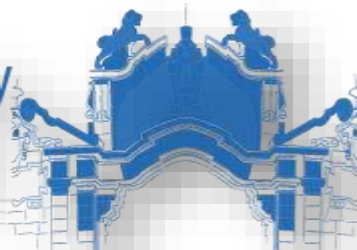




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**ADDIS ABABA UNIVERSITY
COLLEGE OF DEVELOPMENT STUDIES
CENTER FOR FOOD SECURITY STUDIES
ANALYZING FACTORS DETERMINING THE NUTRITIONAL STATUS
OF UNDER FIVE CHILDREN IN YEKA SUB-CITY, ADDIS ABABA,
ETHIOPIA**

**BY
SENAIT ASMARE**

**A THESIS SUBMITTED TO COLLEGE OF DEVELOPMENT STUDIES, CENTER
FOR FOOD SECURITY STUDIES, ADDIS ABABA UNIVERSITY IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF
SCIENCE IN FOOD SECURITY**

**NOVEMBER, 2021
ADDIS ABABA, ETHIOPIA**

**ADDIS ABABA UNIVERSITY
COLLEGE OF DEVELOPMENT STUDIES
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SCIENCE IN FOOD SECURITY**

November, 2021

ADISS ABABA, ETHIOPIA



Declaration

I, Senait Asmare, the undersigned, declare that this thesis is my original work and that all foundations of materials used for this thesis work have been fully acknowledged.

Signature: _____ Date: _____

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

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This is to certify that the thesis prepared by Senait Asmare, entitled: “ANALYZING FACTORS DETERMINING THE NUTRITIONAL STATUS OF UNDER FIVE CHILDREN IN YEKA SUB-CITY, ADDIS ABABA, ETHIOPIA”, and submitted in partial fulfillment of the requirements for the degree of Masters (Food Security and Development Studies) complies with the regulation of the University and meet the accepted standards concerning for originality and quality

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List of Abbreviations

AOR	Adjusted Odd Ratio
ARI	Acute respiratory infection
BMI	Body mass index
CSA	Central Statistics Authority
cms	Centimeters
DHS	Demographic Health Survey
FAO	Food and Agriculture Organization
GDP	Gross developmental Product
gms.	Grams
H/A	Height-for-age
Ht.	Height
kgs.	Kilograms
MCH	Maternal and Child Health
MLE	Maximum Likely-Hood Estimator
MUAC	Mid-Upper-Arm Circumference
NACS	Nutrition Assessment, Counseling, and Support
NCHS	National Centre for Health Statistics OR Odds Ratio(s)
PEM	Protein-energy Malnutrition PPS Probability Proportional to Size
RDI	Required Daily Intake
SD	Standard Deviation(s)
USA	United States of America
W/A	Weight- for-Age
WFA	Weight for Age
W/H	Weight-for-Height
WHO	World Health Organization

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Abstract

Among one of the major problems related to public health of various countries globally is prevalence of malnutrition. Worldwide more than 30% of children under five years old are affected by malnutrition. Nutritional status of children is an important element of crucial public. More over the deprived status of children's nutrition is still unfulfilling problem of Ethiopia. In this community based cross sectional study the determinants of nutritional status of were analyzed and assessed from four selected woredas of Yeka sub city from which 294 children of age under five were engaged for the study.

From the study result the prevalence of stunting was found to be 26.6% and 10.4% children were severely stunted (<- 2SD and <- 3SD respectively). Under consideration of sex of the children from the study group, the result showed that, prevalence of stunting of male children was found to be 34.7% and for females it was 17.7%. This result prevails that prevalence of stunting was more in male children. This study found that children between 12 to 23 (30.3%) months and with uneducated mothers were more stunted.

This study result found that 8.8% of the children were underweight, in addition prevalence of underweight was higher among male children than that of female children, 12.1% male and 5.9% female children under five of age were underweight. Stunting and underweight of children under five was very high in the study area. The determinant factors of stunting in the study area were mother's education and sex and age of the child, whereas conjecturers of child underweight was sex of the child and father's occupation.

This study found that nutritional status of children were influenced by the educational background of their parents, in which children from literate parents had a better nutritional status than those from illiterate parents. The study has found that the precursor issues for children under the age of five malnutrition are related with maternal, child, socio economic and environmental characteristics. To improve interventions additional detailed studies should also be invigorated till nutritional status of children is insured.

Keywords: Nutritional status, stunting, underweight, anthropometric measurement, Yeka sub-city.

CHAPTER ONE

INTRODUCTION

1. INTRODUCTION

1.1 Background

In developing countries, children and mothers are affected severely by synergic problems of malnutrition, infection, and unregulated fertility (Sham PM, 1992). Moreover, health care in the developing world, like in Africa faces a lack of resources, inefficient management with the increasing cost of medical services. This resulted in a high prevalence of communicable diseases, poverty, frequent famine, and war which have forced the continent to carry the full burden of underdevelopment (Monekosso GL, 1989 Logie ED, 1993). Frequent structural adjustments which usually fall short of meeting public needs have also contributed to the slow socioeconomic takeoff (FaIola T, 1992). Rapid population growth that does not match socio-economic growth and food production has also posed a threat to the staggering developmental activities (The World Bank, 1989). In Africa nutrition and food problems can be categorized into two major classes: Long-standing moderate shortages, with poor utilization and misuse of available foods causing chronic malnutrition, and the second one, is acute shortage that leads to a mild or severe famine. PEM is one of the most outstanding forms of malnutrition appears (Maletenlema TN, 1986). As compared to the population, children are the most to suffer from effects that coexist frequently such as malnutrition, ARI, and diarrhea, as a result about a quarter to a third of the babies born do not reach five years of age.

The multiple problems including nutritional problems and social injustices that exist among communities frequently affect mothers and children among the members of the population (Wallace HM, Giri K 1990). Their nutritional status is crucial not only because they are the majority, but also because the effects of malnutrition are severe among them. Thus this is particularly, in early childhood where most growth flattering takes place leading to a permanent defect in later life (Ebrahim GJ 1991). According to the most recent Demographic and Health Survey (DHS), (Central Statistical Agency (CSA) [Ethiopia] and ICF international 2016, malnutrition has a lot of adverse consequences in terms of long-term wellbeing and child survival

in childhood and pregnancy. Moreover, it also affects human capital, economic productivity, and national development in general. The malnutrition effects in Ethiopia should be a significant concern for policymakers, where about 5.8 million children under 5 years (38 %) are suffering from chronic malnutrition (stunting or low height-for-age). Despite effective health interventions, over 10 million children under the age of 5 years die every year from preventable and treatable illnesses worldwide, in which more than one-third of these deaths are caused by malnutrition (WHO, 2003). MDG-1 is targeted at reducing under nutrition by half. However, 146 million children under five suffer from under nutrition which is one of the main factors that causes malnutrition in the developing countries (UNICEF, 2007). In Ethiopia, one of the world's poorest countries with low levels of development, many people live in conditions of chronic hunger with a low average daily energy supply (Tassew, 2008). The country also faces serious and growing food insecurity problems, affecting as much as 45% of the population (UNICEF, 2007).

According to CSA and ICF, 2016 in Ethiopia there are several additional factors are contributing to poor nutrition outcomes. For example Childbearing begins early by age 19, in 2016, about 27.7 % of adolescent girls had begun childbearing which is a slight decrease from 33.6 % in 2011. This as a result has serious consequences because, relative to older mothers, adolescent girls are more likely to be malnourished and have a low birth weight baby who is more likely to become malnourished and be at increased risk of illness and death than those born to older mothers. According to Fink et al. 2014, the risk of stunting is 33% higher among first-born children of girls under 18 years in Sub-Saharan Africa, and as such, early motherhood is a key driver of malnutrition.

As the World Bank, 2004, reported that malnutrition in children is one of the most serious public health problems in Ethiopia and the highest in the world. According to the Federal Ministry of Health, 2008, Ethiopia has the second-highest rate of malnutrition from Sub-Saharan Africa and with a high under-five mortality rate (88/1000 live births) which is caused as a result of infection and malnutrition.

According to 2011 Ethiopian DHS data children under five years of age are 44.4% stunted, 9.7% wasted, and 28.7% underweight.

Moreover, Ethiopia has very low usage of sanitation services; there is only 7% usage of basic services nationally. The use of basic drinking water services is also low, especially in rural areas where they are used by only 30 % of the rural population (UNICEF 2017).

Although in the past ten years Ethiopia is remarking a progressive change in increasing health service centers and promising economic growth, malnutrition is still a highly prevalent problem to the public health of children under five years of age. The gap between nutrition, health service, and food is aggravating highly due to the prevalence of poverty and very swift growth in population. According to the 2014 food security and vulnerability analysis of Ethiopia, food shock, and food poverty indicators, food insecurity is an alarming obstacle in Ethiopia. There are many factors that affect feeding patterns and nutritional status of children which influence their growth, development, and health. Improvement of all-over nutritional status of children under five years throughout their life is very crucial by boosting efforts to enhance approved nutritional practices and through designing and implementing multi-sectoral community-based nutritional interventions to overcome under nutrition related problems.

This study, therefore, has considered diverse factors that affect nutritional status of children under five years old. Regarding this, this study tried to analyze the nutritional status and recognized determinant factors of children under the age of five in Addis Ababa four selected woredas of Yeka sub-city.

1.2. Statement of the problem

Malnutrition is the condition that affects and limits people to develop immunity and as a result, puts them at risk of vulnerable to an impairment or less efficient and finally to death. The major reason for household food insecurity and malnutrition has become one of the buffet health problems in developing countries by affecting the child is the prevalence of poverty. It is poverty that is a root cause and other underlying causes such as food security health and care for malnutrition. The state of malnutrition includes, one is under nutrition, which has a major underlying issue in developing countries, and the second state is over nutrition, which is characterized by increased habits of eating. The occurrence of under nutrition and over-nutrition is simultaneous in many developing countries among groups of different populations, this process or phenomenon is referred to as a double burden of malnutrition. Despite that, there are lots of

studies that contribute important interventions concerning food security nutritional status of children especially those under five years of age are not widely studied which makes it a major problem (Mekonnen et al., 2013).

Unbalanced dietary intake and exposure to infections are usually core causes of malnutrition. According to the world food program because of children's limited ability to withstand adverse conditions and environments, they are at high risk of malnutrition and they are susceptible to respond to dietary changes. According to Gomez Malnutrition is referred to as a pathological condition of varying degrees and diverse clinical manifestations, which resulted from the deficient assimilation or intake of the food components of the nutrient complex. Similarly, Brayson DF and Jelliffe DB, Jelliffe EFP explains, malnutrition is characterized by a state of under nutrition and is caused by insufficient intake of calories and proteins relative to body requirements manifested by physical, psychological, and biochemical abnormalities.

According to WHO report in 1988 1990 a global review on nutritional surveys shows that the first studies in nutritional status and food intake in developing countries were conducted before the Second World War, the first large and comprehensive nutritional surveys appear in the developing world was in the 1950s and 1960s and for the last fifty years, developing countries have been facing nutritional problems including malnutrition and under nutrition, which are the major health and welfare problems.

According to the report from World Bank 1993, particularly among children and mothers in most developing countries, malnutrition and under nutrition remain the main causes of suffering, disability, and death. Moreover, malnutrition causes one-fourth of all child deaths in the world and one-third of child deaths in Africa. According to a UNICEF report, the major cause for 40,000 child deaths and 150 million children living with ill-health and poor growth is the so-called 'silent emergency', malnutrition, and other diseases (Grant GP.1991). About 25% of the world's under-five children are described as malnourished (Wallace HM, Giri K 1990) and the proportion is high in most developing countries where malnutrition is among the leading health problems (The Lancet 1988, The World Bank.1993, Wallace HM, Giri K1990).

The World Bank, 2004, reported that malnutrition in children is one of the most serious public health problems in Ethiopia and the highest in the world. According to the Federal Ministry of

Health, 2008, Ethiopia has the second-highest rate of malnutrition from Sub-Saharan Africa and with a high under-five mortality rate (88/1000 live births) which is caused as a result of infection and malnutrition. According to 2011 Ethiopian DHS data children under five years of age are 44.4% stunted, 9.7% wasted, and 28.7% underweight. As a result, the government of Ethiopia has been establishing promising services in the areas of nutrition and health of children under five years. Nevertheless, the prevalence of under nutrition in children continuous to be a major health problem. Moreover, the percentage of children wasted and stunted has not changed in over six year's period. In addition, the children who survive out of under nutrition lack the physical and mental ability to be productive and innovative which leads again to low social and economic development in adult life. However, studies in the areas of the need for health and nutrition of children particularly those under five years of age are limited in Ethiopia, more focus has been given to children with a greater risk of mortality. Therefore, assessing the prevalence, and practice of mothers on child nutrition and its associated factors is a very important step in outlining appropriate strategies in helping the process of reduction of malnutrition of under-five children in Ethiopia in general and Yeka sub-city in particular. Malnutrition prevalence and its causing factors of Ethiopia are better recognized in rural areas. However, urban areas require more study and emphasis on the cause and effect of malnutrition problems under five. According to (Alemu et al, 2005; and Christiaensen, and Alderman, 2001) suggestion, it is true that the in Ethiopia there is scarcity of documentation and addressing with regard to malnutrition problems and their particular parameters, specifically about their relative influence of various factors for children's nutritional status. As Woldemariam and Timotiows, 2002, suggests, national surveys and furthestmost minor studies on child nutrition were expressive in nature and limited to examination of the relationship between associated variables and nutritional status. Moreover, in central cities like Addis Ababa the underlying factors that indicate frequency of malnutrition between the ages of under five children is not well addressed in different studies. If there is also, the determinant factors related to children nutritional status across various studies is inconsistent.

The basis of this study was begun by collecting information from different mass Medias and then monitored by observation and qualitative preliminary studies. The key reason to select this study area is that, there are no several complete studies directed to cover all aspects of nutrition mainly, the effects of demographic and socio-economic features on malnutrition, which still made the problematic situation remains unchanged regardless of some concerned bodies have worked in

group. Therefore, this study tries to explore the major child nutritional status determining factors in the study area that help to climax the effort in prevention of malnutrition.

1.3. Significance of the study

There was much research work on the different issues of Addis Ababa from theory to practical interventions to program success stories. But to my knowledge, there is no comprehensive research on the topic of understudy particular to the study area. Therefore, the results of this study will be important to programmers and policymakers as the source of firsthand information. Similarly, the results of this study will benefit decision-makers of the sub-city and the woreda with appropriate recommendations and implementation of multi-sectorial community-based nutrition interventions and promotion of income-generating activities for the community with malnourished children and food-insecure households in the study area. It will also help as a source of data for researchers in academia and organizations who would like to conduct further study in the study area.

1.4. Objectives

1.4.1. General objective

- To analyze factors determining the nutritional status and it's among under-five children in yeka sub-city, Addis Ababa Ethiopia.

1.4.2. Specific objectives

- To determine the prevalence of malnutrition among children under five in the study area
- To analyze factors determining the nutritional status of under-five children in the study area

1.5. Research Question

The study will also be able to answer the following questions:

1. What is the relationship between the factors for malnutrition, specifically socio-demographic, child characteristics, and childhood illnesses in the households of the study area?
2. What is the prevalence of stunting and underweight of children among the age of under five in the study area?

1.6. Scope of the study

In order the study to be more controllable, it was encircled in concepts or issues, time and topography. Child malnutrition concept was related to the factors such as socio-economic and demographic, child-caring and maternal caring characteristics, and environmental condition. This study was also bordered to the four selected Woredas of Yeka Sub City, Addis Ababa, Ethiopia in terms of geography. Similarly, the study was community based cross-sectional in design restricted to determinants of nutritional status of under five years of age from April 2021 to June 16, 2021.

1.7. Limitation of the study

As the study is cross-sectional in design, some quantities may not be correct due to personal answers and since most of the information was questionnaire based, thus questions that requisite a good recall were defenseless to remember bias. Moreover, there was results of likely events of below or over -reporting and misrepresenting. In addition, and in this study some basic laboratory tests were not encompassed to cover related factors and to triangulate the outcomes. Therefore this may have undesirable effect on the report to the qualitative and qualitative studies.

CHAPTER TWO

LITERATURE REVIEW

2. LITERATURE REVIEW

2.1 The Concept of Basic Determinants of Nutritional Status

Nutrition is defined as a state of physiology of an individual, which is mainly resulted from the body's capability to digest, assimilate, transport, absorb or use of nutrient intake, and requirement. It is simply resulted from the interaction between nutrient intake and requirements.

Nutrition is a corner stone that influence and describes the health of rich and poor people. oppositely, malnutrition makes all people more vulnerable to disease and premature death which makes it as one of the devastating problem, particularly for the poor and unprivileged groups of people as poverty is a fundamental cause of malnutrition which continues to be one of the major and most pressing health problems affecting children and adults (WHO, et al, 20011).

According to the report of UN, children's fund, 2009, Nutritional status is defined as the outcome of multifaceted relations between food consumption and the total health status and care practices. The nutritional status of children and women are affected by several socioeconomic and cultural factors in patterns of feeding children. For a healthy growth and development of a child, the period from birth to age two is especially important, but it is often marked by micronutrient deficiencies that disturb their optimal growth.

Moreover the common childhood illnesses includes diarrhea and acute respiratory infections (ARI) are common. Improving the overall nutritional status of women throughout the life cycle is crucial to the mother's health. Because increased risk of prenatal problems and susceptibility to infections, prolonged recovery from illness, and possibly death are resulted from a malnourished women during pregnancy and children who fail to grow and develop normally due to malnutrition at any time during their life, including during fetal development. Therefore, improving maternal nutrition is crucial for improving children's health. A very serious problem in Ethiopia for many years has been the poor nutritional status of children and women. Thus, the health sector has to increase its efforts to enhance good nutritional practices through numerous ways such as treatment of highly malnourished children, health education, and provision of micronutrients to the most vulnerable group of the population in particular mothers and children (CSA, *et al* 2011).

Malnutrition is the condition that affect and limit people to develop immunity and as a result put them in risk of venerable to an impairment or less efficient and finally to death. The major reason for household food insecurity and malnutrition has become one of the buffet health problem in developing countries by affecting child is the prevalence of poverty. It is poverty that is a root cause and other underlying causes such as food security health and care for malnutrition. The state of malnutrition includes, one is under nutrition, which has a major underlying issue in developing countries, and the second state is over nutrition, which is characterized by increased habits of eating. The occurrence of under nutrition and over nutrition is simultaneous in many developing

countries among groups of different populations, this process or phenomena is referred as a double burden of malnutrition. Despite that there are lots of studies that contribute important interventions concerning to food security nutritional status of children specially those under five years of age are not widely studied which makes it a major problem (Mekonnen et al., 2013).

Unbalanced dietary intake and exposure to infections are usually core causes for malnutrition. According to World Food Program because of children limited ability to withstand adverse conditions and environments they are at high risk of malnutrition and more over they are susceptible to respond dietary changes. According to Gomez Malnutrition is referred to a pathological condition of varying degrees and diverse clinical manifestations, which resulted from the deficient assimilation or intake of the food components of the nutrient complex. Similarly, Brayson DF and Jelliffe DB, Jelliffe EFP explains, malnutrition is characterized by a state of under nutrition and it is caused by insufficient intake of calories and proteins relative to body requirements manifested by physical, psychological and biochemical abnormalities.

Therefore, in this study some of the major determinant factors of nutritional status of children under the age of five in the study area were tried to be identified. Thus the demographic characteristics, child health and care practice, socio economic and environmental factors were the major determinant factors in the study site.

2.2. Theoretical Framework Specification

This study's theoretical framework foundation applied and ruled by a renowned typical model in the tradition of Becker (1981), in which a household maximizes a utility function defined over ease, social, demographic, economic, family status, child caring and character, and environmental factors. There are sets of inputs where the production of nutrition depends on such as food or nutrients and the utilization of health services includes a sequence of exogenous individual characteristics such as health status, sex and age of the child; a vector of child caring characteristics including feeding, immunization and hygiene; maternal caring and characteristics like knowledge, age, antenatal practice. Thus nutritional status of children among the age of under-five may be directly affected by factors including environmental health condition like that of access to and quality of household conditions, sanitation and water supply.

Solution of the household's optimization problem produces a summary form request equation for child nutritional status (H):

$$H_i = f(X_{SED}, X_{CC}, X_{CP}, X_{MCC}, X_{EH}, \varepsilon)$$

Where

X_{SED} is socio, economic and demographic characteristics of the child of the households such as paternal and maternal education and occupation, and their religion.

X_{CC} is the child caring practices such as feeding, hygiene, and immunization.

X_{CP} is community child care practice such as feeding practice, hygiene and immunization?

X_{MCC} is maternal caring and characteristics such as age of the mother, nutritional awareness of the mother and antenatal care practice of the mother.

X_{EH} is environmental health condition such as water source, sanitation and housing condition of the participants.

ε is a random error or disturbance term representing the unobservable individual, household and community characteristics affecting the child's nutritional status which is assumed to be uncorrelated with the independent variables.

2.3. Empirical Literature

According to UNICEF's documentation the determinants of children nutritional status, there are various affecting factors related to their nutrition, essentially those features are grouped in 3 major levels. The first one is basic cause which includes factors around the structure and processes of societies. The second is underlying causes including the factors influencing households and communities and the third factors are immediate causes that affect operating at the individual level.

2.3.1. Aspects of Child Nutritional Status

Anthropometric measurements are basically used in this study for child nutrition status measurement, which is driven from measurement of the size, proportions, and composition of the child's body, reflecting both health and nutritional status and predicting performance, health, and survival. The anthropometric measurements presented as indexes for acute malnutrition are weight for height or body mass index (BMI) and weight-for-height and Height for-age (HFA) is an index for chronic under nutrition and weight-for-age (WFA) is an aggregate measure of underweight or wasting and stunting reflecting poor nutritional conditions in both long and short term. These

indexes are recorded as a z-score which are measured by standard deviations (SD) to describe how an individual's anthropometric measurement deviates from the mean for a healthy person of the same age and sex in terms of length and magnitude.

In this study the new growth standards published by the World Health Organization (WHO) in 2006 is used to calculate the nutritional status of children, were they are generated using data gathered in the Multicenter Growth Reference Study of WHO (WHO, 2006). Therefore based on WHO discoveries whose sample included 8,440 children in six countries designate how children should grow under optimum health situations. Thus, to assess children all over the world the WHO Child Growth Standard can be used regardless of their feeding practices, ethnicity, and social or economic obstacles.

In order to standardize the three measures of child malnutrition mentioned above, they are characteristically changed into Z-scores stated as height-for-age Z-scores (HAZ), weight-for-height Z scores (WAZ) or weight-for-age Z-scores.

For example, in the case of HAZ indicates chronically or severity of undernourishment, if a child whose HAZ score is below -2 standard deviations (-2 SD) from the median of the WHO reference population, the child is measured and considered to be short for his/her age (stunted), or chronically malnourished whereas children who are less than -3 standard deviations (-3 SD) are called severely stunted.

Similarly, WAZ is an index of height for age and weight for height that measures malnutrition as chronic and acute. A general pointer of a population's nutritional status of a child can be indicated as stunted if child is underweight for his/her age. And thus children with weight-for-age below -2 standard deviations (-2 SD) are grouped as underweight. In addition children with weight for age less than -3 standard deviations (-3 SD) are measured severely underweight.

Likewise, present nutritional status of a child can be described by WAZ index which measures body mass relative to body height or length. Children are considered to be thin or wasted (highly undernourished) if the Z-score indicates below -2 standard deviations (-2 SD) and severely wasted child to a weight-for-height index below minus three standard deviations (-3 SD).

2.3.2. Determinants of children's nutritional status

According to Ministry of Education, children in Ethiopia are affected by a wide range of health- and nutrition-related problems that affects their ability to perform, accept and benefit from education. As Ethiopian Ministry of Economic Development and Cooperation study indicates, 50% of the Ethiopian population are living below the food poverty line and are not able to meet their daily minimum nutritional requirement. As such, children are particularly vulnerable to malnutrition because of low dietary intakes, inequitable distribution of food within the household, improper food storage and preparation and infectious diseases children in particular are mostly vulnerable to malnutrition. Therefore, nutritional status of an individual is often the result of many inter related factors (Asres & Eidelman, 2011).

Children have special nutritional needs in their early childhood and are fully dependent on their mothers to get these needs and as they pass through life, growing physically, mentally, and emotionally they become subjected to sequences of changes (Nabarro.1981).

Before children progressively become independent of their mothers, they are nurtured completely by their mothers with adequate supply of nutrients to be capable of operating at their potential. During this time, they are particularly susceptible to infection of pathogenic microorganisms those that cause the specific infectious disease of childhood as a result of their home environment (Nabarro.1981). For most of the Africa countries, even though in areas where mothers still breast feed adequately, child growth is initially up to the standards given by WHO. But this is maintained up to the age of 4-6 months then followed by growth retardation due to poor weaning foods and feeding practices (Welbourn HF, de Beer G 1964)

Globally children are becoming a major public health concern is malnutrition among school age children. malnutrition and particularly under nutrition are still highly prevalent despite the economic growth observed in developing countries (El-Sabely et al., 2013).

More over to the physical and cognitive consequences, malnutrition can have severed effects on the economy (Frye, 2013; Lwanga et al., 2012). According to the World Bank, malnutrition affects the economy of a country directly through a loss of productivity, indirectly through a loss of cognitive function, and losses caused by a buildup health care cost. The loss of productivity can cost an individual suffering from malnutrition 10% of his or her lifetime earnings, which can

translate into a 2-3% loss in GDP. On the other hand, decreasing the prevalence of malnutrition can have the reverse effect, this means a 1% decrease in stunting can increase wages by approximately 1.4%.

Ethiopia is one of the poorest underdeveloped countries in the world economically in which one of the major and most pressing health problems especially among children is malnutrition (Edris, 2007). Based on the information from World Food Program, Ethiopia is amongst the countries in the world with the highest rate of school age children with special needs mainly attributed to impairments from malnutrition.

In the past, studies on nutritional status and health have been focused by many studies and scholars, the sections of literature reviews listed below emphasizes on major determinants of nutritional status of a children. These major predators include demographic and socio economic, household or individual characteristics and education, environmental health condition, maternal caring and mother's characteristics, child caring and practices. The demographic and socio economic determinants: includes for example household economic status of care giver, income, and tremors. Individual characteristics and education: for example structure of the household mainly educational background of the mother, children status (such as birth interval, sex, age, and birth order), and environmental health condition: for instance situations including sanitation, water and hygiene.

2.3.3. Household Economic Status

2.3.3.1. The Household Income

One of the basic cause for hunger and malnutrition is poverty. As the income of the household drops down as a result both the quality and quantity of food also decreases. According to UNICEF, 2009, evidence shows that family members eat cheaper and less nutritious food that lead to consecutive weight loss, health problems and malnutrition are as a result of factors such as low wages and unemployment. According to Christiansen, L and Alderman, H, 2001 children's intake of nutrients like proteins and nutrients from these groups decreases with poverty because proteins containing animal products are more expensive than other food items. (Christiansen, L and

Alderman, H, 2001). According to Piercecchi-Marti et al., 2006, Malnourishment develops when the food ingested does not meet the high protein and energy needs of the child.

Actually, in many countries malnutrition is related with poverty. Therefore nutritional status of the community can be enhanced by maximizing the income and purchasing power of an individual, which is taken as an important prerequisite.

According to the study by E.Seyoum, et al., 1996 showed, in Ghana researches arguments to the impact of income being handled by the woman of the households on the nutritional status of her children. As one of suggestions to the reason for association between the mother and her children has been increased in terms of capability of the mother to provide food stuffs to her kids throughout the day.

In another way round, for the families around Dire dawa the association between the mother's economy and income with her children nutritional status is not of almost important. Women that are engaged in the selling milk and wood fuel repeatedly leave their children such as for their family members, which may clearly account for the lack of association and the fact that the absence of the mother affects their children nutritional status.

2.3.3.2. Characteristics and education of the Household

As many studies show, the result of children nutritional status is highly dependent of the household and individual characteristics and also parental educational level. The household structure and child nutrition associations can be influenced by socioeconomic and demographic factors.

Households that are extended have much more helpful children nutritional status results than those that are not extended. Because there is no limitation in terms of boundary between reproduction, consumption, production and child rearing functions thus children obtain a better care. (Desai, 1992).

According to Sobolewski J.M et al, 2007, Studies show a mixed result on the relationship between household structure and child nutrition show mixed results. Comparing marital status of parents, most studies exemplify that children living with both married birth parents have higher nutritional status compared with those that are not.

Socio economic and demographic factors related to household structure includes economy, sex, age and education.

According to Saaka and Osman, 2015, study shows, improved dietary diversity and food access are very significant to advance the nutritional status of children, there is a positive and improved dietary diversity and food access in households with high socio-economic status.

According to Christiaensen, L and H Alderman, 2004 findings Female headed households face financial and time constraints because of certain reasons such as absence of a partner because of death or divorce but in Ethiopian sex of head of the household does not influence nutrition status of the children.

According to Shahabuddin A.K.M, et al., 2000 suggestion, stunting and wasting is not the same in different countries, in which girls are more likely to be less stunted, underweight, and also more likely to be as compared to boys. For example, as many study findings in Africa show that rates of malnutrition among boys are consistently higher than girls. More over the successive DHS survey of Ethiopian result shows that boys are more frequently affected.

According to Yimer, 2000, suggestions, children's nutritional status at definite ages can be affected by feeding practices and care and disclosure to infection. Studies in Ethiopia have shown that older children are more at increased malnourishment level.

According to various studies one of the major element in improving children's nutritional status is maternal education. Children of mothers achieving secondary education and above are the less likely to be stunted, malnourished, under weight than those children that are with illiterate mothers (EDHS, 2011). Educated mothers have relatively better income, and power in the household. This have a positive outcome to their children's nutritional status as well as to the society, which will put her in a higher position of decision making and other related situations about her children.

2.3.4. Maternal characteristics

Based on history and lots of studies practically indicates that mothers usually reduce food items from themselves, adults or by lending meals and money from families and lenders in order to provide the children with food at the time of food shortage seasons. But they have to be aware of conditions related to how to use available food for their children through family planning (limiting

children's number) and postnatal child care no matter how much they care to their children and the rest of the family.

According to EDHS, 2011 report, among the major health problem of women in developing countries like Ethiopia are complications of pregnancy that are received at early stage of pregnancy and also continuous until delivery. This problem can be minimized and prevented through appropriate medical devotion and clean situations. As a result complications, death or infection for both the mother and the new delivered baby can be minimized. Another means of minimizing such problems can be gained by maximizing deliverance of new born babies in health institutions such as clinics and hospitals, by directing high risk pregnant mothers to referral hospitals in time and providing a good infrastructure of rural areas which is in fact practically a leading problem in many areas of Ethiopia.

Employment status of caregivers

As Airin Roshita, 2011 study tells, the increase in the income of middle class societies and contribution of women in the market are related with nutritional status of children in lots of developing countries. According to Marye kassaye, 2019, study shows, about 17 lack of maternal care and malnutrition among young children rises alongside with mother's employment status, that are the principal caregivers. More over previous studies on association between maternal employment and child malnutrition have discovered to the developing and emerging middle class countries, for instance in Indonesia studies showed that, since the country is emerging starting from 1980s, children become undernourished and loose treatment and care due to a maximized workforce of the mothers employment.

In another way round, according to the study of Lamontagen, et al, 2000, by applying a multiple regression analyses in some randomly taken samples of low income Nicaraguan households' studies were inspected to document the effect of mother's employment and nutritional status of their children. The analysis indicated that 56% of young children with working mothers had an improved WAZ than those children with unemployed mothers. Children with less maternal care had also low HAZ even if other variables are controlled. The study result emphases more about the relationships between the mother's employment status and child malnutrition under

consideration and control of other variables such as education and economic status of the mother, fathers' support and other child characteristics.

2.3.5. Practices on child care

According to World Bank, 2010, among the most important caring factors feeding practices are very vital with respect to nutritional status. The major basic means of determining nutritional status of infant and young children and stopping malnourishment is by providing a stable or well-adjusted home-based feeding mechanism. Care essentially is defined in terms of behaviors and practices, which explains on the way how assets specifically such as food and health means are essentially utilized in the household.

Breastfeeding

Child breastfeeding is one of the most significant nutritional parameter to ensure satisfactory growth and development of infants and young children. An infant less than the age of six month must be exclusively breastfed before the child start to take semi solid food items in the diet.

According to report of UNICEF report, 2009, breast feeding status of the mother is related with returning to their another fertility condition and length of pregnancies interval nevertheless of the gifts and abilities of malnourished mother to deliver sufficient quality of breast milk to her infant. More over the study shows and recommend that children should continually breastfed for their first six months and then start supplementary semi solid food along with breast milk from seven months to their second years of age.

In another way round studies of Ukwuani and Suchindran, 2003, shows the nutritional status of children in countries such as Nigeria discovered that, situations such as current incidents of diarrhea, fever and short duration of breastfeeding triggered to an amplified wasting and stunting condition of a child even though the child is fully immunized and high birth weight.

Nutritional status and Health Access

According to studies by Alemu Mekonnen, Belete T et al., 2005, the nutritional status of a child can be affected as a result of access to health services. This can be verified, due to untreated fever, diarrhea and similar communicable infectious illness because of health service inaccessibility children are highly malnourished. More over the children's nutritional status is also related with

factors such as drug availability and market price, family insurance to health service and service quality of the health facilities. This clearly indicates that health service accessibility has large impact on rural areas than urban.

Additional studies such as FMoH, 2006, indicates that, in Ethiopia, safeguarding households to be better productive need an access to available public health service facilities, adequate education service, information on continuous health bases and environmental protection. In general, after handling a number of other determinants of child malnutrition, remoteness to get health facility center is not substantial and the absence of descriptive power of the distance factor could be hypothetically explained by the fact that the representation for admission to health center does not take part the value of healthcare a reflection. Another choice is that households may be unable to pay, therefore accessibility of health services may not upsurge practice (Christiansen and Alderman, 2004).

2.4. Conceptual framework

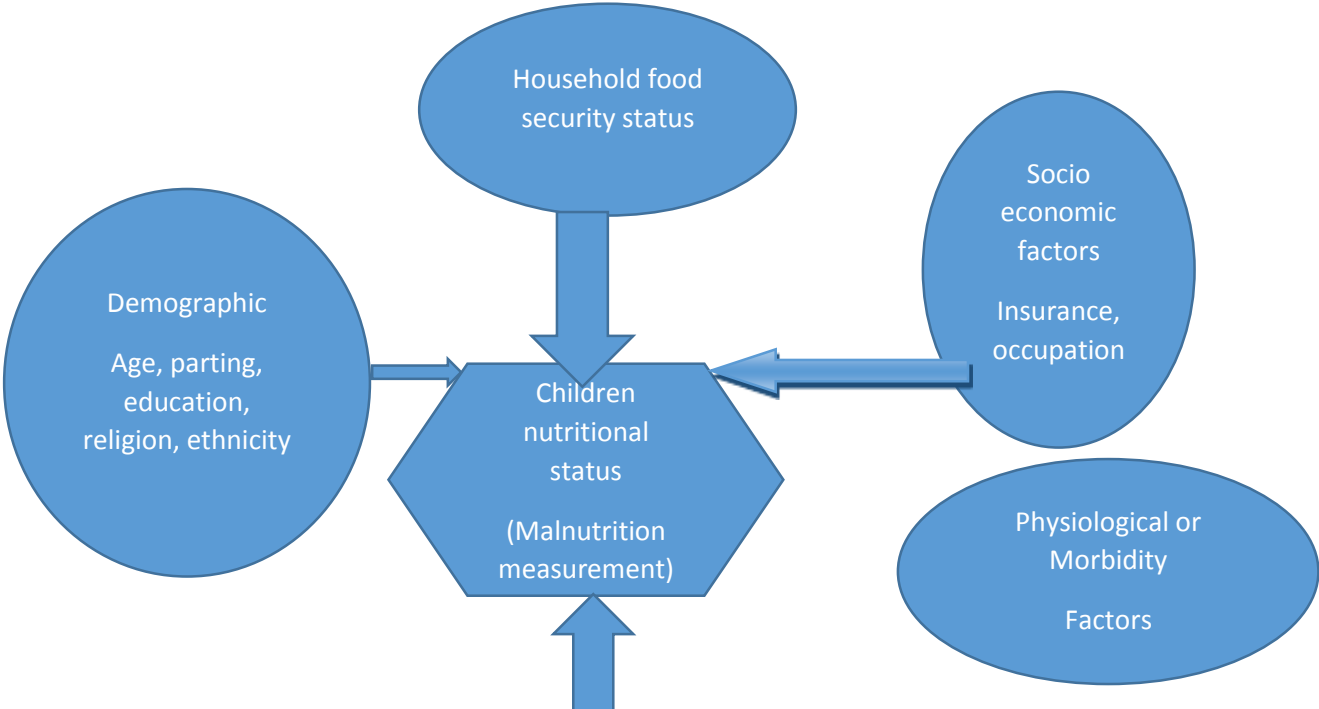
The conceptual framework used for this study is adopted and modified from UNICEF's conceptual framework on the determinants of malnutrition (UNICEF, 2012). The framework below represents factors determining the nutritional status of children under the age of five years old.

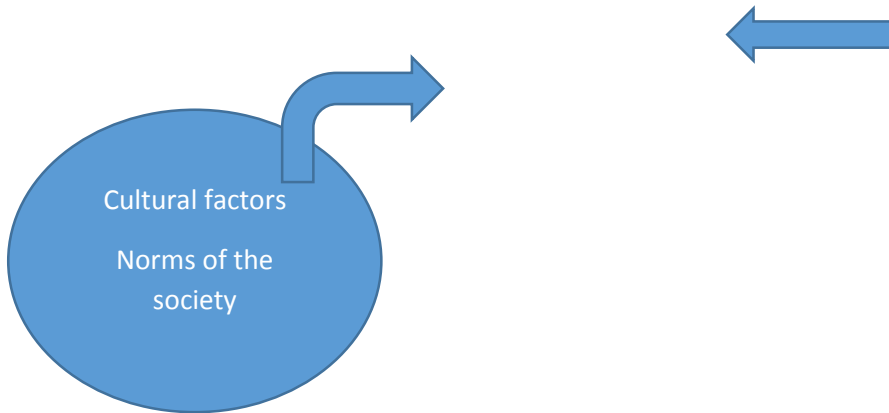
The variable in the framework which is dependent is nutritional status or malnutrition. Whereas the independent variables are the apparent fundamental factors that has impact on the child nutritional status. These factors include maternal demographic factors including age, parity, level of education, and physiological status (morbidity) of the mother are the immediate causes. When the dietary diversity is poor it affects the children's morbidity status as there is reduced immunity and increased chances of developing infections. This means, morbidity status of a children either due to poor appetite which leads to only likable foods being selected or some practices such as pica which affect nutrient intake. Socio-economic as measured by assets owned and the occupation has been found as a factor that influences nutritional status. Cultural factors and household food security situation are also factors affecting children nutritional status.

There is more malnourishment in children below the age of five than older children. This can be explained, children at this age have a very fast physical and mental growth and development, need frequent care in all features including provision of nutritious food for optimal physical and mental

development. Thus, if these conditions are not well managed it might lead to malnutrition. In addition, factors other than sanitation and health service, they can be related with reduction of the children's vital body micronutrients, as a result this expose the child various infections and maximize the chance of stunting, wasting and malnourishment of a child.

Other factors determining nutritional status of a children among the age of five is affected by availability of potential and economic resources and the way they are transformed in to edible food in order the caregivers nurture their infant and young ones. There is a direct relationship between economic statuses of households.





Source: UNICEF model for nutritional status and determinant factors, adapted by the researcher.

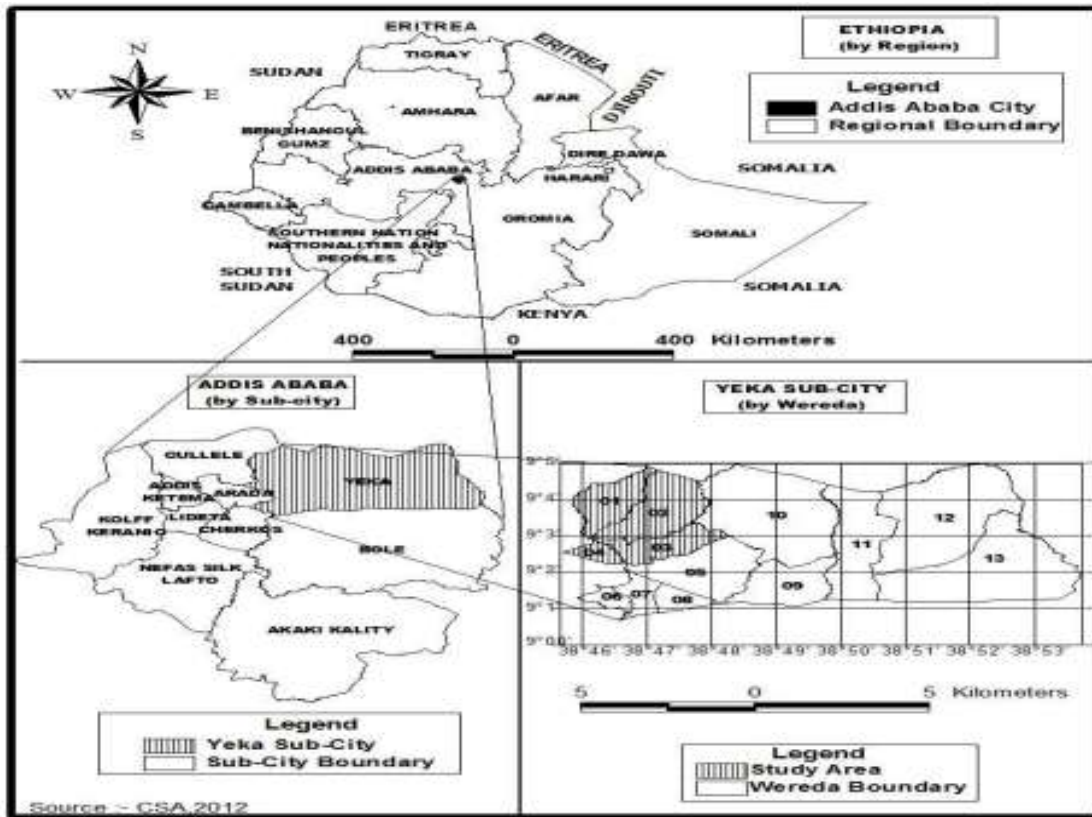
CHAPTER THREE

3. Materials and Methods

3.1. Study area

Yeka sub-city is located in the North east Part of Addis Ababa city. It borders with the districts of Gullele, Arada, Kirkos and Bole. It is one of the eleven sub cities which is a very large and exceeds the carrying capacity of the sub city and the total area of the sub-city is 85.98 km square and 4,284.9 people live in one-kilometer square. Moreover, its entire population of the area is 368,418 people. Yeka Sub-City Administration office is found Megenagna in front of Marathon motors building. It is located at a geographical coordinate of 9°01'30.73" N and 38°48'27.55" E on the earth surface. The Administration has 547 permanent and 24 contract employees. Furthermore, in

the fiscal year of 2010/2011, the administration's budget was 337,750,165.29 birr and its capital expense were 672,072,002.85 birr.



3.1 Geographical presentation of Adiss Ababa

3.2. Study design and period

In order to analyze factors determining nutritional status among under five years children, cross sectional, community based research design is applied. When there is no control over the variables while conducting a research, this research design applied is used in order to shot what has happened in the area as well as to clarify characteristics associated with the population subject where the research is conducted.

According to Kothari .C.R (2004), using such type of design helps to answer questions such as where the research is conducted, duration and conductor of the researcher, and more information can be gained and described in association with the current status of the phenomena related to the variables.

One way to quantify duration and gather the data from a somewhat large number of cases at a particular time can be improved using a cross sectional design, where large sample groups were determined and included in a short period of time.

Furthermore, research plans are very helpful for researchers to deliver research questions answer and by providing data as a result objectives the research can be achieved. In general, a descriptive explanatory method which then followed by a cross sectional studies from April 16, 2021 to June 16, 2021 were used to achieve the objective of this study.

3.2.1. Research approach

In order to achieve the objectives of this study and thereby to give answer for the problems, quantitative research approach was used by the researcher which helps to select participants of the study to determine the nutritional status of children aged under five in yeka sub city selected woredas. This approach enables a better understand and communicate what and the why of phenomena and practices systematically. This methodology is chosen because it remains as an essential element to measure economic and social phenomenon and it helps in analyzing the determinant factors of nutritional status and to analyze the complex variables of nutrition status under five children at the study area at a point in time thus enhance confidence while making conclusion.

3.3. Source and Study Population

All under-five children living in Yeka Sub City, Addis Ababa, were considered to be the source population. The study population were those children below the age of five who live in the selected four woredas of Yeka sub city. The households were selected out of the all woredas by random sampling method, and then the study unit considered were those under-five children who lived in these household.

3.4. Inclusion and Exclusion Criteria

Children under the age of five live and raising with their mothers or care givers in the selected woredas have been included in the study population. Also, children whose care - takers were not

around during the study period and children with illnesses which make attendance difficult will be excluded from the study.

3.5. Sampling techniques

3.5.1. Sample size determination

There are variety of techniques for the determination of sample size determination. However, this study applied Cochran (Israel, 1992) to get the sample size. A multi stage population proportion determination formula was used to determine and calculate the sample size:

$$n = \frac{z^2 pq}{e^2}$$

Where;

n is the desired sample size;

Z is the standard normal deviate at 95% confidence level (1.96);

P is the proportion of the target population estimated to have characteristic being measured;

q is 1-p and

e is the level of statistical significance set

The prevalence malnutrition among children under five in the study site has no reference to use as p value. Then when such evidence is not available 50% is considered as maximum prevalence of nutritionally insecure children under five. So taking 50% as p-value with 95% confidence interval, 5% marginal error and none responsive rate of 10%. At 95% the z is 1.96.

$$n = \frac{(1.96)^2(0.5)(1-0.5)}{(0.05)^2} \cong 384$$

Finite population correction was done to produce a sample size that was proportional to the population therefore the sample size was calculated as;

$$n = n/1 + (n - 1)/N$$

Where n= desired sample size

N=the estimate of the population size (1439 children in one worda)

$$n = \frac{384}{1+384-1} = 303$$

The sample size is 303 of children under five calculated for the study. To find the sampling interval, the average number of children in one woreda (1439) is divided by the required sample size of 303 which gives us 4.75. Based on the value above, every 5th children under-five ages was interviewed until the sample size achieved. This was done daily during the weekdays for one month until the target sample size is achieved.

3.5.2. Sampling Technique and Procedures

In order to select the required size random and purposive sampling techniques were employed in the study. Primarily, due to the limited resource, the researcher purposively selected Yeka sub city from the remaining sub cities because of the series problematic and observation report from the woredas Health Bureaus, its proximity to the researcher's place of residence, and hence has an adequate knowledge about the study area chance to communicate with the concerned government sectors to get appropriate information. Both indicators show more slum areas were found in the selected Sub-Cities.

Therefore there are thirteen Woredas according to information attained from the sub city administrators, then four woredas were selected using stratified sampling out of the total thirteen woredas and they were considered to be a representative sample, since there is a relatively mixed socio-economic characteristics in Yeka sub city as compared to the remaining sub cities of Addis Ababa.

Therefore, based on probability proportional to the population size of each eligible Woredas the calculated 303 samples were assigned as a result sampling frame for each selected four Woredas was made. Following sample generating, from each Woreda's health office the list of households with competent children in the given selected four Woredas were obtained, and random sampling then applied to select the given number from the list of households. Finally proportion sample size technique used to get each woredas size of illustrative sample:

$$p_n = \frac{n}{N} * N_o$$

Where:

p_n = Proportional distribution to size within each Woredas (n=1, 2, 3, 4)

N_o =number of children with consistent to each Woredas (2720, 1365, 2401, 1190)

N =Total number of children consistent in the selected four Woredas (7676)

n= the mothers with children consistent in the selected four Woredas (303)

Thus, 303 of total sample size dispersal through the randomly selected four Woredas based on the probability proportionate to population size is presented in the table following:

Table 3.1 sample size the four selected Woreda of yeka sub city, Addis Ababa, 2021.

study area	Number of child among the age of under five in each woredas	Proportion (%)	size
Woreda 1	2720	35.4	107
Woreda 2	2401	31.3	95
Woreda 3	1365	17.8	54
Woreda 4	1190	15.5	47
Total	7676	100	303

Source: health offices of the woreda, 2021

3.6. Data Source

In order to collect data during the research period both primary and secondary sources were used.

3.6.1. Primary and Secondary sources of data

To get information about the frequency of child malnutrition and nutritional status a prime source of data was gained from the children's caregiver or mothers. The majority of the primary data was found after applying anthropometric measurement and interview questionnaires intended through utilization of information created from secondary survey after taking which was due awareness of the purpose and objectives of the study. Second-hand information was prepared and collected from different documents of previous studies on a related area of research.

3.7. Data Collection

Data collection of the research was carried using ordered Questionnaire from mothers of children among the age group of 0-5 years with the help of three field data collectors.

Anthropometric measurements such as WAZ, HAZ of the child index were taken to assess the main issues and statistics related to socio demographic, economic, and health status.

Weight of the children in the study group was taken using a weighing scale, height was measured using a movable calibrated wooden scale. Moreover, information on the age of the child was obtained from caregivers (mother) and birth certificate.

3.8. Data Collecting Tools

During the data collections some of the tools used includes, to collect quantitative data from mothers or the child care-givers administered questionnaire was applied, Weighing scale to take weight index of the child, height board to take height of the index child, and to fill in the questionnaire Pencils, pen, and note manuscript were used.

3.8.1. Anthropometric measurements

3.8.1.1. Weight; the weighing scale was placed on a fit flat and hard surface, measured by Seca weighting scale made in Germany Weighing balance is calibrated in kilogram and the child was weighted in to the nearest 0.1kg in light clothes and no shoes.

3.8.1.2. Height; Child height was measured by standing height scale model AIWA. The subject stand erect & bare footed on the scale with a movable head piece and height was recorded to the nearest 0.1cm.

The anthropometric measurements such as stunting, wasting and underweight of children in the study group were compared and interpreted with the WHO growth standard reference points (WHO, 2006).

The z-score or the standard deviation unit (SD) show how far the measurement from the median value and cut-off values applied were less than -2 or -3 SD from the median value.

Stunting; according to WHO, 2006 growth standard, it is referred to us when length/height-for-age z-score is below -2 SD and as z-score below -3 SD is described as sever stunting.

Wasting; is if weight-for-height z-score is below -2 SD and z score below -3 SD is defined as severely wasted according to WHO, 2006 reference point of population.

Underweight; according to WHO, 2006, as z score goes to below -2 SD and as z-score below -3 SD of reference population it is described as severely underweight.

Each participant was weighed twice by using a weight scale to calculate

Body Mass Index (BMI); is defined as an anthropometric indicator based on weight-to-height ratio. Its accuracy and reliability was improved by relating it the mean value to the nearest 0.1 kg with WHO recommendation.

3.9. Data qualification

The data quality was managed at different points. Before data was collected, emphasis on designing structured questionnaire including scientific terms that can meet the objective of the study were systematically handled and pre-tested. Data collection tools dependability and consistency was generated throughout the pretesting of questionnaire in the selected woredas of study area. This was done by inspection of the responses agreed by respondents in the study area. In general, in order to guide observation seven issues (See annex 2) were applied. The data collection were carried by a trained degree holders who are well aware of handling measurements of anthropometry data, and each collected data was checked daily.

3.10. Study variables

3.10.1. Dependent variables

Based on logistic regression techniques,

- The degree of wasting (weight-for-height); after the value reverted in dichotomous (yes or no) method constructed on median cutoff point of WHO.
- The degree of underweight (weight-for-age index); after the value reverted in dichotomous (yes or no) method constructed on median cutoff point of WHO.
- The degree of stunting (height-for-age); after the value reverted in dichotomous (yes or no) method constructed on median cutoff point of WHO.

3.10.2. Independent variables

- Socio-economic and demographic variables: including type of family, family size, Maternal/paternal education and occupation.
- Child characteristics: including Age, Sex, and morbidly status.
- Environmental health condition: including sanitation, water supply and housing conditions.
- Child care practices: feeding, health care seeking, immunization and hygiene.
- Maternal Caring and characteristics: nutrition awareness, age and ANC.

3.11. Data analysis

Data processing was carried out after data was collected. The raw data was converted into suitable form for analysis and interpretation. Data processing was achieved by following sequences of procedures, these are editing, coding, entry, and tabulation. Statistical analysis was carried out

using Excel and Statistical Package for Social Science (SPSS) software (v.20). Both the independent and dependent, and both binary and multiple logistic regression analysis was applied to determine the relationship of variables during descriptive statistical analysis.

3.12. Model specification

Based on the theoretical framework offered above in the second chapter, multivariate analysis was carried out. When the dependent variable is dichotomous (if the value is 0 or 1) logistic model is used, for instance when children are underweight compared with those that were not underweight. Maximum Likely-Hood Estimator (MLE) methodology was applied to avoid errors. Hence general mathematical model is shown as follows:

$$\log\left(\frac{p_j}{1-p_j}\right) = B_o + \sum_{i=1}^n B_{iX_{SED}} + B_{2i}X_{Chi} + \sum_{i=1}^n + B_{3i}X_{CCI} + \sum_{i=1}^n + MCI + \sum_{i=1}^n + B_{4i}X_{EHI} + \varepsilon_j$$

Where:

j=1, 2, 3 under the consideration of the three anthropometrics measurements

i = 1, 2... n (n is numbers of factors)

p = is the estimated probability of prevalence of malnutrition in the population which value's lying between 0 and 1

$$\frac{p_j}{1-p_j} = \text{odds of success}$$

X_{SDI} = Socio-economic and demographic variables such as maternal/paternal education and occupation

X_{CHI} = Child characteristics like Age, Sex, and health status

X_{CCI} = Child caring practices such as feeding, hygiene, and immunization

x_{MCI} = Maternal caring and characteristics like age, height, nutrition awareness, and ANC visits

X_{EHI} = Environmental Health condition such as water supply, sanitation and housing conditions

ε_j = random error or disturbance term based on the anthropometrics type.

Under the assumptions of:

- i. The dependent variable non- linearly related with the independent variables;
- ii. The dependent variable need not normally distribution (but does assume its distribution is within the range of exponentials family of distribution such as normal, poisons, binomial and gamma);
- iii. The dependent variable need not be constant variance for each level of independent variables, which means there is no homogeneity of variance assumption; and

- iv. Normally distributed error terms are not assumed.

3.13. Ethical Consideration

Ethical approval was gained from Addis Ababa University Ethical Board in its meeting held on 01/08/2014. And permission was obtained from administrators of the selected woredas prior to starting the data collection and oral consent was obtained from the caregivers. The researcher has got a support letter from Food Security department and communicated all health centers found in the selected Woredas legally and smoothly.

3.14. Operational Definitions

Food security: Is defined as the physical, social and economic access of all people to appropriate, safe and nutritious food that encounters their dietary needs and food preferences for an active and healthy life at all time (UNICEF, 2013).

Nutritional status: Is defined as the result of complex interactions between food consumption and the overall status of health and care practices. The nutritional status of children and women are affected by several socioeconomic and cultural factors in patterns of feeding children. For a healthy growth and development of a child, the period from birth to age two is especially important, but it is often marked by micronutrient deficiencies that disturbs their optimal growth (UN children's fund, 2009).

Malnutrition: is the condition that affect and limit people to develop immunity and as a result put them in risk of venerable to an impairment or less efficient and finally to death. The major reason for household food insecurity and malnutrition has become one of the buffet health problem in developing countries by affecting child is the prevalence of poverty.it is poverty that is a root cause and other underlying causes such as food security health and care for malnutrition. The state of malnutrition includes, one is under nutrition, which has a major underlying issue in developing countries, and the second state is over nutrition, which is characterized by increased habits of eating. The occurrence of under nutrition and over nutrition is simultaneous in many developing countries among groups of different populations, this process or phenomena is referred as a double burden of malnutrition. Despites that there are lots of studies that contribute important interventions concerning to food security nutritional status of children specially those under five years of a age are not widely studied which makes it a major problem (Mekonnen et al., 2013).

Anthropometry: is a technique of assessing a body growth change using methods such as height/length, weight, skin-fold thickness, and head circumference etc., could detect the change of body composition to assess the nutritional status in specific population groups, including newborn, children under age of five and adults (NACS, 2016).

Stunting: is a measure of chronic malnutrition; that shows in adequate nutrition over a long period of time, or effects of recurrent or chronic illness, and the stunting case rate of under five in percentage whose height for age is below -2 SD (moderate and severe stunting) from the median height for age (UNISEF, 2018).

Underweight: is a condition that reflects both acute and chronic malnutrition, and the underweight rate for child under 5 is the percentage of whose weight for age is below minus 2 standard deviations (moderate) and minus-3 standard deviations (underweight) from the median weight for age (UNISEF, 2018).

Wasting: Is defined as a measure current acute malnutrition which reflects acute food shortage or recent episodes of illness, and the wasting rate is the percentage of children under five whose weight for height is below minus 2 standard deviations (moderate) and minus 3 standard deviations (severe) from median weight for age (UNISEF, 2018).

Socio-economic factors: are factors that are measured by determining some dimensions. These include education, income and occupation or a sum of these dimensions. The economic status of a household's socio economic status is an indicator of access to use of health services, adequate food supplies, availability of improved water sources, and sanitation facilities, which all together are major determinants of child and mother's nutritional status (UNICEF, 2018).

Overweight: is defined as excessive fat accumulation that may impair health. The rate of overweight among under five children is percentage whose weight for height is above positive 2 standard deviations from the median weight for age, and among adolescents and adults it the %age of individuals with a body mass index equal or higher than 25 (UNICEF, 2018).

CHAPTER FOUR

4. Result and Discussion

The data which is presented in the preceding chapter gathered from primary source from april16, 2021 to June16, 2021. A total of 294 children under five years of age were included. In terms of organization, this chapter is prepared by categorizing it in to two sections, these are the descriptive analysis that determine the socio demographic characteristic, child care and feeding practice, child health and sanitation and maternal characteristics and statistical model analysis to show the relationship of dependent variables.

4.1. Demographic characteristics of respondents

Table 4.1: Household characteristics

Variables	Status	number	percent
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Marital status	Unmarried	30	10.2
	Married	240	81.63
	Widow	10	3.4
	Divorced	10	3.4
	Separated	4	1.4
Educational background of mother	Capable of reading and writing	206	70.1
	Reading but not writing	34	11.6
	Cannot read or write	54	18.4
Occupation of husband	Daily worker	170	57.82
	Self employed	40	13.56
	Wage worker	54	18.37
	Business \ Trader	30	10.2
Mother's main occupation	House wife	119	40.5
	Daily laborer	56	19.1
	Business/trader	95	32.3
	Wage worker	24	8.2
Working at	Home	200	68
	Away from home	65	22.1
	Both	27	9.2
Mother's working outside home/week	<3days	244	83
	3-5 days	28	9.5
	>5 days	22	7.5
The HH head has other additional work	Yes	187	63.6
	No	107	36.4
Is someone take care of the index child when the mother away from home	Yes	246	83.67
	No	48	16.3

Based on the information give on table 4.1, the most participant of the study mothers/caregivers, 240 (81.63%), are married. And the remaining are single, means they are unmarried, divorced, or widowed. This finding tells majority of the study group are not single.

Related to the paternal occupational statuses of the respondents, majority, 170 (57.8%) fathers are daily workers; likewise, 30 (10.2%) were business traders and same number of participants are also self-employers. This shows that most of study population household's children fathers have lower income.

In addition, the educational background of the majority of participants of the child mother or caregivers 206 (70.1%) are capable to reading and writing and the remaining 34 (11.6%) respondents are illiterate.

The data collected after asking participants whether their husband had other work or not; most of the respondents 187 (63.6%), confirmed that their partners did not have other source of income in addition to their current work and their basic income of most of the study participants 95(32.3%) were trading with 119 (40.5%) housewife.

From the total study majority of the mothers, 200 (68%) were working in their home, and the remaining participants 65 (22.1%) were working away from their home. The study also asked the frequency of working days outside home, accordingly 244 (83%) participants of the study respond that they spend outside at least 3 days or less per a week. Out of the total participant of the study 246 (83.67%) of the respondents replied that there is no somebody who will treat the index child while they working away from home.

4.2. Socio-economic characteristics of the study group

Table 4.2: Household socioeconomic status

Variable	Category	Number	Percent
The house where the HH lives	Owned house	52	17.7
	rented	242	82.3
Use of electricity power	Yes	280	95.2
	No	14	4.8
Other electric power	Solar	10	3.4
	Generator	-	-
	No other type	284	96.6

Use of fuel for cooking	Electricity	5	1.7
	Wood	198	67.3
	Kerosene	91	31
Main floor material of the HH	Earth land	90	30.6
	Concrete	204	69.6
Main exterior material	Rudimentary wall	206	70.1
	Traditional wall	74	25.2
	Finished wall	14	4.8
Roof material	Rudimentary material	236	80.3
	Finished material	58	19.7

According to table 4.2, about 242 (82.3%) of the study participants were living in rented house and the remaining 52 (17.7%) were resided in their own houses.

Nearly 204 (69.4%) participants of the study house floor was made from concrete, but, the remaining participants 90 (30.6%) house floor condition were earth land.

According to the finding of the study, 74 (25.2%) of the study respondents were living in traditional stone wall made houses. Whereas, 174(4.8%) households said they lived in the finished wall house.

Majority of the study population, 236 (80.3%) lived in a house made up of grass and other plastic like made roof, whereas the remaining 58(19.7%) participants responded that they lived in the houses where their roof are finished. This suggests the massive study population participants' house conditions were found to be below the quality.

In other way round, of all the respondents 198(67.3%) households use Wood/straw, (1.7%) kerosene and 5 (1.7%) of the respondents use electricity, were the major sources of cooking fuel. Therefore the result of the study show larger amount residents use wood as a major source of households' fuel for cooking.

4.3. Demographic characteristics of the child

Table 4.3: Child demographic characteristics

Variable	Group	number	%
Sex of the child	Female	156	53.1
	male	138	46.9
age of the child (in months)	0 – 6	4	1.3
	6 – 24	146	49.7
	24 - 59	144	49
Number of children under five	1 children	270	91.8
	2 children	24	8.2

From the information given above in table 4.3, majority of the study participant children need additional food other than breast milk, this is because majority of the child, 146 (49.7 %) in the study area are found between the age of 6 and 24 months, while, the remaining few number of children, 4 (1.3 %) are found below 6 month years of age.

In the time being, the study also assessed number of children under the age of five, of all the participants 270 (91.8%) households had only one child, whereas, with the rest of the study group households, 24(8.2%), had 2 under five year children while survey was carried out.

4.4. Work condition of mothers and child care arrangements

Table 4.4: Mothers working condition

Variable	Responses	No	%
Mother giving milk along with home work	Yes, always	47	16

	Yes, sometimes	3	1
	No, never	24	83
Having enough time for taking care of the child	Yes, always	228	77.5
	Yes, sometimes	14	4.8
	No, never	52	18
Having much working burden	Yes, always	66	22.4
	Yes, sometimes	22	7.5
	No, never	206	70.1
Feel attention to finalize the work on time	Yes, always	12	4.1
	Yes, sometimes	21	7.1
	No, never	261	88.8

As the table 4.4 above reveals, majority of the mothers, 244 (83%) of the index children were not providing breast while they are in their household duties; however, 47 (16%) mothers gave their breast milk despite of how much work burden in their house. This indicates that majority of children from the study population not get breast milk from their mother due to work burden.

Moreover, while the study conducted care giving practice of the mother, 228 (77.5%) of the mothers responded that they have plenty time to give care to their children, but the remaining 52 (18%) respondents did not have enough time to give care to their children. From the study participants, 206 (70.1%) respondents said they have no work burden and 66 (22.4%) respondents said that they have work burden. Therefore this implies that majority of the study participants have enough time to take care of their children, since more than $\frac{3}{4}$ of mothers from the study area did not have multifaceted work burden.

4.5. Child caring and health practice

Table 4.5: Child health and Caring Practice

Variable	Rank	number	%
Antennal care before	Yes	278	94.5
	No	16	5.5
Number of the time the care was taken	Never taken	23	7.8
	1 – 4	12	4.1
	>= 4	259	88.1
The child depleting colostrum	No	2	1.7
	Yes	292	99.3
Child exclusive breast feeding	No	15	5.1
	Yes	279	94.9
Duration breast feeding do not taken at all	Did not taken at all	8	2.7
		264	89.8
	>6 month	22	7.5
	<6 month		
Full immunized	Yes	288	97.9
	No	6	2.1
Number of days leave child per a week	Never leave	249	84.7
	< 5	31	10.5
	>5	14	4.8
Leaving child in the last 24 hours	Do not leave	247	84.0

	<= 10 hours	34	11.6
	>10 ours	13	4.4
In the last 24 hours leave the mother without the index child	No	204	69.4
	Yes	90	30.6
At the time of leaving the child stayed with	Home	254	86.4
	Neighbor	6	2
	Others	34	11.6
The child had got diarrhea within the past two weeks	Yes	11	96.2
	No	283	3.8
child is illness with in the past two weeks	Yes	11	96.2
	No	283	3.8

According to the finding of table 4.5 shown above, regarding to antenatal care of the child's mother, 278(94.5%) respondents took antenatal care when they were pregnant, the remaining 16 (5.5%) mothers never took the service. Thus majority of the mothers participated in the study visits and took the care service during their pregnancy time.

Moreover, while conducting frequency of their visit, 259 (88.1%), visit the antenatal care service more than 4 times and the other 12 (4.1%) participants took between 1 and 4 times.

Concerning to intake of first breast milk, 292(99.3%) mothers responded that their child depleting colostrum, whereas, 2(1.7%) participants responded their child never taken.

Jointly considering complimentary feeding or transition from exclusive feeding, which obviously covers the period from 6 to 18-24 months, the study asked for the respondents whether they moderately to give a breast milk on time for their children or not. Of all the respondents, 279 (94.9%) mothers from the study population stopped breast milk after 6 month, while, 15 (5.1%)

respondents reject their breast feed before the child even got 6 month of age. This finding of the study result indicates that majority of the study population participants gave their breast for their children above 6 months.

Mutually, the result of the study showed majority of the mothers' participant in the study have a relatively better knowledge about the importance of immunization, since of all the participants 288 (97.9%), of the mothers fully immunized their children, but 6 (2.1%) did not fully immunized their children.

The result of the study illustrated that the vast majority of the mothers/care givers, 249 (83.7%), never left their children while they are going out, whereas 31(10.5%) of the mothers leave their child at list one day per week; similarly, 14 (4.8%) study participants from the study population responded that they leaved their child in a week at least for more than 5 days. According to the majority of the respondents answer, 247 (84%), mothers never left their children at all; however, 34 (11.6%), respondents of the study population said that that they leave their children lower than less than 10 hours. The remaining 13 (4.4%) mothers or care givers should leave out their children more than 10 hours per day. This illustrated that majority of the mothers convinced that they have their children by themselves.

Moreover, before the data was collected within the past 24 hours, of all the respondents 204(69.4%) mothers or care givers never leave their index child; whereas, the remaining 90 (30.6%) of the mothers responded that they left out the child before 24 hours.

To get information where child stays when the mothers or care givers left away from home, the majority of the respondents, 254 (86.4%), answer that the children were staying at home; whereas, the rest of 34 (11.6%) participants said they leave them with others family members. The remaining 6 (2%) mothers left their child in their neighbor. This indicates from the majority of the study population, $\frac{3}{4}$ of the mothers keep their children by themselves in addition to caring practice of their children also assessed by breast and add-on feeding preparation together with work burden mothers.

Of all the entire under-five children under the study 283 (96.2%) of the children had not any type of illness, however 11 (3.8%) children had at least one type sicknesses within the past two weeks such as diarrhea which is one of the health problem in the study area. it affected 11 (3.8%) of

children conducted in the study. This finding of the study shows that diarrhea is higher in children among the age of under-five.

4.6. Environmental factors and hygiene

It is true that a society health depends mainly on environmental conditions where the community live and cooperates including water source and toilet facility. Lack of access to a clean and neat environment results in cause for various airborne and waterborne infections. Thus this study had evaluated environmental condition where the participants live.

Table 4.6: Environmental and hygiene

variable	Category	number	Percent
Main water source	Pipe water	89	30.3
	Public water	200	68
	Protected dug well	5	1.7
Toilet facility	Pit latrine without slab	58	19.7
	Flush/ pour flush	6	2.1
	Pit latrine with slab	225	76.5
	open defecation	5	1.7

Based on the finding of the study listed above in table 4.6, majority of participants of the study, 200 (68%) use a public tap as main source of drinking water, and the remaining 89 (30.3%) get water from pipe. But the rest of 5 (1.7%) from the study population use water from dug well.

Jointly regarding to sanitation condition the vast number of the study population, 225 (76.5%), used pit latrine with slab, 58 (19.7%) households of the study area used pit latrine without slab. The least residents 5 (1.7%) from the study area did not have any latrine. Few of the study

participants 6 (2%), said the use flush or pour flush toilet. Therefore from the finding of the study majority of the participants use pit latrine and slab as their toilet facility.

4.7. Nutritional Status of Under-five Children

Table 4.7 below shows the nutritional status of 294 children among the age of children under five from four woredas. It was determined after taking anthropometric measurements calculated by applying international growth standards WHO Anthrop version software according to the WHO (2011). The software provides a clear evaluations on determinant of nutritional status and its prevalence according to sex and age by providing z-scores of standard deviation and median indicators.

Table 4.7. Overall frequency of stunting and underweight

Indicators	%<-3SD	%<-2SD	mean	SD
Stunting (length or height-for-age)	10.6	17.7	-1.13	1.56
Underweight (weight-for-age)	1.6	4.08	-0.45	1.13

As table 4.7 indicates above standard deviation from the median reference group are expressed as indicators. Therefore by using median of the reference population there is a cut point for a child to be stunted, wasted or underweight (<-2 SD) although severely stunted, wasted or underweight (<-3SD).

Based on the information from table 4.7, stunting (the average height-for-age) was -1.13 SD (± 1.56). The prevalence of stunting (<-2SD) was 17.7%, while 10.6% of the study population children were severely stunted (<-3SD). The mean Underweight prevalence (Weight-for-age) was -0.45 (SD ± 1.13). Of all the study participant children 4.08% of them were Underweight (<-2SD) whereas 1.6% of the children were severely underweight. The finding of the study indicated that extent of both underweight and stunting in the study area was very high when comparing the result of the study with the national and regional prevalence of stunting, and underweight of WHO (2007) cut off point.

Table 4.8. Children stunting prevalence by sex and age group

Variables	Stunting rank			
	%<-3 SD	%<-2 SD	Mean	SD
Child sex				
Female 151	6.8	17.7	1.82	1.55
Male 143	15.2	34.1	1.84	1.51
Total 294	11	26.9	1.475	1.53
Child age				
<6 months	—	0.8	0.12	1.10
6 – 11 months	—	4.5	0.65	2.0
12 – 23 months	11.9	30.3	1.01	1.57
24 – 35 months	10.8	21.4	0.97	1.35

36 – 47 months	5.8	22.6	0.92	1.23
48 – 59 months	7.1	9.5	0.45	1.41

As table 4.8 depict, comparing sex of the children under study the prevalence of stunting among male children is higher than those of female children, 95(32.3%) of male children were under chronic malnutrition with mean value -1.82; while 55 (18.7%) female children were stunted with mean value -1.82.

This indicates that the degree of severity of stunting in female children (15.2%) is less than in male children who are severely stunted (6.8%).

Regarding with the age of children the prevalence of stunting was found to be higher in children age group between 12-23 months (30.3%), but the prevalence of malnutrition in in children the age of < 6 months was recorded low. Moreover severity of stunting in children the age of 12-23 months was 11.9%, and proceeding to 35 months of age was higher.

Table 4.9. Children underweight Prevalence by Sex and age group

Variables		Underweight rank			
		%<-3 SD	%<-2 SD	Mean	SD
Child sex					
Female	151	1.8	5.9	0.585	1.14
Male	143	15.2	12.1	1.005	1.09
Total	294	11	9	0.795	1.115
Child age					
<6 months		—	—	—	—
6 – 11 months		14	42.5	0.65	2.0
12 – 23 months		0.70	5.8	0.08	1.09
24 – 35 months		0.50	7.6	0.37	1.07
36 – 47 months		—	10.2	0.67	1.0
48 – 59 months		7.1	10.7	0.7	1.0

The study result above in table 4.9 on chronic and acute malnutrition (underweight) shown that the prevalence of underweight in the study population were higher in male children 36 (12.1% with mean value 1.005) as compared to female children which counts as 17 (5.9% with mean value of -0.795).

And the degree of male children who are severely underweight (2.1%) was higher than those of female children (1.8%).

Moreover regarding with the age group from the finding of the study, there was higher prevalence of underweight in children at the age group between 6-11 months 42.5% and with severely underweight with 14.0%. Though there was no prevalence of underweight, with infants of the age below 6 months.

4.8. Statistical analysis

Statistical analyses were carried to identify significant (dependent) and independent determinants of child malnutrition. The analysis was done at two stages. A bivariate logistic regression was completed to find the variables that impact child nutritional status on bivariate level first and secondly, multivariate logistic regression analysis was employed because it is most important variable to identify and estimate determinants of nutritional status of children under the age of 5 years. The predictors found related with child undernourishment status in the bivariate analysis at 5% levels of significance were measured as applicant variables for the multivariate analysis regression.

Table 4.10. Multiple binary logistic regression analyses of the risk factors which significantly related to stunting

<u>Stunting</u>				
Child characteristics				
Variables	NO	YES	COR (95% C.I)	AOR (95% C.I)

Child age				
0 -6 months	3 (2.5%)	1 (2.3%)	0.512 (0.207, 0.792)	1.027 (0.189, 5.365)
6 -24 months	124 (49.6%)	22 (20%)	0.523 (0.366, 0.792)	0.557 (0.367, 0.938)**
24 – 60 months	123 (4.9.2%)	21 (47.7%)	1*	1*
Child sex				
Female	124 (95.8%)	32(76.2%)	0.656 (1.365, 3.568)	2.258 (1.378, 3583)
male	118 (48.7%)	20 (27.8%)	1*	1*
maternal characteristics				
maternal education				
Both writing and reading	189 (72.4 %)	17 (51.5 %)	1*	1*
Reading but not writing	29 (11.1 %)	6 (18.2 %)	1.098 (0.287, 3.666)	1.056 (0326, 3.581)
Cannot read and write	43 (16.5%)	10 (30.3 %)	2.585 (1.253, 3.396)	2.140 (1.198, 3.467)**

* represents the reference group

** represents a significant value with 0.05 level of significance

Prevalence of stunting was 55.7% times higher in the children age between 24 and 59 months than those children age found between 6-24 months, (AOR=0.557, 95% C.I:(0.36, 0.792). This higher indication of stunting condition in the elder children than the early infants of the study finding is similar with EDHS (2016) and Lancet (2008).

In addition, dealing with child characteristics, one of the significant determinant factors of nutritional status is sex of the child, which is capable to affect the children nutritional status (AOR 0.656, 95% C.I: (1.365, 3.568). So after holding the other effect as a constant, males are

0.656 times more likely to be stunted than female children. This finding of the study indicates that the prevalence of stunting is larger in male children than female counterpart. Apparently, the finding of this result of the study in line with the idea shared by CSA (2011) and ICF International (2016). According to table 4.10, the finding of the study from a logistic regression shows, there is a positive relationship regarding to prevalence of stunting and education level of the mother suggestively at 5% significance level. Based on the analysis result illiterate mothers children were 2.140 times more likely to be stunted as compared to mothers those that took informal education. This implies that, educated mothers kept their kids healthy, so the prevalence of stunting was lower than the illiterate mothers. This result supported the disagreement of idea by Moen (1993).

Table 4.11. Multiple binary logistic regression analyses of the risk factors which significantly related to underweight.

Underweight				
Variable	NO	YES	COR (95% C.I)	AOR (95% C.I)

Socio economic factors				
Father's occupation				
Wage worker	14 (5.1%)	12 (5.5%)	0.681 (0.193, 2.101)	0.667 (0.175, 1.879)
Daily laborer	27 (34.6%)	33(15.3%)	0.269 (0.065, 0.760)**	0.265 (0.065, 0.776)**
Business/ trader	34 (43.6%)	136 (63%)	0.194 (0.076, 0.864)**	0.173 (0.068, 0.799)**
Self-employer	3(3.8%)	35 (16.2%)	1*	1*
Child characteristics				
Sex of child				
Female	9 (45%)	147(53.6%)	0.595 (0.231, 0.860)**	0.461 (0.160, 0.873)**
Male	11 (55%)	107 (46.4%)	1*	1*

Regarding to underweight paternal occupation and sex of the child are the main significantly linked factors ($p < 0.05$) under the expected casual factors. The above table 4.11 illustrated clearly about the association between underweight and identified factors.

As it is shown above, the result of logistic regression analysis is that children whose father engaged in as self-employee are 26.5% times more risky of being underweight than those who working as a daily laborer [(AOR= 0.265, 95% C.I : (0.065, 0.776). furthermore, self-employers fathers children 17.3% affected by the problem of underweight comparing with fathers working in business [(AOR=0.173, 95% C.I :(0.068, 0.799). This finding of the study specified that there is high prevalence of underweight in self-employee participants than daily laborer and traders which in line with study outcome investigated by FAO (2013). Under the consideration of child characteristic , the probability of being underweight is found to be 0.461 times larger among male than those female children (AOR=0.461, 95% C.I : 0.461 (0.160,

0.873). Thus male children are at higher risk underweight prevalence. The idea of this research finding is mostly in line with literatures like CSA (2011; 12) and ICF International (2016).

4.9. Determinants of nutritional status of children aged under-five

This section has split with the result of regression analysis of the determinants of nutritional status among under-five children in four different selected woredas of yeka sub city, Addis Ababa . In order to regress stunting and underweight against set of variables collected during survey from sampled respondents logistic regression model was used. Two steps were followed in order to identify relevant and significant determinant factors of nutritional status for children of the study population. A bivariate logistic regression was completed to detect the variables that affect child nutritional status on bivariate level first and secondly, multivariate logistic regression analysis was employed because it is most important variable to identify and estimate determinants of nutritional status of children under the age of 5 years. The predictors found associated with child malnutrition status in the bivariate analysis at 5% levels of significance were measured as candidate variables for the multivariate examination.

Determinants of Stunting

Outcomes from the multivariate logistic regression illustrated that sex of child, age of child, maternal education, were significant predictors of child stunting for the population of the study.

Age of child:

This result of the finding shown that age of child had a positive quantity and significant at 5%, which indicates that as age of the child rises, it has higher risk of being stunted. This result is similarity with previous studies in west Gojam and south Ethiopia (Bealu et al, 2017, and Beka et al., 2009) explains that since stunting is a collective effect of insufficient food availability, infection exposure and care for a long time, as a result as the age of a child increases so does risk of being stunted.

Sex of the child:

the proportion of male and female respondents were 48.7% and 51.3% respectively. In this study finding, male stunting (34.1%) which was higher than stunted females (17.7%). This study showed significant relationship between gender and nutritional status of children ($p < 0.05$).

Maternal education: The finding of the study presented that there is significant association between mother's education and stunting. The level of significance amplified along with education level. Children whose mothers is capable of reading and writing , primary and secondary had negatively linked with stunting at 5% significance level respectively. This study result segment ideas like with study results found which was conducted in Shire Endassilassie, Ethiopia by Gezae and Nigatu (2014)

Determinants of underweight

Sex of the child: the percentage participants were male 48.7% and 51.3% female participants. According male underweight (12.1%) was higher than female underweight (5.9%). The result of this study displayed significant relationship between sex and nutritional status of children ($p<0.05$) level of significance.

Paternal occupation: Regarding the paternal occupational statues of the respondents, majority, 170 (57.8%), of them are daily laborer followed with traders, 30 (10.2%); whereas, 54 (18.4%) fathers are wage workers; likewise, 40 (13.56%) study participants were self-employers. This implies that the larger study participant children fathers were coming from the lower income households. This study result exhibited significant association between paternal occupation and nutritional status of children ($p<0.05$) level significance.

CHAPTER FIVE

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. CONCLUSIONS

According to the result of this study, the conspicuous major public health problem among children under five years is malnutrition conducted in selected study group. A high prevalence degree of malnutrition (stunting and underweight) detected among children under the age of five observed which directs in the study area there is still unresolved regarding the nutritional status.

According to the finding of the study, socio-economic, child characteristics, environmental factor, and maternal characteristics are key visible determinant factors for nutritional status among children under five ages.

In addition, breast feeding is crucial at an early age of the infant and as the child age rises it must followed supplemented with other food substances. This is because the children become malnourished if there is deficiency of supplementary food items together with breast milk.

The condition of stunting is high among children whose age is found between 24 and 59 months than those lying between 6-24 months. Majority mothers from the study group provided their breast milk at the early stage of their child. Subsequently, until the complimentary feeding time reach, the mothers' breast is enough for them. As a result, in this stage malnutrition exposure chance decreases. Though, as the child grows, he/she never get adequate supplementary food this increases the risk of children being further stunted. Equally, children of illiterate mothers are tremendously affected by stunting which is shown that the malnutrition problem of the child mainly arisen due to the mothers' awareness level on which foods are necessary to their youngest.

The finding of the study indicated that prevalence of underweight was higher in male children than female.

There was high underweight children who lived with uneducated father than those with educated ones, since they had a better knowledge about food as well as nutrition so they can provide a protective mechanism to their children.

The aim of this study was to analyze the nutritional status of children and identifying determinant factors. Constructed on the key findings taken from the study, the following conclusions were made.

According to this study finding, in the independent analysis of selected variables; stunting was significantly associated with child characteristics (age and sex) and maternal education. Also in both bivariate and multivariate analysis, underweight was linked with socioeconomic characteristics including paternal occupation and child characteristics such as sex of the child. Both bivariate and multivariate analysis indicated that child characteristics (age and sex) and maternal characteristics (literacy level) were determinant of stunting.

Furthermore socioeconomic characteristics were found to be significantly associated factors of underweight.

In general, the prevalence of child malnutrition was high in the study area and it indicates long-lasting problem of nutritional status.

In contrast to the EDHS 2016 report of the region, stunting, underweight and their sever forms is lower. The findings of this study was lower; stunted (17.7%) and sever form of stunting condition (10.6%), underweight of the children (4.08%) underweight and 1.6% severely underweight) in the study area were also lower than that of the regional (EDHS, 2016).

5.2. Recommendations

Based on the summarized result of the research, the study findings showed many problems that are significantly associated with the prevalence of stunting and underweight. Based on these results the study population may get advantage from interventions targeted on following focus areas:

- Upgrading and balancing feeding: awareness and Counseling of mothers about how to provide safe and nutritious food as well as appropriate amounts of food intake for children at different range of age groups should be taken in to account because the multivariate analyses of this study reveal that elder children are more likely to be undernourished than the younger children.
- The nutritional intervention should aim at identified local factors influencing nutritional status in order to reduce the prevalence of malnutrition in the study area. This can be done by carrying out regular health education on the importance of adequate nutrition for the child normal growth and development.
- Parents education should be improved in order to diminish the prevalence of malnutrition among children under the age of five in Addis Ababa because the socioeconomic status of the children's parents/caregivers do not have important difference even though it can be the key reason for high risk of prevalence of malnutrition.
- Generally, Intervention initiatives should focus on improving household food security; by providing opportunities such as provision of income generation, nutrition awareness, raise of education of women. In general, the figures in these study areas explain, the problems mentioned still need a very attention. For that reason, it is worth observing that planning and implementing protective policies intended at addressing child nutritional status in vulnerable urban areas remain to be key factors.

References

Aurisinkala-Appadoo,S., Oogarah-Pratap, B., &Ruggoo, A. (2013). *Nutritional Status of School*

- Children Aged 8-12 Years in Deprived Areas of Mauritius*. African Journal of Food, Agriculture, Nutrition and Development.
- Alemu M., Nicola J., Bebele T., 2005. Tackling child malnutrition in Ethiopia. *Young lives Project working paper No 19; Save the children UK*.
- Alemu Mekonnen, BekeleTefera, Tassew Woldehanna, Jones, N., Seager, J., TekieAlemu, Getachew Asgedom. 2005. Child Nutritional Status in Poor Ethiopian Households: *The Role of Gender, Assets and Location. Working Paper, No. 26. Young Lives. Save The Children UK*
- Bealu Betebo, Tekle Ejajo, Fissahaye Alemseged and Desalegn Massa (2017). Household Food Insecurity and Its Association with Nutritional Status of Children 6-59 Months of Age In East Badawacho District, South, Ethiopia. *Hindawi Journal of Environmental and Public Health*, pp no. 17.
- BekaTeshome, WambuiKogi-Makau, ZewdituGetahun and GirumTaye (2009). Magnitude and Determinants of stunting in children under-five years of age in food surplus region of Ethiopia: The case of West Gojam Zone. *Ethiopian Journal of Health and Development*, 23(2), 97-108.
- Black E, Allen L, Bhutta Z, Caulfield L, Onis M, Ezzati M, Mathers C, Juan R, (2008), for the Maternal and Child Under nutrition Study Group. Maternal and child under nutrition: global and regional exposures and health consequences.
- Brayson DF. *Nutrition and the communization of food in Sub- Saharan Africa. SocSci Med 1989 Central Statistical Agency [Ethiopia] and ICF International. 2012*. Ethiopia Demographic and Health Survey 2011. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ICF International.
- 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 (2011) Ethiopian Demographic and Health Survey. Central Statistical Authority (CSA), Addis Ababa, Ethiopia.
- Central Statistical Agency and ICF International, Ethiopia Demographic and Health Survey 2011, CSA, Addis Ababa, Ethiopia; ICF, Calverton, Md, USA, 2012.

- Central Statistical Agency [Ethiopia] and ICF International. Ethiopia Demographic and Health Survey 2011. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ICF International; 2012.
- CSA. 2007a. Population and housing census of Ethiopia, Ethiopian Population Census Commission, Addis Ababa, Ethiopia.
- CSA (2016). Ethiopia Demographic and Health Survey (EDHS): Key Indicators Report. Addis Ababa, Ethiopia.
- Christiansen, L. and Alderman, H., 2001. Child malnutrition in Ethiopia: Can maternal Knowledge augment the role of income? *Africa region working paper series, No. 22*
- Desai S. 1992. Children at risk: *The role of family structure in Latin America and West Africa*. Population and Development Review, 18(4): 689-725
- Develop Med Child 1982 Brown RE. *Decreased brain weight in malnutrition and its Implications*.
- E Afr Med J 1974. Beghin I, Cap M, Dujardin B. A guide to nutritional assessment. Geneva. WHO. 1988.
- El-Sabely, A. A., Tork, H. M., & Hussien, Y. E. S. (2013). Comparative Study of Nutritional Status and Dietary Habits of Children from Public and Private Primary Schools in Zagazig City, Egypt. *Journal of Nursing and Health Science*.
- Edris, M. (2007). Assessment of nutritional status of preschool children of Gumbrit, North West Ethiopia. *Ethiopian Journal of Health Development*.
- Ebrahim GJ. Nutrition into the 1990's. [Editorial]. *J Trop Pediat* 1991
- Ethiopia Central Statistical Agency and World Food Program, 2014. *Ethiopia comprehensive Food Security and Vulnerability Analysis*. [http://www. Wfp.org/ethiopia-Comprehensive-food-security-and-vulnerability-analysis2014](http://www.Wfp.org/ethiopia-Comprehensive-food-security-and-vulnerability-analysis2014). Accessed 15 April 2016.
- EDHS (2016). *Central Statistical Agency Addis Ababa, Ethiopia, ICF International Calverton, Maryland, USA*.
- Fouka G. and Martzorou M, 2011. What are the major ethical issues in conducting research? Is There a conflict between the research ethics and the nature of nursing? *5(1), 3: 3-14*.
- Gewa C.A.2009. *“Childhood overweight andobesity among Kenyanpre-school children:*

Association with maternal and early child nutritional factors”.

FSAU/FAO. (2005). Nutrition, a Guide to Data Collection, Analysis, Interpretation and Use. Food Security Analysis Unit for Somalia (FSAU). Page 1-69. Retrieved on December 10, 2014, from <http://www.fsnau.org/downloads/Nutrition-Guide-to-Data-CollectionInterpretationAnalysis-and-Use-English.pdf>

FaIola T, Ityavyar D. The political economy of health. Africa Series 1992.

The World Bank. Sub-Saharan Africa: from crisis to sustainable growth. Washington DC. 1989; 16-35.

Federal Ministry of Health, Program Implementation Manual of National Nutrition Program (NNP) I, *Federal Ministry of Health*, Addis Ababa, Ethiopia, 2008.

Fink, G., Sudfeld, C.R., Danaei, G., Ezzati, M., and Fawzi, W.W. 2014. “*Scaling-Up Access to Family Planning May Improve Linear Growth and Child Development in Low and Middle-Income Countries.*” PLoS ONE 9(7): e102391. Doi: 10.1371/journal.pone.0102391.

F. A. and C M Suchindran. 2003. *Implications of women’s work for child nutritional Status in sub-Saharan Africa: a case study of Nigeria.* Nigeria Social Science & Medicine, Nigeria.

FAO/WHO/UNU (2004). Human Energy Requirements. Report of a Joint FAO/WHO/UNU Expert Consultation. Food and Nutrition Technical Report Series, Food and Agriculture Organization, Rome.

Food Security Coordination Bureau, Food Security Program Monitoring and Evaluation Plan October 2004–September 2009, Food Security Coordination Bureau, Addis Ababa, Ethiopia, 2004.

Federal Ministry of Health Family Health Department Ethiopia, “*National strategy for infant And young child feeding*, “Ethiopia, 2004 Fredrico G. Mortality in second- and third-Degree malnutrition.

Frye, K. (2013). Assessing the Nutritional Status of Primary School Children in Wakiso District Uganda (Doctoral dissertation, University of Pittsburgh).

- Gazae Berhane and NigatuRegassa (2014). *Nutritional status of children under five years of age in Shire Indaselassie, North Ethiopia: Examining the prevalence and risk factors.* Kontakt, 16, 160-171.
- Jessica F. Lamontagen, Patrice L. Engle. And Marian F. Zeitlin. 2000. *Maternal Employment, Child Care, and Nutritional Status of 12-18 Month-Old Children in Managua, Nicaragua.* Program in International Nutrition. University of California, U.S.A.
- Jelliffe DB, Jelliffe EFP. *Community nutritional assessment.* New York. Oxford Univ Press. 1989.
- J Trop Pediat 1991. Wallace HM, Giri K. *Health care of women and children in developing countries.*
- J Trop Pediat 1956. Social, economic, health and environmental determinants of nutritional status
Food Nut Bull 1981 Welbourn HF, de Beer G. Trail of a kit for artificial feeding in tropical village homes.
- Kothari.C.R, 2004. *Research Methodology: Methods and Techniques.* Jaipur (India): New Age International (P) Limited Publishers.
- Kabubo-Mariara, J., Godfrey, K.N. and Domisiano, M.K. 2006. Determinants of children's nutritional status in Kenya: Evidence from demographic and health surveys. Annual Conference of Centre for the Study of African Economies (CSAE), Oxford, UK. pp. 17-27.
- Lennernas M. (1998). Dietary assessment and validity: To measure what is meant to measure. Scandinavian Journal of Nutrition INaringsforskning.
- Logie ED, Woodroffe. *Structural adjustment: the wrong prescription for Africa?* Br Med J 1993.
- Maletenlema TN. *The problem of food and nutrition in Africa.* WldDevNutr Diet 1986.
- Moen A. 1993. *The Impact of Child and Maternal Survival Programs on Socio-economic Development.* Upper Montclair. Centre for Economic Research on Africa. School of Business, Montclair State University, New Jersey.
- Mekonnen, H., Tadesse, T., & Kisi, T. (2013). Malnutrition and its Correlates among Rural

- Primary School Children of Fogera District, Northwest Ethiopia. *Journal of Nutritional Disorders Therapy*, 12, 2161-0509.
- Monekosso GL. *Accelerating the achievements of Health for-all Africans*. Brazabille .WHO. 1989; 1-3
- Ministry of Education (2012). National School Health and Nutrition Strategy.
- Ministry of Health: National Nutrition Program 2013. https://www.unicef.org/Ethiopia/National_Nutrition_Programme.pdf. Accessed 18 Oct 2013.
- Nabag, F. O. (2011). *Comparative study of nutritional status of urban and rural school girl children in Khartoum State, Sudan. Journal of Science and. Technology.*
- NACS. (2014). NACS User’s Guide Glossary http://www.fantaproject.org/sites/default/files/resources/NACS-Glossary-July2014_0.pdf
- NACS. 2016. Users guide: How to calculate Weight-for-Height Z-Score (WHZ) in children 0-59 months of age. <https://www.fantaproject.org/sites/default/files/download/Calculate-WHZ-2.6-NACS-Users-Guide-Apr2016.pdf>. (Accessed on April 12, 2021).
- Oakl and, California. Third World Publishing Compo 1990. *Combating malnutrition in the Third World* [editorial]
- Piercecchi-Marti, M.D., Louis-Borrione, C., Bartoli, C., Sanvoisin, A., Panuel, M., PelissierAlicot, A.L. and Leonetti, G. 2006. *Malnutrition, a Rare Form of Child Abuse: Diagnostic Criteria*. *Journal of Forensic Science*, Vol. 51, no. 3
- P.Pinstrup-Andersen, “*The food system and its interaction with human health and nutrition,*” in *Leveraging Agriculture for Improving Nutrition and Health*,pp.1–4,International Food Policy Research Institute,Washington,DC,USA,2011.
- Stoch MB, Smyth PM, Moodie AD, Bradshaw D. *Psychological outcome and CT findings after gross undernourishment during infancy: a developmental study.*
- Sobolewski J.M., Amato P.R. 2007. *Parents’ discord and divorce, parent child relationships And subjective well-being in early adulthood: Is feeling close to two parents always Better than feeling close to one?* *Social Forces*, 85(3): 1105-1124.
- Saaka, M., Larbi, A. and Hoeschle-Zeledon, I. (2015). Factors Contributing To Positive

- Nutritional Deviance in the Growth of Children Aged 6-36 Months in Rural Northern Ghana. *Jacobs Journal of Food and Nutrition*, Vol. 3, No. 3, pp no. 12
- Shahabuddin A.K.M, Khurshid Talukder, Talukder MQ-K, Andrew Seal, Quddusur Rahman, Abdul Mannan, Andrew Tomkins, Anthony Costello. 2000. *Adolescent nutrition in a Rural community in Bangladesh, the Indian Journal of Pediatrics*. Volume 67, India.
- Sham PM. Integration of MCH/ FP services in other functions of health care. *AFYA* 1992; 26:181-88.
- The World Bank. World development report: *Investing in health*. Oxford. Oxford Univ Press. 1993. Warren N. Malnutrition and mental development. *Psycho Bull* 1973.
- The World Bank. World development report: Investing in health. Oxford. Oxford Univ Press. 1993.
- The Lancet 1988. Rosenfield A, McNamara R. *Community-oriented health, nutrition and family Planning services: Overview and lessons from operational research*. Columbia Univ. 1985. Combating malnutrition in the Third World [editorial] *The Lancet* 1988.
- Ebrahim GJ. Nutrition into the 1990's. [Editorial]. *J Trop Pediat* 1991.
- The World Bank, World Development Report: *Making Services Work for Poor People*, Oxford University Press, Washington, DC, USA, 2004.
- United Nations Children's Fund (2009). *The state of World's children* 2009. Special edition: Celebrating 20 years of the conception on the right of the child. New York: United Nations Children's Fund.
- UNICEF report, 2009. Child and Maternal Nutrition in Bangladesh. Annual report, Bangladesh
- Ukwuani, F. A. and C M Suchindran. 2003. *Implications of women's work for child nutritional Status in sub-Saharan Africa: a case study of Nigeria*. Nigeria Social Science & Medicine, Nigeria.
- UNICEF (2012). Nutrition Glossary: A resource for Communicators.
- UNICEF-WHO-World Bank Joint Child Malnutrition Estimates. Levels and trends in child Malnutrition. <http://who.int/nutgrowthdb/estimates2011/en/>. Accessed 12 Dec 2014.
- United Nations Children Fund, Progress for Children: A World Fit for Children, Statistical Review, UNICEF, New York, NY, USA, 2007.

UNICEF.2017.TheState of the World’s Children 2017. Availableat: <https://www.unicef.org/sowc/>

WHO. *The role of the health sector in food and nutrition*. Technical report series; 1981. Grant GP. The children's vaccine initiative and other promises to keep [editorial].

UNICEF report, 2009. *Child and Maternal Nutrition in Bangladesh*. Annual report, Bangladesh Ukwuani,

UNICEF (2012). *Nutrition Glossary: A resource for Communicators*.

UNICEF report, 2009. *Child and Maternal Nutrition in Bangladesh*. Annual report, Bangladesh

W.Tassew, “Correlates of poverty in Rural and Urban Ethiopia: Department of Economics Addis Ababa University, Ethiopia,” *Ethiopian Journal of Agricultural Economics*, vol.7, no.1, pp, 2008.

WHO. *Diet, nutrition and prevention of chronic diseases*. Technical report series 797. 1990.

Woldemariam G. and Timotiows G., 2002. *Determinants of nutritional status of Women and Children in Ethiopia*. EHNRI Addis Ababa, Ethiopia

World Bank. 2010. *Supplementary Feeding for Women and Young Children*. Washington DC: World Bank.

Wallace HM, Giri K. *Health care of women and children in developing countries*. Oakl and, California. Third World Publishing Compo 1990

World Health Organization, *Turning the Tide of Malnutrition, Responding to the Challenge of The 21st Century: Nutrition for Health and Development*, WHO, Geneva, Switzerland, 2000.

World Health Organization, the World Health Report Shaping the Future WHO, Geneva, Switzerland, 2003.

Appendices

Annex 1:

Consent form

Hello,

My name is senait Asmare.

Introduction

I am a student at Addis Ababa University, Center for Food Security Studies and I am carrying out a study to assess determinant factors nutritional status of under five children in four selected Woredas of Yeka sub city, Addis Ababa, Ethiopia.

Procedure

You will be required to answer questions during an interview that will last approximately 10 minutes, and then your child measurements of height and weight will be taken.

Benefits

There are no direct benefits during this study. However, it is hoped that the information obtained will be used to advice on improvement of malnutrition.

Right

All information provided will remain confidential and will only be reported as group data with no identifying information. All data, including questionnaires will be kept in a secure location and only those directly involved with the research will have access to them. After the research is completed, the questionnaires will be destroyed. Participation in this research study is voluntary.

Interviewer's signature: _____

Date: ____/____/2021

Do you agree to proceed with the interview?

Yes, I agree /__/

No, I don't agree /__/

Annex 2: Questionnaires (English Translation)

PART I: Household demographic and socio-economic characteristics

101 Region: /___/___/	102. Sub city: /-----/-----/ /___/___/ 104. House no. /___/___/___/	103. Woreda:	
105 Respondent (Mother) To HH Questionnaire	Name		
106 Name of Head of Household	Name		
107 Number of Children Under Five	Number		
108 Name of The Index Child	Sex 1 = female 0 = Male		
109 Age of the Index Child	Age [.....] [.....] Mo		
110 Religion of the respondent's mother	Orthodox Christian..... 1 Muslim.....2 Protestant.....3 Catholic.....4 Other (specify).....5 NA.....98		
111 Date of interview	Day	Month	Year

Part II: HH socio economic status and characteristic

no	Question	Code
----	----------	------

201	Do you own the house you live in?	Rents..... 1 Owns house..... 2 Free housing..... 3 Others (specify)..... 4
202	Do you have a garden where you grow vegetables and/or fruits?	Yes..... 1 No..... 0>>704
203	If yes, how do you use the produce?	Sell all of it..... 1 Sell part of it 2 Use all for HH consumption..... 3 Other, specify.....4
204	Does your household have any electricity? (HYDROELECTRIC POWER) ?	Yes 1 No..... 0
205	Do you have any other kind of electric power? If yes, which type	Generator..... 1 Solar..... 2 No other type..... 3
206	What type of fuel does your household mainly use for cooking?	Electricity..... 1 LPG2..... 2 Natural gas..... 3 Biogas..... 4 Kerosene..... 5 Charcoal..... 6 Wood/straw..... 7 Animal dung..... 8 OTHER..... 9
207	Main floor material [OBSERVATION]	Natural (EARTH/SAND)..... 1 Wood/Bamboo..... 2 Concrete..... 3 Finished (TILE/CERAMIC/MOSAI..... 4 OTHER..... 5
208	Main exterior material [OBSERVATION]	No wall..... 1 Rudimentary wall (Mud, Cardboard, Palm, Bamboo, Straw,

		leaves..... 2 Traditional wall made from stones 3 Finished wall (Concrete, Corrugated Wood) 4 Other (specify) 5
209	Main roof material [OBSERVATION.]	No roof..... 1 Rudimentary (Grass, Palm, leaves, Straw, Plastic sheeting, cardboard, bamboo)..... 2 Finished roof (metal, wood, corrugated tin, Other metal, tile, cement)..... 3 Other (specify)..... 4

Part III: Work condition and child care arrangements

No	Question	Code
301	What is your marital status?	Single 1 Married/Living together 2 Widowed 3 Divorced 4 Separated 5 Married, more than one spouse 6
302	What is your husband's main occupation? (Note: If multiple occupation, ask for the main occupation)	Farmer 1 Wage work permanent 2 Wage work occasion 3 Daily laborer 4 Handicraft 5 Business/Traders 6 Other Self-employment 7 Household Work 8 Student 9 Retired/Old age 10 Physically challenged 11 Jobless 12 Other(specify) 13
302	Are you capable of reading and writing?	Yes, read and write 1 Yes, only read 2 No, cannot read and write 3
304	Beside from your household task, do you have another job currently?	Yes 1 No 0

305	What is your main occupation? (MAIN OCCUPATION)	Farmer or family farm work..... 1 Wage work Permanent..... 2 Wage work occasional..... 3 Daily laborer.....4 Handicraft..... 5 Business/Traders..... 6 Other Self-employment.....7 Household Work /Housewife 8 Student..... 9>>212 Retired/Old age 10 Physically challenged..... 11 Jobless..... 12>>212 Other (specify).....13
306	206 Do you do your work at home or outside the home? (main occupation) (refer to employment noted in 205)	Home.....1>> 218 Away from home 2 Both..... 3
307	How many days a week do you work outside the home?	Days
308	Do you take your youngest child (NAME) with you or do you have someone to take care of him/her While you work outside? only ask this question if mother works outside of her home	Always brings with her..... 1 Always leaves with someone else..... 2 Both..... 3 NA..... 98>>221
309	On average, how many days a week do you usually leave the youngest child with someone else to take care of him/her? (if less than once a week, ask number of days/month)	Days/Week _____ Days /MONTH _____
310	On average, for how long each time do you usually leave the youngest child with someone else?	Hours -----
311	211 In the last 24 hours, did you go out of the house without taking [INDEX CHILD NAME]?	Yes..... 1 No..... 0 >> 225
312	For how long were you gone? (Enter the number of minutes or hours)	() Minutes () Hours
313	Where was the baby?	Home..... 1 Neighbor's house.....2 Other (specify).....3
	Roles, priorities and time	

314	Is [INDEX CHILD NAME] with you when you are doing work inside the household?	Yes.....1 >> 227 No 0
315	If no, who cares for [INDEX CHILD NAME] while you do household work? Adult (>15 year) family member within	Household..... 1 Adult (>15 year) family member outside household.....2 Child (<15 year) family member within household..... 3 Child (<15 year) family member outside household..... 4
316	Are you able to give [INDEX CHILD NAME] breast milk along with your household work?	Yes, always..... 1 Yes, sometimes..... 2 No, never..... 3
317	Are you able to give [INDEX CHILD NAME] family food along with your household work?	Yes, always..... 1 Yes, sometimes..... 2 No, never..... 3
318	Do you feel that you have enough time to take good care of the child along with the household work?	Yes, always..... 1 Yes, sometimes..... 2 No, never..... 3
319	Some mother's tell us that they have a lot of work to do in one day and so they cannot find a moment for themselves. Now tell me do you have work pressure like this?	Yes, always..... 1 Yes, sometimes..... 2 No, never..... 3
320	Do you feel tense about finishing all of the work that you must do in 1 day?	Yes, always..... 1 Yes, sometimes..... 2 No, never..... 3

Part IV: Environmental Factors and Hygiene

No	question	Code
401	What is your main water source?	1= pipe water 2 = public tap 3 = protected dug well 4 = protected dug well 5 = protected spring 6 = unprotected spring 7 = surface water 8 = other, specify-----
402	What kind of toilet facility do the house usually use?	1 =flush or pour flush 2 = ventilated improved pit latrine (VIP) 3 = pit latrine with slap 4 = pit latrine without slap/open pit 5 = no facility or bush/field

Part v: Child health and caring practice

No	Question	Code
501	301 When you were pregnant (Name of child, did you have any antenatal care checkup? If yes, how many times?	1 = yes 0 = no / -----/
502	Is the child depleting colostrum? (the first yellow milk)	1 = yes 0 = no
503	Is the child exclusively breastfed for the first six months?	1 = yes 0 = no
504	Duration of breast feeding (in month)	/ -----/
505	Age of complementary feeding started (in month)	/ -----/
506	Is the child fully immunized? If possible verify with the available document	1 = yes 0 = no
507	Has (name of child) had diarrhea in the last two weeks?	1 = yes 0 = no 88= don't know
508	Has (name of child) been ill at any time in the past two weeks ?	1 = yes 0 = no 88 = don't know
509	Has (name of child) been ill a cough in the last two weeks?	1 = yes 0 = no 88 = don't know

Part VI: HH Dietary diversity

First ask if yesterday was a special day, like a celebration or feast day or a fast day where anyone in the household ate special foods or more or less than usual or did not eat because they were fasting.

Yes1

No2

Was yesterday a special day where special kinds of foods were eaten? If yesterday was not a special day, then ask the respondent about the types of foods that they or anyone else in their household ate yesterday during the day and at night. If yesterday was a special day, then ask the respondent to describe the foods (meals and snacks) consumed the day before yesterday (or the last normal day up to 7 days) during the day and night, whether at home or outside the home.

No		Questions Eaten by respondent (Index Child's Mother)	Eaten by Index Child
601	CEREALS? Rice, bread made of wheat, puffed rice, injera, pressed rice, noodles, or any other foods made with rice, wheat, maize/corn, or other locally available grains	Yes..... 1 No..... 0	Yes..... 1 No.....0
602	Vitamin a rich vegetables and tubers? Pumpkin, carrots, sweet potatoes that are orange and yellow inside	Yes..... 1 No..... 0	Yes.....1 No.....0
603	White tubers and roots or other starchy foods? Potatoes, white yams, white sweet potato (not orange inside), potato crisps or	Yes.....1 No.....0	Yes.....1 No.....0

	other foods made from roots (not orange or yellow roots)		
604	Dark green leafy vegetables? Dark green leafy vegetables, including spinach, kale, costa,	Yes.....1 No.....0	Yes.....1 No.....0
605	OTHER VEGETABLES? Other vegetables (e.g., squash, eggplant, green papaya, cauliflower, cabbage, onion, (beans),	Yes.....1 No.....0	Yes.....1 No.....0
606	Vitamin a rich fruits? Ripe mangoes, ripe papaya/	Yes.....1 No.....0	Yes.....1 No.....0
607	other fruits Other fruits (e.g. banana, apples, guava, oranges, other citrus fruits, pineapple, watermelon, olives, grapes, (grapefruit) berries, , plum	Yes.....1 No.....0	Yes.....1 No.....0
608	Beef, goat, lamb, chicken, duck or other birds, liver, kidney, heart, or other organ meats?	Yes.....1 No.....0	Yes.....1 No.....0
609	EGGS? Eggs of different birds – chicken, duck, turkey etc.; with yolk, without yolk	Yes.....1 No.....0	Yes.....1 No.....0
610	FISH? Big/small fresh or dried fish or shellfish	Yes.....1 No.....0	Yes.....1 No.....0
611	Any foods made from beans, peas, or lentils? Beans, peas, lentils, other pulses, soybeans, peas	Yes.....1 No.....0	Yes.....1 No.....0
612	Milk and milk products? Milk, cheese, yogurt other milk product	Yes.....1 No.....0	Yes.....1 No.....0
613	Oils and fats? oil, fats or butter added to food or used for cooking including ghee	Yes.....1 No.....0	Yes.....1 No.....0
614	SWEETS? Sugar, molasses, honey, cold drinks, chocolates, candies, biscuit	Yes.....1 No.....0	Yes.....1 No.....0
615	Spices, condiments, beverages? Spices (cumin, coriander, salt), condiments (pickles, chutney), coffee, tea, etc.	Yes.....1 No.....0	Yes.....1 No.....0

Part VIII: Anthropometry measurement (height, weight, MUAC, etc.)

Respondent: Index child				weight, height of index child			
Member ID	Name	DATE OF BIRTH (DD MM YYYY)	AGE (Months)	WEIGHT (KG)	HEIGHT (CM)	MEASURED STANDING UP OR LYING DOWN Lying.....1 Standing.....2	RESULT Measured...1 Absent..... 2 Refused...3 Other..... 4
Child's MUAC		RESULT Measured..... 1 Absent..... 2 Refused.....3 Other..... 4					

Annex 3: Bivariate and multiple regression analysis outputs

Table. Annex 3.1. Bivariate regression analyses of the risk factors which significantly related to stunting, for the selected woredas of Yekasub city, Addis Ababa, N=294, 2021

Variable	Stunting		COR 95% (CI)
	NO	YES	
Socio economic factors			
Father's occupation			
Wage worker	30 (14.6%)	24 (27.6%)	0.568 (0.097, 1.794)
Daily laborer	25 (12.2%)	5 (5.75%)	1.378(0.696, 2.462)
Business/ trader	116 (56.6%)	54 (62.1%)	1.059 (0.574, 1.699)
Self-employer	34 (16.6%)	4 (4.6%)	1*
Maternal occupation			
House wife	96 (44.2%)	23 (29.9%)	1*
Daily laborer	42 (19.4%)	14 (18.2%)	0.776 (0.368, 1.768)
Business/ trader	63 (29%)	32 (41.6%)	1.057 (0.469, 2.265)
Wage worker	16 (7.4%)	8 (10.4%)	1.490 (0.763, 2.768)
Child characteristics			
Age of the child			
0 -6 months	3 (2.5%)	1 (2.3%)	0.512 (0.207, 0.792)
6 -24 months	124 (49.6%)	22 (20%)	0.523 (0.366, 0.792)
24 – 60 months	123 (4.9.2%)	21 (47.7%)	1*
Sex of child			
Female	124 (95.8%)	32(76.2%)	0.656 (1.365, 3.568)
male	118 (48.7%)	20 (27.8%)	1*
Exclusive breast feeding			
YES	254 (95.8%)	25 (86.2%)	1*
NO	11 (4.2 %)	4 (13.8%)	0.669 (0.295, 1.380)
morbidity			
NO	261 (97.4%)	22 (84.6%)	1*
YES	7(2.6%)	4 (15.4 %)	1.289 (0.489, 3.196)
maternal characteristics			

	NO	YES	
Mother's age			
15 -25 years	31 (13.3 %)	15 (28.3%)	0.958(0.286, 2.467)
25 -35 years	201 (83.4 %)	4 (64.1 %)	0.874 (0.295, 2.199)
35 -49 years	8 (3.3 %)	4 (7.5 %)	1*
Number of live children			
1 child	254 (93.4 %)	16 (72.7 %)	0.895 (0.449, 1.783)
2 children	18 (6.6 %)	6 (27.3 %)	1*
maternal education			
Both writing and reading	189 (72.4 %)	17 (51.5 %)	1*
Reading but not writing	29 (11.1 %)	6 (18.2 %)	1.098 (0.287, 3.666)
Cannot read and write	43 (16.5 %)	10 (30.3 %)	2.585 (1.253, 3.396)**
religion of the mother			
Christian	201 (81.4 %)	34 (72.3 %)	0.899 (0.376, 2.064)
Muslim	46 (18.6 %)	13 (27.7 %)	1*
IDDS			
Low IDDS tercile	3 (1.1 %)	0 (0 %)	1.664 (0.163, 15.071)
Medium IDDS tercile	9 (3.6 %)	5 (18.5 %)	0.864 (0.379, 2.059)
High IDDS tercile	241 (95.3 %)	22 (81.5 %)	1*
environmental health condition			
	YES	NO	
Water supply			
Pipe water	79 (27.9 %)	10 (19.6 %)	2.864 (0.894, 8.680)
Protected dug well	159 (45.6 %)	41 (80.4 %)	1.586 (0.668, 3.869)
Protected spring	45 (15.9 %)	0 (0 %)	1*

sanitation			
YES	231 (99.1 %)	60 (98.4 %)	1.664 (0.163, 15.085)
NO	2 (0.9 %)	1 (1.6 %)	1*
condition of floor of the house			
Earth land	68 (30.6 %)	22 (30.6 %)	0.787 (0.506, 1.226)
Concrete	154 (69.4 %)	50 (69.4 %)	1*
wall condition of the house			
Rudimentary	164 (70.1 %)	42 (70 %)	0.463 (0.066, 1.873)
Traditional	62 (26.5 %)	12 (20 %)	0.463 (0.066, 1.873)
Finished	8 (3.4 %)	6 (10 %)	1*
condition of the roof			
Simple	201 (80.1 %)	35 (81.4 %)	0.463 (0.066, 1.873)
Finished	50 (19.9 %)	8 (18.6 %)	1*

Source: from the survey, 2021

* represents the reference group

** represents a significant value with 0.05 level of significance

Table. Annex 3.2. Bivariate regression analyses of the risk factors which significantly related to underweight, for the selected woredas of Yeka sub city, Addis Ababa, N=294, 2021

(C.I)	Underweight		COR 95%
	YES	NO	
Variable	Socio economic factors		
Father's occupation			
Wage worker	14 (5.1%)	12 (5.5%)	0.681 (0.193, 2.101)
Daily laborer 0.760)**	27 (34.6%)	33(15.3%)	0.269 (0.065,
Business/ trader 0.864)**	34 (43.6%)	136 (63%)	0.194 (0.076,
Self-employer	3(3.8%)	35 (16.2%)	1*
Maternal occupation			
House wife	85 (57.4%)	34(23.3%)	1*
Daily laborer	13(8%)	43(29.5%)	1.366 (0.195, 6.861)
Business/ trader	9(32.4%)	47(32.2%)	1.090 (0.461, 2.3677)
Wage worker 1.196)	2(1.4%)	22(15.1%)	0.3694 (0.060,
Child characteristics			
Age of the child			
<25 months	4(0.4%)	146 (51.5%)	0.76. (0.259, 1.264)
>25 months	6 (0.6%)	138 (49.5%)	1*
Sex of child			
Female 0.860)**	9 (45%)	147(53.6%)	0.595 (0.231,
Male	11 (55%)	107 (46.4%)	1*
exclusive breast feeding			
Yes 2.352)	5(71.4%)	274(95.5%)	0.653 (0.150,
NO	2(28.6 %)	13 (4.5%)	1*
morbidity			
YES	8 (72.7%)	275 (97.2%)	1*

NO 4.558)	3(27.3%)	8 (2.8 %)	1.036 (0.165,
maternal characteristic			
Mother's age			
15 -25 years	5 (23.8 %)	3 (1.1%)	1.450 (0.196, 7.778)
25 -35 years	15 (71.4 %)	131 (47.9 %)	1.373(0.253, 6.183)
35 -49 years	1 (4.8%)	140 (51 %)	1*
Number of live children			
1 child	2 (66.6 %)	268 (92.1 %)	0.699 (0.285, 2.058)
2 children	1(32.4 %)	23 (7.9 %)	1*
maternal education			
Both writing and reading	6 (60%)	200 (69.9 %)	0.466 (0.154, 1.046)
Reading but not writing	1 (10%)	35 (12.1 %)	0.399 (0.059, 4.027)
Cannot read and write	3 (30 %)	51(17 %0	1*
religion of the mother			
Christian	13 (81.2 %)	222 (79.9 %)	3.652 (0.493, 27.751)
Muslim	3 (18.8 %)	56 (20.1 %)	1*
IDDS			
Low IDDS tercile 20.751)	0 (0 %)	3 (1.1 %)	2.263 (0.176,
Medium IDDS tercile 4.874)	1 (10 %)	0 (11.5 %)	1.623 (0.485,
High IDDS tercile	9 (90 %)	254 (89.4 %)	1*
BMI			
<16.0 kg/m ² = severely underweight	10(3.7%)	1 (4.5%)	0.252 (0.019, 4.027)
16.0 -18.49 kg/m = underweight 4.581)	22 (8.1%)	2(9.1%)	0.794 (0.063.

18.5 - 24.9 kg/m ² = normal	212(77.9%)	17 (77.3%)	0.569 (0.085, 2.893)
25 – 29.9 kg/m ² = overweight	21 (7.7%)	1 (4.5%)	0.490 (0.067, 3.265)
>30 kg/m = Obese	7 (2.6%)	1(4.5%)	1*
Environmental health condition			
water supply			
Pipe water	3 (13.6 %)	86 (27.6 %)	0.352 (0.017, 7.293)
Protected dug well	19 (86.4 %)	181 (58 %)	2.353(0.318, 18.588)
Protected spring	0 (0%)	45 (14.4 %)	1*
sanitation			
YES	22 (100 %)	269 (90 %)	2.157 (0.165, 19.699)
NO	0 (0%)	3 (10%)	1*
condition of floor of the house			
Earth land	6(33.3 %)	84 (30.6 %)	1.668 (0783, 3.499)
Concrete	11 (69.7 %)	193(69.4 %)	1*
wall condition of the house			
Rudimentary	11 (68.7 %)	195 (70.1 %)	0.462 (0.065, 1.873)
Traditional	4 (25 %)	70 (25.2 %)	1.019(0.253, 4.052)
Finished	1 (6.3 %)	13 (4.7 %)	1*
condition of the roof			
Simple	12 (85.7 %)	224 (80 %)	4.386 (1.035, 18.783)**
Finished	2 (14.3 %)	56(20%)	1*

Table. Annex 3.3. Bivariate regression analyses of the risk factors which significantly related to wasting, for the selected Woredas of Yeka sub city, Addis Ababa, N=294, 2021

C.I)	Wasting		
	Socio economic factors		COR (95%
	Variable	YES	NO
Father's occupation			
Wage worker 3.367)	3 (15.8%)	51 (18.5%)	0.668 (0.068,
Daily laborer 3.077)	2 (10.5%)	28(10.8%)	0.890 (0.265,
Business/ trader	13 (68.4%)	157 (57.2%)	0.494 (0.066, 2.661)
Self-employer	1 (5.3%)	37 (13.5%)	1*
Maternal occupation			
House wife	3(33.3%)	116 (40.7%)	1*
Daily laborer	2(22.2%)	54 (19%)	3.394 (0.784, 16.895)
Business/ trader 3.168)	3 (33.3%)	92 (92.2%)	1.051 (0.282,
Wage worker 3.456)	1(11.1%)	3(8%)	1.068 (0.257,
Child characteristics			
Age of the child			
<25 months 1.696)	1 (25 %)	149 (51.4%)	0.661 (0.255,
>25 months	3 (75%)	141 (48.6%)	1*
Sex of child			
Female 1.264)	6 (46%)	150 (82.9%)	0.466 (0.155,

Male	7 (54%)	131 (17.1%)	1*
exclusive breast feeding			
Yes	3 (75%)	276 (95%)	1.699 (0.173, 5.170)
NO	1 (25 %)	14 (5%)	1*
morbidity			
YES	3 (75%)	280 (96%)	0.572 (0.136, 2.868)
NO	1 (25%)	10 (4 %)	1*
maternal characteristics			
Mother's age			
15 -25 years	3(37.5 %)	43 (15%)	2.007(0.165, 18.567)
25 -35 years	4 (50 %)	201 (69 %)	1.861 (0.156, 14.663)
35 -49 years	1 (12.5%)	42 (16 %)	1*
Number of live children			
1 child	1 (50 %)	269 (92.1 %)	0.890 (0.165, 3.050)
2 children	1 (50 %)	23 (7.9 %)	1*
maternal education			
Both writing and reading	2 (50%)	204 (70.4 %)	2.192 (0.565, 7.478)
Reading but not writing	1 (25%)	35 (12 %)	2.267 (0.159, 24.169)
Cannot read and write	1 (25 %)	53(18 %0)	1*
religion of the mother			
Christian	190 (84 %)	45 (66.2 %)	2.266 (0.264, 17.573)
Muslim	36 (16 %)	23 (33.8 %)	1*
IDDS			
Low IDDS tercile	1 (25 %)	2 (6.1 %)	4.047 (0.360, 36.469)

Medium IDDS tercile	1 (25%)	13 (4.5 %)	2.7988(0.798, 8.761)
High IDDS tercile	3 (75 %)	260 (88.4 %)	1*
environmental health condition			
Water supply			
Pipe water	2 (11.7 %)	87 (31.4 %)	0.851 (0.079, 10.887)
Protected dug well	14 (82.3 %)	186 (67 %)	1.481 (0.191, 11.456)
Protected spring	1 (6%)	44 (1.6 %)	1*
sanitation			
YES	19 (95 %)	272 (909 %)	3.492 (0.351, 31.990)
NO	1 (5%)	2 (1%)	1*
condition of floor of the house			
Earth land	4 (33.4%)	86 (30.6 %)	1.384 (0.565, 3.363)
Concrete	8 (66.6 %)	196 (69.4 %)	1*
wall condition of the house			
Simple	9 (75 %)	197 (69.8 %)	0.959 (0.071, 7.560)
Traditional	2 (16.6 %)	72 (14.9 %)	0.667 (0.071, 7.371)
Finished	1 (8.4 %)	13 (4.6%)	1*
condition of the roof			
Simple	11(91.6 %)	225 (79.8 %)	1.698 (0.493, 5.765)

Finished	1 (8.4 %)	57 (20.2%)	1*
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Annex 4: Questionnaire (Amharic Translation)

ክፍል አንድ: የቤተሰብ መረጃ

ተ.ቁ	ጥያቄ						
101 ክልል /-----/ /-----/							
102 ክፍል ከተማ /-----/ /-----/							
103 ወረዳ /-----/ /-----/							
104 የቤት ቁጥር /----/---/-----/-----/							
105 ለቤተሰብ መጠይቅ መላሽ/እናት/	ስም						
106 የቤተሰብ ሀሊፊ ስም ስም	ስም						
107 ከአምስት ዓመት በታች የሆኑ ህፃናት ብዛት	ብዛት:						
108 የተመረጠው ህፃን ስም	ስም ይታ: 0 = ሴት 1 = ወንድ						
109 የተመረጠው ህፃን እድሜ	እድሜ /-----/ /-----/ ወር						
110 ሀይማኖት (ከአምስት ዓመት በታች ለሆኑ መላሾች አይመልከትም)	አርቶድክስ ክርስቲያን = 1 ፕሮቴስታንት = 2 ካቶሊክ = 3 ሙስሊም = 4 ሌላ (ይገለፅ)----- = 5 አይመለከተውም----- = 6						
111 መረጃ የተሰጠበት ቀን	<table border="1"> <thead> <tr> <th data-bbox="885 1451 1149 1520">ቀን</th> <th data-bbox="1149 1451 1339 1520">ወር</th> <th data-bbox="1339 1451 1529 1520">ዓ.ም</th> </tr> </thead> <tbody> <tr> <td data-bbox="885 1520 1149 1583"></td> <td data-bbox="1149 1520 1339 1583"></td> <td data-bbox="1339 1520 1529 1583"></td> </tr> </tbody> </table>	ቀን	ወር	ዓ.ም			
ቀን	ወር	ዓ.ም					

ክፍል ሁለት: የስራ ሁኔታና የህፃናት እንክብካቤ

ተ.ቁ.	ጥያቄ	ከድ
201	የትዳር ሁኔታ?	<p>ያገባ/ያገባች----- = 1</p> <p>ያላገባ/ያሊገባች ኦብሮዮሚኖር----- = 2</p> <p>ባለቤት የሞተባት/በት----- = 3</p> <p>የተፋታች/ታ----- = 4</p> <p>የተለየች/የ----- = 5</p> <p>ከአንድ በላይ የትዳር ጓደኛ ያላት/ለው----- = 6</p>
202	የባለቤትዎ ዋና ስራ?	<p>ገበሬ----- = 1</p> <p>ቋሚ ተቀጣሪ----- = 2</p> <p>ጊዜያዊ-----</p> <p>= 3</p> <p>የጉሌበት ስራ----- = 4</p> <p>የሙያ ስራ----- = 5</p> <p>ነጋዴ----- = 6</p> <p>ላላየ ግል ስራ----- = 7</p> <p>የቤት ውስጥ ስራ----- = 8</p> <p>ተማሪ----- = 9</p> <p>ጡረተኛ----- = 10</p> <p>አካል ጉዳተኛ----- = 11</p> <p>ስራአጥ----- = 12</p> <p>ላሊ ይግለፅ----- = 13</p>
203	ማንበብና መጻፍ ይችላሉ-?	<p>አዎ ማንበብና መጻፍ----- = 1</p> <p>አዎ ማንበብ----- = 2</p> <p>ማንበብና መጻፍ አልችልም----- = 3</p>

204	በአሁኑ ወቅት ከቤት ውስጥ ስራ ውጪ የተለየ ላላ ስራ አሎታት?	አዎ----- = 1 የለም----- = 2
205	የእርስዎ ዋና ስራ ምንድን ነው?	ገበሬ ወይም የቤተሰብ ግብርና ስራ----- = 1 ቋሚ ተቀጣሪ----- = 2 ጊዝያዊ ተቀጣሪ----- = 3 የጉልበት ስራ----- = 4 የሙያ ስራ----- = 5 ነጋድ----- = 6 ላሊ የግል ስራ----- = 7 የቤት ውስጥ ስራ/የቤት እመቤት----- = 8 ተማሪ----- = 9 ጡረተኛ----- = 10 አካል ጉዳተኛ----- = 11 ስራ አጥ----- = 12 ላላ የገለፅ----- = 13
206	ስራዎን የሚሰሩት በቤትዎ ውስጥ ነው ወይንስ ከቤትዎ ውጪ?	እቤት----- = 1 2 3 ከቤት ውጪ----- = ሁሉም----- =
207	ከቤት ውጪ ሲሰሩ ህፃን (ስም) አብረው ይወስዷሉ ወይንስ ላላ ሰው እንክብካቤን ይሰጣሉ?	ሁሉንም አብረው ይወስዷሉ----- = 1 ሁሉንም ለላላ ሰው ይሰጣሉ----- = 2 ሁሉም----- = 3 አይመለከተውም----- = 4
208	ከቤት ውጪ ሲሰሩ ህፃን (ስም) አብረው ይወስዷል ወይንስ ላሊ ሰው እንክብካቤን ይሰጣሉ?	ሁሉንም አብረው ይወስዷሉ----- = 1 ሁሉንም ሆላሊ ሰው ይሰጣሉ----- = 2 ሁሉም----- = 3 አይመለከተውም----- = 4

209	በዓማካኝ በሰዓምንት ስንት ቀን ልጅዎን ለላላ ሰው ሰጥተው ይሄዷል?	ቀን በሰዓምንት----- ቀን በወር-----
210	በአማካኝ በየጊዜው ለምን ያህል ሰዓት ነው ልጅዎን ለላላ ሰው ሰጥተው የሚሄዱት?	ሰዓት-----
211	ሊለፉት 24 ሰዓት ውስጥ ልጅዎን ሳይዙ ከቤት ወጥተው ነበር?	አዎ----- = 1 የለም----- = 2
212	ለምን ያህል ሰዓት ህፃኑን ትተውት ሄዱ?	ሰዓት:----- ደቂቃ:-----
213	ህፃኑ የት ነበር?	እቤት----- = 1 ጎረቤት----- = 2 ላላ የገለፅ----- = 3
214	በቤት ውስጥ ስራ በሚሰሩበት ጊዜ ልጅዎ ከእርሰዎ ጋር ነው?	አዎ----- = 1 የለም----- = 2
215	መሌሰዎ አይደለም ከሆነ ህፃኑን ማን ይንከባከብዋል?	ከ15 ዓመት በላይ የሆነ የቤተሰብ አባል-----1 ከ15 ዓመት በላይ የሆነና የቤተሰብ አባል ያልሆነ-----2 ከ15 ዓመት በታች የሆነ የቤተሰብ አባል-----3 ከ15 ዓመት በታች የሆነና የቤተሰብ አባል ያልሆነ-----4
216	የቤት ስራዎን እየሰሩ የጡት ወተት ለተመረጠው ህፃን መስጠት ይችላሉ?	አዎ ሁሌጊዜ----- = 1 አዎ አንዳንድ----- = 2 የለም----- = 3
217	የቤት ስራዎን እየሰሩ ህፃኑን ምግብ ለመመገብ በቂ ጊዜ እንዲለሉዎት ይሰማዎታል?	አዎ ሁሌ ጊዜ----- = 1 አዎ አንዳንድ----- = 2 የለም----- = 3

218	ለተመረጠው ህፃን ለመንከባከብ ከቤት ስራዎ ጋር በቂ ጊዜ እንዲሎዎት ይሰማዎታል?	አዎ ሁሌ ጊዜ----- = 1 አዎ አንዳንድ----- = 2 የለም----- = 3
219	አንዲንዴ እናቶች እንደሚነግሩን በቀን ውስጥ ብዙ ስራ መስራት ስላለብን ለራሳችን ጊዜ የለንም ይላሉ። አሁን እርስዎ የሚነግሩን የስራ ጫና አለብዎት?	አዎ ሁሌ ጊዜ----- = 1 አዎ አንዳንድ----- = 2 የለም----- = 3
220	በአንድ ቀን ውስጥ መሰራት ያለበትን ስራ ለማጠናቀቅ የመጨነቅ ስሜት ተሰምቶዎት ያውቃል?	አዎ ሁሌ ጊዜ----- = 1 አዎ አንዳንድ----- = 2 የለም----- = 3

ክፍል ሦስት: የሀፃኛ/ኑጤና ሁኔታ

ተ.ቁ	ጥያቄ	ኮድ
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301	(የህፃን ስም) እርጉዝ በነበሩበት ወቅት የእርግዝና ክትትል አግኝተው ነበር? አዎ ከሆነ ስንት ጊዜ?	አዎ----- = 1 የለም----- = 0 ብዛት----- አላውቅም----- = 98
302	ለህፃኑ የመጀመሪያ የእናት ጡት ወተት (እንገር) ሰጥተውት ነበር?	አዎ----- = 1 የለም----- = 0
303	ለመጀመሪያ ስድስት ወር ህፃኑ ጡት በደንብ ጠብቷል?	አዎ----- = 1 የለም----- = 0
304	ህፃኑ ለምን የህል ጊዜ ጡት ጠብቷል?	/-----/
305	ለህፃኑ በስንተኛው ወር ነው ተጨማሪ ምግብ መስጠት የጀመሩት?	/-----/
306	(የህፃኑ ስም) ሁለንም ክትባቶች ተከትሏል? ከተከተበ ካርዱን ሉያሳዩኝ ይችላሉ?	አዎ----- = 1 የለም----- = 0 ታይቱዋሌ----- = 3 አልታየም----- = 4
307	(ስም) ባለፈት 2 ሳምንት ውስጥ ተቅማጥ ይዞት ነበር?	አዎ----- = 1 የለም----- = 0 አላውቅም----- = 99
308	(ስም) ባለፈት 2 ሳምንት ውስጥ በማንኛውም ጊዜ ታሞ ነበር?	አዎ----- = 1 የለም----- = 0 አላውቅም----- = 99
309	(ስም) ባለፈት 2 ሳምንት ውስጥ ሳል ይዞት ነበር?	አዎ----- = 1 የለም----- = 0 አላውቅም----- = 99

ክፍል አራት፡ የቤተሰቡ ውሃ ማግኛ ቦታና ንፅህና

ተ.ቁ	ጥያቄ	ኮድ
401	ቤተሰቡ የሚጠጣው ውሃ ዋና ምንጭ ከየት ነው?	<p>ከቤት ውስጥ ሲገኝ----- = 1</p> <p>ግቢ ውስጥ ካለ ሲገኝ----- = 2</p> <p>ከግቢ ውጭ ካለ ሲገኝ/ቦኖ----- = 3</p> <p>የተጠበቀ የጉዳይ ውሃ----- = 4</p> <p>የተጠበቀ ምንጭ----- = 5</p> <p>ያልተጠበቀ ጉዳይ----- = 6</p> <p>ያልተጠበቀ ምንጭ----- = 7</p> <p>ወንዝ----- = 8</p> <p>ኩሬ----- = 9</p> <p>ከዝናብ ውሃ----- = 10</p> <p>ላላ ካለ ይገለፅ----- = 11</p>
402	ቤተሰቡ ምን ዓይነት ሽንት ቤት ነው የሚጠቀመው?	<p>በውሃ የሚወርድ ሽንት ቤት----- = 1</p> <p>የተሸለ ማስተንፈሻ ያለው ደረቅ ሽንት ቤት----- = 2</p> <p>ደረቅ ሽንት ቤት----- = 3</p> <p>ከዳን ያለው ሽንት ቤት----- = 4</p> <p>የለም በሜዳ ላይ ወይም በጫካ----- = 5</p>

ክፍሌ አምስት፡ የቤተሰብ አመጋገብ

በመጀመሪያ ቀኑ ሌዩ ቀን መሆኑን ጠይቅ ማለት ለየት ያለ ክብር በዓል፤ የአፅዋማት ቀን መሆኑን፤ ከተለመደው የአመጋገብ ሁኔታ ያነሰ ወይም የበለጠ የተመገቡ መሆኑን ወይም ይህ ልሆን የቻሉት እየሰሙ መሆኑን ጠይቅ፡፡

501፡ ትናንት ምርጥ ማዕድ ቀርቦ የሚበላበት ቀን ነበር?

አዎ = 1

የሆኖ = 0

የትናንትና ምርጥ ማዕድ ቀርቦ የሚበላበት ቀን ካልሆነ የቀረው የቤተሰብ አባላት በትናንትናው ቀን እና ማታ የተመገቡትን ጠይቅ?

የትናንትና ቀን ለየት ያለ ቀን ከሆነ ተጠያቂው ከትናንትና በፊት ወይም ላለፈት ሰባት ቀናት የተመገቡት ምግብ በቤት ውስጥም ሆነ ከቤት ውጪ እንደሆነ እንዲገልጹ/እንዲዘረዝሩ ጠይቅ?

ተ.ቁ	ጥያቄ	የተጠያቂው እናት የበለት	የተመረጠው ህፃን የበላው
501	ጥራጥሬ? ሩዜ፤ ስንዳ፤ ዲቦ፤ እንጀራ፤ ፓስታ፤ በቆል ወይም በአካባቢ የሚበቅሉ ጥራጥሬ	አዎ = 1 የሆኖ = 0	አዎ = 0 የሆኖ = 0
502	በቫይታሚን ኤ የቡሆፀጉ አትክሌትና ዴንች ዜርያ? ደባ፤ ካሮት፤ ስኳር ዴንች፤ ውስጣቸው ብርቱካናም ወይም ቢጫ የሆነ	አዎ = 1 የሆኖ = 0	አዎ = 1 የሆኖ = 0
503	ነጭ ዴንች ዜርያ እና ስራስር ወይም የእስታርች ምግቦች? ዴንች፤ ነች ስኳር ዴንች፤ (በውስጣቸው ብርቱካናም የላሊቸው) የቶረቁ ዴንች ወይም ከላልች ብርቱካናም ቢጫ ያሌሆኑ ስራስሮች የተጋጁ ምግቦች	አዎ = 1 የሆኖ = 0	አዎ = 1 የሆኖ = 0
504	ጥቁር አረንጓዳ የሆኑ ቅጠሊማ አትክሌቶች እንደ ስፒናች(ቆስጣ አይነት)?	አዎ = 1	አዎ = 1

		የሆም = 0	የሆም = 0
505	ላልች አትክሌቶች? ላልች ቅጠሊቅጠልች (ምሳሌ ቶብርጃን፣ አረንጓዳ ፓፓያአበባ ጎመን፣ ሸንኩርት)	አዎ = 1 የሆም = 0	አዎ = 1 የሆም = 0
506	በቫይታሚን ኤ የበሆፀጉ ፍራፍሬዎች? የበሰሆ ማንጎ፣ ፓፓያ፣ ፓውፓው	አዎ = 1 የሆም = 0	አዎ = 1 የሆም = 0
507	ላልች ፍራፍሬዎች? (ምሳሌ ሙዜ፣ አፕሌ፣ ብርቱካንአናናስ፣ የወይራ ፊት፣ ሱሰኒ	አዎ = 1 የሆም = 0	አዎ = 1 የሆም = 0
508	ማንኛውም የበሬ ስጋ፣ የፍየሌ ስጋ፣ የድሮ ስጋ፣ ዲክወይም የአእዋፍ ፍርጎት፣ ኩሊሉት ወይም ላሊ የእንስሰውነት ክፍሌ?	አዎ = 1 የሆም = 0	አዎ = 1 የሆም = 0
509	እንቁሊሌ? የተሆያዩ የአዋፍ እንቁሊሌ፣ የድሮ፣ የዲክዌ፣ የተርኪ ድሮ ወፍተ ከእስኳሊ ወይም አስኳሊ የሆሆው	አዎ = 1 የሆም = 0	አዎ = 1 የሆም = 0
510	አሣ? ትንሽ/ትሌቅ የሆነ ትኩስ፣ ቶረቅ ወይም ከነቅርፉቱ	አዎ = 1 የሆም = 0	አዎ = 1 የሆም = 0
511	ማንኛውም ከባቄሊ፣ አተር ወይም ምስር፣ አቶንጓሬ፣ ላሊ የቅባት አህሌ የሚሰራ ምግብ?	አዎ = 1 የሆም = 0	አዎ = 1 የሆም = 0
512	ወተት ወይም የወተት ተዋፅዖ? ወተት፣ ዓይብ፣ እርጎ ወይም ላልች የወተት ውጤቶች	አዎ = 1 የሆም = 0	አዎ = 1 የሆም = 0
513	ፊትና ቅባት? ስብ ወይም ቅቤ የተጨመረበት ምግብ ወይም ሆምግብ የሚሆን የበሰሆ ቅቤ	አዎ = 1 የሆም = 0	አዎ = 1 የሆም = 0
514	ጣፊጭ ነገሮች? ስኳር፣ ሞሊሰስ፣ ማር፣ ሆስሊሳ መጠጦች፣ ቸኮላት፣ ከረሜሊ፣ ብስኩት	አዎ = 1 የሆም = 0	አዎ = 1 የሆም = 0
515	ቅመማ ቅመም፣ ማጣጥጫ መጠጦች? ቅመሞች፣ ጨው ማጣጥጫ ቡና፣ ሻይ ወፍተ	አዎ = 1 የሆም = 0	አዎ = 1 የሆም = 0

ክፍል ስድስት፡ የቤተሰብ የኢኮኖሚ ሁኔታና ንብረት

ተ.ቁ	ጥያቄ	ኮድ
601	የምትኖሩበት ቤት ይዝታው የማን	ነው? የግሌ ቤት----- = 1 የኪራይ ቤት----- = 2 በነፃ የተገኘ ቤት----- = 3 ላሊ ካህ የገሃፅ----- = 4
602	የጓሮ አትክሌትና ፍራፍሬ ታቦቅሊሊችሁ?	አዎ----- = 1 የሆም----- = 2
603	መሌሰዎ አዎ ከሆነ ምርቱን እንዳት ይጠቀሙበታሉ?	ሁለንም እሸጠዎሆሁ----- = 1 በክፉሌ እሸጠዎሆሁ----- = 2 ሁለንም ሆኔት ውስጥ ጥቅም አውሆዎሆሁ--- = 3 ላሊ ካህ ይገሃፅ----- = 4
604	ቤተሰቡ ኤላትሪክ ኃይሌ ይጠቀማሉ?	አዎ----- = 1 የሆም----- = 2
605	ላሊ አይነት የኤላትሪክ አገልግልት ያገኛሉ? መሌሰዎ አዎ ከሆነ ምን አይነት ኤላትሪክ?	ጀኔረተር----- = 1 ሶሊር/በፀሃይ የሚሰራ----- = 2 ላሊ ካህ ይገሃፅ----- = 3
606	በአብዚኛው ቤተሰቡ ምግብ ለማብሰሉ ምን አይነት የሀይሌ ምንጭ ይጠቀማሉ?	ኤላትሪክ----- = 1 የሲሉንዮር ቡታጋዜ----- = 2 ከተጋጥሮ ጋዜ----- = 3 ከባዮ ጋዜ----- = 4 ነጭ ጋዜ----- = 5 ከሰሌ----- = 6 እንጨት----- = 7 የከብት እዲራ----- = 8 ላሊ ካህ ይገሃፅ----- = 9
607	/ምሌከታ/ የዋናው ቤት ውሃሌ የተሰራበት ቁስ ምን ይመስላሉ?	አጋር----- = 1 ቀርቀሃ ሳጠራ----- = 2 ሲሚንቶ----- = 3 ሸክሊ ንጣፍ----- = 4 ላሊ ካህ ይገሃፅ----- = 5
608	/ምሌከታ/ የዋናው ቤት የውጭ ግዴግዲ የተሰራበት ቁስ ምን ይመስላሉ?	ግዴግዲ የሆነውም----- = 1 ከጭቃና እንጨት /ሳር/ ቅጠሌ የተሰራ--- = 2 ባህሊዊ ከዴንጋይ የተሰራ----- = 3 የዴንጋይ፣ የእንጨት፣ የቆርቆሮ----- = 4 ላሊ ካህ ይገሃፅ----- = 5
609	/ምሌከታ/ የቤቱ ጣራ የተሰራበት ቁስ ምን አይነት ነው?	ጣራ የሆነውም----- = 1 ሳር፣ ቅጠሌ፣ ሊስቲክ፣ ቀርቀሃ----- = 2 ብረት፣ እንጨት፣ ቆርቆሮ፣ ዴንጋይ፣ ሲሚንቶ፣ አጋር----- = 3 ላሊ ካህ ይገሃፅ----- = 4

ክፍል ሰባት፡ አጠቃላይ የተከለሰውነት ልኬት (ክብደት፡ ቁመት፡ ክንድ፡ ወዘተ)

የተመረጠው ህፃን				የተመረጠው ህፃን ቁመትና ክብደት			
አባሊትቁ ፕር	ስም	የተውሆኑበት ቀን (ቀን ወርዓ.ም)	እዴሜ (በወር)	ክብደት (ኪል)	ቁመት (ሴ.ሜ)	ቆመውወይምተኝተውየተሆኑ ኩ ተኝተው.....1 ቆመው.....2	ውጤት ተሆክቷሌ.....= 1 አሌተገኙም.....= 2 አሌጾሆጉም.....= 3 ላሊካሆይጉሆፅ.= 4
	1ኛሌኬት						
ተመሳሳይ	2ኛ ሌኬት						
የህፃኑ የክንዴ ሌኬት (ሙዋአክ)				ሌኬት		ውጤት ተሆክቷሌ.....= 1 አሌተገኙም.....= 2 አሌጾሆጉም.....= 3 ላሊካሆይጉሆፅ.....= 4	