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**SCHOOL OF GRADUATE STUDIES
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**NUTRITIONAL STATUS OF U5 CHILDREN AND
KNOWLEDGE, ATTITUDE, AND PRACTICES
OF MOTHERS ON FOOD SAFETY AMONG
OUTPATIENT HEALTH CARE SERVICE
SEEKERS AT CURE HOSPITAL, ADDIS ABABA,
ETHIOPIA**

**BY
HIWOT DISASSA (GSR/4745/11)**

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ADDIS ABABA, ETHIOPIA

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Nutritional Status of U5 Children and Knowledge, Attitude, And
Practices of mothers on Food Safety among outpatient health care
service seekers at Cure Hospital, Addis Ababa, Ethiopia

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OF SCIENCE IN FOOD SECURITY AND DEVELOPMENT STUDIES

DECLARATION

I hereby declare that the thesis entitled “**Nutritional Status of U5 Children and Knowledge, Attitude, And Practices of mothers on Food Safety among outpatient health care service seekers at Cure Hospital, Addis Ababa, Ethiopia**” has been carried out by me under the supervision of Professor Mogessie Ashenafi, Center for food Security studies, Addis Ababa University. I further declare that this thesis is my original work and has not been submitted to any other university or institution for the award of any degree and all sources of materials used for the thesis have been duly acknowledged.

Declared By: Hiwot Disassa

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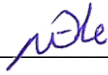
This is to certify that the above declaration made by the candidate is correct to the best of me knowledge as an advisor.

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(Advisor)	Signature	Date

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This is to certify that the thesis proposal prepared by Hiwot Disassa entitled “***Nutritional Status of U5 Children and Knowledge, Attitude, And Practices of mothers on Food Safety among outpatient health care service seekers at Cure Hospital, Addis Ababa, Ethiopia***” and submitted in partial fulfillment of the requirements for the Degree of Master of Science in Food Security and Development complies with the regulations of Addis Ababa University and meets the accepted standards concerning originality and quality.

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Acronyms and Abbreviations

DALYS	Disability Adjusted Life Years
DHS	Demographic and Health Survey
CSA	Central Statistical Agency
FAO	Food and Agriculture Organization
FSNAU	Food Security and Nutrition Security Analysis Unit
HFIAS	Household Food Insecurity Access Scale
IDP	Internally Displaced People
KAP	Knowledge, Attitude, and Practice
SDGs	Sustainable Development Goals
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization

Abstract

This study examines the food security status, malnutrition, and food safety knowledge, attitude, and practice (KAP) of mothers having outpatient children in Cure Hospital, Addis Ababa, Ethiopia. A cross-sectional study had been carried out using a semi-structured questionnaire to collect the needed data from a total of 210 participants. A SPSS (a software package) was used for interactive, statistical analysis. The results showed that the prevalence of under-nutrition of the children: about 45.1% of them were stunted, 50.3% underweight and 16.2% were found to be wasting. The knowledge of food handling of mothers had been described as satisfactory: separate storage of cooked and raw food (53.74%) while 15.86% lacked awareness of proper food handling. The food safety attitudes level of mothers' food handling was adequate (48%) in terms of risks if eating spoiled food, keeping hot/cold, preventing food contamination, and reheating while ready to serve though 19% lacking. The participants had positive attitudes toward food hygiene, 84% of them employed the use of safe food handling practices such as properly washing using detergents or preserving at the right temperature. The attitude of most mothers (89%) is considered good about the proper washing and preventing of food poisoning and other diseases. Despite 11% of respondents, did not know proper food handling and cleaning procedures. The accessibility of food was assessed and about 35.3% of the investigated households were found to have timely access to adequate quantity of food supply, 46.4% suffer different food insecurity of varying severity levels, and about 18.3% of the investigated respondents reported to be severely food insecure. Overall, the findings estimated that the level of KAP of respondents was at an acceptable level. However, there is a need to increase the food safety knowledge, nutrition, and education among the mothers which may improve the under nutrition of children and food safety.

Keywords: Knowledge, Attitude, Practice, Mothers, Nutrition, Food Hygiene.

CHAPTER 1: INTRODUCTION

1.1 Background of the study

For decades, one of the most popular ideas among academicians is the idea that food safety-related knowledge, attitudes, and practices (KAP) among mothers of children under five years. The nutritional status and safety of a community are affected by various factors. Families' ability to feed children with sufficient quantity and quality of food and how they raise children, affect these factors at the family level. Food safety has been recognized as a public health issue (FDA, 2004). Therefore, as large health institutions and governments in different countries seek ways to monitor the production chain, food safety has become a major issue of global concern (De Oliveira et al., 2016). Sometimes, the food itself may pose a health risk, and people may get sick from eating contaminated food. This is called a foodborne illness.

There is an inseparable connection between sustenance, the wellbeing of food, and the security of food (WHO, 2017). Hazardous foods can trigger foodborne illnesses, particularly influencing defenseless shoppers like older, debilitated, little youngsters, and newborn children. There has been a sharp expansion in worry for the security of food among the affluent individuals from different social orders. Notwithstanding, the sensible misfortune of foodborne sicknesses happens inside the creating scene (Omari and Frempong, 2016). As indicated by the Focuses for Infectious prevention and Avoidance (CDC) update in 2017, every year around 50 million individuals surrender to food-based infirmities, prompting the passing of an expected 3,000 individuals. The World Wellbeing Association (WHO, 2017), gauges that kids who matured five years and more youthful represented 40% of the foodborne affliction trouble. However, universally the expanding attention to foodborne ailments as setting off huge dangers to the

wellbeing, social turn of events, financial turn of events, and security of food proceeds to remain minimized (WHO, 2017).

Current estimates from the Global Nutrition Report indicate that one in three people worldwide is affected by malnutrition, which can broadly include features indicative of under nutrition, poor micronutrient status, or overweight and obesity. Increasingly, evidence is also suggesting a double burden of malnutrition in many of these individuals where under nutrition coexists with overweight, obesity, and other diet-related non-communicable diseases (Micha et al., 2020). This double burden of malnutrition creates unique societal challenges with potential negative impacts on healthcare costs, productivity, and economic growth, particularly in low-resource populations (WHO, 2019).

Unsafe food creates a vicious cycle of disease and malnutrition, which particularly affects infants, young children, the elderly, and the sick populations (WHO, 2020). Ensuring food safety is critical for optimal nutrition and health, and effective food safety management at the national level involves multiple stakeholders operating under diverse environmental, infrastructural, and sociopolitical conditions (Jaffee et al., 2020).

Various scientists suggest that foodborne illnesses pose a significant public health risk, especially for the young generation, the elderly and pregnant women in developed and developing countries (WHO, 2020). As a result, foodborne illnesses can affect consumers in different ways, e.g. Health problems and deaths, for example, and significant economic losses related to the cost of medical treatment. Food poisoning outbreaks have been reported in various areas of the world, particularly in restaurants and hotels (Temeche et al., 2016). It is currently estimated that the most recent data on global nutrition consistently and even consist in the

coexistence of different forms of malnutrition within countries, populations, and families (WHO, 2018).

Globally, this is a third of the population's malnutrition and given the current trend by 2030, this number could be halved, making the goal of ending all forms of malnutrition by 2030 unattainable (HLPE, 2017). It also describes the effects of diet and food securities on human health, especially during the first two years of childhood are seen as a critical period for growth and development. Food insecurity during this period is also a source of many chronic diseases in adulthood (Bottino et al., 2017), so the mother is the one who takes care of the child. Being a mother of a child, you must know how to care for children under five (between 0 and 5), and the nutrition they need.

Acute malnutrition (waste or lightweight for height) have decreased over the past decade but are still high, in Ethiopia. About 38% of children younger than 5 years are stunted and 10% are emaciated. Children who are predisposed to low birth weight, short stature, low resistance to infection, and a high risk of disease and death. This is because very few sanitation facilities are used in Ethiopia and only 7% of basic services are used nationwide. The drinking water supply is also low, especially in rural areas where it is used by only 30% of the rural population (UNICEF, 2017).

According to UNICEF (2013), the early stages of a child's life, when all parts of the baby grow physically, mentally, and socially, are very important. This requires an optimal supply of energy and nutrients to the body and, therefore, an adequate and balanced supply. Nutritional content is very important to prevent malnutrition, which can affect the child's health and development, and affect the baby's intelligence, educational capacity, and productivity. It also leads to an increased

risk of chronic non-communicable diseases in old age. Therefore, maternal/caregiver knowledge, attitudes, and practice (KAP) about infant and young child nutrition during this period are very important for the health, growth, and development of the child (WHO, 2014). It is recommended that mothers' knowledge of child care and nutrition is vital. A proper and healthy diet is also believed that essential to help children reach their full potential at every stage of their development. (Caldeira et al., 2017). In addition, little is known about knowledge, attitudes, and practices of food safety and nutrition and there is no previous research on outpatients. Hence, this study was carried out for the above-mentioned reasons.

1.2. Statement of the Problem

A balanced diet is essential for normal life activities. Since there is enough food available, adequate education and awareness can improve it. Good nutrition and proper nutrition programs prevent disease and disability. Malnutrition remains one of the causes of morbidity and mortality. Children under five: are more prone to nutritional deficiencies. Certain socioeconomic, biological, environmental, and behavioral factors increase the risk and must be identified at an early stage to promote health and prevent disease (Chetan, 2018).

Mothers with nutrition education can raise their children healthier. Improving breastfeeding techniques not only provides adequate nutrition for the child but can also reduce the incidence of gastroenteritis and respiratory infections and reduce the number of infant deaths. the newborn as it is a source of proteins, antibodies, and vitamins. Many developing countries report malnutrition and micronutrient deficiencies during the weaning phase (Chetan, 2018). These deficiencies can be prevented by supplementary feeding, the addition of energy through non-human milk, and semi-solid or solid foods to the diet of children (WHO, 2005). As the saying goes "children are the future of society and mothers are the guardians of this future." First of all, toddler health, safety, and nutrition are written everywhere on behalf of toddlers. Ultimately, it is children who benefit from parents who understand and know how to protect and promote their safety and wellbeing by learning about nutrition. Nutrition is the supply of cells and organisms with the necessary materials (in the form of food) to sustain life. There can be many common health problems nutrients are organic and inorganic complexes found in food. There are six main classes of nutrients, most of which are carbohydrates, fats, minerals, proteins, vitamins, and water. These nutrient classes can be classified as macronutrients (required in relatively large amounts) or micronutrients (needed in smaller amounts). Macronutrients include carbohydrates, fat, protein, and water. Micronutrients are minerals and vitamins (Roy et al., 2005).

More than 3.5 million mothers and children under the age of five die unnecessarily each year from the causes of malnutrition, and millions more are permanently disabled in the first few months of life by the physical and mental effects of poor food intake. When children reach their second birthday and are malnourished, they can suffer irreversible physical and cognitive damage that would affect their future health and finances. The consequences of inadequate

nutrition continue into adulthood and are passed on to the next generation as malnourished girls and women have children of their own.

Under nutrition includes a wide array of effects including Intrauterine Growth Restriction (IUGR). It appears in low birth weight and underweight resulting in low birth weight; underweight, a reflection of low weight-for-age; stunting, a chronic restriction of growth in height indicated by a low height-for-age; wasting, an acute weight loss indicated by a low weight-for-height; and less visible micronutrient deficiencies. Under nutrition is mainly caused by a poor dietary intake that may not provide sufficient nutrients, and/or by common infectious diseases, such as diarrhea. These conditions are most significant in the first two years of life, highlighting the importance of nutrition in pregnancy and the window of opportunity for preventing under nutrition from conception through 24 months of age (Faruque et al., 2008).

Child malnutrition remains a key public health problem in developing countries, including Ethiopia. Ethiopia has made promising strides in reducing malnutrition. However, the basic levels of malnutrition remain so high that the country still needs to make significant investments in nutrition (CSA 2011 and ICF International, 2012). According to the Ethiopia Demographic and Health Survey, there are significant differences in malnutrition across Ethiopia. For example, there are regional differences in the prevalence of stunting in children. The estimated prevalence of chronic malnutrition in most regional states is above the national average. Various researchers conducted a study on malnutrition among children under five in different parts of the country. This study mainly focused on the prevalence and determinants of malnutrition in children under five years of age.

1.3 Objectives of the study

1.3.1 General objective

The overall objective of this thesis was to assess nutritional status of u5 children and knowledge, attitude, and practices of mothers on food safety among outpatient health care service seekers at Cure Hospital, Addis Ababa, Ethiopia.

1.3.2 Specific objectives

More specifically, the study aspires to:

- ✓ investigate the knowledge, attitude, and practice of the mothers in food safety and malnutrition.
- ✓ to examine the food safety knowledge, attitude, and practice of mothers
- ✓ to assess the current nutritional status of the U5 children using anthropometric methods.
- ✓ to determine food access using Household Food Insecurity Access Scale (HFIAS)

1.4. Research Questions

This research intended to answer the following basic questions which were derivatives of the above-mentioned research objectives:

1. what is the level of food insecurity in households who seek free medical treatment at the hospital?
2. what is the nutritional status of children seeking medical treatment as outpatients at Cure hospital?
3. What are the food consumption patterns of children
4. what is the extent of KAP of mothers on food safety and malnutrition?

5. what are the knowledge gaps, cultural beliefs, and behavioral patterns to identify needs, problems, and barriers?

1.5. Significance of the study

Knowledge in nutrition, Food, and its safety has become the topic of globally increasing research efforts, particularly because of the growth of the human population. Various researches may have been conducted concerning these topics in Ethiopia. However, there is no available literature on the topic at a hospital level. Therefore, the output of this research will fill the knowledge gap in local and institutional responses towards children and mothers on the given topic.

1.6. Definition of key concepts

Attitudes: Attitudes are emotional, motivational, perceptive, and cognitive beliefs that positively or negatively influence the behavior or practice of an individual. An individual's feeding or eating behavior is influenced by his/her emotions, motivations, perceptions, and thoughts. Attitudes influence future behavior no matter the individual's knowledge and help explain why an individual adopts one practice and no other.

Food safety: Food safety refers to the conditions and practices that preserve the quality of food to prevent contamination and food-borne illnesses. It includes the production, processing, preparation, and handling of food to ensure it is safe to eat.

Food security: When all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

Knowledge: Knowledge is the understanding of any given topic. It refers to an Individual's understanding of nutrition, including the intellectual ability to remember and recall food- and nutrition-related terminology, specific pieces of information, and facts.

Malnutrition: A deviation from the norm in a child's growth and development. It can manifest as either under or over-nutrition.

Practice: is defined as the observable actions of an individual that could affect his/her or others' nutrition, such as eating, feeding, washing hands, cooking, and selecting foods.

Stunting: being short for age measured as height for age were defined by Z-score less than two standard deviations (SD) below the median of the reference population and a sign of chronic undernutrition that reflects a failure to receive adequate nutrition over a long period.

Wasting: Refers to thinness and it is measured as weight-for-height at least 2SD below the median of a reference population. A measure of acute undernutrition that represents the failure to receive adequate nutrition.

Underweight: having low weight for age, defined by Z-score less than -2 standard deviation (SD) below the median of the population. It may indicate wasting or stunting (CSA, 2016).

CHAPTER TWO: RELATED LITERATURE REVIEW

2.1. Theoretical and conceptual literature review – on Food safety and nutrition

2.1.1. Food safety

Food safety has become a major issue around the world. The world's advanced governments and health authorities are looking for ways to monitor the chain of food production to the table (De Oliveira et al., 2016). In theory, food poisoning is 100% preventable. However, for various reasons related to the supply chain and the fact that pathogens can enter food regardless of the precautions taken, this cannot be achieved (Aujoulat et al., 2019). Developed countries have complex food preparation standards, while less developed countries have low standards and compliance. In recent years, concerning food safety, food crises have been reported both nationally and internationally. Hospital nutrition has a significant impact on patient trust (Tsakali et al., 2016).

Despite significant advances in food science and technology, as well as consumer awareness of food safety issues, foodborne illness is seen as a major challenge with devastating consequences. economy and health in developed and developing countries (Bredbenner et al., 2015). It is associated with the deaths of about two million people each year, including many children around the world (WHO 2013). Harmful bacteria, viruses, and parasites are responsible for more than 200 diseases, from diarrhea to cancer. In addition, various epidemiological data indicate that a significant proportion of foodborne illnesses can be attributed to inappropriate preparation practices among consumers. Solid waste disposal, sanitary conditions, and handwashing facilities, lack of knowledge about food security, traditional beliefs, inadequate food security.

Legislation, poor health services, and poor food safety education affect all four aspects of food safety.

Improvements of intervention strategies in all stages between production and consumption of food to prevent foodborne illnesses are widely observed. These strategies include government inspections and awareness campaigns targeting grocers, from process to consumption (Crowther et al., 1999). The complex causal pathways to food and food insecurity, along with valid indicators to measure these concepts, are important to inform programs and strategies that can be used to deal with them effectively.

The causes of food insecurity are interrelated and stem from poverty. They are influenced by cultural factors and different social, economic, and political structures depending on the context (Ruel M, 2013). For example, the infection-diet interaction leads to a cycle in which poor nutrition interferes with immune function and makes children more vulnerable to infections. At the same time, infections can interfere with the absorption of nutrients and worsen nutritional status. Recent episodes of malnutrition and acute illness. Chronic or repeated exposure to malnutrition or infection affects linear height growth and leads to short stature in the elderly or stunted growth. Mothers need adequate nutrition and health to prevent malnutrition in children, especially malnutrition with short- and long-term consequences early in life. In boys, the intergenerational cycle of malnutrition persists as malnourished girls become malnourished mothers with an increased risk of low birth weight babies and the effects of malnutrition during the developmental stages. Infections and illnesses caused by contaminated food continue to pose a threat to global public health (Luo et al., 2019).

Food safety awareness remains a major concern for consumers in both developed and developing countries. However, developing countries are hardest hit by foodborne illnesses due to low standards of living, poor personal hygiene, and lack of access to adequate medical treatment (Odeyemi and Bamidele, 2016). The food supply chain and the consumer are the final touchpoints with food. As a result, consumer awareness and food safety practices play an important role in foodborne illness outbreaks. More than 35% of foodborne illness cases occur in homes, according to WHO (2015). Several studies on consumer food safety knowledge, attitudes, and practices have been carried out in different parts of the world. This is one of the reasons why consumers and grocers do not seek home care (Lim et al., 2016).

2.1.2. Nutrition of children

Nutrition is the work of food in the body and is known as the process of taking in food and using it for growth, metabolism, and repair. Diet is the form of food that includes everything that happens from eating to food used for various bodily functions (Srilakshmi, 2002). Nutrition is the basis of human development and is a series of specific plans. Not only can it reduce the burden of malnutrition and deprivation, but it can also help countries move forward (Gazette, 2012). The nutritional state is the state of our body resulting from food consumption and food use. Nutritional status can be good, good, or bad (Mudambi et al., 2012).

A balanced diet is essential for normal functioning. Since there is enough food, proper education and awareness can improve it. Malnutrition remains the leading cause of morbidity and mortality in children under 5 years of age. Children are prone to malnutrition. Several socioeconomic, biological, environmental, and behavioral factors increase risk and must be identified at an early stage to promote health and prevent disease (Ahmed et al., 2001). Children in a healthier way. In addition to providing adequate nutrients for babies, breastfeeding can also reduce the incidence

of gastroenteritis and respiratory infections reduce mortality in children. Colostrum is used for infants because it is a source of protein, antibodies, and vitamins. According to reports, in many developing countries, complementary feeding can prevent these deficiencies. Energy additives from non-maternal milk and semi-solid or solid foods. Description of infant nutrition (World Health Organization, 2005).

Around 45% of deaths of children under 5 worldwide are linked to malnutrition (Black, et al., 2013). For those who are still alive, malnutrition will affect their health later. Insecurity, inadequate nutrition, limited nutritional knowledge, and/or repeated infections are the main factors affecting a child's growth and development. As a result, malnutrition severely affects children in low- and middle-income countries, particularly in sub-Saharan Africa and South Asia, where an estimated 250 million children under 5 are at risk of stunting. Severity factors such as insufficient food intake, chronic and recurrent infections, and unfavorable prenatal conditions. Stunting (deficiency) caused by chronic malnutrition is associated with increased morbidity and mortality, poor physical and cognitive development, low economic productivity, and adverse effects on fertility. maternal fertility in adulthood (Victoria et al., 2008). Causes lasting damage and can be passed on to the next generation. Since childhood malnutrition can have far-reaching consequences at the individual, community, and national levels, it is considered one of the most important forms of malnutrition.

Health problems in developing countries like Ethiopia is a serious problem. Ethiopian children under 5 have one of the highest rates of dangerous illnesses in the world. The age-weight index (WAZ) -Z scores less than 2 standard deviations (SD) are relatively strong in Ethiopia. Judges Maluccio, Berman JR, etc. Recently, the joint efforts of the Ethiopian government and development partners have dramatically improved the nutritional status and health of mothers

and children through specific nutritional interventions such as deworming, vitamin supplementation, and other micronutrients (Lancet, 2013). If these plans are implemented without addressing fundamental factors such as poverty and food security, problems will arise. The fact that the following data highlights the challenge in addressing the causes of malnutrition is that only about 12% of children under two years of age achieve the minimum acceptable level of nutritional diversity⁸, shows the urgent need to adopt sustainable and responsible dietary practices, such as increasing product development and growing crops.

2.1.3. Malnutrition as a burden

Developing countries have made progress in meeting the Millennium Development Goals for reducing malnutrition. These targets aim to halve the proportion of children under 5 years of age consuming less than minimum energy consumption and being underweight. However, there are significant differences between regions with high rates of malnutrition. In South Asia and Sub-Saharan Africa (FAO, IFAD, WFP, 2013). At the same time, rapid demographic, social, and economic changes in many developing countries have resulted in rapid urbanization and changes in food systems, leading to food transitions. Global. This change is linked to recent changes in the world's diet, namely increased consumption of saturated fats, sugars, and refined foods. And technological advances make foods high in calories and low in nutrients cheaper in the global food market (FAO, IFAD, WFP, 2013).

Consumption of foods rich in fiber has decreased. Inequalities in the burden of under nutrition persist in all regions, countries, and cities, and overweight and obesity rates are increasing, often in the same city. The result is often seen as the double burden of malnutrition. Thus, malnutrition and obesity coexist. While it may seem counterintuitive, undernutrition and obesity can be caused by the same thing: poverty and food insecurity. According to reports, it exists not only in

the community but also in families and individuals. At these levels, different types of dual burdens are described, including families with young children and obese mothers. The proportion of the burden relative to economic development. Overweight children have muscle atrophy and the mother may be due to lack of adequate nutrition. High-energy and low-micronutrient diets can cause micronutrient deficiencies in children, limit their growth and development, and lead to overweight, obesity, and obesity. women are more likely to be micronutrient deficient (double the individual burden) (Garrett and Ruel, 2005).

It has been found that iron deficiency anemia coexists in women. In addition to the aggravating effect of parity, this diet may also explain this phenomenon, as the horizontal diet can influence obesity and anemia. Concerning increased household food and energy supply between infants and adults, malnutrition and developmental delays may be associated with future obesity risk. It has been reported that stunted children are at increased risk of concurrent overweight in childhood. Increased vulnerability of stunted children to the effects of high-fat diets (Gartner et al., 2014). Rapid changes in diet composition, a key feature of dietary changes, favor stunting and obese children. In middle-income countries, underweight and overweight families are also described. The causes may be related to the rapid change in the food supply. , Risks are related to age or reduced energy requirements, infectious diseases, nutritional or behavioral factors, and genetic and environmental risk factors. The pairs of stunted infants and obese mothers may reflect a statistical increase in maternal obesity under static conditions of stunted children, as these phenomena are important for the development of coping strategies. with the burden of paying attention to nutritional needs (Dieffenbach, 2012).

Malnutrition includes under nutrition and/or over nutrition. However, in developing countries, under nutrition is used to refer to undernutrition (Shinsugi et al., 2015). The indicators of child

malnutrition are stunting, emaciation, and low birth weight. Stunting, emaciation, and low birth weight occurring in children under 59 months of age had a standard deviation of fewer than 2 times the averages for height for age, weight for height, and weight for age, respectively. According to the World Growth Standards 2006 of the World Health Organization (WHO). Childhood under nutrition remains widespread in sub-Saharan Africa. The prevalence of stunting, emaciation and low birth weight in children under 5 years old is 39%, 10%, and 25%, respectively. Under nutrition has short- and long-term effects. For example, its short-term effects include mortality and morbidity. Global reports have shown that about 45% of child deaths in developing countries are due to malnutrition (WHO, 2018).

2.1.4. Knowledge, Attitudes and Practices (KAP)

Physical and economic access to food alone is not enough to ensure that people are food secure and well-nourished. What is needed is for people to understand what constitutes a healthy diet; namely, the health issues related to nutrition that affect their community and how to solve them through approaches based on the food and how to make the most of their resources. They should also have a positive attitude towards nutrition, diet, food, and hygiene and health are closely related to the application of diets and diet optimized to ensure their nutritional health and that of their families. Knowledge, attitudes, and self-reported practice (KAP) of food handlers on food safety is the subject of many studies worldwide (Gerges & Jaoude, 2018).

Knowledge, Attitudes, and Practices (KAP) study is seen as the most viable way of obtaining updated information on hygiene behavior and practices in the community. Thus, the present study was conducted to obtain baseline information on the existing knowledge, attitude, and practices about sanitation and hygiene in the target population. Knowledge is information that the target population has about sanitation and hygiene-related issues. Attitude is the way a person

views something or tends to behave towards it. In the context of the present study, an attitude refers to what the target population feels or believes about sanitation and hygiene-related issues. Practice refers to how people demonstrate their knowledge and attitudes through their actions (Mohd 2017).

2.1.5. Food Availability and Nutritional Status

The food does not eat only. It is an essential part of the culture of communities, regions, or countries. Food is a relative concept. Good health depends on the appropriate food supply and the achievement of nutritional adequacy, agricultural policy, and the food distribution system (ADEL, et al, 2006) is good (ADEL et al, 2006 and the most important results from the most important steps to increase food if the national diet is nutrient deficient, it appears. Vitamins followed by iron deficiencies and blindness followed by the lack of tribe that could be overcome by providing or consuming this nutrient-rich diet (Gyawali, 2002).

Factors affecting nutritional status are maternal food security, breastfeeding practices, type of infant food, feeding frequency, nutritional status of women and children, and ultimately, who feeds the child and how the child eats (NMICS, 2010). Many other factors influence nutritional status, some of which are food availability and distribution systems, food consumption, sources of income and purchasing power, family size, illiteracy rate, socio-cultural and religious beliefs, sanitation, and health. In Ethiopia, about 33.6% of the Ethiopian population lives below the food poverty line and cannot meet the minimum daily nutritional requirement of 2,200 calories (MOFED, 2013).

In Ethiopia, around 33.6% of the Ethiopian population lives below the food poverty line and cannot meet their minimum daily food requirement of 2,200 calories (MOFED, 2013). Based on

the latest small report from the Ethiopia Demographic and Fitness Survey (DHS), nationally 40%, 25%, and 9% of adolescents under 5 are stunted, overweight or underweight in 2014 (CSA, 2014). But according to this report, the preponderance of obese or overweight young people is no longer greater than 3%. This extreme child under nutrition has disastrous social and monetary implications. For example, 28% of infant mortality is linked to low vitamin intake; 44% of exercise costs related to malnutrition occur before the child is 1 year old; Children are expected to be undernourished before the age of five (AU Commission et al., 2014). As the numbers show, in Ethiopia vitamins are not as big a problem as the vitamins below; As a result, our review is better focused on the factors that influence child malnutrition.

2.1.6. Assessment of nutritional status

The nutritional assessment of the community is one of the first stages of formalization of public health strategies that are fighting for nutrition. The principle of this assessment is to determine the type, size, and distribution to identify nutrition in other geographical areas and to determine the contribution elements. The correct proliferation of the injury is the vulnerable sector, the community, the community, or the vulnerable areas of nutritional assessments to ensure the sale of materials and human resources, to ensure that directors and politicians are sensitive and planned. The appropriate way for nutritional assessments. Compared with the postal state, this can be done as a specific attempt to perform as part of the practice to document the current status or to assess the impact of the intervention program (Wrieden, 2014).

2.1.7. Anthropometric Measurement

Nutritional Human Measures Measures Changes in Renal and Body Configuration Based on Age and Nutrition Status (Anyzewska et al., 2013). Nutritional human systems are generally

performed in kindergarten children, which are the most common and severe Pempose age group, are most commonly performed. Here is a brief description of the human body measurement or nutritional indicators that kindergarten children are generally accepted. Weight height: Use standard digital scales and segment diameters to measure the weight and height of numerical scales and standard children. This indicator is expressed as a standard diversion of 2006, 2006, following the 2006 Children's Growth Standard. Similarly, a typical deviation is considered a small loss. The standard deviations of 2 and 3 or less are considered moderate and severe losses, respectively. II. Age Weight: Age and Weight This includes children less than the central value of two differences of less than two standard deviations below the central value of the population. Reflect on the impact of acute and chronic nutrition.

III. Group's height: children smaller than two standard deviations of the central value of the base population are considered short or short. This is the result of malnutrition and chronic or recurring disease.

IV. Perimeter of mud arm: MUAC is the diameter of the arm and is a measure of body fat and muscle mass. It is mainly used for children, but in pregnant women can be used to assess conditions. Measurement performance is simple and minimal is needed. Therefore, it has been proposed to use MUAC in a nutritional status when it is difficult to collect data in height, weight, and age. Sometimes there is a fixed threshold for children sometimes used to define the implementation of nutrition (WHO, 2006). Children with an average shoulder under 12.5 cm are considered nutrition. Therefore, it is very important to diagnose the energy nutrition of proteins. Fiberglass or steel strip (Anyzewska et al., 2013).

Especially, we regularly integrate weight and higher measurements for children. These measures have adopted the narrow tax with the signs of nutrition by their means because the weight and the top depend on each age and sex. Genetic and other variations affect physical properties. However, even if such a variant herbal exists, it is much more competent to apply physical measures to assess the relevance of the diet and growth of infants and children. This is done by the distribution of the same indicators for a healthy reference institution and a method of assessing the signs that may be exclusively or found in this distribution. For example, three of the upper and upper and upper weights and weights are generally based on signs assessment methods based on the most commonly used intra-romantic signs of introduced signs generally used for infants and children. Weight, high, age, and sex for facts about healthy children (Bernstein, 2012).

Anthropometric indices were constructed thanks to a means of evaluating the measures applicable to similar individuals (sentence of age and sex) in the criteria. There are three ways to express this comparison (WHO, 2006). Z-score (priority score): Based on the criteria of the same age or the same sum of the masses and public references to the public, the public departure of the public. The median value ratio is the ratio of expenses measured at the central value of the central value charge of the reference for the same sex and the age or the same vertex. Several percentiles: the person's ranking in a given reference distribution has been said to a sentence on the number of institutions it is equal to or exceeded.

2.1.8. Conceptual Framework

The amount of food consumed directly affects the nutritional status. Eating less than the recommended dose can lead to malnutrition. Malnutrition is mainly related to an inadequate diet, and inadequate combination of nutrients, an unbalanced diet, and insufficient nutrients to meet

healthy conditions. Humans influence how food is used in the human body. Illnesses generally increase the body's need for nutrients to repair tissues damaged by disease and, through poor absorption of nutrients, ensure a greater loss of nutrients associated with the disease. diseases. Impaired metabolism and loss of appetite. Malnutrition is known around the world as a “silent emergency” and it causes widespread death and disability, especially in children and women of childbearing age.

Malnutrition destroys lives by jeopardizing health, learning, and productivity. , Curiosity, encouragement, and hope. The economic and social costs of malnutrition have undermined human development. Most of the world's population (mainly the poor in developing countries) is malnourished in calories, protein, and/or micronutrients (FSNAU, 2012). Infants with high nutritional needs, preschool children, pregnant and lactating women are the most susceptible to malnutrition. Malnutrition is easily transmitted from generation to generation. The greatest harm caused by malnutrition occurs in the womb and in the first two years of life, which is irreversible.

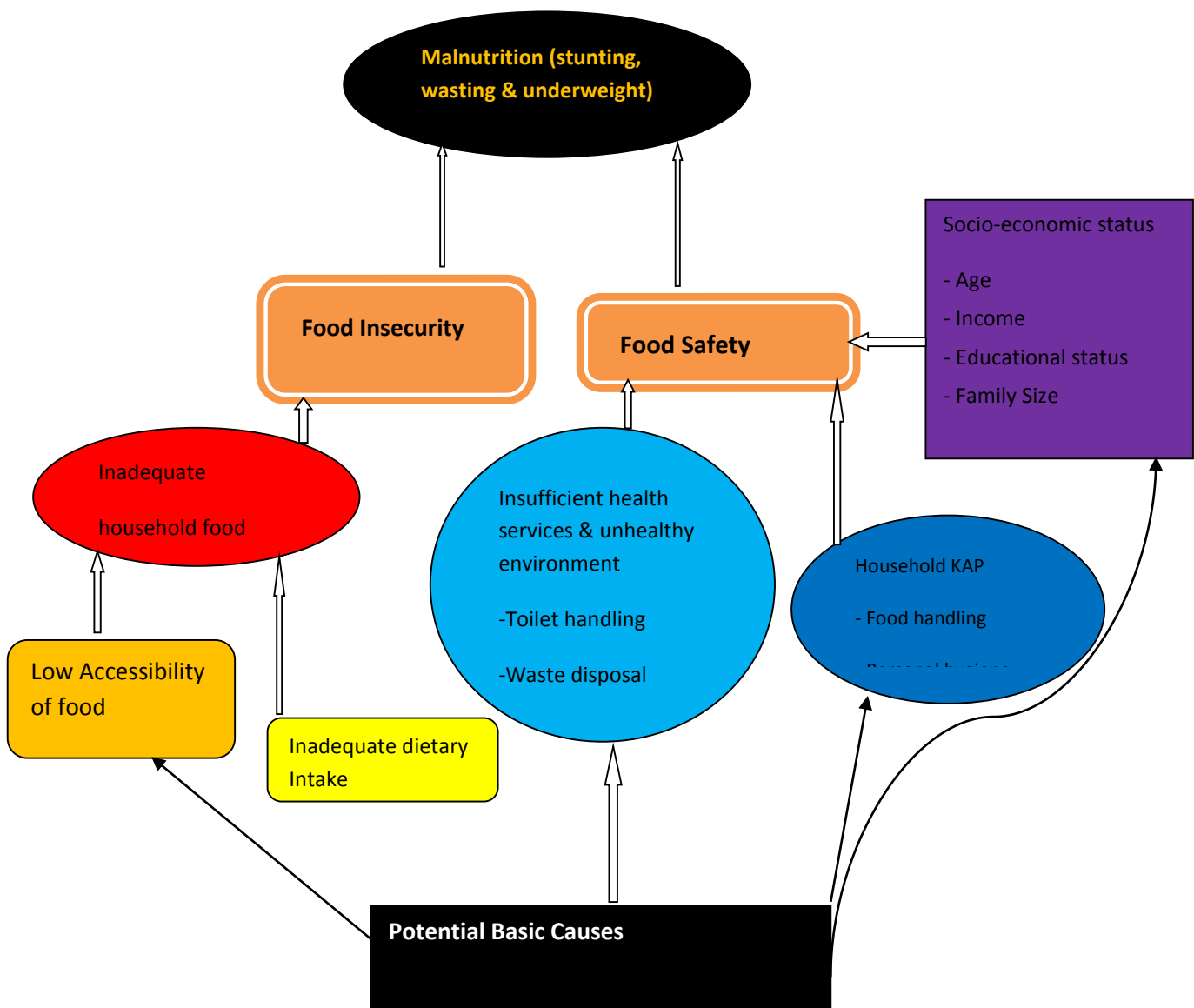


Figure 2.1: Food safety and Child Nutritional Status Conceptual Framework (modified from UNICEF, 1991)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 The study area

The study was carried out at Cure International Hospital in Addis Ababa, Ethiopia's capital. The average altitude of this city is 2,400 meters above sea level. The total area of the city is 540 square kilometers. According to data from the CSA (2017), the population of Addis Ababa in 2017 was almost 4 million and the United Nations population projections estimated that by 2021 the population will grow to 5,006,000 (UN, 2020). Ethiopia CURE is a pediatric orthopedic training hospital located in the capital. The hospital opened in 2008 and provides sophisticated modern medical and surgical care for children with disabilities. As Ethiopia has been one of the poorest countries in the world, with only a handful of citizens having access to health services, these health services are in dire need. The Foot Club Clinics and Clinics in Ethiopia provide top-notch care for Ethiopian children.

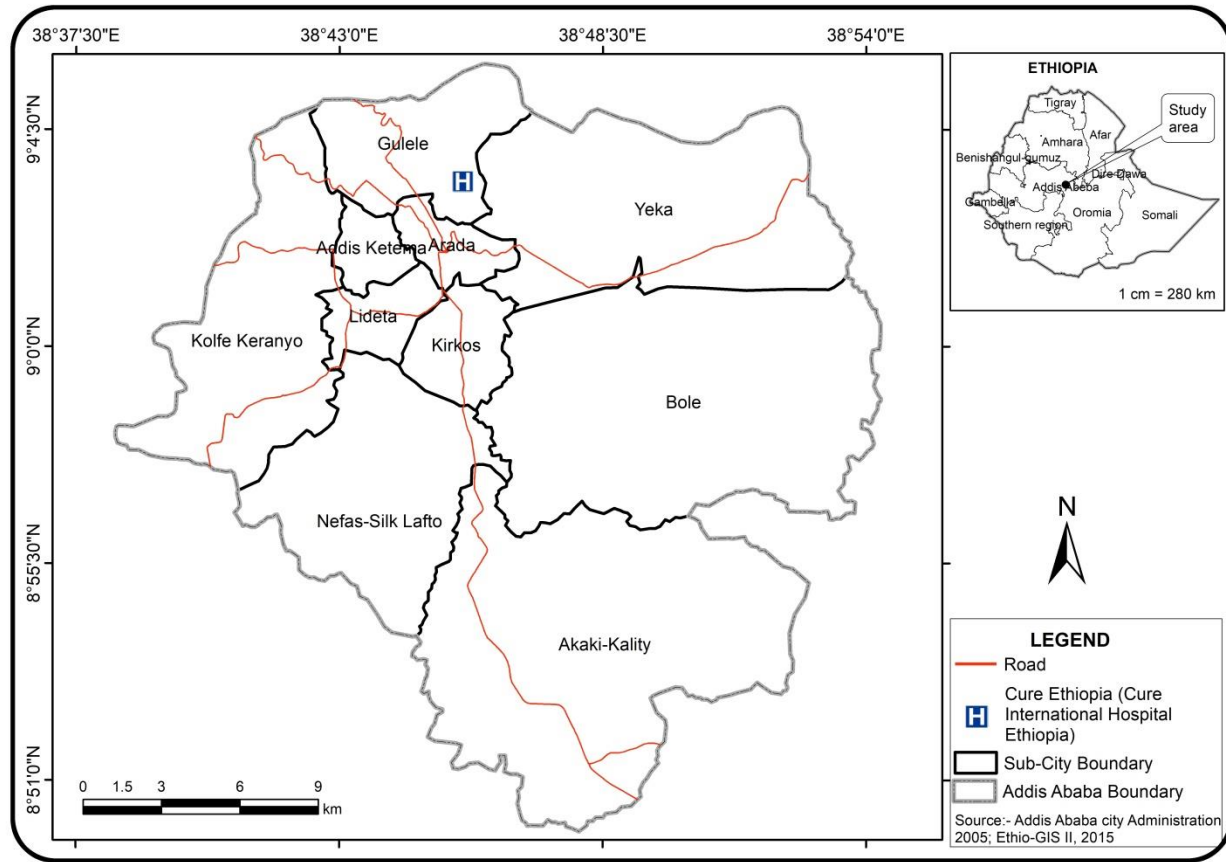


Figure 1: Map of the Study Area (source CSA, 2012).

3.2. Study design

The study is a descriptive cross-sectional design. 210 people were enrolled in the hospital for anthropometric measurements in children under 5 years of age and to test knowledge, attitudes, and practices related to food security and malnutrition. Check out the mother. Family 3 January to March 5, 2021.

3.3. Source population

The hospital is a state-of-the-art complex that provides modern medical and surgical care to physically disabled children. So that, the original population source was mothers and their under 5 children receive medical care at the Hospital.

3.4. Sampling technique and sample size

For this study, a convenience sampling method was selected and considered appropriate. Convenience sampling involves selecting a population from a sample that seems convenient to him/them to the management of the institution where he is conducting the research. Samples for the study were obtained from mothers and their children under 5 at Cure Hospital. The sample size was calculated based on a simple proportionality formula developed by Yamane (1967) with 95% confidence and $P = 0.5$ was assumed for the equation. The sample size was determined using Yamane's formula. Therefore, the sample size was determined using this formula:

$$\text{Sample size (n)} = N / (1 + N (e)^2)$$

$$\text{Sample size (n)} = 3000 / (1 + 3000 (0.07)^2) = 210$$

3.5. Types and Sources of Data

All associated key and secondary data sources have been examined in the research. The basic data was collected directly from direct observations and structured interviews. The secondary data were published in infant nutritional matters such as books and journals.

3.6. Data collection techniques and tools

This study was a transversal hospital based to assess the nutritional status of children in under 5 taking medical care in the hospital. The default data was collected via semi-structured questionnaires in the form of interviews. This study was conducted between January and March 2020 and the collection of data required was based on social-economic and demographic profiles, KAP questionnaires and Household Food Insecurity Access Scale (HFIAS). The first group included different personal information (sex, age, employment, level of education, and family size). The second question contains the data of the human system (weight of the weight of

KG, the height of the lunch, and the questions of the MUAC band). The third group was focused on food access according to the access tool for the access to the instability of home food (HFIAS). The last group has been developed to assess the knowledge, attitude, and practice of respondents (manipulation of food, personal hygiene, and hygiene).

3.6.1. Household survey

Parent data was collected by respondent interviews with age, education, income, food, and non-food expenditures. The knowledge, attitude, and practice of nutrients (KAP) were collected from the mother. The knowledge, attitude, and practice of nutrients (KAP) have been measured using a series of instruments. Children's data contain age, sex, weight, and length/height. The weight has been measured with an electronic balance. The scale has been calibrated periodically. All subjects lost weight only for lightweight clothes. The length/height of which was measured by the length/infant height measurement card recommended.

Answer the nine domains for the HFIAS evaluation and you cannot solve the three domains and you cannot solve the three domains, or sometimes or sometimes. Furniture, which has experienced anxious food conditions, or which are not worried about food is defined as food security. The worried furniture of light food is sometimes unable to eat food or desirable foods, or more boring than desirable, or you cannot eat food remotely, or you will not be able to eat unwanted food, but that n is rarely disturbing. Unstable moderately fantastic hypotheses have started eating good quality food or unwanted food because it eats a monotonous diet or an unwanted food or sometimes reducing the size of a meal or meal, or sometimes reduces the number of meals. Unstable furniture based on food often the size of meals or meals and experience one of the three most serious conditions. All the hypotheses that have experienced

one of the most severe conditions (to get out of food (out of the food, get out of food, or every day and night), were considered severe food (Coates et al., 2007).

3.6.2. Observation

In addition to the above data collection method, field observations were made to verify the information provided using the underlying data collection tool.

3.6.3. Anthropometric Measurements

Anthropometric measurements used in the study were weight, height, and Mid–Upper Arm Circumference (MUAC). These were presented according to cut–off points in terms of z-scores based on the standard deviation SDs from a reference median value (z-score) being above or below the cut–off points. Weights of the children were measured and recorded to the nearest 0.1 kg (accuracy of 100 g) using a salter scale with a capacity of 25 kg adjusted to zero points before starting the reading.

The child was hung on the scale and the measurement was recorded as soon as the pointer on the scale had stabilized. Height was measured by using horizontal length (for those who could not stand erect) or standing height (for all above 13 months of age). Measurement was reported to the nearest 0.1 cm. A health extension worker used a height board to measure the height/length of children. The measurement was recorded while the subject was standing without shoes on a horizontal flat with heels together, back straight, and eyes looking straight ahead, and the board was pressed firmly horizontally against the board then the measurement was recorded. The MUAC was measured by using the tape at the midpoint between the shoulder and elbow of the child by halving the distance between the shoulder and the tip of the elbow. The child's arm was uncovered as far as the shoulder and hanged straight. During the measurement process, the tape

was placed comfortably around the arm at the marked mid-way point, and measurement was taken and recorded. Children were classified according to nutritional classification.

Age determination- Information on age was obtained from a written birth card or similar document, with verbal information on the date of birth from the mother, and age was calculated in months.

Child's nutritional status was assessed using the child's weight, height, and age. by using Emergency Nutritional Assessment (ENA for SMART 2011) in the scale of WHO standards 2006 in the evaluation of nutritional status; height-for-age (HAZ below -2SD) which measures stunting; weight-for-height (WHZ below -2SD) which reflects wasting; and weight-for-age (WAZ below -2SD) that reflects underweight.

3.7. Data Quality Management

All questionnaires confirmed completeness before disclosing an interviewed target at the end of the interview. The daily examination conference was conducted with health expansion workers who have made human-based measures and have helped to face all the problems that occur. We have also tested the tools before handling the tools of the target population and high-quality data tested. Health expansion workers were appropriately known to provide quality data collection and have been verified and calibrated every morning using a standard known weight. Before leaving the learning area, the health expansion worker examines and signs all forms so that the data is not excluded. Health expansion workers have recorded all the additional points of the laptop as soon as possible (for example, during the evening or evening, during the base), observations, ideas, problems, measures drunkards, and evidence of such actions. Each note contains the date, location, and name of the user concerned.

3.8 Technique of data analysis

The data was entered and analyzed using the Statistical Package for Social Sciences (SPSS v22). Descriptive statistics including average mean, frequency, and standard deviation were used for demographic and anthropometric indicators. The weight and height of the children were used to calculate weight-for-age, weight-for-height, and height-for-age by using Emergency Nutritional Assessment (ENA for SMART 2011) in the scale of WHO standards 2006. Children were classified as stunted, wasted, or underweight if the respective z-scores fell below -2SD of the reference population for the age and sex (WHO, 2009).

The Household Food Insecurity Access was measured using a set of nine questions related to three different domains of food insecurity access: (i) anxiety and uncertainty about the household food supply; (ii) insufficient quality in terms of variety and preferences of the type of food and (iii) insufficient food intake in terms of reducing the quantity of food. The food security status of households as food secure, mildly food insecure, and moderately food insecure was determined according to (Coates, 2007).

Qualitative data such as knowledge, attitude, and practices on food handling, personal hygiene, and water and sanitation assessment were converted to percentages and used as indicators for knowledge, attitude, and practice on safe food handling. The assessment was based on the FAOs guidelines on food safety and nutrition-related KAP assessments (Macías and Glasauer, 2014). A three-point Likert's scale with a positive, negative, and neutral response was used to measure the knowledge, attitude, and practices of food handling. The knowledge, attitude, or practice of the population is calculated for each question by dividing the total number of correct responses by the number of respondents who answered the particular question (Macías and Glasauer, 2014).

Anthropometric indices were calculated using reference medians recommended by the World Health Organization (WHO) and classified according to standard deviation units (z-scores), based on the WHO criteria (11). Wasting (weight-for-height z-score–WHZ) indicates thinness. It is usually the result of recent nutritional deficiency and is affected by seasonal shifts associated with the availability of Foods and/or prevalence of the disease. A WHZ of <-2 defines the presence of acute malnutrition (wasting). Stunting, represented by a low height-for-age z-score (HAZ), results from extended periods of inadequate food intake, poor dietary quality, increased morbidity, or a combination of these factors. A HAZ of <-2 defines chronic malnutrition (stunting). Weight-for-age z-score (WAZ) is essentially a composite of weight-for-height and height-for-age, thus a measure of both acute and chronic malnutrition. A WAZ of <-2 is used for defining a child as underweight. A z-score of <-3 defines severe levels of each of the indices. To measure the impact of food insecurity on children, the results from this survey were compared with the results of a similar nutritional survey conducted in Ethiopia.

3.9. Ethical considerations

Since the measurements were made on human subjects, research ethics issues were reasonably taken into account. I have received a certificate of ethics from Addis Ababa University for Development Studies, Department of Food Security. The management of Cure Hospital was informed of the research objective and permission to conduct the study was granted. The following factors were explained to each respondent: the purpose of the study and its objectives, confidentiality of information obtained from respondents, right not to answer questions to which respondents would not feel comfortable and the importance of answering all questions. The participants were also told that the study did not encourage them. In the presentation of the study results, the respondent's name was not used. Finally, respondents received oral consent.

3.10. Scope and Limitation of the study

This study was conducted to assess knowledge, attitudes, and practices (KAP) on issues of food security and child malnutrition, food security, and nutritional status of children. Children under the age of five in households within the school district at the hospital. Nutritional assessment was performed using anthropometric measurements which were then compared with WHO criteria (SD classification) using summary indicators of nutritional status: weight for age, height for age, and weight for height. Due to time and resource constraints, the study did not assess diversity in household diets.

CHAPTER 4. RESULT AND DISCUSSION

This chapter presents the research results on Demographic characteristics of the study population, food security status, malnutrition and security knowledge, attitudes and practices (KAP) of food safety and water of mothers with their children in the Cure Hospital, Addis Ababa, Ethiopia. Data are presented in table formats.

4.1 Socio-economic and demographic characteristics of the households

This master thesis, conducted at Cure Hospital, Ethiopia in 2021, aimed to investigate the knowledge, attitudes, and practices (KAP), food security, and nutritional status of mothers of children under 5 years old. 210 population samples (mothers and their children under 5 years of age) were selected in the selected study area (Cure Ethiopia Hospital) using a questionnaire. Data were analyzed using SPSS-a, software widely used as a statistical analysis tool in the social sciences. The results of the study are presented as frequencies and percentages. The result is presented in frequency and percentage of their demographic characteristics. are Table 4.1 below.

The analysis of demographic variables of the mothers of under-five children is tabulated in Table 4.1. The data revealed that the majority of the mothers (42.6%) of the parents were employed in the private sector followed by agriculture (22.8) and in the daily labor/ solid waste clinging (16.3%) as well as in the urban beatification (5.4%) while the rest 11.4% do not have any occupation (housewives). The majority had children aged between one to three years (58%), whereas 52% of the respondents had a larger family size with more than four or five.

As it has been depicted in table 4.1, the education qualification wise distribution of the study sample was with the majority (42.8%) of the sample was 1-8 graders, 33.8% completed their diploma and above levels, 14%.8 secondary school (9-12) and least 9% (literate) were able to

read and write. Almost half (45.8%) had an estimated monthly income of more than 2500 birr and 31% of the mothers had their monthly income birr 1501-2500 and 23.2% of the mothers had birr 500 to 1500 monthly income (table 4.1). The respondents were aged with the majority (51.9%) between 18-31 years, 32.9% of them belong to 21-40 years, while 10.5% of the women belong to more than 41 years and at least 4.9% was above 50 years. Based on their religion, the majority of the sample populations (81.4%) were Christians, while 13.7% of them were Muslims and the rest 4.9% were categorized to other religions.

Table 4.1. Socio-economic and demographic status of the study population in Cure Hospital

Variables	Category	Frequency (n)	(%)
Age group Mother (maternal) Father (paternal)	18-31 (IN years)	109	51.9
	21-40	69	32.9
	41-50	22	10.5
	>50	10	4.9
	18-31	63	32.6
	21-40	73	37.8
	41-50	40	20.7
	>50	17	8.8
Marital status of mothers	Married	143	68.1
	Divorced	31	14.8
	Widowed	22	10.5
	Widower	14	6.7
Religion	Orthodox	106	51.7
	Catholic	15	7.3
	Protestant	46	22.4
	Muslim	28	13.7
	Other	10	4.9
Education	Writing and reading	19	9.0
	1-8 Grade	89	42.4

	9-12 Grade	46	21.9
	Diploma	31	14.8
	Above Diploma	25	11.9
Occupation	Agriculture	46	22.8
	Private	86	42.6
	solid waste clinging and/urban beautification;	11	5.4
	watershed development	3	1.5
	Housewife	23	11.4
	Daily labor	33	16.3
Monthly Income in birr	500-1500	47	23.2
	1501-2500	63	31.0
	>2501	93	45.8
Number of children	1	94	44.8
	2	54	25.7
	3	30	14.3
	>4	32	15.2
Age of children in years	1	27	12.9
	2	53	25.2
	3	42	20.0
	4	50	23.8
	5	38	18.1
Sex of children	Male	121	58
	Female	89	42

4.2. Nutritional Status of Children: Anthropometric Data

Anthropometry is known as a measurement of certain physical parameters of the human body and the most frequently used tool to assess the nutritional status of individuals or the community. Anthropometric measurements of the selected children were obtained by adopting different methods described below. The assessments of the children, from the Cure Hospital Ethiopia,

were considered in this study, the outcome was analyzed based on age, weight, and height, showing the varying prevalence of underweight.

The results of this study show that the rate of stunting (height for age), underweight and malnutrition in children is high. The current study shows no significant difference to the national report. Anthropometric evaluation of children, based on age, weight, and height, showed the average prevalence of underweight and stunting (32.0% and 39.0%), respectively (Tables: 4.4a and 4.5a). The higher prevalence of under nutrition (acute malnutrition) in the current study may be due to the fact that all respondents belong to the poor community and the came from rural areas receiving medical support in the hospital, having luck of dietitian and financial support. With this information, children in the current study area may not have enough food, increasing their risk of acute malnutrition.

The proportion of underweight and stunted children observed in the current study is consistent with a report done by Demographic and Health Survey (DHS) (Central Statistical Agency (CSA) and ICF International (2016). According to this report (DHS, CSA and ICF International, 2016), about 5.8 million children under 5 years (38 percent) were suffering from chronic malnutrition (stunting or low height-for-age). However, the current finding was comparatively higher than a study conducted by Degarege and Animut (2015), in Addis Ababa City, Ethiopia (19.6%) as well as a study done by Erko et al. (2015), in Durbete Town, Ethiopia (11.2%). MUAC measurements showed that 36.0% of children were suffered acute malnutrition (Table: 4.2c). This shows that unequal access and poor nutrition for children lead to inequalities in child health outcomes between rural and urban settings as it has been described in a report by Central Statistical Authority and ORC Macro (2011).

Table 4.2a. Prevalence of wasting based on weight-for-height z-scores by sex

	All n = 210	Boys n = 108	Girls n = 102
Prevalence of total wasting (<-2 z-score)	(91) 43.3 %	(45) 21.4 %	(48) 22.9 %
Prevalence of moderate wasting (<-2 z-score and ≥ -3 z-score)	(50) 23.8 %	(29) 13.8 %	(31) 14.8 %
Prevalence of severe wasting (<-3 z-score)	(69) 32.9 %	(31) 14.8 %	(29) 13.8 %

Table 4.2a shows wasting of the children based on weight-for-height by sex. The result shows that, 14.8% male and 13.8 female were severely wasted, 21.4 % male and 22.9% were total wasting while 13.8% male and 14.8% female were moderately wasted.

Table 4.2b. Prevalence of wasting based on weight-for-height z-scores by age

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (≥ -3 and <-2 z-score)		Normal (≥ -2 z score)	
		No.	%	No.	%	No.	%
12-24	79	5	17.3	7	25.6	16	63.6
25-36	43	7	24.0	4	10.2	21	72.5
37-60	88	3	15.5	3	13.7	9	74.4
Total	210		18.9		16.5		70.1

Table 4.2b shows wasting of the children based on weight-for-height by age. The result shows that, 17.3% below two years, 24.0% 2-3 years and 15.5% of 3-5 years were severely wasted while 25.6%, 10.2% and 13.7% were moderately wasted.

Table 4.2b shows wasting of the children based on weight-for-height by age. The result shows that the prevalence of wasting 32.9 % were severely wasted, 43.3 % were total wasting while 23% were moderately wasted.

Table 4.3a: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

	MUAC		
	All n = 208	Boys n = 112	Girls n = 98
Prevalence of total malnutrition (< 125 mm and/or oedema)	59 (28.1%)	50 (23.8%)	35 (46.7%)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	76 (36.2%)	36 (17.1%)	21(10%)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	73 (34.7%)	26 (12.4%)	42 (20%)

Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex has been depicted in table 4.3a. The prevalence of severe malnutrition with male and female was at 12% and 20% while 17.1% (male) and 10% (female) were moderately malnutrition.

Table 4.4a: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 210 (%)	Boys n = 121 (%)	Girls n = 89 (%)
Prevalence of underweight (<-2 z-score)	99 (47.1%)	65 (53.7%)	49 (55%)
Prevalence of moderate underweight (<-2 z-score and ≥ -3 z-score)	69 (32.8%)	32 (26.4%)	24 (27%)
Prevalence of severe underweight (<-3 z-score)	36 (17.1 %)	24 (19.8%)	16 (18%)

Prevalence of underweight based on weight-for-age z-scores by sex has been depicted in table 4.4a. The prevalence of severe underweight with male and female was at 19.8% and 18% while 26.4% (male) and 27% (female) were moderately underweight.

Table 4.4b. Prevalence of underweight by age, based on weight-for-age z-scores

Age (mo)	Total no. 210	Severe underweight (<-3 z-score)		Moderate underweight (≥ -3 and <-2 z-score)		Normal (≥ -2 z score)	
		No.	%	No.	%	No.	%
< 2	82	15	18.3	43	52.9	36	42.1
3-5	128	45	35.0	30	37.0	51	39.9
Total	210	60	53.3	73	89.9	87	82

Prevalence of underweight by age, based on weight-for-age z-scores has been depicted in table 4.4b. The prevalence of severe underweight of below two years of children were at 18.3% while 3-5 years of age were moderately underweight.

Table 4.5a. Prevalence of stunting based on height-for-age z-scores and by sex

	All n =208 (%)	Boys n = 106 (%)	Girls n=102(%)
Prevalence of stunting (<-2 z-score)	88.8 (42.7 %)	57 (54.2 %)	34 (33.7%)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	115(55.3%)	16 (15.4%)	57 (56.4 %)
Prevalence of severe stunting (<-3 z-score)	40 (19.5 %)	52 (49.6 %)	10 (9.8 %)

Table 4.5a shows Prevalence of stunting based on height-for-age z-scores and by sex. The children with moderate stunting were 15.4% (male) and 56.4 (female) while those with severe stunting accounted for 49.6%. (male) and 9.8% (female).

Table 4.5b: Prevalence of stunting by age based on height-for-age z-scores

Age (mo)	Total no.	Severe stunting (< -3 z-score)		Moderate stunting (≥ -3 and < -2 z-score)		Normal (≥ -2 z score)	
		No.	%	No.	%	No.	%
< 2	82	18	21.7	19	23.5	54	65.6
3-5	128	91	71.3	24	18.4	33	26.1
Total	210	109	46.5	43	21	87	45.9

Table 4.5b shows Prevalence of stunting by age based on height-for-age z-scores. The children with moderate stunting were 21 while those with severe stunting accounted for 46.5%.

Table 4.5c: Prevalence of acute malnutrition based on MUAC cut-offs by sex

	MUAC		
	All n = 205	Boys n = 106	Girls n = 99
Prevalence of total malnutrition (< 125 mm)	43 (52.4%)	53(50%)	46 (46.5%)
Prevalence of moderate malnutrition (< 125 mm and ≥ 115 mm,)	19 (26.8%)	32 (50%)	13 (13%)
Prevalence of severe malnutrition (< 115 mm)	24(29.7%)	21(20%)	33 (33.3)

Table 4.5c: show prevalence of acute malnutrition based on MUAC cut-offs by sex results, male (20%) and female (33.3) were found to be severely malnourished (MUAC <11.5cm) while male (50%) and female (13%) were moderately malnourished.

4.3. Food Safety Knowledge, Attitude, and Practice

4.3.1. Respondents Knowledge of Food Safety

Food handlers play a major role in the passive transmission of pathogens from contaminated sources such as the transmission of pathogens from raw meat or ready-to-eat foods. Foodborne illnesses are responsible for a large number of illnesses around the world. The World Health Organization (WHO, 2010) estimates that around 1.8 million children die from diarrhea each year, largely due to the consumption of contaminated food and water.

The respondents were asked if they were aware of any reason for the separation of raw and cooked foods, the signs of thorough cooking of soups and stews for safety and readiness to be served, kinds of perishable foods to be stored in the refrigerator or a cool place, reasons for avoiding eating leftovers that were not kept in a cool place and the importance of washing raw fruits and vegetables before eating. The respondents' level of general knowledge about personal hygiene, cleaning, sanitation procedures, cross-contamination as well as causes and transmission of foodborne illnesses is summarized in the following tables (Tables: 4.6-4.15).

Out of the five knowledge-related questions, 81.47% of the study participants answered correct answers, indicating that the majority of study participants had a good level of knowledge about food safety (Table 4.6). In this report, 51.0% of participants recognized likelihood of getting sick from eating contaminated food or due to cross-contamination during food safety activities, but only 27% and 22.8% were not have a clue or the lack the confidence the consequences

contaminated food to health (Table 4.7). Slightly fewer respondents felt that importance cleaning kitchen surfaces and utensils after preparing dinner and the importance of storing perishable fresh foods such as raw meat, poultry, and seafood to avoid contamination and tend to practice good hygiene level with an average percentage score of 38.7 percent, and only just above half of the respondents considered that sanitation procures are not their concern (Table 4.8). Another result was given in a study by Nee and Norrakiah (2011), where the majority of respondents had average practice in all parts of the question, despite their good knowledge. The percentage of food handlers in our study scoring high on average can be explained in addition to high knowledge of compliance with hygiene orders.

Regarding the personal hygiene, specifically key moments for hand washing, 98.9 percent of respondents identified that they were aware of such services. Eight-ninth percent (89%) had good practices and had positive knowledge of personal hygiene knowledge, 11% of them have did not have proper food handling knowledge and cleaning procedures. Generally, encouraging good knowledge on personal hygiene and sanitation was found (Table 4.9).

Improving drinking water conditions and sanitation facilities remains a major concern globally. Though 89% of the world's population has access to drinking water facilities, about 768 million people rely on unimproved drinking water sources; 83% of them residing in rural areas (WHO, 2013). Information of water sanitation knowledge was surveyed water in terms of methods to disinfect water if it's not safe or does not come from a safe source.

The practice of personal hygiene is important to ensure food safety and protect consumers from foodborne illness and infection. A high percentage (79.3%) of people surveyed in this study said that they always wash their hands after using the toilet. They also perceived that a step-by-step

description of hand washing is important for an appropriate personal hygiene practice. 97.7% of the participants perceived that the quality of water can affect health unless unsafe water is not treated properly by adding chemicals or by boiling. 15 percent of the participants used poor methods to make water safe for drinking, the major reason being the perception that water received was already clean (Table 4.10). This result is consistent with that of a study conducted by Soares et al. (2012), and higher than Adesokan & Raji (2014), who reported that around 90 and 78.2% of respondents wash their hands after using the toilet, respectively.

Table 4.6: Food handlers' food safety knowledge

Food Handling Knowledge				
	Know	Number of correct answers		
		Three and more	Two	One
1: Reason for separation of raw and cooked foods				
				108 (51.7 %)
“ Raw animal foods often contain germs	108(51.7%)			
“ Other	44(21.1%)			
“ Don‘t know	57 (27.3%)			
2: Signs of thorough cooking of soups and stews for safety and readiness to be served				
				143 (68.4%)
“ They are boiling/ well cooked	143(68.4%)			
“ Other	34 (16.3 %)			
“ Don‘t know	32 (15.3%)			
3: Kinds of perishable foods to be stored in the refrigerator or a cool place				
				55 (26.6%)
Meat, offal	33 (15.9%)			
Poultry	8(3.9%)			
Fish	14 (6.8%)			
Foods from the sea or lake	7(3.4%)			
Milk/dairy products	9(4.3%)			
Cooked foods	27(13.0%)			
Other	4(1.9%)			
all	69(33.3%)			
4: Reasons for avoiding eating leftovers that were not kept in a cool place				
				155(74.5%)
Because food is not safe anymore	83 (39.9%)			

Foods get spoiled	58(27.9%)			
Higher temperatures make germs grow faster	14(6.7%)			
Other	22(10.6%)			
Don't know	31(14.9%)			
5: Washing raw fruits and vegetables before eating				
				185(91.6%)
.. Wash them with clean water	167(82.7%)			
.. Other	18 (8.9%)			
.. Don't know	17 (8.4%)			
Total knowledge = 81.4%				

Table 4.6: Shows Participants' food safety knowledge

Among the study participants, 91.6% have good knowledge of food handling they practice washing raw fruits and vegetables before eating, 74.5% aware of reasons for avoiding eating leftovers that were not kept in a cool place. 64.8% of respondents know the understand signs of thorough cooking of soups and stews for safety and readiness to be served. 51.7 % of respondents release the reason for separation of raw and cooked foods. 26.6%, recognize the kinds of perishable foods to be stored in the refrigerator or a cool place (Table 4.6).

4.4. Attitude of Respondents towards Food Hygiene

Hazardous food makes an endless loop of sickness and hunger, which especially influences babies, small kids, older, and the debilitated (WHO, 2020). Guaranteeing sanitation is basic for ideal nourishment and well-being, and viable sanitation the board at the public level includes numerous partners working under assorted natural, infrastructural, and sociopolitical conditions (Jaffee, 2018). Dangers to sanitation can happen at any phase of the worth chain from creation to utilization and can go from defilement with microbes or poisons to utilization of perilous added substances just as hazardous dealing with or capacity that compounds hazard.

Table 4.7 shows that the perspectives of the food handlers toward the avoidance and control of food-borne illnesses. Essentially, some share of what the respondents replied, with the majority of them (96.1%) agreed that goodness of properly re-heating left-over before eating or serving them to prevent cross-contamination of foods. Respondents also agreed on the goodness of keeping meat, poultry, fish, or cooked food in a cool place (59.5%). Other limited (53.6%) of food-handlers were aware of the likelihood of getting sick from eating contaminated food. They were also mindful of the fact that seriousness of getting sick from eating contaminated food (44.0%).

Thus, the general attitudes of the food handlers toward food safety were satisfactory. The majority of respondents (51 percent) showed that positive attitudes toward food safety risks of getting sick/ seriousness of getting sick from eating spoiled food, keeping hot/cold, preventing food contamination, and reheating while ready to serve. This has been indicated that the respondents believed that can limit the danger of food defilement, which an uplifting perspective is revealed by the greater part of the respondents. About 27 percent of food-handlers had an unsatisfactory attitude and did not find it necessary to follow the proper knowledge concerning the food handling attitude and they considered that keeping food safe and heating while serving was not inevitably useful. Respondents (22.8%) were not sure how to apply these processes (Table 4.7).

Table 4.7: Food handlers' food safety attitudes

Food Handling Attitude			
	It is	It is not	Not sure
Perceived susceptibility: Likelihood of getting sick from eating contaminated food?	112(53.6 %)	18(8.6%)	79 (37.6%)
Delete reows			
Perceived severity: Seriousness of getting sick from	92(44.0%)	51 (24.4%)	66 (31.6%)

eating contaminated food.			
Perceived benefits: Goodness of keeping meat, poultry, fish, or cooked food in a cool place.	122(59.5%)	20 (9.8%)	63 (30.7%)
Perceived barriers; Difficulty of keeping these foods in a cool box or the refrigerator.	48(13.68%) ⁴	163(77.78%)	30 (8.55%)
Goodness of re-heating left-over before eating or serving them	201(96.01%)	10 (2.85%) ⁵	4 (1.14%)
Difficulty of re-heating leftovers before eating or serving them	67(32.4 %) ⁶	83(40.1%)	57 (27.5%)
Total attitude	51%	27%	22.8%

Table 4.7 shows the food handlers' food safety attitudes: Most of the mothers (51%) have a positive response, 27% lacks while 22.8% have no clue.

4.5. Food safety practices by respondents

The poor practice of handwashing can contribute to food contamination with pathogenic bacteria (Abdul-Mutalib et al., 2012). Respondents were asked to identify whether they agreed or disagreed with several statements regarding the importance of cleaning kitchen surfaces and utensils after preparing dinner and the importance of storing perishable fresh foods such as raw meat, poultry, and seafood to avoid contamination. According to table 4.8, slightly fewer respondents felt that importance and tend to practice good hygiene level with an average percentage score of 38.7 percent, and only just above half of the respondents considered that sanitation procures are not their concern. A different result was obtained in a study conducted by Nee and Norrakiah (2011), in which the majority of the respondents had an average practice in

all parts of the questions, despite their good knowledge. The high mean percentage score of food handlers in our study could be explained in addition to high knowledge is obeying the orders attitude of sanitation.

Table 4.8: Food Handling Practice of Respondents

Food Handling Practice		
1. Usual cleaning of kitchen surfaces and utensils after preparing dinner	No	%
“ Scrape excess food into a rubbish bin	75	35.7
“ Wash with hot water	73	34.8
“ Wash with detergent	53	25.2
“ Don’t know/no answer	9	4.3
2. Storing perishable fresh foods such as raw meat, poultry, and seafood	No	%
“ In the refrigerator (below 5 °C)/cool box	63	30.0
“ Covered (protected from insects, rodents, pests, and dust)	96	45.7
“ Separated from cooked or ready-to-eat foods	32	15.2
“ Other/ Don’t know	19	9.0
;Total practice = 38.7 %		

4.6. Personal hygiene knowledge of respondents

In this study, the food handlers were knowledgeable about personal hygiene practices, cleaning and sanitation procedures (Table 4.9). The present study indicates that over 89% of the food handlers had positive knowledge toward food poisoning could be resulted from contact with germs and feces and the perform proper hand washing and proper cleaning procedures/removal of feces from their home and surrounding. The awareness of such important hygienic procedures by the majority of the institutional food-handlers in this study is very appropriate. Regarding key moments for handwashing, 98.9 percent of respondents identified that they were aware of such

services. Not more than 11% of them did not have proper food handling knowledge and cleaning procedures. Generally, encouraging good knowledge on personal hygiene and sanitation was found.

Table 4.9: Personal Hygiene Knowledge of Respondents

Personal Hygiene Knowledge			
	Know	Number of correct answers	
		Two	One
1. Action for preventing food poisoning from germs from feces			
			185(89.0%)
“ Wash hands (after going to the toilet and cleaning the baby’s bottom)	126 (60.6%)		
“ Remove feces from the home and surroundings	59 (28.4%)		
- Other	15 (7.2 %)		
- No answer	8 (3.8 %)		
;Total knowledge= 89%			
2. Key moments for hand washing			
			98.9
“ After going to the toilet/latrine	87 (41.8 %)		
“ After cleaning the baby’s bottom/ changing a baby’s nappy	41 (19.7 %)		
“ Before preparing/handling food	40 (19.2 %)		
“ Before feeding a child/eating	29 (13.9 %)		
“ After handling raw food	3 (1.4%)		
“ After handling garbage	4 (1.9 %)		
- Other	2(1.0 %)		
- No answer	2(1.0%)		
;Total knowledge= 98.9%			

4.7 Personal hygiene Attitudes and Practices of respondents

Table 4.10 shows the personal hygiene attitudes and practices of respondents. In assessing the personal hygiene attitudes and practices of persons, 44.5 percent reported that they are confident and have a positive attitude to do it properly while 23 percent were not. Additionally, 32.6 percent of the respondents were not sure and have no clue. Generally, most attitude variables showed a positive outlook meaning mothers in the study were well aware of the seriousness and gravity of any poor personal hygiene and shows a good deal of determination and character for further improvement.

Table 4.10: Personal hygiene Attitudes and Practices of respondents

Personal Hygiene Attitude/ Practices			
	It is	It is not	Not sure
Perceived susceptibility: Likelihood of oneself or child having stomach ache or diarrhea, from not washing your hands.	104(50.0 %)	32(15.4 %)	72 (34.6 %)
Perceived severity: Seriousness of oneself or child getting diarrhea from oneself not washing one's hands.	111 (53.4 %)	22 (10.6 %)	75 (36.1%)
Perceived benefits: Goodness of washing one's hands before preparing food or before feeding a child/eating.	144(69.2 %)	24(11.5 %)	40 (19.2 %)
Perceived barriers: Difficulty to wash ones hands before preparing food or before feeding a child/eating	15 (7.2 %)	121(58.2 %)	72 (34.6 %)
Perceived self-efficacy: Confidence in washing one's hands properly?	88 (42.5 %)	40 (19.2 %)	80 (38.5 %)
; Total attitude	44.5%	23%	32.6

4.8. Water and sanitation knowledge and attitude

Improving drinking water conditions and sanitation facilities remains a major concern globally. Though 89% of the world's population has access to drinking water facilities, about 768 million people rely on unimproved drinking water sources; 83% of them residing in rural areas (WHO, 2013). Information of water sanitation knowledge was surveyed water in terms of methods to disinfect water if it's not safe or does not come from a safe source. The majority of the participants (79.3%) perceived that a step-by-step description of handwashing is important for an appropriate personal hygiene practice. 97.7% of the participants perceived that the quality of water can affect health unless unsafe water is not treated properly by adding chemicals or by boiling. 15 percent of the participants used poor methods to make water safe for drinking, the major reason being the perception that water received was already clean (table 4.11).

Table 4.11: Water and sanitation knowledge and attitude of participants

Personal Hygiene Practice		
A step-by-step description of hand washing	Poor	Appropriate
a. Wash hands in a bowl of water (sharing with other people)	32 (15.4%)	--
b. With someone pouring a little clean water from a jug onto one's hands – appropriate practice	--	83 (39.9 %)
c. Under running water — appropriate practice	--	41(19.7%)
d. Wash hands with soap or ashes— appropriate practice	--	41(19.7%)
e. Other/ Do not know	--	4(2%)
Total practice= 79.3%		

Table 4. 12 Water Sanitation Knowledge of participants

Water Sanitation Knowledge				
	Know	Number of correct answers		
		Three	Two	One
Treating unsafe water				
				196(97.7%)
“ Boil it	75(35.9%)			
“ Add bleach/chlorine	31 (14.8%)			
“ Strain it through a cloth	14 (6.7%)			
“ Use a water filter (ceramic, sand, composite etc.)	8 (3.8%)			
“ Use solar disinfection	4(1.9%)			
“ Let it stand and settle	38 (18.2%)			
“ Discard it and get water from a safe source	26(12.4%)			
- Other	8(2.9%)			
- Do not know	7(3.3%)			
;Total knowledge = 97.7%				

63.6 percent of the participants perceived the goodness of boiling water before drinking or using it and 50.7 percent believed in the likelihood of oneself or one's child getting diarrhea from using unsafe water. Others were confident in boiling water before drinking or using it (42.6 percent). Almost 45 percent of the participants have a positive attitude towards water sanitation while 24.01 were not, with 30.5 percent hesitated to decide (Table 4.12).

Table 4.13. Water Sanitation Attitude of participants

Water Sanitation Attitude			
	It is	It is not	Not sure
Perceived susceptibility: Likelihood of oneself or one's child to get diarrhea from using unsafe water	117 (56.0 %)	13 (6.2 %) ¹	79 (37.8 %)
Perceived severity: Seriousness of getting sick from using unsafe water	106 (50.7 %)	18 (8.6 %) ²	85 (40.7 %)
Perceived benefits: Goodness of boiling water before drinking or using it	133 (63.6 %)	48 (23.0 %) ³	28 (13.4 %)
Perceived barriers: Difficulty of boiling water before drinking or using it	30(14.1 %) ⁴	87(41.6 %)	92 (44.0 %)
Perceived self-efficacy: Confidence in boiling water before drinking or using it	87 (42.6 %)	85(40.7 %) ⁵	35 (16.7 %)
;Total attitude	45.4	24.01	30.5

The majority (29.2%) of the respondents collected water for domestic use from a piped water. They used clean items for the collection of water for domestic use (89.5%) and the proportion of respondents who boiled or added bleach and let it stand and settle to water to make it safe was more than 70.5% (Table 4.13).

Table 4.14 Water Sanitation Practice of participants

Water Sanitation Practice	
1. The main source of water for a household for drinking, cooking, and hand washing	
Piped water	61 (29.2 %)
Piped into a dwelling	14 (6.7 %)
Piped into yard or plot	12 (5.7 %)
Public tap/standpipe	9 (4.3 %)
Tube well/borehole/Protected well	13(6.2%)
Dug well	21(10.0%)
--Other	--
2. Collection of water for domestic use	
Yes (item used)	188 (89.5%)
No	22 (10.5%)
3. Treating collection item to make them clean	
Yes (how?)	207(98.86 %) ¹
No	--
No answer	3(1.14 %)
4. Description of how water is stored	
“ Covered container or jar	64 (30.5 %)
“ Clean and covered container or jar	57 (27.1%)
“ Clean container or jar	46 (21.9%)
“ Don’t know/no answer	43(20.5%)
5. Treatment of water to make it safe to drink	
--Yes	125 (43.3 %)
--No	199 (18.6%)
--Don’t know/no answer	46 (21.9)
6. Actions did to the water to make it safer to drink	
--Boil it	69 (32.9%)
--Let it stand and settle	49 (23.3%)
--Add bleach/chlorine	30 (14.3%)
-- Strain it through a cloth	17 (8.1%)
--Use solar disinfection	4 (1.9%)
--Don’t know/no answer	23 (10.9%)

Dietary Practice of Mothers

Knowledge of maternal nutrition is frequently identified as an important target for nutrition promotion interventions (Laurens, et al., 2012). In this study majority of the mothers interviewed had knowledge of nutritional practice. The Majority, 82.6% of the respondents knew the importance of fruits and vegetables in feeding, 73.8% believed the advantage of breastfeeding

and continued breastfeeding is vital in child growth. More than 60 percent of the respondents having correct knowledge of dietary diversity. The majority of the respondents, 79.7% of the respondents knew and serves eggs to their children. 55.9 % knew the child was to be fed/breastfed on-demand three times a day as an average requirement of the minimum meal frequency. Only 3% knew the importance of Vitamin A, fruits and vegetable pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside for children's balanced diet. Overall, it was shown that 63.3% of the respondents had good knowledge of feeding milk, such as tinned, powdered, or fresh animal milk three times a day (Table 4.15). This study is also supported by a study carried out by Berra (2013) in Ethiopia on 240 mothers. The study showed that a high percentage (92.4%) of mothers had a good knowledge of breastfeeding; Its benefits and duration are expected to continue, and the source of medical information is from medical centers (30.9%). In previous studies, mothers with higher nutritional knowledge, mainly acquired outside of school, could choose a more varied diet for their children and, by extension, use the diet more efficiently (Francesco, 2010).

Table 4.15: Nutritional Practice of Participants

PRACTICE		
1. Continued breastfeeding		
Was the child breastfed or did he or she consume breast milk yesterday during the day or at night?	Yes	155 (73.8%)
	No	55 (26.2%)
2. Dietary diversity – foods the child ate yesterday		
Group 1: Grains, roots, and tubers Porridge, bread, rice, noodles, or other foods made from grains. White potatoes,	Yes	197 (93.8%)
	No	13(6.2%)
Group 2: Legumes and nuts Any foods made from beans, peas, lentils, nuts, or Seeds	Yes	201 (95.7%)
	No	9 (4.3%)
Group 3: Dairy products Infant formula(4x)	Yes	41 (19.5%)
	No	169 (80.5%)
Milk, such as tinned, powdered, or fresh animal milk (3x)	Yes	133 (63.3%)

	No	77 (36.7%)
Yogurt or Cheese or other dairy products (1x)	Yes	11(5.2%)
	No	199 (94.8%)
Group 4: Flesh foods Any meat, such as beef, lamb, goat, or chicken	No	114 (54.3%)
	Yes	96 (45.7%)
Fresh or dried fish	No	205 (97.6%)
	Yes	5 (2.4%)
Group 5: Eggs	Yes	167 (79.7%)
	No	43 (20.3%)
Group 6: Vitamin A, fruits and vegetable Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside	Yes	6 (3%)
	No	204 (97%)
Group 7 ☐ Other fruits and vegetables	Yes	173 (82.6%)
Any other fruits or vegetables	No	37 (17.4%)
3. Minimum meal frequency		
The number of times the child ate foods the previous day during the day or at night?	2x	7 (3.5%)
	3x	118 (55.9%)
	4x	67 (32.1%)
	5x	18 (8.5%)

4.9. Household Food Insecurity Access Scale (HFIAS)

Table 4.16 provides key information on the respondents' access components of food security status. Accordingly, about 35.3% of the investigated households were found to have timely access to an adequate quantity of food supply. The table also displays the fact that about 46.4% of the investigated households suffer different food insecurity of varying severity levels. It is surprising to see that about 18.3% of the investigated respondents reported being severely food insecure. As it can be seen from the result, the challenges faced in accessing food may be due to the fact that many of the respondents were from poor rural areas.

Table 4.16: HFIAS in the past four weeks

HFIAS conditions	Occurrence		Frequency		
	Yes	No	Rarely	Sometimes	Often
	Yes (%)	No (%)	No (%)	No (%)	No (%)
In the past four weeks, did you worry that your household would not have enough food?	165 (80.1)	41 (19.9)	57 (27.7)	63 (30.6)	45 (21.8)
In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	146 (70.1)	62 (29.8)	72 (34.6)	39 (18.8)	35 (16.8)
In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?	154 (73.7)	55 (26.3)	53 (25.4)	68 (32.5)	33 (15.8)
In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	151 (74.4)	52 (25.6)	44 (21.7)	47 (23.2)	60 (29.6)
In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	151 (74.4)	52 (25.6)	44 (21.7)	68 (33.5)	39 (19.2)
In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	152 (74.9)	51 (25.1)	40 (19.7)	67 (33.0)	45 (22.2)
In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	135 (67.5)	65 (32.5)	64 (32.0)	41 (20.5)	30 (15.0)
In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	128 (74.0)	72 (36.0)	53 (26.5)	50 (25.0)	25 (12.5)
In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	101 (51.3)	96 (48.7)	50 (25.4)	27 (13.7)	24 (12.2)

Category based on HFIAS		percent	
Category based on HFIAS	Percent		percent
Adequately Food secure	35.3		35.3
Mildly food insecure	31		31
Moderately food insecure	15.4		15.4
Severely food insecure	18		18

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This chapter has been devoted to the concluding remarks of the main findings of the study which was aimed at investigation of the Knowledge, Attitude and Practices (KAP), food safety and nutritional status of mothers of children under five years in.

Most of the mothers are married, housewives, most have graduated from primary and lower secondary schools. Total household income is very low for basic needs. The study concluded that the mothers' nutritional knowledge was not bad. Most children have suffered and it was not much different from the national statistics average.

Generally, the level of knowledge among the mothers towards the food safety knowledge, attitudes, and practices of food handlers need to be prioritize for improvement through measures such as the provision of basic and advanced food safety training programmers, to enhance the use of safe food handling practices. Such food safety training programmers should focus on correcting undesirable practices such as poor hand, cutlery, and working surfaces hygiene, habits (for example coughing and sneezing over food), and inadequate thawing and refreezing of food.

Ethiopia's food safety laws should be revised to include a basic training of food handling not only for managers but also mothers in the food service sector to provide periodic food safety training to food handlers. This highlights the need for future food safety studies to use observation to validate food handlers' self-reports about their food handling practices. This study also showed that a large percent of the children were sub-optimally fed. This is believed to the result of the low knowledge level of the participants on infant and young child feeding,

a large proportion of mothers had a negative attitude and poor practice on proper infants and young child feeding besides on sanitation process.

Overall, the present study finds that the food safety knowledge in this group of the population was relatively moderate, which still needs further intervention. The level of Attitude toward food safety was also not as good as is expected but still needs further effort to improve the misconception on food safety/hygienic practice. Lastly, mothers should commit themselves to build a positive food safety culture in child feeding.

5.2 Recommendations

Behavior change in knowledge and practices, if based on appropriate strategies and training for mothers and caregivers, targeting cultures, beliefs and practices related to infant and young child feeding should be carried out using religious leaders, teachers, students, youth associations, women's unions, frontline health organizations and other stakeholders. Further development collaborations should help bridge the gap between knowledge and practice. Following the conclusions of this study, the following recommendations are formulated:

- ✓ A comparative study of the nutritional effectiveness currently supported should be carried out in order to develop specific protocols for each problem.
- ✓ A study of mothers' knowledge of how nutrition can help with adequate nutrition.
- ✓ A study on attitudes and willingness of mothers towards food safety and water treatment and nutrition could be useful to the community. For a correct satisfactory KAP practices in food safety;
- ✓ It is necessary to make all mothers aware of the common services provided in health facilities.

- ✓ Further studies based on the results of this study will be done to be able to assess and evaluate. More research is needed to determine why stunting was more common than leanness and underweight in the current study, particularly in men than in women.
- ✓ Competent authorities should establish specific standards at the national level to improve the food safety practices of food establishments. The health department along with the culture and tourism department should conduct awareness-raising activities such as training for all food handlers and employers.
- ✓ Food establishments must make all of their facilities operate beyond physical availability.
- ✓ Food handlers must strive to learn and update themselves. Therefore, as resources can influence food handlers' food handling practices, researchers should consider assessing these probabilities in their study.
- ✓ In addition, researchers should consider the food safety practices of other types of food establishments that were not included in this study.

Reference

- Adel P. den Hartog (2006). Food habit and Consumption in Developing countries, Food culture 1st edition Wageningen Academic Publisher, 2006 The Netherland page no.19.
- African Union Commission, World Food Programme, United Nations Economic Commission for Africa. 2014. The Cost of Hunger in Ethiopia: The Social and Economic Impact of Child Under nutrition in Ethiopia Summary Report. Addis Ababa, Ethiopia.
- Ahmed I., Farooq N., Jadoon H., Khalid K., Seema N., et al., 2001, cited in Chetan (2018).). Lactation, breast-feeding supplementation and nutrition. Journal of Ayub Medical College Abbottabad 13(2): 34-37.
- Alelign T, Degarege A, Erko B (2015). Prevalence and factors associated with undernutrition and anaemia among school children in Durbete town, Northwest Ethiopia. Arch Public Health. 2015;73(1):34. doi: 10.1186/s13690-015-0084-x.
- Anyzewska A, Wawrzyniak A, Wozniak A, Krotki M, Górnicka M. Nutritional assessment in Polish men with cardiovascular diseases. Rocz Panstw Zakl Hig 2013;64:211-5.
- Bernstein (2012). The increasing role for the laboratory in nutritional assessment. Clin Biochem 2012;45:1150-1
- Black RE, Victora CG, Walker SP, et al. (2013). The maternal and child nutrition study group. Maternal and child under nutrition and overweight in low-income and middle-income countries.
- Bottino CJ, Rhodes ET, Kreatsoulas C, Cox JE, Fleegler EW (2017). Food insecurity screening in pediatric primary care: can offering referrals help identify families in need? Academic pediatrics;17(5):497-503.
- Bou-Mitri et al., 2018; McIntyre et al., 2013
- Byrd- Bredbenner C, Cohn MN, Farber JM, et al. (2015) Food safety considerations for innovative nutrition solutions. Annals of the New York Academy of Sciences 1347: 29-44.

- Central Statistical Agency (2011) and ICF International (2012). Ethiopia Demographic and Health Survey 2011. Addis Ababa: CSA and ICF International; 2012
- Central Statistical Agency (CSA) (2016). Ethiopia Demographic and Health Survey 2016, Addis Ababa, Ethiopia.
- Central Statistical Agency (CSA) (2017). Ethiopia Demographic and Health Survey 2017, Addis Ababa, Ethiopia.
- Central Statistical Agency (CSA) [Ethiopia] and ICF International (2016). Ethiopia Demographic and Health Survey 2016. Addis Ababa, Ethiopia, and Rockville, Maryland, USA: CSA and ICF.
- Central Statistical Authority [Ethiopia] and ORC Macro (2011). Ethiopia demographic and health survey 2011. Addis Ababa: Ethiopia and Calverton; 2011.
- Chetan S Patali (2018). Department of Psychiatric Nursing, Rajiv Gandhi University of Health Sciences, Bangalore, Karnataka, India.
- Coates, J., Swindale, A. and Bilinsky, P. (2007). Household Food Insecurity Access Scale (HFIAS) for Measurement of Food Access: Indicator guide (v.3). Washington DC. Food and
- Cristovam E, Almeida D, Caldeira D, Ferreira JJ, Marques T. Accuracy of diagnostic tests for Legionnaires' disease: a systematic review. J Med Microbiol. 2017 Apr;66(4):485-489. doi: 10.1099/jmm.0.000454. PMID: 28463665.
- Crowther J, Cox L, Gross R, et al. (1999). Food safety training for nutritionists. Bulletin of the World Health Organization 77: 172.
- CSA (Central Statistical Agency) (2014). Ethiopia Mini Demographic and Health Survey 2014. Addis Ababa, Ethiopia.
- de Oliveira LH, Camacho LAB, Coutinho ESF, Martinez-Silveira MS, Carvalho AF, Ruiz-Matus C, et al. (2016). Impact and Effectiveness of 10 and 13-Valent Pneumococcal Conjugate Vaccines on Hospitalization and Mortality in Children Aged Less than 5

Years in Latin American Countries: A Systematic Review. PLoS ONE 11(12): e0166736. <https://doi.org/10.1371/journal.pone.0166736>

De Souza, C. V. S., de Medeiros, A. P. R., & Seabra, L. M. J. (2018). Food safety in Brazilian popular public restaurants: Food handlers' knowledge and practices. *Journal of Food Safety*, 38, e12512. <https://doi.org/10.1111/jfs.12512>

Debela BL, Shively G, Holden S.(2015). Does Ethiopia's productive safety net program improve child nutrition? *Food Secur*;7(6):1273–89.

Degarege D, Degarege A, Animut A (2015). Undernutrition and associated risk factors among school age children in Addis Ababa, Ethiopia. *BMC Public Health*. 2015;15(1):375. doi: 10.1186/s12889-015-1714-5.

Dieffenbach S, Stein AD (2012). Stunted child/overweight mother pairs represent a statistical artifact, not a distinct entity. *The Journal of nutrition*; 142(4):771-3.

FAO, IFAD, WFP (2013). *The State of Food Insecurity in the World 2013. The multiple dimensions of food security*. Rome: FAO; 2013. Nutrition Technical Assistance (FANTA) project.

FAO, WFP, IFAD (2012). *The State of Food Insecurity in the World 2012. Economic growth is necessary but not sufficient to accelerate reduction of hunger and malnutrition*. Rome:

Faruque AS, Ahmed AM, Ahmed T, Islam MM, Hossain MI (2008). Nutrition: basis for healthy children and mothers in Bangladesh. *J Health Popul Nutr* 26(3): 325-339.

Garrett J, Ruel MT (2005). The coexistence of child under nutrition and maternal overweight: prevalence, hypotheses, and programme and policy implications. *Maternal & child nutrition*. 1(3):185-96.

Gartner A, El Ati J, Traissac P, Bour A, Berger J, Landais E, et al., (2014). A double burden of overall or central adiposity and anemia or iron deficiency is prevalent but with little socioeconomic patterning among Moroccan and Tunisian urban women. *The Journal of nutrition*. 144(1):87-97.

- Gerges & Jaoude (2018). Food safety knowledge, attitudes and practices of food handlers in lebanese hospitals: A cross-sectional study
- Ghosh S, Shah D. Nutritional problems. *Journal of Indian Paediatrics*. 2004;15-16.
- High Level Panel of Experts (HLPE) (2017). Nutrition and food systems. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome. <http://www.gainhealth.org/wp-content/uploads/2017/09/HLPE-12-Nutrition-and-food-systems.pdf>
- Jaffee S, Henson S, Unnevehr L, Grace D, Cassou E. (; 2018). The safe food imperative: Accelerating progress in low-and middle-income countries: The World Bank.
- Lim, T.-P., Chye, F. Y., Suleiman, M. R., Suki, N. M., & Lee, J.-S. (2016). A structural modeling on food safety knowledge, attitude, and behavior among Bum Bum Island community of Sempron, Sabah. *Food Control*, 60, 241–246.
- Luo, X., Xu, X., Chen, H., Bai, R., Zhang, Y., Hou, X., ... Zhao, Y. (2019). Food safety related knowledge, attitudes, and practices (KAP) among the students from nursing, education and medical college in Chongqing, China. *Food Control*, 95, 181–188.
- Macías, Y. and Glasauer, P. (2014). Guidelines for assessing nutrition-related Knowledge, Attitudes and Practices. Guidelines for assessing nutrition-related Knowledge, Attitudes and Practices. Food and Agriculture Organization of the United Nations, Rome.
- Martorell R. The nature of child malnutrition and its long-term implications. *Food Nutr Bull*.
- Micha R, Mannar V, Afshin A, Allemandi L, Baker P, Battersby J, et al. (2020). Global nutrition report: action on equity to end malnutrition. 2020.
- MOFED (Ministry of Finance and Economic Development) (2013). Development and Poverty in Ethiopia 1995/96-2010/11. Addis Ababa, Ethiopia.
- Mudambi et al (2012). Fundamental of Food nutrition and diet therapy 6th edition, New Age International P ltd. Publisher, Delhi India, Food, nutrition and health page no. 5-6

- Odeyemi, O. A., & Bamidele, F. A. (2016). Harnessing the potentials of predictive microbiology in microbial food safety and quality research in Nigeria. *Future Science OA*, 2(1), 1–4.
- Omari, R.; Frempong, G. (2016). Food safety concerns of fast food consumers in urban Ghana. *Appetite*, 98, 49–54.
- Roy SK, Fuchs GJ, Mahmud Z, Ara G, Islam S, et al. (2005). Intensive nutrition education with or without supplementary feeding improves the nutritional status of moderately-malnourished children in Bangladesh *J Health Popul Nutr* 23(4): 320-330.
- Ruel M (2013). *Food Security and Nutrition: Linkages and Complementarities. The Road to Good Nutrition*: Basel, Karger.
- Shinsugi C, Matsumura M, Karama M, Tanaka J, Changoma M, Kaneko S (2015). Factors associated with stunting among children according to the level of food insecurity in the household: a cross-sectional study in a rural community of southeastern Kenya. *BMC Public Health*;15(1):441.
- Soares LS, Almeida RCC, Cerqueira ES, Carvalho JS, Nunes IL (2012). Knowledge, attitudes and practices in food safety and the presence of coagulase-positive staphylococci on hands of food handlers in the schools of Camaçari, Brazil. *Food Control* 2012;27:206-13.
- Adesokan HK, Raji AOQ (2014). Safe meat-handling knowledge, attitudes and practices of private and government meat processing plants' workers: Implications for future policy. *J Prev Med Hyg* 2014;55:10-6.
- Srilakshmi, B. (2002). *Nutrition Science*. 1st edition New Age International (P) Limited, Publisher, Delhi, India.
- Temeche ME, Satheesh NE, Dibaba KU (2016). Food Safety Knowledge, Practice and Attitude of Food Handlers in Traditional Hotels of Jimma Town, Southern Ethiopia.
- U.S. Department of Health and Human Services Food and Drug Administration Center for Drug Evaluation and Research (CDER)(2004). *Guidance for Industry Sterile Drug Products Produced by Aseptic Processing Current Good Manufacturing Practice*

- UNICEF (2013). Improving Child Nutrition: The achievable imperative for progress, New York: United Nations.
- UNICEF (2017). The State of the World's Children 2017. Available at: <https://www.unicef.org/sowc/>
- Unicef(1991). Conceptual framework of the causes of malnutrition. New York: UNICEF.
- Victora C, Adair L, Fall C, et al.(2008). Child under nutrition study group. Maternal and child under nutrition: consequences for adult health and human capital. ;371:340–357.
- WHO (2005) Breastfeeding and family foods loving and healthy pediatric companion.
- WHO (2018). The World Health Organization child growth standards; 2016. WHO. World health organization.
- WHO Food Safety Fact Sheet No. 399. (2015). <http://www.who.int/mediacentre/factsheets/fs399/en/>
- WHO. (2014). Comprehensive Implementation Plan on Maternal, Infant and Young Child Nutrition.
- World Health Organization (1995). Physical status: The use and Interpretation of Anthropometry. Geneva: World Health Organization.
- World Health Organization (2006). WHO Child Growth Standards: Length/Height-for-Age, Weight-for-Age, Weight-for-Length, Weight-for-Height and Body Mass Index-for-Age: Methods and Development, WHO, Geneva, Switzerland, 2006.
- World Health Organization (2010). Food safety. Retrieved from <http://www.who.int/foodsafety/consumer/5keys/en/>
- World Health Organization (2017). Joint External Evaluation of IHR Core Capacities of the Kingdom of Saudi Arabia: Mission Report; WHO: Geneva, Switzerland, 2017.
- World Health Organization (2017). WHO Fact Sheet. Available online: <http://www.who.int/mediacentre/factsheets/fs399/en/>

World Health Organization (2018). World Health Statistics: Monitoring health for the SDGs.
https://www.who.int/gho/publications/world_health_statistics/2018/en/

World Health Organization (2019). Essential nutrition actions: mainstreaming nutrition through the life-course.

World Health Organization. Food Safety. Factsheet 2020 Available from:
<https://www.who.int/news-room/fact-sheets/detail/food-safety>.

Wrieden W, Peace H, Armstring J, Barton K (2014). A Short Review of Dietary Assessment Methods Used in National and Scottish Research Studies, 2003. Available from:
<http://www.multimedia.food.gov.uk/multimedia/pdfs/scotdietassessmethods.pdf>.

Annex 1. Participant Information Sheet and Consent

Hello. My name is Hiwot Disasa and I am a student at Addis Ababa University. I am conducting a study on investigate food safety knowledge, attitude and practices (KAP) and nutritional status of household members with emphasis on child nutrition in Cure Hospital Addis Ababa, Ethiopia from May 05–June 05, 2020. I and health extension workers will ask you questions about your food safety, personal hygiene and sanitation, infants feeding and will also measure your infants Mid Upper Arm Circumference, weight and height.

Your participation in this study will not involve any known risks or minimal risk to you. By participating in this study and answering the question you will not receive any direct benefit. However, this will help to improve the child nutritional status by understanding food safety. Personal hygiene and child feeding practice based on information obtained from you. Whatever information you shall provide will be kept strictly confidential and will not be shown to any other persons. Participation in the study is voluntary and you can choose not to answer any individual question or all of the questions.

.....		
Name of respondent	Signature of respondent:	Date

.....		
Name of researcher	Signature of researcher	Date

Annex 2: English Version Questionnaire and Interviews, Version 1

College of National Development Studies Center for Food Security Studies, Addis Ababa University

The aim of this study will be to investigate the status of knowledge, attitude and practices in food safety and food secured households as well as to assess the nutritional status of mothers of outpatient children, in Cure Hospital Addis Ababa, Ethiopia. The information you provide used only for academic purpose. So, please put a thick mark and short answer for the following questionnaires.

Part 1; Demographic and socio-economic data

No	Question	Response Options	Code
1.1	Sex	Male=1, Female=2	
1.2	Age of Father Age of Mather		
1.3	Age of children Sex of children		
1.4	Marital status	01= Marred 02= single 03=divorced 4. Widowed 5. Widower	
1.5	Occupation of Mather	1=Agriculture; 2=Private 3=solid waste clinging and urban beatification; 4= watershed development 5.House wife 6.Daily labor	
1.6	Occupation of Father)	1=Agriculture; 2=Private 3=solid waste clinging and urban beatification; 4= watershed development 5.House wife 6.Daily labor	
1.7	Educational status of Mather	01= Illiterate 04= 9-12 Grade 02= Writing and reading 05= Diploma 03=1-8 Grade 06=Above Diploma	
1.8	Educational status of Mather	01= Illiterate 04= 9-12 Grade 02= Writing and reading 05= Diploma 03=1-8 Grade 06=Above Diploma	
1.9	Monthly income (Birr)		
1.10	Family size/ under-five children		

Part 2 Anthropometric data

No	Question	Response Options	Code
2.1	Weight (kg)		
2.2	Height (m)		
2.3	MUAC(MUAC tape)		

Part 3. Household Food Insecurity Access Scale (HFIAS) Measurement Tool

No	Question	Response Options	Code
3.1	1. In the past four weeks, did you worry that you r household would not have enough food?	0 = No (skip to Q2) 1=Yes	 _
3.1a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	 _
3.2	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	0 = No (skip to Q3) 1=Yes	 _
3.2a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	 _
3.3	In the past four weeks, did you or any household Member has to eat a limited variety of foods due to a lack of resources?	0 = No (skip to Q4) 1 = Yes	 _
3.3a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	 _
3.4	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of lack of resources to obtain other types of food?	0 = No (skip to Q5) 1 = Yes	 _
3.4a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	 _
3.5	In the past four weeks, did you or any household member have to eat smaller meal than	0 = No (skip to Q6) 1 = Yes	 _

	you felt you needed because there was not enough food?		
3.5a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	
3.6	In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	0 = No (skip to Q7) 1 = Yes	
3.6a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	
3.7	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	0 = No (skip to Q8) 1 = Yes	
3.7a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	
3.8	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	0 = No (skip to Q9) 1 = Yes	
3.8a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	
3.9	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	0 = No (questionnaire is finished) 1 = Yes	
3.9a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times	

		in the past four weeks) 3 = Often (more than ten times in the past four weeks)	
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4. Food handling KAP Knowledge

No	Question	Response Options	Code
4.1	Why should you prevent raw meat, offal, poultry and seafood from touching other foods such as those that are cooked or ready to eat?	1= Raw animal foods often contain germs (which may be transferred to cooked and ready-to-eat foods) 2= Other 3= Don't know	
4.2	When cooking soups and stews, what sign shows that these are ready and safe to be served?	1= They are boiling/ well cooked 2= Other 3=Don't know	
4.3	What kinds of food should be placed in the refrigerator or in a cool place, such as an icebox or cool box? Perishable foods	1=Meat, offal 2=Poultry 3=Fish 4=Foods from the sea or lake 5=Milk/dairy products 6=Cooked foods 7=Other 8=all 9=Don't know	
4.4	Why should someone avoid eating leftovers that were not kept in a cool place?	1=Because food is not safe anymore 2=Foods get spoiled (germs multiply very quickly and can cause illness) 3=Higher temperatures make germs grow faster 4=Other 5=Don't know Any of the three first response options is correct.....	
4.5	What should you do before eating raw fruits and vegetables?	1=Wash them with clean water 2=Other 3=Don't know	

Attitudes

No	Question	Response options	Code
4.6	How likely do you think you are to get sick from eating spoiled food?	1= Not likely 2= You're not sure 3=Likely If Not likely: Can you tell me the reason why it is not likely?	
4.7	How serious do you think it is to be sick from eating spoiled food?	1= Not serious 2= You're not sure 3=Serious If Not Serious: Can you tell me the reason why it is not serious?	
4.8	How good do you think it is to keep meat, poultry, fish, seafood or cooked food in a cool place, for example in a cool box or in the refrigerator?	1= Not good 2= You're not sure 3= Good If Not good: Can you tell me the reasons why it is not good?	
4.9	How difficult is it for you to keep these foods in a cool box or in the refrigerator?	1= Not difficult 2=So-so 3=Difficult If Difficult: Can you tell me the reasons why it is difficult?	
4.10	How good do you think it is to reheat leftovers before eating or serving them?	1=Not good 2=You're not sure 3= Good If Not good: Can you tell me the reasons why it is not good?	
4.11	How difficult is it for you to reheat leftovers before eating or serving them?	1=Not difficult 2=So-so 3= Difficult If Difficult: Can you tell me the reasons why it is difficult?	
4.12	How good do you think it is to wash fruits and vegetables with clean water?	1=Not good 2=You're not sure 3= Good If Not good: Can you tell me the reasons why it is not good?	

Practices

No	Question	Response Options	Code
4.14	After you have prepared dinner, kitchen surfaces, pots, pans, plates and utensils are dirty. Can you describe how you clean them usually?	1= Scrape excess food into rubbish bin 2=Wash with hot water 3=Wash with detergent 4= Don't know/no answer	
4.15	How do you store perishable fresh foods such as raw meat, poultry and seafood?	1= In the refrigerator (below 5 °C)/cool box 2= Covered (protected from insects, rodents, pests and dust) 3= Separated from cooked or ready-to-eat foods 4= Other 5= Don't know/no answer	

Part 5 ☐ Personal hygiene

Knowledge

No	Question	Response Options	Code
5.1	Food poisoning often results from contact with germs from feces. What can you do to avoid sickness from germs from human or animal feces?	1=Wash hands (after going to the toilet and cleaning the baby's bottom) 2=Remove feces from the home and surroundings (use a latrine, teach small children to use a potty and put children's feces in the latrine, and clean up feces from animals) 3=Other 4=Don't know	
5.2	There are key moments when you need to wash your hands to prevent germs from reaching food. What are these key moments?	1=After going to the toilet/latrine 2=After cleaning the baby's bottom/changing a baby's nappy 3=Before preparing/handling food 4=Before feeding a child/eating 5=After handling raw food 6=After handling garbage 7=Other 8=Don't know	

Attitudes

No	Question	Response Options	Code
5.3	How likely do you think you are to become sick, such as having stomach ache or diarrhea, from not washing your hands/How likely do you think it is that your child will become sick, such as having stomachache or diarrhea, from you not washing your hands?	1= Not likely 2=You're not sure 3=Likely If Not likely: Can you tell me the reason why it is not likely?	
5.4	How serious do you think it is if you or your child gets sick from you not washing your hands? OR How serious do you think diarrhea is for your health? OR How serious do you think is diarrhea for a baby's health?	1=Not really serious 2= Neutral/unsure 3=Serious If Not Serious: Can you tell me the reason why it is not serious?_____	
5.5	How good do you think it is to wash your hands before preparing food? OR How good do you think it is to wash your hands before feeding a child/eating?	1= Not good 2= You're not sure 3=Good If Not good: Can you tell me the reasons why it is not good? _____	
5.6	How difficult is it for you to wash your hands before preparing food? OR How difficult is it for you to wash your hands before feeding a child/eating?	1=Not difficult 2= So-so 3=Difficult If Difficult: Can you tell me the reasons why it is difficult? _____	
5.7	How confident do you feel in washing your hands properly?	1= Not confident 2= Ok/so-so 3= Confident If Not confident: Can you tell me the reasons why you do not feel confident?	

Practices

No	Question	Response Options	Code
5.8	Could you please describe step by step how you wash your hands?	1=Washes hands in a bowl of water (sharing with other people)-poor practice. 2=With someone pouring a little clean water from a jug onto one's hands — appropriate practice 3=Under running water — appropriate practice 4=Washes hands with soap or ashes 5=Other 6=Don't know/no answer	

**Part 6 □ Water and sanitation
Knowledge**

No	Question	Response Options	Code
6.1	If you know that the water you are going to use for cooking or drinking is not safe or does not come from a safe source, what should you do?	1=Boil it 2=Add bleach/chlorine 3=Strain it through a cloth 4=Use a water filter (ceramic, sand, composite, etc.) 5=Use solar disinfection 6=Let it stand and settle 7=Discard it and get water from a safe source 8=Other 9=Don't know	

Attitudes

No	Question	Response Options	Code
6.2	How likely do you think you are to get diarrhea from using unsafe water? OR How likely do you think your child is to get diarrhea from using unsafe water?	1=Not likely 2=You're not sure 3= Likely If Not likely: Can you tell me the reason why it is not likely?	
6.3	How serious do you think it is to get sick from using unsafe water?	1=Not really serious 2=Neutral/serious 3=Serious If Not serious: Can you tell me the reason why it is not serious?	
6.4	How good do you think it is to boil water before drinking or using it?	1=Not good 2=You're not sure 3=Good If Not good: Can you tell me the reasons why it is not good?	
6.5	How difficult is it for you to boil water before drinking or using it?	1=Not difficult 2=So-so 3=Difficult If Difficult: Can you tell me the reasons why it is difficult?_____	
6.6	How confident do you feel in boiling water before drinking or using it?	1=Not confident 2=Ok/so-so 3=Confident	

		If Not confident: Can you tell me the reasons why you do not feel confident?	
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Practices

NO	QUESTION	RESPONSE OPTIONS	CODE
6.7	What is the main source of water used by your household for drinking, cooking and hand washing?	1=Piped water 2=Piped into dwelling 3=Piped into yard or plot 4=Public tap/standpipe 5=Tube well/borehole 6=Dug well 7=Protected well 8=Unprotected well 9=Water from spring 10=Protected spring 11=Unprotected spring 12=Rainwater collection 13=Tanker-truck 14=Cart with small tank/drum 15=Surface water (river, stream, dam, lake, pond, canal, irrigation channel) 16=Bottled water 17=Other (specify)_____ 18=Don't know	
6.8. A	Do you collect water for domestic use?	1=Yes.....Go to question P.2B. 2=No..... Go to question P.3.	
6.8.B	What item do you use to collect water?	-----	
6.8.C	To know if the item is clean probe: Did you treat this item in any way to make it clean?	1= Yes 2=No 3=Don't know	
6.8D	If Yes: How?	1=Use of water and soap (clean container) 2=Other 3=Don't know/no	

		answer	
6.9	Could you describe how you store water?	1=Clean container or jar 2= Covered container or jar 3=Clean and covered container or jar 4=Other 5= Don't know/no answer	
6.10.a	Do you treat your water in any way to make it safe to drink?	1=Yes 2=No 3=Don't know/no answer 4= If Yes: Go to next question	
6.10.b	What do you usually do to the water to make it safer to drink?	1=Boil it 2=Add bleach/chlorine 3=Strain it through a cloth 4=Use a water filter (ceramic, sand, composite, etc.) 5=Use solar disinfection 6=Let it stand and settle 7=Other 8=Don't know/no answer Anything else? (Record all items mentioned)	

Part 7. Feeding young children (below five years

Now I want to ask you about liquid or food that your baby ate yesterday during the day or at night. I want to know if your child will eat it even if it is combined with other foods. For example, if (baby's name) eats millet porridge cooked with dressing, you should answer yes to any food I ask about the porridge or sauce ingredients. Please do not include foods used in small amounts for seasoning or seasoning (such as chilies, seasonings, herbs, or fishmeal); I will ask you questions about these foods separately. Yesterday, day and night, (baby's name) ate:

7.1 Food categories	Food lists	No	yes
Group 1: Grains, roots and tubers	Porridge, bread, rice, pasta/noodles, or other foods made from grains		
Group 2: Legumes and nuts	Any foods made from beans, peas, lentils, nuts or seeds		
Group 3: Dairy products	Infant formula, Milk, such as tinned, powdered, or fresh animal milk, Yogurt, or drinking yogurt, Cheese, or other dairy products		
Group 4: Flesh foods	Any meat, such as beef, lamb, goat, chicken or other meat, fish.		
Group 5: Eggs	Eggs from poultry		
Group 6: Vitamin A fruits and vegetables	Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside		
Group 7: Other fruits and vegetables	Any other vegetables and fruits		
Other oils and fats	Any oil, fats, or butter or foods made with any of these		