገ /ከተሸፈነ ምግብ ማዘጋጀት ይችላሉ	1. ትክክል 2. ስህተት 3. አላውቅም	
302	ጥሬ ስጋ ከነኩ/ከያዙ በኃላ እጆትን በውሀ ብቻ መታጠብ በቂ ነው	1. ትክክል 2. ስህተት 3. አላውቅም	
303	ሽንት ቤት ከተጠቀምን በኋላ ሁልጊዜ እጃችንን በውሀ እና በሳሙና መታጠብ አለብን	1. ትክክል 2. ስህተት 3. አላውቅም	
304	የሰውነት ክፍሎች ከተነካኩ እጅን መታጠብ ያስፈልጋል	1. ትክክል 2. ስህተት 3. አላውቅም	
305	የእጅ ጓንት ለብሰው ጥሬ ስጋ ከያዙ በኃላ የበሰለ ምግቦችን መያዝ ይቻላል	1. ትክክል 2. ስህተት 3. አላውቅም	
306	ምግብ ሲዘጋጅ ወይም ለደንበኞች ሲቀርብ ንጽህናውን የጠበቀ የደንብ ልብስ እና የፀጉር መሸፈኛ መልበስ ያስፈልጋል	1. ትክክል 2. ስህተት 3. አላውቅም	
307	ካስነጠስን ወይም ከተናፈጥን በኃላ እጅን በአግባቡ መታጠብ ያስፈልጋል	1. ትክክል 2. ስህተት 3. አላውቅም	
ክፍል አራት፡- የምግብ ብክለት			

401.	የምግብ ወለድ በሽታዎች የበሰሉ እና ጥሬ ምግቦችን በአንድ ፍሪጅ በማስቀመጥ ሊከሰት ይችላል	1. ትክክል 2. ስህተት 3. አላውቅም	
402.	ምግቦች ደህንነቱ ካለተጠበቀ ምግብ ጋር ንክኪ ካላቸው በተህዋሲያን ሊበከሉ ይችላሉ	1. ትክክል 2. ስህተት 3. አላውቅም	
403	የመመገቢያ ሳህን መድረቂያ ፎጣ/ጨርቅ ለምግብ ወለድ በሽታ መከሰት ምክንያት ነው	1 ትክክል 2 ስህተት 3 አላውቅም	
404	ለምግብነት የተዘጋጁ ምግቦች (ለምሳሌ አትክልቶች) ስጋ በተከተፈባቸው መክተፊያ በመጠቀም ማዘጋጀት ይቻላል	1. ትክክል 2. ስህተት 3. አላውቅም	
405	መክተፊያ፣ ስጋ መፍጫ እና ቢላዋ ከተገለገልን በኃላ መፀዳት አለባቸው	1. ትክክል 2. ስህተት 3. አላውቅም	
ክፍል አምስት፡- የምግብ ሙቀት ቁጥጥር			
501	ሙቀታቸው እንደተጠበቀ እንዲቆዩ የሚፈለጉ ምግቦች ሙቀታቸው ከ60 ዲግሪ/ከዛ በላይ መጠበቅ አለበት	1. ትክክል 2. ስህተት 3. አላውቅም	
502	ትርፍራፊ ምግቦችን ለማሞቅ ቢያንስ 75 ዲግሪ ሙቀት መጠቀም ያስፈልጋል	1. ትክክል 2. ስህተት 3. አላውቅም	
503	ምግቦች ፍሪጅ ከመግባታቸው በፊት በዝግታ በከባቢ አየር ሙቀት መቀዝቀዝ አለባቸው	1. ትክክል 2. ስህተት 3. አላውቅም	
504	ማቀዝቀዣ ሁሉንም ምግብ ወለድ በሽታ	1. ትክክል	

	አምፑ ባክቴሪያዎች ይገድላል	2. ስህተት 3. አላውቅም	
505	በረዶ የሰሩ/የረጉ ምግቦችን የመታጠቢያ ሳህን በመጠቀም ማቅለጥ ይቻላል	1. ትክክል 2. ስህተት 3. አላውቅም	
506	ስጋ ከቀለጠ/ቅዝቃዜው ከለቀቀ በኃላ በአካባቢ አየር ለ5 ሰዓት ማቆየት ይቻላል	1. ትክክል 2. ስህተት 3. አላውቅም	
507	በ40 ዲግሪ ሴንቲግሬድ ምግቦች በአደገኛ የሙቀት ክልል ውስጥ ናቸው	1. ትክክል 2. ስህተት 3. አላውቅም	
ክፍል ስድስት፡- የምግብ ደህንነት ላይ ተሳታፊዎች ያላቸው ዝንባሌ			
601	የሙቀት ቁጥጥር የምግብ መመረዝን ለመቀነስ ፍቱን መድኃኒት ነው	0.በጣም አልስማማም 1.አልስማማም 2.ፍቃደኛ አይደለሁም 3.እስማማለሁ 4.በጣም እስማማለሁ	
602	የምግብ መስሪያ ግብዓቶችን ከመጠቀም በፊት ሁልጊዜ የምርታቸውን ወቅት ማየት ግዴታ መሆን አለበት	0.በጣም አልስማማም 1.አልስማማም 2.ፍቃደኛ አይደለሁም 3.እስማማለሁ 4.በጣም እስማማለሁ	
603	ሁሉም ምግብ እና የምግብ መገልገያ ቁሳቁሶች ጋር ቀጥተኛ ንክኪ ያላቸው የምግብ ቤት ሰራተኞች የምግብ ደህንነት ስልጠና ሞያ ሊኖራቸው ይገባል	0.በጣም አልስማማም 1.አልስማማም 2. ፍቃደኛ አይደለሁም 3.እስማማለሁ 4.በጣም እስማማለሁ	

604	የምግብ ደህንነት ስልጠና እጥረት የምግብ አያያዝ ላይ ተጽእኖ ያደርጋል	0.በጣም አልስማማም 1.አልስማማም 2. ፍቃደኛ አይደለሁም 3.እስማማለሁ 4.በጣም እስማማለሁ	
605	የምግብ አያያዝ መመሪያ ያለመኖር ደህንነቱ የተጠበቀ የምግብ አያያዝ ላይ ተፅእኖ ይኖረዋል	0.በጣም አልስማማም 1.አልስማማም 2. ፍቃደኛ አይደለሁም 3.እስማማለሁ 4.በጣም እስማማለሁ	
606	በቂ ያልሆን የደረቅ እና የእርጥብ ምግብ ማከማቻ ደህንነቱ የተጠበቀ የምግብ አያያዝ ላይ ተጽእኖ ያደርጋል	0.በጣም አልስማማም 1.አልስማማም 2. ፍቃደኛአይደለሁም 3.እስማማለሁ 4.በጣም እስማማለሁ	
607	የመመገቢያ እቃዎችን በሙሉ በአንድ ፎጣ/ጨርቅ ማድረቅ ተገቢ ነው	0.በጣም አልስማማም 1.አልስማማም 2. ፍቃደኛ አይደለሁም 3.እስማማለሁ 4.በጣም እስማማለሁ	
608	የተቆጣጣሪዎች ቆራጥነት/ተነሳሽነት ማነስ ደህንነቱ የተጠበቀ የምግብ አያያዝ ላይ ተጽእኖ ያደርጋል	0.በጣም አልስማማም 1.አልስማማም 2. ፍቃደኛ አይደለሁም 3.እስማማለሁ 4.በጣም እስማማለሁ	

ክፍል ሰባት፡- የምግብ ደህንነት/ንፅህና ትግበራ			
701	ያልተሸፈኑ /ያልታሸጉ ምግቦችን ከነኩበኃላ እጅወትንይታጠባሉ	1. ሁልጊዜ 2. አልፎአልፎ 3. በፍፁራሽ	
702	የበሰለ ምግቦችን ከመንካትዎ በፊት እጅዎትን ይታጠባሉ	1. ሁልጊዜ 2. አልፎ አልፎ 3. በፍፁራሽ	
703	የበሰለ እና ያልበሰለ /ጥሬ ምግቦችን ለማዘጋጀት የተለያዩ ቁሳቁሶችን ይጠቀማሉ	1. ሁልጊዜ 2. አልፎ አልፎ 3. በፍፁራሽ	
704	የረጉ/በረዶ የሰሩ ምግቦችን በክባቢ አየር ሙቀት ነው የሚያቀልጡት	1. ሁልጊዜ 2. አልፎ አልፎ 3. በፍፁራሽ	
705	የሁሉንም የምግብ ምርቶች ከመጠቀምዎ በፊት የአገልግሎት ዘመን ያረጋግጣሉ	1. ሁልጊዜ 2. አልፎ አልፎ 3. በፍፁራሽ	
706	የምግብ የሙቀት መጠን ለመቆጣጠር የሙቀት መለኪያ ቴርሞ ሜትር ይጠቀማሉ	1. ሁልጊዜ 2. አልፎ አልፎ 3. በፍፁራሽ	
707	ያልታሸጉ ምግቦችን ሲያቀርቡ የእጅ ጓንት ይጠቀማሉ	1. ሁልጊዜ 2. አልፎ አልፎ 3. በፍፁራሽ	
708	ጓንት ከመጠቀምዎ/ከማጥለቅዎ በፊትእጅዎን ይታጠባሉ	1. ሁልጊዜ 2. አልፎ አልፎ 3. በፍፁራሽ	
709	ጓንት ከተጠቀሙ በኃላ እጅዎን ይታጠባሉ	1. ሁልጊዜ 2. አልፎ አልፎ	

		3. በጭራሽ	
710	በሚሰሩበት ድርጅት የተደነገገ የጤና ምርመራ ያደርጋሉ	1. ሁልጊዜ 2. አልፎ አልፎ 3. በጭራሽ	
711	በህመም ወቅት ፈቃድ ያገኛሉ	1. ሁልጊዜ 2. አልፎ አልፎ 3. በጭራሽ	
712	የምግብ አገልግሎት ሲሰጡ የፀጉር መሸፈኛ ይጠቀማሉ	1. ሁልጊዜ 2. አልፎ አልፎ 3. በጭራሽ	
713	የምግብ አገልግሎት ሲሰጡ ጌጣጌጥ ይለብሳሉ	1. ሁልጊዜ 2. አልፎ አልፎ 3. በጭራሽ	
714	በተገለገሉ ቁጥር መክተፊያ ያፀዳሉ	1. ሁልጊዜ 2. አልፎ አልፎ 3. በጭራሽ	
715	መገልገያ ቁሳቁሶችን ከተገለገሉ በኃላ ታጥበው በደንብ እንዲፀዱ ያደርጋሉ	1. ሁልጊዜ 2. አልፎ አልፎ 3. በጭራሽ	
ስለትብብርዎ በጣም አመሰግናለሁ !!!			

የምልከታ ቼክሊስት

የምግብ ንፅህና ትግበራ ከምግብ እና ምግብ መገልገያ እቃዎች ጋር ቀጥተኛ ንክኪ ያላቸው የምግብ ቤት ሰራተኞች የምግብ ንፅህና ተግባር			
ረጃጅም ጥፍሮች	1. አዎ		
	2. የለም		
ንፅህናውን የጠበቀ የደንብ ልብስ	1. አዎ		
	2. የለም		
ፀጉር ተሸፍኖአል	1. አዎ		
	2. የለም		
በምግብ አገልግሎት በሚሰጥበት ግዜ ጌጣጌጥ መጠቀም ሁኔታ	1. አዎ		
	2. የለም		
ባልተሸፈነ ምግብ ላይ ማስነጠስ /ማሳል	1. አዎ		
	2. የለም		
የምግብ አገልግሎት ከመስጠት በፊት እና በኃላ እጅ መታጠብ	1. አዎ		
	2. የለም		
ከአፍንጫ ፈሳሽ እያለ መስራት	1. አዎ		
	2. የለም		
የእጅ ቁስለት/የቆዳ ችግር እያለ መስራት	1. አዎ		
	2. የለም		
ለበሰለ እና ለጥሬ ምግቦች ሳያፀዱ አንድ መክተፊያ መጠቀም	1. አዎ		
	2. የለም		
የተቋሙ ሁኔታ			
አገልግሎት የሚሰጥ ቧንቧ ውሀ ለምግብ ሰራተኞች እና ተጠቃሚዎች አለ	1. አዎ		
	2. የለም		
ሶስት ደረጃ የተከተለ የእቃ ማጠቢያ ዘዴ አለ	1. አዎ		
	2. የለም		
ለምግብ ቤት ሰራተኞች የተዘጋጀ መልበሻ ክፍል አለ	1. አዎ		
	2. የለም		
ለእጅ መታጠቢያነት የሚያገለግል ሳሙና አለ	1. አዎ		
	2. የለም		
ለምግብ ሰራተኞች የምግብ ደህንነት/ንፅህና መመሪያ አለ	1. አዎ		
	2. የለም		
ነፍሳት እና አይጦች በምግብ ቤቱ ውስጥ አሉ	1. አዎ		
	2. የለም		
በምግብ ቤት ባለቤት/ተቆጣጣሪ ቁጥጥር ይደረጋል	1. አዎ		
	2. የለም		