



**ADDIS ABABA UNIVERSITY**  
**COLLEGE OF HEALTH SCIENCE**  
**SCHOOL OF PUBLIC HEALTH**

Prevalence of Undernutrition and its Association with Maternal Depression among Economically Disadvantaged Women with Children Aged 12-36 Months in Selected Urban Areas of Ethiopia

**By: -** Sitota G/melak (BSc)

**Advisors: -** Tefera Darge (PhD)

Gudina Egata (PhD)

A Thesis Submitted to the Graduate Program of Addis Ababa University, College of Health Sciences, School of Public Health in Partial Fulfillment for the degree of Masters of Public Health in Nutrition

**June, 2025**

**ADDIS ABABA, ETHIOPIA**

**ADDIS ABABA UNIVERSITY**  
**COLLEGE OF HEALTH SCIENCE**  
**SCHOOL OF PUBLIC HEALTH**

Prevalence of Undernutrition and its Association with Maternal Depression among Economically Disadvantaged Women with Children Aged 12-36 Months in Selected Urban Areas of Ethiopia

**By: - Sitota G/melak (BSc)**

**Signature**

\_\_\_\_\_  \_\_\_\_\_

**Approved by Examining Board**

**Signature**

\_\_\_\_\_

\_\_\_\_\_

(Chair Dean SPH)

Dr. Tefera Darge (PhD)

**Signature**

(Advisor)

\_\_\_\_\_

Dr. Cherinet Abuye (*Phd*)

**Signature**

(External Examiner)

\_\_\_\_\_

Dr. *Jemal Haidar (Phd)*

**Signature**

(Internal Examiner)

\_\_\_\_\_

**June, 2025**

**Addis Ababa, Ethiopia**

## **Acknowledgments**

First and for most, I would like to express my heartfelt gratitude to God for restoring my health and standing with me during a challenging period that necessitated the postponement of my classes.

I would like to extend my sincere appreciation to my advisors, Dr. Tefera Darge and Dr. Gudina Egata, for their invaluable guidance, support, and encouragement throughout this process. Their expertise and constructive feedback have been instrumental in shaping this research.

The author thanks the International Development Research Center for funding the evaluation of childcare center through the GrOW East Africa initiative. Gratitude also extended to the implementing partners' Child Fund Ethiopia, Children Believe, and Tesfa Berhan Child and Family Development for facilitation and support during data collection. The author is also grateful to the study participants and the survey teams for their time and patience during data collection.

I am grateful to the faculty and teachers of Addis Ababa University, College of Health Science, and School of Public Health for providing the necessary resources and a conducive environment for my studies.

Finally, I express my deepest gratitude to my family for their unwavering love and support. Your belief in me has been a constant strength throughout this endeavor.

## **Acronyms and Abbreviations**

AAU	Addis Ababa University
AOR	Adjusted Odd Ratio
CI	Confidence Interval
COR	Crud Odd Ratio
EDHIS	Ethiopia Demographic and Health Survey
EPDS	Edinburgh Postnatal Depression Scale
ETB	Ethiopian Birr
GDP	Gross Domestic Product
GHI	Global Hunger Index
GROW	Grow and Economic Opportunity for Women
HFIAS	Household Food Insecurity Access Scale
LMICs	Low and Middle-Income Countries
MCH	Maternal and Child Health
NNP	National Nutrition Program
PCA	Principal Component Analysis
PHQ9	Patient Health Questionnaire-9
SGD	Sustainable Development Goals
UNICEF	United Nations International Children's Emergency Fund
VIF	Variance Inflation Factor
WHO	World Health Organization

## Table of Contents

Acknowledgments.....	I
Acronyms and Abbreviations .....	II
Table of Contents.....	III
List of Tables .....	VI
List of Figures.....	VII
Abstract .....	VIII
Chapter 1: Introduction .....	1
1.1. Background.....	1
1.2. Statement of Problem.....	2
1.3. Significance of Study .....	4
Chapter 2: Literature Review.....	5
2.1. Prevalence of Undernutrition.....	5
2.2. Factors Associated with Undernutrition among Children.....	5
2.2.1. Socio-demographic Factors.....	6
2.2.2. Socio-economic Factors .....	6
2.2.3. Environmental Factors .....	7
2.2.4. Maternal Depression .....	8
2.3. Conceptual Framework .....	10
Chapter 3: Objectives .....	11
3.1. General Objective .....	11
3.2. Specific Objectives .....	11
Chapter 4: Methods.....	12
4.1. Description of Data Source and Study Area.....	12
4.2. Study Period .....	12
4.3. Study Design.....	12
4.4. Population.....	12
4.4.1. Source Population .....	12
4.4.2. Study Population.....	12
4.5. Eligibility Criteria .....	13
4.5.1. Inclusion Criteria .....	13
4.5.2. Exclusion Criteria .....	13

4.6.	Sample Size Determination .....	13
4.6.1.	Sample Size Determination for Primary Objective (prevalence of undernutrition) .....	13
4.6.2.	Sample Size Determination for Secondary Objective (association with maternal depression).....	14
4.7.	Sampling Methods .....	15
4.8.	Data Collection Tool and Procedure .....	16
4.9.	Study Variables.....	16
4.9.1.	Dependent / Outcome Variable .....	16
4.9.2.	Exposure Variables .....	16
4.9.3.	Covariates .....	16
4.10.	Measurement of Variables .....	17
4.10.1.	Anthropometric Measures.....	17
4.10.2.	Maternal Depression Assessment.....	17
4.10.3.	Household Socioeconomic Status .....	17
4.10.4.	Household Food Security Status .....	18
4.11.	Operational Definitions .....	19
4.12.	Data Extraction and Analysis.....	20
4.12.1.	Data Extraction.....	20
4.12.2.	Data Processing and Analysis .....	20
4.13.	Data Quality Assurance .....	21
4.14.	Ethical Considerations .....	21
4.15.	Result Dissemination Plan .....	22
5.	Result.....	23
5.1.	Socio-demographic and economic characteristics of study participant .....	24
5.2.	Health, water and sanitation characteristics of the respondent.....	26
5.3.	Prevalence of undernutrition .....	26
5.4.	Maternal depression and its characteristics .....	28
5.5.	Association between maternal depression and stunting among children aged 12-36 month	29
5.6.	Association between maternal depression and underweight among children aged 12-36 month .....	32
6.	Discussion.....	35
7.	Strength and limitation of the study.....	38

8. Conclusion and Recommendations.....	39
8.1. Conclusion.....	39
8.2. Recommendations.....	39
References .....	40
8.3. Annex 1: The Prevalence of Maternal Depression by Residence, Maternal age, and Child age .....	47
8.4. Annex 2: Cross tabulation result of wasting among children aged 12-36 months ...	48
8.5. Annex 3: Study information sheet and Oral Consent form.....	49
8.6. Annex 4: Data Extraction Tool in English .....	50
8.7. Annex 5: ስምምነት .....	57
8.8. Annex 6: Data extraction Tool in Amharic .....	58
8.9. Annex 7: IRB Decision letter of the project .....	68
8.10. Annex 8: Assurance of Principal Investigator.....	69

## List of Tables

<b>Table 1:</b> Sample size determination for the primary objective of the study on the prevalence of undernutrition and its Association with maternal depression among economically disadvantaged mothers with children aged 12 – 36 months in selected urban areas of Ethiopia, 2022.....	13
<b>Table 2:</b> Sample size determination for the second objective of the study on the prevalence of undernutrition and its Association with maternal depression among economically disadvantaged mothers with children aged 12 – 36 months in selected urban areas of Ethiopia, 2022.....	14
<b>Table 3:</b> Distribution of the socio-demographic and economic characteristics of study participants in selected urban settings: July to September 2022(N=627) .....	25
<b>Table 4:</b> Distribution of health, water and sanitation characteristics of the study participants in selected urban settings: July to September 2022(N=627) .....	26
<b>Table 5:</b> Association between maternal depression and stunting among children aged 12–36 months in selected urban areas of Ethiopia (2022), adjusted for socio-demographic and health-related confounders. ....	30
<b>Table 6:</b> Association between maternal depression and underweight among children aged 12–36 months in selected urban areas of Ethiopia (2022), adjusted for socio-demographic and health-related confounders. ....	33

## List of Figures

- Figure 1:** Conceptual framework for study on prevalence of undernutrition and its association with maternal depression among economically disadvantaged women of children aged 12-36 months in selected urban area of Ethiopia, 2022. .... 10
- Figure 2:** Flow chart on how data filter out for analysis of the study ..... 23
- Figure 3:** The prevalence of undernutrition among children aged 12-36 months in selected urban settings, Ethiopia, 2022,(stunting N=627,wasting N=619,and underweight N=627) ..... 27
- Figure 4:** The prevalence of undernutrition among children aged 12-36 months by residence in selected urban settings, Ethiopia, 2022,(stunting N=627,wasting N=619,and underweight N=627)..... 27
- Figure 5:** The prevalence of maternal depression among study participant in selected urban setting: Ethiopia July to September 2022(N=627)..... 28

## **Abstract**

**Background:** Undernutrition remains a global pressing public health issue, but few studies in Ethiopia have examined how maternal depression related to child undernutrition. We estimated the prevalence of child undernutrition and examined how undernutrition was associated with maternal depression in urban Ethiopia.

**Objective:** To assess the prevalence of undernutrition and its association with maternal depression among economically disadvantaged children aged 12-36 months in selected urban areas of Ethiopia.

**Method:** This study used extracted data from the baseline household survey conducted from June to September 2022 as part of the Growth and Economic Opportunities for Women (GrOW) Africa project. A cross-sectional design was computed among 627 mother-child pairs. Child undernutrition was assessed using anthropometric measures and maternal depression was assessed using the Patient Health Questionnaire-9(PHQ-9). The anthropometric indices were derived from WHO 2006 Child Growth Standard. The association between child undernutrition (stunting and underweight) and maternal depression was analyzed separately using binary logistic regression. However, regression analysis was not conducted for wasting due to its low prevalence, which could lead to unreliable results. Adjusted odds ratios (AORs) along with 95% confidence intervals (CIs) were estimated to measure the strength of the association.

**Result:** The prevalence of stunting, underweight, and wasting was 52.7% (95% CI: 48.7–56.5), 14.0% (95% CI: 11.3–16.7), and 3.6% (95% CI: 2.1–5.0), respectively. Maternal depression affected one in every six mothers (16.0%) (95% CI: 13.1–18.9). Maternal depression was significantly associated with stunting [AOR = 2.21; 95% CI: 1.11–2.15] but not with underweight, after controlling for possible confounding variables.

**Conclusion:** Undernutrition, mainly stunting and underweight are still alarming public problem in this study area. Maternal depression has significant association with stunting. Hence, integrating maternal mental health into child health program could enhance effort to combat child undernutrition.

**Key words:** stunting underweight, wasting, maternal depression, household food insecurity, Ethiopia.

## **Chapter 1: Introduction**

### **1.1. Background**

Undernutrition is insufficient intake of nutrients to meet an individual's needs to maintain good health. It encompasses wasting, stunting, underweight, and micronutrient deficiencies(1). Good nutritional status of children can be a pivot of health that will optimize growth, development and reduce morbidity, disability, and death. Globally, undernutrition in children is highly prevalent and remains a big challenge. It is also an alarming public health concern in developing countries, especially in Asia and Africa(2). Ending all form of malnutrition in under five children are one of Sustainable Development Goals (SGDs) for 2030(3). According to the United Nations International Children's Emergency Fund (UNICEF) conceptual framework Several complex, multidimensional, and interrelated factors influence the nutritional status of child(4).

Rapid physical growth and development occur in the first two years of life when children are the most dependent on caregivers to meet their nutritional needs. Studies have shown that healthy maternal behavior and attitude have an essential role in maintaining healthy nutrition in children. Maternal depression is a depressive disorder that possibly happens during pre-pregnancy, pregnancy, and the post-partum period from birth up to 12 month. Globally, depression affects 280 million peoples. From this, the majority occurred in low and middle-income countries(5). In Ethiopia, During postpartum period, 12.2%-33% mothers suffered by depression(6) Some researchers also suggested that maternal depression has been linked to poor child growth outcomes, child feeding problem, poor child-parent interaction, parent feeding practice, and child development in developing countries(7–10).

Generally, undernutrition remains major obstacle to improve child health and nutrition in Ethiopia(11). Despite national effort, Ethiopia is still off-track in achieving 2030 Sustainable Development Goals(SGDS) target of ending all form of malnutrition(12). While maternal depression affect child feeding practice, impairs emotional responsiveness and care, its potential contribution to child undernutrition remains overlooked. Therefore growing evidences on their association is needed to address integrated intervention of maternal mental health and child nutrition.

## 1.2. Statement of Problem

Undernutrition is connected to various health outcomes, including, weakened immune function, increase risk of mortality, and impaired cognitive abilities(1). Despite global efforts, in 2022, approximately 148 million under five children were stunted, and 45 million were wasted. In sub-Saharan Africa, the prevalence of stunting declined from 36 % ( 2012) to 31.5 % ( 2022)(1). However, the reduction is not sufficient to meet the SGD goals. The highest hunger level with a Global Hunger Index score(GHI) of 27 also reported from Sub- Saharan Africa which is classified as a serious public health problem(12).

Globally, Undernutrition is attributed to 50% of all deaths among under five children. It severely hindering their cognitive development during the most critical years of growth(13). It also results in an estimated economic loss of US\$3.5 trillion per year per individual due to health costs of malnutrition. In developing countries, child mortality as result of child undernutrition has reduced 1to13.7% of national workforces(1). Maternal depression is also a public health problem in the world. In Low and Middle-Income Countries (LMICs), maternal depression affects 15.6% of mothers during pregnancy and 19.8% of mothers after childbirth. Beside, 20% of suicidal attempts happened during postpartum periods. In Sub-Saharan Africa, 6 to 30% of women are affected by maternal depression during the postpartum period(14).

Ethiopia has implementing several nutrition strategies and programs including; National Nutrition Program (NNP I and II), micronutrient supplementation, school feeding, and Productive Safety Net. Despite these efforts, the prevalence of stunting was 39% in 2022, which remains alarmingly high(11). In Ethiopia, undernutrition continues to have significant impact on the national economy. Around 17% of its GDP each year has lost due to the long-term effects of child malnutrition. Additionally, 18% school repetition and 67% adult stunting are associated to childhood stunting(15,16).

In Ethiopia, where poverty and conflicts are common, maternal depression is a major but largely neglected public health problem. It's ranging from 12.2% to 33.8%. Despite this, an estimated 76–85% of depressed mothers are neither diagnosed nor treated(6). Maternal depression is common in urban areas, often linked to living without husband, financial constrain, and having postpartum health issues. This could impair mother's responsiveness and ability to care for herself and her baby(17,18).

Researches shown that maternal depression affects child-feeding practices by increasing the early cessation of exclusive breastfeeding and reduce the likelihood of consuming one additional food group. It also affect child eating behaviors and increasing their susceptibility to infection(19–21). Intervention involving early screening, diagnosis and treatments of maternal depression during the first 1,000 days is critical in reducing child undernutrition. Despite this evidence, examining the association between maternal depression and child undernutrition has given little attention in Ethiopia. Therefore, this study aims to grow evidence on association between maternal depression and child undernutrition among economically disadvantaged urban women along with children beyond 1 year.

### **1.3. Significance of Study**

Undernutrition remains a serious public health problem, particularly in low-resource settings(12). Maternal depression also rising globally, yet it remains a continuous neglected health threat to mothers and children in countries such as Ethiopia(6). Researches have also shown that maternal depressions worsen after child 12 months of age. Moreover, maternal depression is also a common problem in urban and economically disadvantages communities, where mothers face added stressors. Maternal depression has been linked to poor child feeding practices, inadequate maternal care and compromising child health(8,17,22). Despite these links, its association with undernutrition is overlooked. This study aim to estimate the prevalence of undernutrition and assess its association with maternal depression among children aged 12-36 months.

The results of this study will help planners to design intervention programs and formulating guideline to address maternal depression to reduce child undernutrition. This study finding will also provide evidences for healthcare providers in maternal and child health department on importance of early screening and treatment of maternal depression for improving child nutrition. It will also offer additional evidences for researchers for further interventional studies with similar interests.

## **Chapter 2: Literature Review**

### **2.1. Prevalence of Undernutrition**

Undernutrition is one of the most serious and least addressed public health problems in the world, especially in Africa and Asia. It is not only a public health threat but also an impediment to world productivity, poverty eradication, and economic growth(12). The results show that during the pandemic years, undernutrition rates, particularly for stunting and wasting worsened(23). Researches indicates that slums have greater rates of undernutrition both in terms of severity and amount, partly because of poverty and subpar living circumstances in comparison to developed city areas(20,24,25). The number of stunted children in Eastern and Southern Africa has risen from 23.6 million to 26.8 million. This is due to a rapidly expanding child population and weak rates of stunting reduction(26).

In Sub-Saharan Africa in 2022, stunted and wasted children were nearly 32% and 6.5% respectively(1). This region confronts various problems in combating malnutrition, including repeated food shortages due to droughts, wars, and economic insecurity. Countries including Congo, Ethiopia, and Nigeria rank among the highest rates of child undernutrition globally(3). Child undernutrition is also a major public health issue in Ethiopia, with large disparities between rural and urban regions(27). However, the problem persists in urban low-income communities, where poverty, poor food access, and inadequate health care contribute to high rates of malnutrition. Stunting still affects more than 5.4 million Ethiopian children under the age of five (39%) and one in ten children under the age of five (which is nearly two million) were stunted, 11% were wasted, and 22% were underweight(1).

### **2.2. Factors Associated with Undernutrition among Children**

Child undernutrition is a complex and pressing public health challenge influenced by a variety of factor(1). The UNICEF conceptual framework highlights the interaction between immediate, underlying, and basic causes which provides a foundational paradigm for comprehending the multifaceted nature of child undernutrition. This framework emphasizes that child undernutrition is influenced not only by inadequate dietary intake and illness but also by socio-demographic factors, maternal health, education, socioeconomic status, and environmental factors(4).

### **2.2.1. Socio-demographic Factors**

The relationship between socio-demographic characteristics and child undernutrition is an important field of research in public health and nutrition. Child age is one of the factors closely associated with nutritional status. Researches have shown that different age groups face varying nutritional challenges, which can significantly impact on their growth and overall health(2,28). Understanding the link helps to identify vulnerable populations and devise targeted solutions. Studies showed that child characteristics like child age and sex were significantly associated with child undernutrition (8,29–31).

Another research done in Rwanda also stated that at ages 24-47 months, the risk of stunting was 3.6 times higher than children aged < 6 months. Female children were about 0.76 times less likely to be stunted as compared to male children(32). Other study done in Mozambique revealed that the risk of stunting in males children increased by 4.57 times than females children(29). Similarly, study done in Peru also indicated that male children have higher risk of stunting than female children(30). However, studies done in urban slum areas of Bangladesh shown that the risk of stunting higher in female children than male children(8,33). A similar studies done in Ethiopia revealed that male children, younger maternal age, maternal BMI, and maternal educational status also have an association with child undernutrition(24,34,35).

A study done in Haramaya revealed that children born from mothers who have lower Body Mass Index (BMI<18.5) have higher risk of stunting than children born from mothers who have normal BMI(36). Another study done in urban slum area of Bahir Dar shown that maternal educational status has significant association with child undernutrition(24). Children born from illiterate mothers were 3 times more likely to be stunted than children born from mother who attained higher education. Similar study done Sekela also indicated maternal educational status has independent significant association with stunting. Maternal literacy decreases the risk of child stunting by 41%(34).

### **2.2.2. Socio-economic Factors**

Various socioeconomic factors can significantly influence a child's nutritional outcomes, including; household wealth index , the number of under-five, total family size of the household, and household food security status(24,36,37). The result of the study done Vietnam indicated that children live in poorest household has 1.72 times higher risk of

stunting and 1.88 times higher in risk of underweight(37). Similar result finding reported from Ethiopia done in Tigiry. Children born from family with poor household wealth index has increased the risk of stunting by 2.73 times than children born from families with rich wealth index(38).

Other studies also showed the significant association between family size and children's nutritional status. Researchers suggest that household having large family size significantly associated with undernutrition. Studies from Bangladesh and Mozambique showed that the odds of child stunting increased in household having large family size(8,29). In Ethiopia studies also have consistent result finding(37,38). Study done in Siraro district of oromia region indicated that children live in household where number of under five children greater than greater than 2 were 3 times more likely to be stunted than children from household having 1 under five children(39). Previous studies showed that child diarrheal illness exposure was related to a considerably higher incidence of stunting and wasting(34,36,37).

One research done in Bangladesh showed that Food-secure households had greater average weight, length, and anthropometric indices from birth to 24 months. Food-secure households had considerably lower proportions of stunting and underweight(8). Another recent research showed that Children from households experiencing food insecurity had a 16%, 21%, and 12% higher chance of being underweight, wasting, and stunted respectively after adjusting possible confounders(34). Similar studies done in Ethiopia revealed that family food insecurity was associated with stunting, underweight and acute malnutrition(40,41). children who were allegedly living in moderately food-insecure households were nearly twice as likely to be stunted and over four times as likely to be underweight in comparison to children in food-secure households(36).

### **2.2.3. Environmental Factors**

Research conducted in Ethiopia indicated that children from families with unimproved toilet facilities were 2 times more likely to be stunted compared to their counterparts with 95% CI. Children from homes with improved water supply sources were 85% and 95% less likely to be wasted and stunted respectively(21). Poor hygiene and sanitation practices and unsafe drinking water create preferable conditions for the development of different infectious diseases that are linked to undernutrition(42). A study done in Haramaya showed that

children from families had used unprotected water sources for drinking were 2.3 times higher risk stunting than children from families who had used protected water source(36).

#### **2.2.4. Maternal Depression**

Research indicates that maternal mental health in developing countries is common but it is least addressed health problem. In low resource setting maternal mental health encourage poor care-giving practices which have negative impact on child health outcomes(22,43). A study done in Peru using the PHQ-9 Assessment tool found that children aged 6-59 months who born from depressed mothers were 1.24 times higher odds of stunting than children from non-depressed mother(30). Another Study done in rural areas of Malaysia using Beck Depression Inventory: Second Edition (BDI-II) maternal depression assessment tool revealed than the risk of child undernutrition increased by 2 times among children of depressed mothers than children from non-depressed mothers(44). Similarly, study done in Vietnam also indicated that maternal depression has increased the risk of underweight by 1.44 times as compared with children born from non-depressed mothers(37).

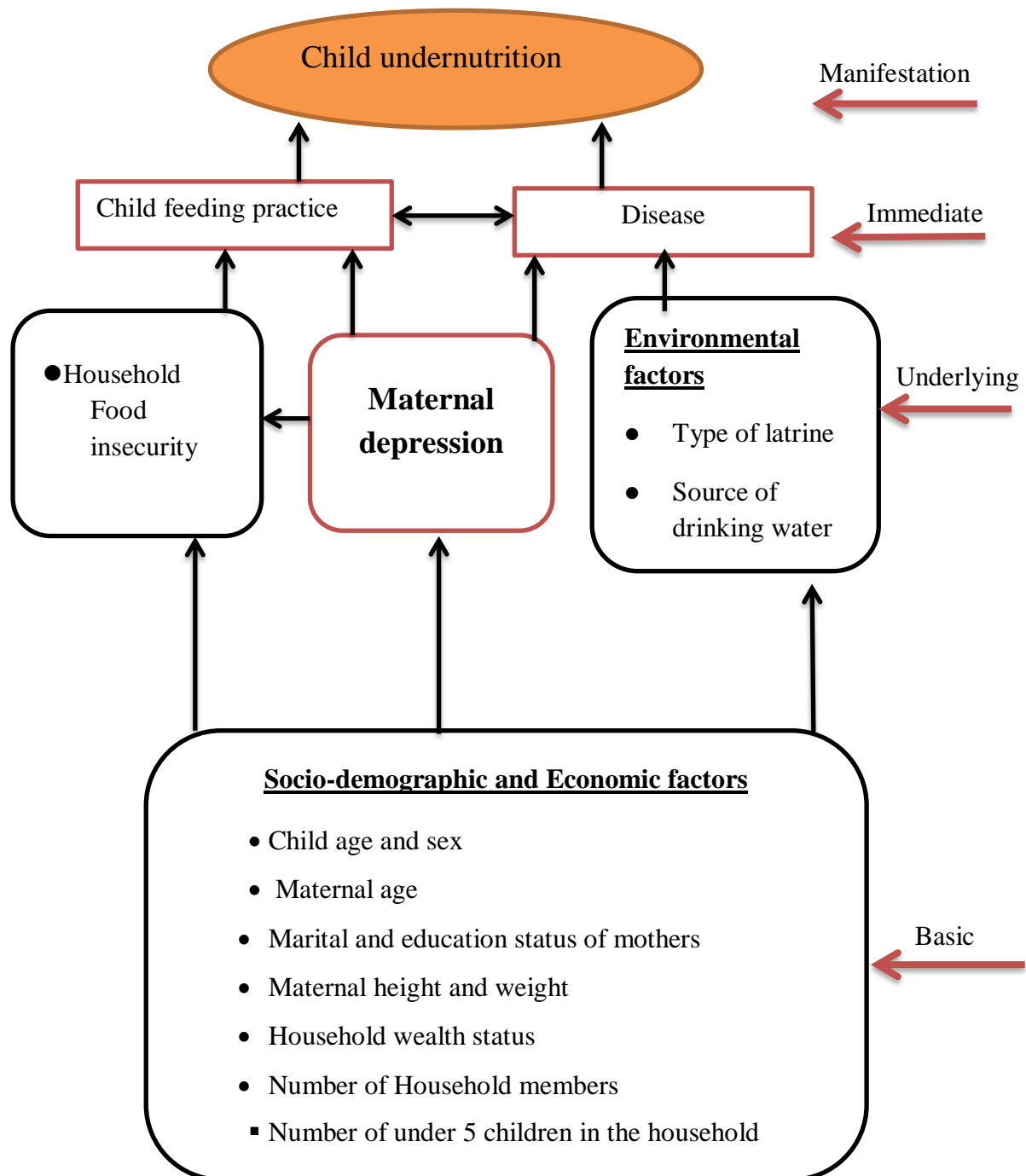
Study done in urban areas of Pakistan also stated that children from depressed mothers were 3 times more likely stunted and underweight with P-value <0.001,even after adjusting possible confounders. This study focused on children under two years of age, and maternal depression was assessed using the Edinburgh Postnatal Depression Scale(45). Another study conducted in Uganda, using Mini International Neuropsychiatric Interview, found that maternal depression was associated with child undernutrition with a 2.4 fold increase in odds of child undernutrition(46). A similar study done in India, using the Self-Reporting Questionnaire, showed that depressive symptoms in mothers were associated with increased risk of stunting in children at 1 year of age by 1.37times and increased the risk of underweight by 1.25 times(37).

In Ethiopia research studies have shown that maternal depression associated with child feeding practice and child growth(21,47). A study conducted in Nekemte town using Self-Reporting Questionnaire (SRQ-20) indicated that maternal common mental disorders were associated with a 2.35 fold increase increase in odds of stunting, after adjusting potential confounders(40).

Inconsistent research findings have been reported regarding the effect of maternal depression on child undernutrition (10,41,48). Research conducted in an urban region of Northern Ghana discovered that mothers' depression, as evaluated by the Centre for Epidemiologic Studies-Depression, was not associated with stunting among children aged 6-23 months (48). Despite the discrepancy of research findings, scarce researches were done in Ethiopia in understanding this relationship. Therefore, this research intends to assess its association with child undernutrition among economically disadvantaged children aged greater than 12 months and give insight for future intervention.

### 2.3. Conceptual Framework

The conceptual framework that was used for this study was adopted and modified after a review of different related literature and document(4,49,50). It illustrated the relationship between undernutrition and independent variables. [Figure 1].



**Figure 1: Conceptual framework for study on prevalence of undernutrition and its association with maternal depression among economically disadvantaged women of children aged 12-36 months in selected urban area of Ethiopia, 2022.**

## **Chapter 3: Objectives**

### **3.1. General Objective**

- ❖ To assess the prevalence of undernutrition and its association with maternal depression among economically disadvantaged women with children aged 12 – 36 months in selected urban areas of Ethiopia.

### **3.2. Specific Objectives**

- ❖ To estimate the prevalence of undernutrition among economically disadvantaged women with children aged 12 – 36 months in selected urban areas of Ethiopia.
- ❖ To assess the association between undernutrition and maternal depression after adjusting other confounders among economically disadvantaged women with children aged 12 – 36 months in selected urban areas of Ethiopia.

## **Chapter 4: Methods**

### **4.1. Description of Data Source and Study Area**

This study used a dataset extracted from the baseline household survey as part of the Growth and Economic Opportunity for Women (GrOW)-east Africa project. The project aimed to assess whether subsidized and enhanced quality community-based childcare services can improve women's well-being and empowerment in Ethiopia. Details have been found in Study ID: RIDIE-STUDY-ID-63bf977db6192. The project was implemented by Child Fund Ethiopia, Child Believe, and Tesfa Berhan Child and Family Development. The survey was carried out in urban areas of three regions of Ethiopia where implementing partners were operating; namely Addis Ababa (the capital city of Ethiopia), Debre Birhan (a city in the Amhara region and located about 120 km northeast of Addis Ababa), and Adama (a city in the central Oromia region and located about 100 km southeast of Addis Ababa).

### **4.2. Study Period**

The data collection of the survey was conducted between July to September 2022. The present study was conducted from January to February 2025.

### **4.3. Study Design**

A cross-sectional study design was employed.

### **4.4. Population**

#### **4.4.1. Source Population**

The source population of the survey data was all women who are unemployed or have irregular jobs primarily due to childcare responsibilities, along with their children aged 12 to 36 months from the Addis Ababa, Adama, and Debre Berhan.

#### **4.4.2. Study Population**

The study population consisted all randomly selected women who are unemployed or have irregular jobs primarily due to childcare responsibilities, along with their children aged 12 to 36 months from the area of Addis Ababa, Adama, and Debre Berhan.

## 4.5. Eligibility Criteria

### 4.5.1. Inclusion Criteria

The inclusion criteria were women with children aged 12-36 months, women who should not have engaged in any income-generating activities or engaged in irregular and low-paying jobs at the time of data collection. Based on this, the present study included all completed data of mother-child pairs who participated in the survey.

### 4.5.2. Exclusion Criteria

Any missed or incomplete data of mothers-child pairs who involved in the survey were excluded from this study.

## 4.6. Sample Size Determination

### 4.6.1. Sample Size Determination for Primary Objective (prevalence of undernutrition)

The required sample size was determined using Epi-info Version 7.1 stat calc. sample size for primary objective was determined by assuming the prevalence of stunting 39%, taken from National Food and Nutrition Strategy 2023 report(11). 95% confidence level (CL), 10% of non-response rate, 1.5 design effect and 5% margin of error are taken into account as shown in the below table.

$$n1 = \frac{(z\alpha/2)^2 p(1-p)}{d^2}$$

Where  $n$  is the desired sample size,  $z\alpha/2$  critical value at 95% confidence level (CL) (1.96),  $p$  proportion of stunting and  $d$  is the degree of precision.

**Table 1: Sample size determination for the primary objective of the study on the prevalence of undernutrition and its Association with maternal depression among economically disadvantaged mothers with children aged 12 – 36 months in selected urban areas of Ethiopia, 2022.**

Variable	Prevalence (P)	Confidence Level (CL)	Degree of precision (d2)	Design effect (DE)	Non-response Rate	Final sample size	Ref
Stunting	39	95%	5%	1.5	10%	603	(11)

#### 4.6.2. Sample Size Determination for Secondary Objective (association with maternal depression)

The sample size to address the second objective was also computed using the double population proportion formula. The prevalence of child stunting among depressed and non-depressed mothers was 66.7% and 21.1%; 56.5% and 20% respectively; taken from a former studies in Ethiopia and India respectively(20,40). 80% power, 95% CL, 1.5 design effect and 5% degree of precision with a one-to-two ratio among depressed and Non-Depressed are taken into account.

$$n_2 = \frac{[z_{\alpha/2}\sqrt{(1+r)p(1-p)} + z_{\beta}\sqrt{p_1(1-p_1)+p_2(1-p_2)r}]^2}{(p_1-p_2)^2}$$

Where;

r: - is the allocation ratio of depressed to Non-Depressed mother

P1\_ is the proportion of child stunting in depressed mother

P2- is the proportion of child stunting in Non-Depressed

Z<sub>α/2</sub> -is the quintile of the standard normal distribution for type I error

Z<sub>β</sub>- is the quintile of the standard normal distribution for type II error/power

**Table 2: Sample size determination for the second objective of the study on the prevalence of undernutrition and its Association with maternal depression among economically disadvantaged mothers with children aged 12 – 36 months in selected urban areas of Ethiopia, 2022.**

Variable	Depressed mother (p1)	Non-depressed mother (p2)	Power (P)	(CL)	Odd ratio (r)	Design effect	Non response rate (10%)	Final sample size	Ref
stunting	66.7	21.1	80	95%	7.49	1.5	14	154	(40)
Stunting	56.5	20	80	95%	5.19	1.5	10.6	117	(20)

The sample size for this study was determined by comparing the two computations and choosing the one with the largest sample size. However, both estimated sample size were smaller than sample included during the baseline survey which was 629. Therefore, this study used all sample of 629 to increase the power of the study.

#### 4.7. Sampling Methods

The baseline survey encompassed 14 woredas /kebeles (which is the smallest level of government in Ethiopia) from seven sub-cities where implementing partners were operating. Specifically, Lemi Kura sub-city was one of the seven sub-cities selected from Addis Ababa, where two woredas were chosen. In Debre Birhan town, from four sub-cities seven kebeles were selected, while five woredas from the Bole and Abba Geda sub-cities were chosen from Adama. All women who satisfied the inclusion criteria and consented to participate in the project were listed in the selected woredas/kebeles. After the list was produced, a random sample of 629 women-child pair were selected and participated in the baseline survey. In household where two children were found, one was randomly chosen to participate in the study.

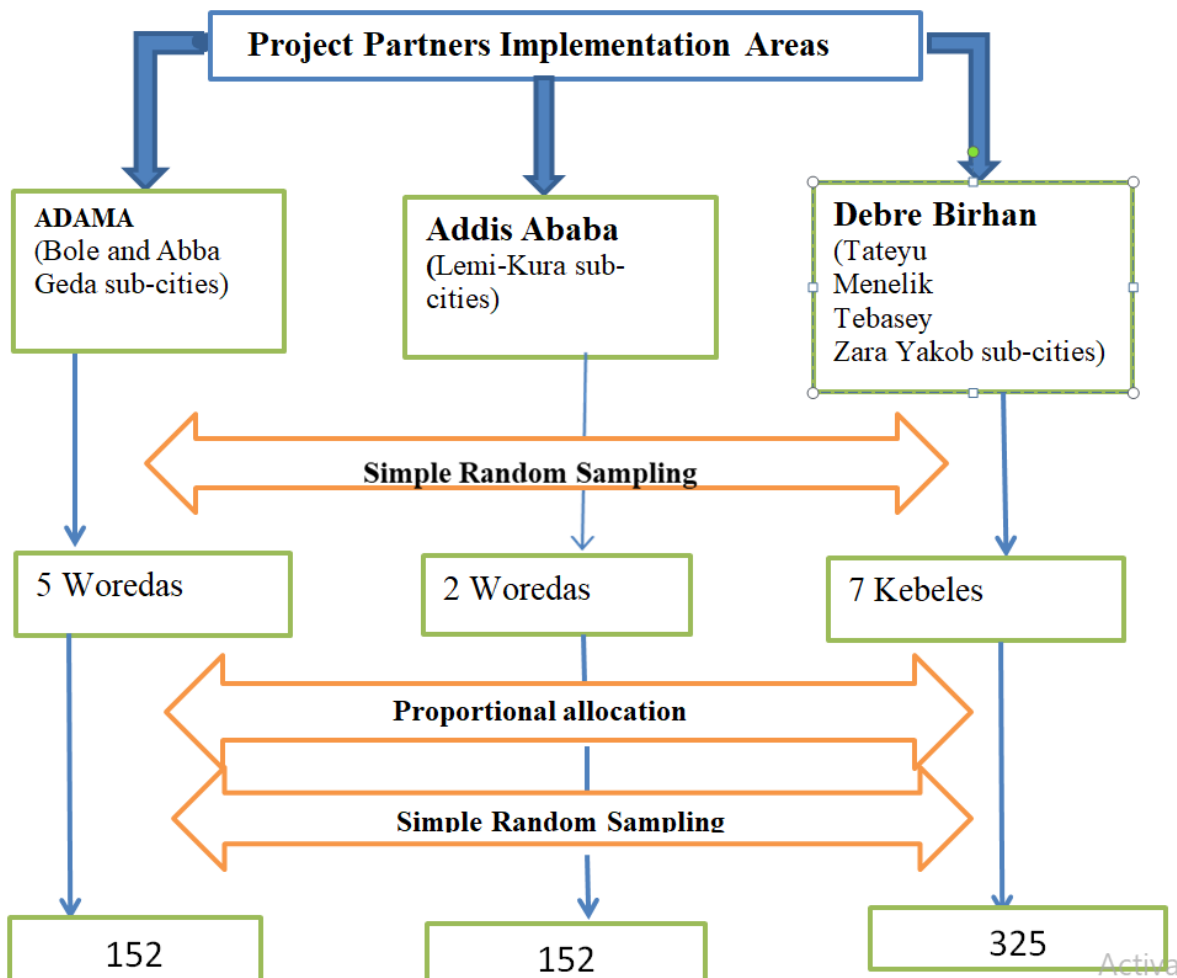


Figure 2: Schematic representation of the sampling procedure for the study of prevalence of undernutrition and its association with maternal depression among economically disadvantaged mothers with children aged 12-36 month in urban setting of Ethiopia, 2022.

## **4.8. Data Collection Tool and Procedure**

The data extracted from the baseline used both standardized and validated questionnaire and anthropometric measures. The questionnaires included socio-demographic and economic characteristics, child characteristics, maternal characteristics, and household characteristics through a face-to-face interview. Height and weight were measured to the nearest 0.1 cm and 0.01 kg, respectively. Height measurements were performed using measuring boards. Children age less than 24 months was measured lying down (recumbent) on the board using a portable measuring board. Measurements were taken twice, and the difference between repeat data was analyzed. Measurements were repeated if weight or height results exceeded the permitted discrepancy (0.5 kg and 1.0 cm, respectively). Finally, the average of both measurements was calculated. All data collection was performed by using the Kobo collection tool.

## **4.9. Study Variables**

### **4.9.1. Dependent / Outcome Variable**

The outcome variables of this study were stunting, wasting and underweight of children aged 12-36 months.

### **4.9.2. Exposure Variables**

Maternal depression was the exposure variable and measured using the Patient Health Questionnaires (PHQ-9).

### **4.9.3. Covariates**

A combination of factors results undernutrition. Several covariates were considered in this study. The variables were selected based on literatures and their availability in surveyed data. This study classified Variables as child related, maternal and parent related and household related factors. The variables included socio-demographic characteristics of the respondent ( age, marital status, education level, and BMI ), child characteristics (age, sex, height, weight, history of illness past two weeks ), and household characteristics (household food insecurity, wealth index, number of children less than 5 years old, number of household members, source of drinking water and type of toilet facility(6,24,36).

## **4.10. Measurement of Variables**

### **4.10.1. Anthropometric Measures**

During survey data collection the height of children aged between 12 months and 23 months was measured in a recumbent position to the nearest 0.1 cm using a board with an upright wooden base and a movable headpiece. Children between 24 and 36 months of age were measured in a standing position of 0.1 cm to the nearest. Besides, the child weight was measured using an electronic digital weight scale for children who were comfortable to measure on their own, and also for children who were uncomfortable to measure on their own, we used the combined mother and child weight and the mother's weight to calculate the child's weight. Measurements were taken in duplicate and checked for differences. If the difference beyond the acceptable value (i.e. 0.5kg for weight and 1.0 cm for length/height), the measurements were repeated twice then the mean value was taken. Finally, the anthropometric indices were derived based on the WHO Child Growth Standard using WHO Anthro 3.2.2 software(51).

### **4.10.2. Maternal Depression Assessment**

It was assessed by using a 9-item Patient Health Questionnaire (PHQ-9) – an instrument widely used to identify symptoms of depression. It consists of 9 occurrence questions followed by 3 frequency-of-occurrence questions in each that assess the individual's mood, sleep pattern, appetite, energy level, thoughts, and behavior over the past two weeks. PHQ-9 score can range from 0 to 27 as each of the 9 items can be scored from 0 (not at all) to 3 (nearly every day). The PHQ-9 tool has been validated in Ethiopia in both urban and rural settings, demonstrating a sensitivity of 86% and specificity of 92%. Based on validation results, cut-off points of 5 and 10 are used for rural and urban areas, respectively. For this study, conducted in an urban areas, a cut-off score of 10 was applied.(52).

### **4.10.3. Household Socio-economic Status**

The household wealth index was constructed using principal component analysis (PCA). It was calculated using available collected data including a household's ownership of selected assets. These assets include radios, televisions, non-mobile telephones, electricity, refrigerators, tables, chairs, beds with cotton or spring mattresses, electric mitad, kerosene lamps, watches, mobile telephones, bicycles, motorcycles, animal-drawn carts, cars or trucks,

Bajaj, livestock. Additionally, housing characteristics such as building materials (including main floor material, main roof material, and main wall material) are considered. Access to utilities and infrastructure is also taken into account, including the source of drinking water, type of toilet facility, type of cooking fuel, ownership of a house, source of drinking water and type of latrine(improved/unimproved were considered(53). A continuous factor score of the Individual household wealth index was categorized as poor, medium, and rich.

#### **4.10.4. Household Food Security Status**

The Household Food Insecurity Access Scale (HFIAS) was used to measure household food insecurity within 4 weeks before the survey. HFIAS consists of nine occurrence questions (yes or no) followed by a frequency-of-occurrence question to assess whether the condition occurred rarely, occasionally, or frequently in the previous 4 weeks. HFIAS question consists of three domains: Anxiety and uncertainty of food supply, insufficient food quality, and insufficient food intake and its physical consequences. A standard scoring technique employed, with frequency scores ranging from 0 to 3, 0 representing nonoccurrence, 1 representing rarely (one or twice in the previous 4 weeks), 2 representing occasionally (3-10 times in the previous 4 weeks), and 3 representing frequently (more than 10 times in the previous month). The total score ranges between 0 and 27. A higher score indicates a severely food-insecure household and a lower value indicates a more food-secure home. However, an individual experienced any of the three most severe conditions (going to bed hungry, running out of food, or going a whole day and night without eating) even as infrequently as rarely classified as severe food insecure(54).

#### 4.11. Operational Definitions

**Stunted:** If children LAZ/HAZ score less than  $|\lt -2|$  and coded as 1. whereas, **not stunted** if children LAZ/HAZ greater than or equal to  $|\geq -2|$  and coded as 0.

**Wasted:** If children WLZ /WHZ score less than  $|\lt -2|$  and coded as 1. whereas, **not wasted** if WLZ /WHZ greater than or equal to  $|\geq -2|$  and coded as 0

**Underweight:** If children WAZ score less than  $|\lt -2|$  and coded as 1. whereas, **not underweight** if children WAZ greater than or equal to  $|\geq -2|$  and coded as 0

**Depressed:** If mother's PHQ-9 score  $\geq 10$  and coded as 1. whereas **not depressed:** mother if mother's PHQ-9  $\lt 10$  and coded as 0.

**Food secured:** Household experiences none of the food insecurity (access) conditions or just experiences worry, but rarely or HFIAS score 0-1 and coded as 0(54).

**Food insecure:** Household experiences mild, moderate, moderate severe, and severe food insecurity conditions or HFIAS score 2-27 and coded as 1(54).

**Respondent age:** Maternal age classified as  $\leq 24$ , 25-29, 30-34 and  $\gt 35$  years(53).

**Child age:** Age of child classified as 12-23 and 24-36 months(51).

**Family size:** Total number of household member who live in household for at least 6 month prior to data collection and classified as family size  $\leq 4$  coded as 0 and  $\gt 4$  coded as 1(53).

**Household under 5 children:** Total number of under five children who live in household for at list 6 month including index case. Classified as  $\lt 2$  coded as 0 and  $\geq 2$  coded as 1(11).

**Drinking water source:** Improved where water from piped distribution, protected well, protected spring, tanker truck and coded as 0. whereas, unimproved were from unprotected dug well, unprotected spring, surface water (river, pond, dam etc.) and coded as 1(53).

**Toilet facility :** Improved toilet including VIP with floor/slab, Pit latrine with slab, Pour-flush to pit/latrine and Composting/dry toilet and coded as 0. whereas, unimproved latrine include Bucket latrine, Pit latrine without slab, and no facility/field/bush and coded as 1(53).

**Irregular job:** Employment that does not provide a stable or consistent source of income.

## **4.12. Data Extraction and Analysis**

### **4.12.1.Data Extraction**

GrOW project, household survey dataset served as the source of data for this analysis. The access to the dataset was insured after receiving permissions from the principal investigator of the project. This was followed by extracting important related child, parents and household factors.

### **4.12.2.Data Processing and Analysis**

The extracted data were exported to IBM SPSS statistic version 27.0.1 to compute statistical analysis. Then the data were re-coded, cleaned, and rechecked to ensure data quality. The anthropometric data were imported to WHO Anthro software to compute anthropometric indices based on standard. Initially, the analysis involved descriptive statistics to describe and summarize the background characteristics of the participant, including child age and sex, maternal age, marital status, educational level, and economic status. Measures including Mean, median, IQR and standard deviation were used to describe the data based on the normality of the data. The results were presented by using numbers and percentages. For visualization, the data were presented using tables and graphs. Binary logistic regression was used to analysis the association of maternal depression with stunting and underweight by adjusting other covariates. First, Bivariable analysis was computed for two outcome variables stunting and underweight separately. Second, Independent variables with p-value less than 0.25 were selected for multivariable analysis.

Finally, Multivariable logistic regression was done to assess the association between maternal depression with stunting and underweight separately after adjusting other covariates. However, regression was not computed for wasting due to lower prevalence which could lead to unreliable result (Annex 2). Model fitness was checked using Hosmer–Lemeshow goodness-of-fit test. The model showed good fit with p-value=0.441 for stunting and p-value=0.216 for underweight. In both case models were adequately fitted ( $p > 0.05$ ). Multicollinearity between independent variables was assessed using the Variance Inflation Factor (VIF), and all variables had VIF values less than 1.5. Variables that showed significant associations were identified based on the adjusted odds ratios (AOR) with a 95% CI and p-value  $< 0.05$ .

#### **4.13. Data Quality Assurance**

In the baseline survey, supervisors and data collectors were chosen based on their educational background, prior experience in conducting surveys, and language proficiency in both Amharic and English. Three days of training were given for data collectors, which focused on the base of the study's purpose, questions, usage of digital data collection tools and research ethics. The questionnaire was designed in English and translated into Amharic for simplicity of understanding by both data collectors and respondents. Prior to data collection, the questionnaire was pretested by conducting a pilot survey in Addis Ababa (outside the actual study areas). Additionally, enumerators received practical training on standardized anthropometric measurement techniques. Calibrated Scales were used to measure height and weight of mothers and children. To minimize missing variables, an open-source digital data collection platform called the Kobo Toolbox app was used to make the variable fields required and use appropriate skipping patterns. Before submitting each questionnaire to the server during field data collection, the supervisors verified that it was complete and consistent. For this analysis, the anthropometric data quality was checked using WHO Anthro Survey Analyzer tool.

#### **4.14. Ethical Considerations**

The baseline survey obtained ethical clearance from the Addis Ababa University College of Health Science institutional review board (IRB: 053/22/SPH) ([Annex 5](#)) and the Addis Ababa City Health Bureau IRB (Ref. No. A/A/13107/227). All the study participants were informed about their voluntary participation, and their right to withdraw from the research at any time without explanation or prejudice. Both verbal and written informed consent were obtained from all participants. Confidentiality was guaranteed, and participants were clearly informed that the information provided was only used for research purposes. Data confidentiality was granted by keeping the anonymity of participants by excluding names and other personal Identifiers. The final result will not be presented or published in way that could compromise confidentiality.

#### **4.15. Result Dissemination Plan**

The result of this study will be submitted and presented to Addis Ababa University College of Health Science, School of Public Health, and department of public nutrition. The findings will be disseminated through publication in a peer-reviewed journal and will be presented at a national and international conference that will be relevant to public health and nutrition. The result will be also submitted and presented to three regional and federal health bureaus, as well as other stakeholders working on maternal and child health.

## 5. Result

In this study, from a total of 629 surveyed data, 627 child-mother pairs of participants were included in this analysis, of these 2(0.2%) data of participants were excluded because of data incompleteness. The response rate of this study was 99.7%. Regarding to outcome variable, from a total of 627 participants of included surveyed data, 620(98.9%) and 619(98.7%) child-mother pairs of participant were included in analysis of stunting and wasting respectively. In brief, 7(1.1%) participants from stunting and 8(1.3%) participants from wasting were excluded from each analysis because of flagged data (Fig 2).

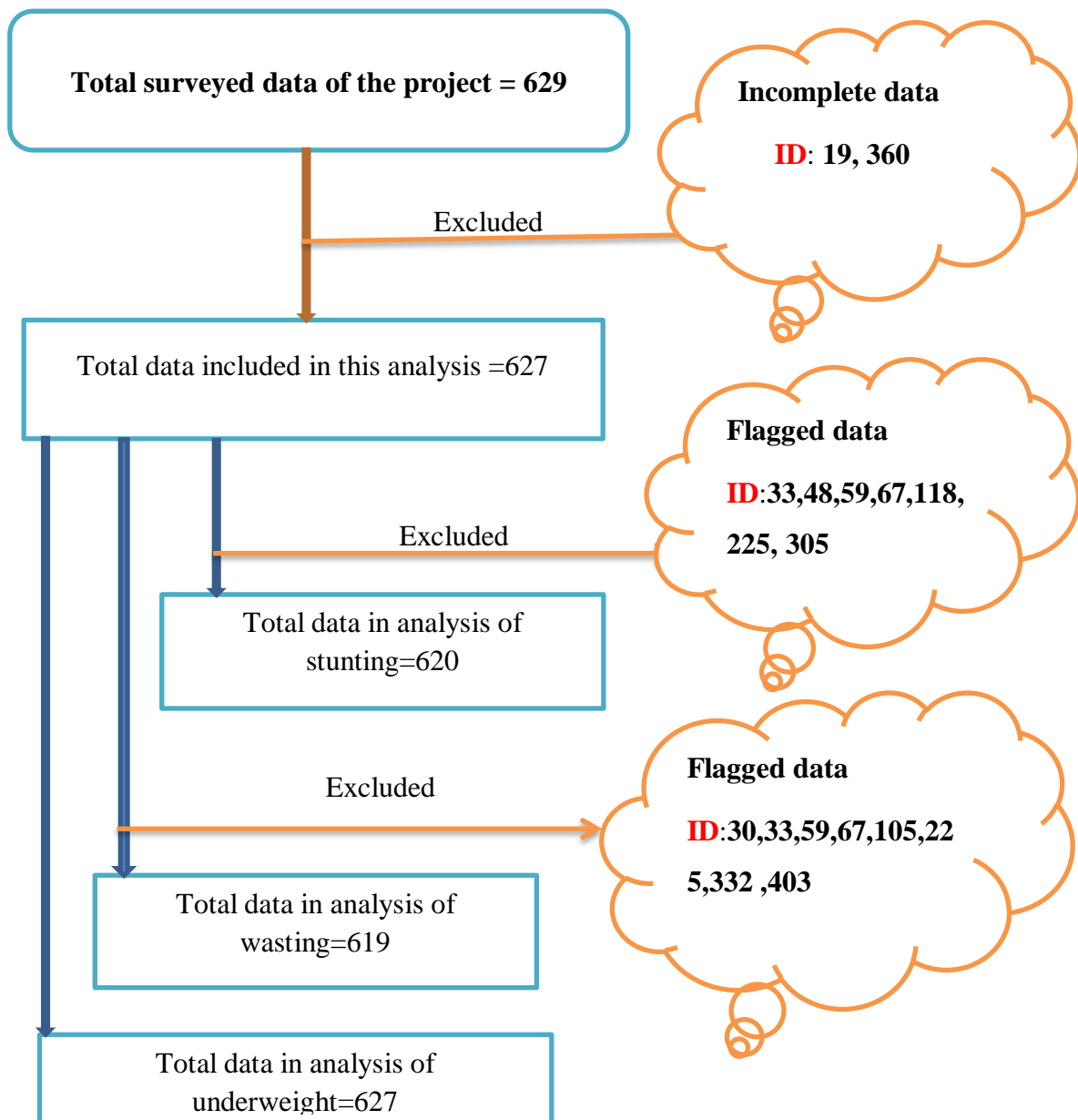


Figure 2: Flow chart on how data filter out for analysis of the study

### **5.1. Socio-demographic and Economic Characteristics of Study Participants**

The median age of children was 26 month, with 355(56.6%) grouped in age 24-36 month. In relation to child sex, the proportion of male to female was nearly equal at 329(52.5%) and 298(47.5%) respectively. The majority of the children 605(96.5%) lived with their biological mother. The median age of the mothers was 28 years, with 256(40.7%) of the respondents grouped in age 25-29 years. The majority of the respondents were married 433(69.1%). Most were followers of the Orthodox religion 531(84.7%). Over half of the respondents (324, 51.7%) were from Debre Birhan. Regarding educational status, 277(44.2%) mothers attained primary education. Nearly one-third of the respondents 174(27.8%) were heads of their households. Additionally, 398(63.5%) children lived in family size  $\leq 4$  household. Over three-fourth 512(81.7%) of the household had less than 2 children under age of 5 years, including index child. Majority 596(96.1%) of children lived in food insecure household. The distribution of household wealth indices among the respondents was nearly proportional (Table 3).

**Table 3: Distribution of the socio-demographic and economic characteristics of study participants in selected urban settings: July to September 2022(N=627)**

Variables	Categories	Frequency	Percent
Residence	Addis Ababa	152	24.2
	Adama	151	24.1
	Debre Birhan	324	51.7
Religion	Orthodox	531	84.7
	Muslim	71	11.3
	Protestant and other	25	4.0
Child sex	Male	329	52.5
	Female	298	47.5
Child age (Months),median(IQR)	26 (20–32)		
	12-23	272	43.4
	24-36	355	56.6
Maternal age (yrs.), median(IQR)	28 (25–33)		
	15-19	11	1.8
	20-24	92	14.7
	25-29	256	40.7
	30-34	134	21.4
	>=35	134	21.4
Marital status	Married	433	69.1
	Single	39	6.2
	Divorced/Separated	134	21.4
	Widowed	21	3.3
Maternal Educational status	Never attained	115	18.3
	Primary	277	44.2
	Secondary and above	235	37.5
Respondent relation to child	Biological mother	605	96.5
	Adopted mother	8	1.3
	Grandmother	13	2.2
Household Headship	Male	453	72.2
	Female	174	27.8
Family size	≤4	398	63.5
	>4	229	36.5
Number of under-5 children	<2	512	81.7
	≥2	115	18.3
Household food security	Food secured	31	4.9
	Food insecure	596	96.1
Wealth index	Poor	209	33.3
	Medium	213	34.0
	Rich	205	32.7

## 5.2. Health, Water, and Sanitation Characteristics of Respondents

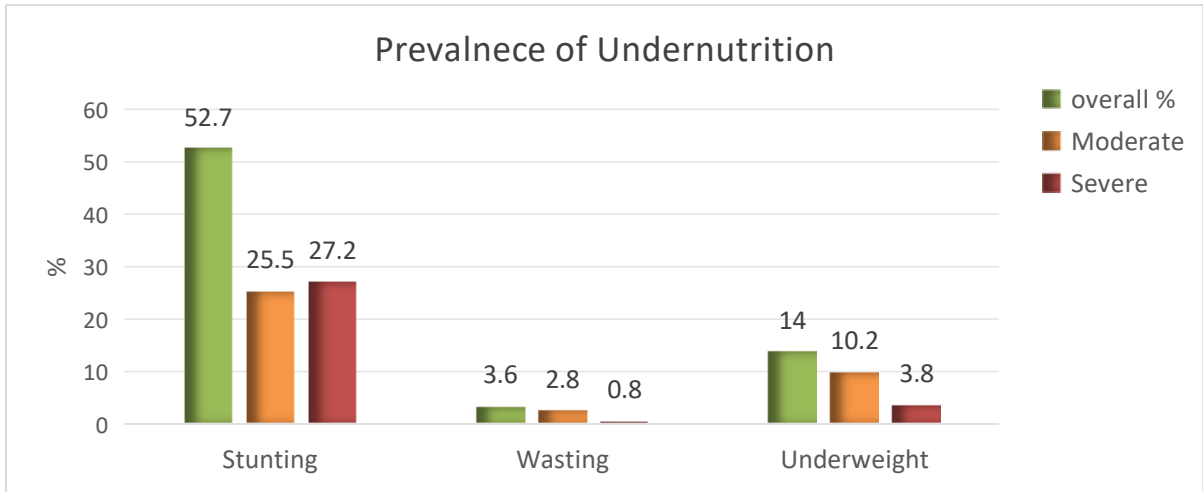
Among 627 mother child pair's surveyed, 254(40.5%) reported illness two weeks preceding the survey. From this, 197(77.5%) experienced fever followed by cough 145(57.1%) and diarrhea 97(38.2%). Regarding maternal nutritional status, 421(67.1%) of mothers had normal weight with in (18.5-24.9kg/m<sup>2</sup>) range. While 141(22.5%) were overweight and 65(10.4%) were underweight. In relation to household characteristics of the respondent, more than three-fifth 389(62.0%) of the participants had improved latrine facility in their household, and 608(97%) used drinking water from improved water source (Table 4).

**Table 4: Distribution of health, water and sanitation characteristics of the study participants in selected urban settings: July to September 2022(N=627)**

Variables	Categories	Frequency	Percent	p-value
Child illness 2 weeks preceding survey	Yes	254	40.5	627
	No	373	59.5	
Cough	Yes	145	57.1	
	No	109	42.9	
Diarrhea	Yes	97	38.2	
	No	157	61.8	
Fever	Yes	197	77.5	
	No	57	22.5	
BMI of the mother	Underweight	65	10.4	
	Normal	421	67.1	
	Overweight	141	22.5	
Drinking water source	Improved	608	97.0	
	Unimproved	19	3.0	
Type of toilet facility	Improved	421389	62.0	
	Unimproved	238	38.0	

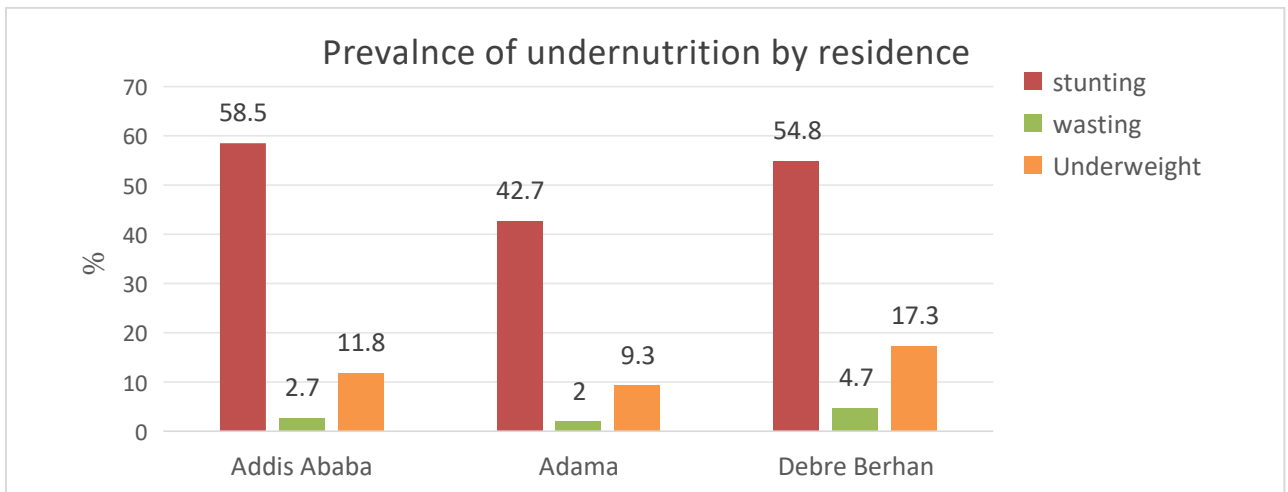
## 5.3. Prevalence of Undernutrition

Based on the analysis result, stunting was the most common form of undernutrition affecting 327(52.7%) children [95% CI: 48.7–56.7]. This was followed by underweight, with prevalence of 88(14%) [95% CI: 11.3–16.7]. Wasting was the least prevalent, affecting 22(3.6%) of children [95% CI: 2.1–5.0]. Regarding severity of undernutrition, 169(27.2%), 24(3.8%), and 5(0.8%) were severely stunted, underweight and wasted respectively (Figure 3).



**Figure 3: The prevalence of undernutrition among children aged 12-36 month in selected urban settings, Ethiopia, 2022, (stunting n=627, wasting n=619 and underweight n=627).**

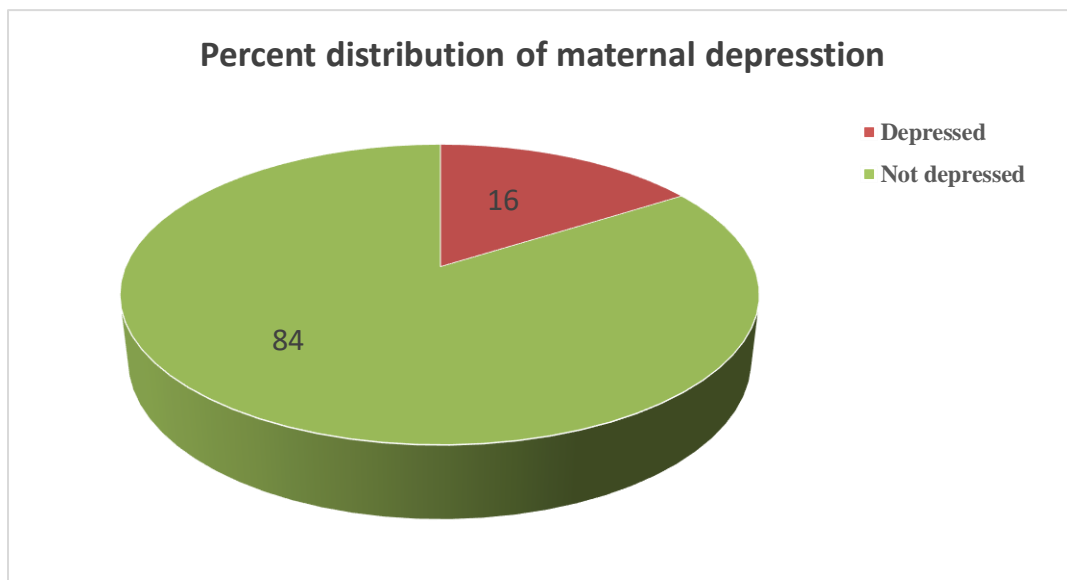
The prevalence of stunting among children in Addis Ababa was 86(58.5%), followed by 18(54.8%) in Debre Birhan and 64(42.7%) in Adama. Underweight prevalence was highest in Debre Birhan at 56(17.3%), compared 18(11.8%) in Addis Ababa and 14(9.3%) in Adama. Wasting rates were low across all three locations, with Debre Birhan at 15 (4.7%), Addis Ababa at 4(2.7%), and Adama at 3(2.0%) (Figure 4).



**Figure 4: The prevalence of undernutrition among children aged 12-36 months by residence in selected urban settings, Ethiopia, 2022,(stunting n=627,wasting n=619,and underweight n=627).**

#### 5.4. Maternal Depression and Its Characteristics

Among the total 627 mothers surveyed, the prevalence of maternal depressions was 100 (16%) [95%CI: 13.1, 18.9) (Figure5). In relation to child age, 45(16.7%) of mothers with children aged 12-23 months were depressed, compared to 55(15.4%) of those with children age 24-36 months. Maternal depression status not meaningfully vary across child age ( $p=0.669$ ). Regarding to maternal age, 46(18%) were reported from 25-29years of age group, followed by 24years and younger 17(16.5%). The lower rate were observed among mothers age 30-34 years 10(14.2%) and  $\geq 30$  years 18(13.4%), with no statistical significant difference ( $p=0.626$ ). In relation to residence, the prevalence of maternal depression was highest in Addis Ababa 43(28.3%), followed by Deber Berhan 54(16.7%), and the lowest in Adama 3(2.0%), with significant difference ( $p=0.001$ ) (Annex1)



**Figure 5: The prevalence of maternal depression among study participant in selected urban setting: Ethiopia July to September 2022(N=627).**

### **5.5. Association between Maternal Depression and Stunting Among Children Aged 12–36 Months**

Based on bivariable analysis, maternal depression was significantly associated with stunting. The unadjusted odds ratio indicated that the odds of stunting were 2.7 times higher among children born from depressed mothers than children born from non-depressed mothers. Similarly, the multivariable analysis showed that maternal depression remained significantly associated with stunting. Children born from depressed mothers had 2.2 times higher odds of stunting as compared to non-depressed mothers after adjusting for potential confounders. Another significant predictor of stunting was child's sex: male children had 1.5 times higher odds of stunting than female children (AOR = 1.49, 95% CI: 1.06-2.11,  $p = 0.023$ ).

Related to child's age: children aged 24-36 months had lower the odds of stunting by 43% as compared to children aged 12-36 months (AOR = 0.57, 95% CI: 0.39–0.79,  $p = 0.001$ ). Additionally, the odds of stunting were three times higher among children who experienced diarrhea compared to their counterparts (AOR=3.15, 95% CI: 1.83-5.43,  $p = 0.001$ ). Maternal educational status was also a significant factor of stunting: children of mothers with no formal education (AOR = 1.98, 95% CI: 1.20-3.24,  $p = 0.007$ ) and mothers with primary education (AOR = 1.59, 95% CI: 1.08-2.32,  $p = 0.018$ ) were more likely stunted than children of mother attained secondary and above education.

Children from large families (>4 members) had 1.7 times higher odds of stunting than children from smaller families (<4members) (AOR = 1.77, 95% CI: 1.22-2.56,  $p = 0.002$ ). Additionally, children from food insecure households had more than twice odds of stunting than secure households (AOR = 2.80, 95% CI: 1.17-6.69,  $p = 0.021$ ). Other factors such as maternal BMI, toilet facility and household headship were not significantly associated with stunting (Table 5).

**Table 5: Association between maternal depression and stunting among children aged 12–36 months in selected urban areas of Ethiopia (2022), adjusted for socio-demographic and health-related confounders.**

Variables	Stunted	Not stunted	COR(95% CI)	AOC(95% CI)	P- value
	N (%)	N (%)			
<b>Maternal depression</b>					
Depressed	71(72.4)	27(27.6)	2.73(1.70-4.40)	2.21(1.33-3.68)	0.001**
Non depressed	256(49.0)	266(51.0)	1	1	
<b>Child sex</b>					
Male	189(58.2)	136(41.8)	1.58(1.15-2.17)	1.49(1.06-2.11)	0.023*
Female	138(46.8)	157(53.2)	1	1	
<b>Child age(months)</b>					
12-23	161(60.5)	105(39.5)	1	1	
24-36	166(46.9)	188(53.1)	0.58(0.42-0.80)	0.57(0.39-0.79)	0.001**
<b>Respondent age(years)</b>					
<24	58(56.3)	45(43.7)	1.23(0.74-2.07)		
25-29	128(51.0)	123(49.0)	1.00(0.65-1.52)		
30-34	73(54.9)	60(45.1)	1.16(0.72-1.88)		
>35	68(51.1)	65(48.9)	1		
<b>Education status</b>					
Never attained	72(63.2)	42(36.8)	2.11(1.33-3.34)	1.98(1.21-3.25)	0.007**
Primary	150(55.1)	122(44.9)	1.15(1.06-2.15)	1.59(1.08-2.32)	0.018*
Secondary and above	105(44.9)	129(55.1)	1	1	
<b>Current Marital status</b>		224			
Married	224(52.2)	205(47.8)	1		
Not married	103(53.9)	88(46.1)	1.07(0.76-1.51)		
<b>HH headship</b>					
Male	224(49.8)	226(50.2)	0.65(0.45-0.92)	0.71(0.48-1.05)	0.087
Female	103(60.6)	67(39.4)		1	
<b>Total under 5 children</b>					
<2	267(52.6)	241(47.4)	1		
≥2	60(53.6)	52(46.4)	1.04(0.69-1.57)		

**Table 5: (Continued....)**

<b>Variables</b>	<b>Stunted</b>	<b>Not stunted</b>	<b>COR(95% CI)</b>	<b>AOC(95% CI)</b>	<b>P- value</b>
	N (%)	N (%)			
<b>Family size</b>					
≤4	187(47.3)	208(52.7)	1	1	
>4	140(62.2)	85(37.8)	1.83(1.31-2.56)	1.77(1.22-2.55)	0.002**
<b>Cough</b>					
Yes	255(53.5)	222(46.5)	0.88(0.61-1.28)		
No	72(50.3)	71(49.7)	1		
<b>Diarrhea</b>					
yes	253(48.2)	272(51.8)	3.79(2.67-6.33)	3.79(2.67-6.33)	0.001**
No	74(77.9)	21(22.1)	1	1	
<b>Fever</b>					
yes	223(52.2)	204(47.8)	1.07(0.76-1.50)		
No	104(53.9)	89(46.1)	1		
<b>Maternal BMI</b>					
Normal	225(54.1)	191(45.9)	1		
Underweight	38(59.4)	26(40.6)	1.24(0.75-2.12)		
Overweight	64(45.6)	76(54.3)	0.72(0.49-1.06)		
<b>Household food security</b>					
Food secured	9(29.0)	22(71.0)	1	1	
Food insecure	318(54.0)	271(46.0)	2.87(1.30-6.34)	2.80(1.17-6.69)	0.021*
<b>Wealth index</b>					
Poor	111(53.9)	95(46.1)	1.05(0.71-1.55)		
Medium	109(51.7)	102(48.3)	0.96(0.65-1.41)		
Rich	107(52.7)	96(47.3)	1		
<b>Toilet Facility</b>					
Improved	189(49.2)	195(50.8)	1	1	
Unimproved	138(58.2)	98(41.5)	1.45(1.05-2.02)	1.31(0.92-1.88)	0.141
<b>Drinking water source</b>					
Improved	317(52.7)	285(47.3)	1		
Unimproved	10(55.6)	8(44.4)	1.12(0.44-2.89)		

COR: Crude Odd Ratio; AOR=Adjusted Odd Ratio; \* indicate significant at p-value less than 0.05 and \*\* indicate significant at p-value less than 0.01; 1=Reference; N= frequency

## **5.6. Association between Maternal Depression and Underweight among Children Aged 12-36 Months**

Maternal depression was not associated with child underweight. From chi-square ( $\chi^2$ ) cross-tabulation results, 15% of children born to depressed mothers were underweight compared to 13.5% of children born to non-depressed mothers. This small difference in proportion aligns with the non-significant bivariate statistical result (COR = 1.10, 95% CI: 0.60–2.00,  $p = 0.76$ ), indicating no strong evidence of association with maternal depression. Due to this non-significant result, maternal depression was excluded from the multivariable analysis. However, several confounding variables showed significant association.

Based on adjusted analysis result, children of mothers who attained primary education had 1.8 times higher odds of underweight compared to those whose mothers had secondary and above (AOR=1.83, 95% CI: 1.08–3.10,  $p = 0.026$ ). Children from underweight mothers had 2.5 times higher odds of underweight than children from mothers with normal BMI. Children from large families (>4 members) had increase odd of underweight than children from smaller families (< 4 members) (AOR =2.21, 95% CI: 1.32-3.69,  $p = 0.002$ ). Children from poor and medium wealth index households had significantly higher odds of stunting compared to children from rich households, with adjusted odds ratios of 3.55 (95% CI: 1.83–5.07,  $p = 0.001$ ) and 2.27 (95% CI: 1.14–4.51,  $p = 0.019$ ) respectively (Table 6).

**Table 6: Association between maternal depression and underweight among children aged 12–36 months in selected urban areas of Ethiopia (2022), adjusted for socio-demographic and health-related confounders.**

Variables	Underweight N(%)	Not underweight N(%)	COR(95% CI)	AOC(95% CI)	P- value
<b>Maternal depression</b>					
Depressed	15(15.0)	85(85.0)	1.10(0.60-2.00)		
Non depressed	73(13.9)	454(86.1)	1		
<b>Child sex</b>					
Male	49(14.9)	279(85.1)	1.17(0.74-1.84)		
Female	39(13.0)	260(87.1)	1		
<b>Child age(months)</b>					
	46(17.0)	224(83.0)	1		
24-36	42(11.8)	315(88.2)	0.65(0.41-1.02)		
<b>Respondent age(years)</b>					
<24	13(12.6)	90(87.4)	0.87(0.41-1.87)		
25-29	37(14.5)	219(85.5)	1.02(0.56-1.86)		
30-34	19(14.2)	115(85.8)	1.00(0.50-1.99)		
>35	19(14.2)	115(85.8)	1		
<b>Education status</b>					
Never attained	11(9.6)	104(90.4)	0.82(0.39-1.71)	0.62(0.28-1.35)	0.231
Primary	50(18.1)	227(81.9)	1.70(1.03-2.81)	1.83(1.08-3.10)	0.026*
Secondary and above	27(11.5)	208(88.5)	1	1	
<b>Current Marital status</b>					
Married	55(12.7)	378(87.3)	1		
Not married	33(17.0)	161(83.0)	1.41(0.88-2.25)		
<b>HH headship</b>					
Male	58(12.8)	395(87.2)	0.71(0.44-1.14)		
Female	30(17.2)	144(82.8)	1		
<b>Total under 5 children</b>					
<2	64(12.5)	448(87.5)	1	1	
≥2	24(20.9)	91(79.1)	1.85(1.10-3.11)	1.53(0.86-2.75)	0.152

**Table 6: (continued...)**

Variables	Underweight	Not underweight	COR(95% CI)	AOC(95% CI)	P-value
	N(%)	N(%)			
<b>Family size</b>					
≤4	44(11.1)	354(88.9)	1	1	
>4	44(19.2)	185(80.8)	1.91(1.22-3.01)	2.21(1.32-3.69)	0.002*
<b>Cough</b>					
Yes	21(14.5)	124(85.5)	1.05(0.62-1.78)		
No	67(13.9)	415(86.1)	1		
<b>Diarrhea</b>					
yes	17(17.5)	80(82.5)	1.37(0.77-2.45)		
No	71(13.4)	459(86.6)	1		
<b>Fever</b>					
yes	28(14.2)	169(85.8)	1.02(0.63-1.66)		
No	60(14.0)	370(86.0)	1		
<b>Maternal BMI</b>					
Normal	59(14.0)	363(86.0)	1	1	
Underweight	17(26.6)	47(73.4)	2.23(1.20-4.13)	2.59(1.32-5.07)	0.001**
Overweight	12(8.5)	129(91.5)	0.57(0.30-1.10)	0.54(0.28-1.06)	0.074
<b>HH food security</b>					
Food secured	3(9.7)	28(90.3)	1		
Food insecure	85(14.3)	511(85.7)	1.56(0.46-5.22)		
<b>Wealth index</b>					
Poor	44(21.0)	166(79.0)	3.60(1.90-6.80)	3.55(1.83-5.07)	0.001**
Medium	30(14.1)	183(85.9)	2.23(1.14-4.33)	2.27(1.14-4.51)	0.019*
Rich	14(6.9)	190(93.1)	1		
<b>Toilet Facility</b>					
Improved	46(11.8)	343(88.2)	1	1	
Unimproved	42(17.6)	196(82.4)	1.60(1.02-2.52)	1.40(0.86-2.17)	0.172
<b>Drinking water source</b>					
Improved	86(14.1)	523(85.9)	1		
Unimproved	2(11.1)	16(88.9)	0.76(0.17-3.37)		

COR: Crude Odd Ratio; AOR=Adjusted Odd Ratio; \* indicate significant at p-value less than 0.05 and \*\* indicate significant at p-value less than 0.01; 1=Reference; N= frequency

## 6. Discussion

The study found that the prevalence of stunting was 52.7%. According to WHO classification, this result represents a critically significant public health problem in the study area. This finding is consistent with study done in Mozambique, which reported a stunting prevalence of 52% (29). Similarly, the prevalence observed in this study is nearly consistent with a study carried out in the Borgu local government of Nigeria, where the prevalence was 47.6%(31). Similarly, this study result nearly consistent with various studies done in Ethiopia, in Bahir Dar (46.2%) (24), in Haramaya (46%)(36), and in Kersa and Omo Nada districts of Jimma Zone (47.6%) (42).

The prevalence of stunting in this study was higher than a pooled result from studies conducted in Africa region, which was 30%. It was also far higher than the global prevalence of childhood stunting, estimated at 22.3% (1). Moreover, The stunting rate in this study exceeded from those reported in several other countries, including Bangladesh 31.3% (33), Ghana (28.2%) (35), Peru (26%) (30), and Vietnam (17%) (37). These discrepancies may be due to socio-economic and cultural difference. The former countries classified as low-middle to upper-middle income countries, where access to health care, sanitation service and child feeding practice are generally better than the current study area.

The present study reported a higher prevalence of stunting compared to the 2023 National food and nutrition strategic baseline report, which indicated a national rate 39% (11). While the national report was based on a representative sample across various socioeconomic groups, the current study focused on children of economically disadvantaged mother in an urban setting. This targeted population may explain the current higher prevalence. Similarly, the stunting rate in this study was also higher than findings from other studies, such as those from Sikela(36.6%) (34), Meket (30.6%) (21)), and Haramay district (37%) (28). The discrepancy may be attributed to variation in the study participants. Unlike those studies, the present study focused solely on economically disadvantaged mothers, where food insecurity and the risk of infection are high.

The prevalence of both underweight and wasting in this study was 14% and 3.6% respectively. This study finding is nearly consistent with study conducted in Northern Ghana, which reported a prevalence of underweight at 16% (7). Additionally, the underweight prevalence found in this study finding is comparable to the pooled estimate across the African

region, reported at 17.1%. This study results also lower than studies conducted in South-East Ethiopia (27, 9.7%) (2) and Tigray (23.9%, 10.6%) (38). The possible explanations for this discrepancy could be that the present study was conducted exclusively in urban areas, while the former studies were done in rural areas, where evidences suggest that the risk of acute malnutrition is higher (27,38). Additionally, in the current study majority of the households had access to improve drinking water source and toilet facilities, which can reduce the risk of infection, which may contribute to lower the prevalence.

The key exposure variable of this study was maternal depression which only focused in children first to third year of life. In this study approximately one out of six mothers (16%) experienced maternal depression. This result is consistent with previous studies conducted in (16.8%) Ghana(43) and (16.7%) Bangladesh(55) . The present study result was lowers than the studies done in Bangladesh (49%) (37), Pakistan (40%) (45), Vietnam (31%) (37) and Nigeria (21.2) (18). The possible explanation for this difference may include variation in screening tool used to screen maternal depression, difference in age range of children studied, variations in the study design and used different cut off score. The studies in Pakistan and Nigeria used EPDS with cut-off point  $\geq 13$ ; Bangladesh and Vietnam used Self Report Questioner (SRQ-25) with cut-off point  $\geq 7$ . However, this study used PHQ-9 with cut-off point  $\geq 10$ ; even not included mild depression this may lower the prevalence of the present study.

A current study reported lower prevalence of maternal depression compared to study done in University of Gondar specialized hospital, which reported 36.4% among mother of children with undernutrition (47). The possible explanation for higher report of the former study may be mother's exposure to stressful hospital environment. This could increase the likelihood of maternal depression. Similarly, this study finding is also lower than that of a study conducted in Meket, which reported maternal depression prevalence of 22.8%(21). This variation may be due to different in assessment tool, variation in study area and child age group. The former study used EPDS assessment scale and done in child age 5 to 10 month in rural area.

The major result finding of this study was a significant association between maternal depression and childhood stunting but not with underweight. Maternal depression increase the odds of stunting by 2.21 times compared to non-depressed mothers (95% CI: 1.33-3.68:  $p = 0.001$ ). The association was persisted even after controlling potential confounders.

This result finding consistent with a case control study done in Uganda. It showed that depressed mothers increase the risk of stunting by 2.4 times than non-depressed mothers (95% CI:  $p = 0.003$ ) (46). Similarly, a case control study done in Pakistan revealed that maternal depression were 3.15 times more likely to have stunted children compared to those of non-depressed mothers (45). A similar study done in Peru indicated that maternal depressions increase likelihood of moderate to severe child stunting by 2.67 times than non-depressed after adjusting confounders (30). Additionally, an adjusted regression from a study conducted in Northern Nigeria showed that children of depressed mothers were nearly three times more likely to be stunted compared to children of non-depressed mothers (7).

A cohort study in India found that children born to depressed mothers have 1.7 times higher odds of stunting when compared to children born to non-depressed mothers(56). Another study done in low-income setting of Bangladesh also revealed that high level of maternal depression increased odds of childhood stunting by 1.8 times compared to non-depressed mothers(55). Other studies in Malaysia(44) and Vietnam(37) also support this result finding. In Ethiopia , studies done in west of Ethiopia and Meket revealed the significant association of maternal depression with child stunting(21,40). The possible explanation for this association may be maternal depression could reduce mother ability to maintain hand hygiene practice, which increase the risk of childhood illness(10). It also contribute to poor feeding practice and weaken mother-child bonding (21,44). Depressed mother also more likely to be unemployed and unable to stay at work place during work time (54). Thus could directly or indirectly relate to food inadequacy, which in turn leads to stunting.

This study result was inconsistent with the study done in Nepal which showed no association between maternal depressions and child stunting (9).The possible reason of inconsistency is socio-economic difference, participants in former study were from both urban and rural area, and the prevalence of stunting in later study was 5%, which may have limited the ability to detect an association. Another study from Northern Ghana also reported no association between maternal depression and child nutritional status (48). This heterogeneity in findings may be due to the availability of specialized social support for depressed mothers in Ghana, which could hinder the negative effects of depression on child nutrition. Additionally, this study also inconsistent result with studies done in Ethiopia(37,41). These discrepancies may be related to different in assessment tool, different scale cut-off point; the later studies also focused on child age less than 12 month.

## **7. Strength and Limitation of the Study**

The study utilized entire sample size of the project above minimum required sample size, which boost statistical power and enhance reliability. The lower missed data suggesting strong participant engagement during data collection, which increases statistical confidence. The use of validated PHQ-9 tool cut off point to assess maternal depression also enhances reliability of the result. Despite of this strength, this study has some limitations that should be considered during interpretation of the results. First, the cross sectional design of the study may limit ability to explain causal relationship between maternal depression and child undernutrition. Therefore, we recommend future researches using longitudinal design to establish causal relationship. Second, the study participants of this research were economically disadvantaged mothers of children aged 12-36 months, therefore generalizing the result to general population should be made with caution.

Third, Self-reporting questioner to assess maternal depression and household food security may have led to recalling and social desirable bias. However, to minimize biases, we used standardized and validating tool, maintained confidentiality and employing trained data enumerators during data collection. Additionally, we recommend future research by consider clinical assessment as additional method to assess maternal depression. Fourth, Child feeding practices were also not assessed; this may have introduced unmeasured confounding in the present association. For this recommend, future researches include child-feeding practice to understand the role in association of maternal depression and child undernutrition.

## **8. Conclusion and Recommendations**

### **8.1. Conclusion**

Based on this finding, undernutrition remains a major public health concern in the study areas. More than half (52.7%) of children were stunted, followed by underweight at 14%, while the prevalence of wasting was relatively low (3.8%). This study also found significant association between maternal depression and stunting, where children born to depressed mothers had more than twice odds of being stunted compared to children born to non-depressed mothers. However, no significant association was found between maternal depression and underweight. This result could contribute to growth evidence on potential risk of maternal depression on child growth. Therefore, this study underscore the integration of maternal mental health screening and support services into existing maternal and child health and nutrition programs, especially at the community and primary healthcare levels. These will improve early detection and management of depression and ultimately enhance child nutritional outcomes.

### **8.2. Recommendations**

Based on this finding, our recommendations are forward to the following concerned body.

1. Integrate maternal mental health services into maternal and child health programs at primary healthcare levels to ensure early identification and support.
2. Scale up community advocacy and awareness on maternal mental health through sustained campaigns and education at the community level.
3. Incorporate maternal mental health into nutrition programs to provide a more holistic approach to maternal and child well-being.
4. Conduct future research using mixed longitudinal study with clinical approach to better understand maternal mental health over time.
5. Highlight the necessity of a large and diverse sample size to enhance generalizability of findings as nation level.

## References

1. World Health Organization, United Nations Children's Fund and World Bank Group joint child malnutrition estimates: Levels and trends in child malnutrition: 2023 [Internet]. [Cited 2024 Jul 17]. Available from: <https://www.who.int>
2. Endris N, Asefa H, Dube L. Prevalence of Malnutrition and Associated Factors among Children in Rural Ethiopia. *Biomed Res Int*. 2017; 2017:6587853. doi: 10.1155/2017/6587853. Epub 2017 May 17. PMID: 28596966; PMCID: PMC5449753.
3. United Nation. Sustainable Development Goal Report 2020. New York, United Nations; 2020 [Internet]. [Cited 2025 Jun 1]. Available from: <https://sdgs.un.org/>
4. United Nations Children's Fund (UNICEF). UNICEF Conceptual Framework on the Determinants of Maternal and Child Nutrition, 2020. [Internet]. New York (NY): UNICEF; 2020 [cited 2024 Jul 17]. Available from: <https://www.unicef.org/documents/conceptual-framework-nutrition>
5. World Health Organization. World mental health report: transforming mental health for all. Geneva: World Health Organization; 2022. 296 p. Available from: <http://apps.who.int/iris>
6. Zeleke TA, Getinet W, Tadesse Tessema Z, Gebeyehu K (2021) Prevalence and associated factors of post-partum depression in Ethiopia. A systematic review and meta-analysis. *PLoS ONE* 16(2): e0247005. <https://doi.org/10.1371/journal.pone.0247005>.
7. Wemakor A, Mensah KA. Association between maternal depression and child stunting in Northern Ghana: a cross-sectional study. *BMC Public Health*. 2016 Aug 24; 16(1):869. doi: 10.1186/s12889-016-3558-z. PMID: 27557725; PMCID: PMC4997709.
8. Khan AM. Maternal mental health and child nutritional status in an urban slum in Bangladesh: A cross-sectional study. *PLOS Glob Public Health*. 2022 Oct 19;2(10):e0000871. doi: 10.1371/journal.pgph.0000871. PMID: 36962625; PMCID: PMC10021263.
9. Adhikari RP, Williamson R, Sparling TM, Ferguson E, Cunningham K. Parental depression and nutrition: findings from a cross-sectional household survey in Nepal.

- Public Health Nutr. 2020 Nov;23(16):2983-2993. doi: 10.1017/S1368980020000968. Epub 2020 Jun 11. PMID: 32524940; PMCID: PMC10200597.
10. Miller LC, Neupane S, Sparling TM, Shrestha M, Joshi N, Lohani M, Thorne-Lyman A. Maternal depression is associated with less dietary diversity among rural Nepali children. *Matern Child Nutr.* 2021 Oct; 17(4):e13221. doi: 10.1111/mcn.13221. Epub 2021 Jun 15. PMID: 34132034; PMCID: PMC8476425.
  11. Ethiopian Public Health Institute. National Food and Nutrition Strategy Baseline Survey Report 2023. [Internet ]. Addis Ababa: Ethiopian Public Health Institute; 2023 [cited 2024 Dec 17]. Available from: [https://ephi.gov.et/wp-content/uploads/2023/03/FNS\\_baseline\\_survey\\_preliminary\\_findings.pdf](https://ephi.gov.et/wp-content/uploads/2023/03/FNS_baseline_survey_preliminary_findings.pdf)
  12. World Food Programme (WFP). The Cost of Hunger in Africa series [Internet]. Rome: WFP; 2020 [cited 2024 Jul 20]. Available from: <https://www.wfp.org/publications/cost-hunger-africa-series>
  13. Ekholuenetale M, Barrow A, Ekholuenetale CE, Tudeme G. Impact of stunting on early childhood cognitive development in Benin: evidence from Demographic and Health Survey. *Egypt Pediatr Assoc Gaz.* 2020 Dec;68(1):31.
  14. Gelaye B, Rondon MB, Araya R, Williams MA. Epidemiology of maternal depression, risk factors, and child outcomes in low-income and middle-income countries. *Lancet Psychiatry.* 2016 Oct 1;3(10):973–82.
  15. United Nations Children’s Fund, World Health Organization, World Bank Group. Levels and trends in child malnutrition: UNICEF/WHO/The World Bank Group joint child malnutrition estimates: key findings of the 2021 edition [Internet]. Geneva: World Health Organization; 2021 [cited 2024 Dec 10]. Available from: <https://www.who.int/publications/i/item/9789240025257>
  16. Zerga AA, Tadesse SE, Ayele FY, Ayele SZ. Impact of malnutrition on the academic performance of school children in Ethiopia: A systematic review and meta-analysis. *SAGE Open Med.* 2022 Sep 20; 10:20503121221122398. doi: 10.1177/20503121221122398. PMID: 36161209; PMCID: PMC9500247.

17. Putri AS, Wurisastuti T, Suryaputri IY, Mubasyiroh R. Postpartum Depression in Young Mothers in Urban and Rural Indonesia. *J Prev Med Pub Health*. 2023 May 7;56(3):272–81.
18. Folayan MO, Oginni AB, El Tantawi M, Adeniyi A, Alade M, Finlayson TL. Association between maternal decision-making and mental health and the nutritional status of children under 6 years of age in sub-urban Nigeria. *BMC Public Health*. 2023 Jun 15;23(1):1159. doi: 10.1186/s12889-023-16055-2. PMID: 37322502; PMCID: PMC10268393.
19. Emerson JA, Caulfield LE, Kishimata EM, Nzanzu JP, Doocy S. Mental health symptoms and their relations with dietary diversity and nutritional status among mothers of young children in eastern Democratic Republic of the Congo. *BMC Public Health*. 2020 Dec;20(1):225.
20. Mhamane S, Karande Y, Ramanathan V. Post-partum depression: Its association with IYCF practices and effect on child growth indicators in urban slums of Mumbai, India. *Clin Epidemiol Glob Health*. 2024;28:101667. doi:10.1016/j.cegh.2024.101667.
21. Anato A, Baye K, Tafese Z, Stoecker BJ. Maternal depression is associated with child undernutrition: A cross-sectional study in Ethiopia. *Matern Child Nutr*. 2020 Jul;16(3):e12934. doi: 10.1111/mcn.12934. Epub 2019 Dec 12. PMID: 31833231; PMCID: PMC7296785.
22. Bennett IM, Schott W, Krutikova S, Behrman JR. Maternal mental health, and child growth and development, in four low-income and middle-income countries. *J Epidemiol Community Health*. 2016 Feb;70(2):168-73. doi: 10.1136/jech-2014-205311. Epub 2015 Sep 10. PMID: 26359503; PMCID: PMC5392254.
23. Parida, S. P., Bhatia, V., Giri, P. P., Behera, B. K., Alekhya, G., & Choudhary, P. (2021). Epidemic of undernutrition during COVID-19 pandemic. *International Journal of Research in Medical Sciences*, 9(3), 923–929. <https://doi.org/10.18203/2320-6012.ijrms20210903>.
24. Tedla M, Malede A, Berhan Z. Prevalence and associated factors of malnutrition among under-five children living in slum areas of Bahir Dar Town, Ethiopia. *Pan Afr Med J*.

2024 Apr 9; 47:176. doi: 10.11604/pamj.2024.47.176.33439. PMID: 39036031; PMCID: PMC11260059.

25. Demirchyan A, Petrosyan V, Sargsyan V, Hekimian K. Predictors of Stunting Among Children Ages 0 to 59 Months in a Rural Region of Armenia. *J Pediatr Gastroenterol Nutr.* 2016 Jan;62(1):150–6.
26. Abdilahi SA, Osman MO, Abate KH. Epidemiology of stunting in children aged 6-59 months, an unresolved chronic nutritional problem in Ethiopia: A systematic review and meta-analysis. *SAGE Open Med.* 2024 Jun 13;12:20503121241259862. doi: 10.1177/20503121241259862. PMID: 38881594; PMCID: PMC11179513.
27. Tadesse S, Alemu Y. Urban-rural differentials in child undernutrition in Ethiopia. *Int J Nutr Metab.* 2015;7(1):15-23. doi:10.5897/IJNAM2014.0171.
28. Abdella F, Atomsa G, Geleto A. Prevalence of malnutrition among children aged 6–59 months in Haramaya District, Oromia, Ethiopia. *J Biom Biostat.* 2017;8. doi:10.4172/2155-6180.1000357.
29. García Cruz L, González Azpeitia G, Reyes Suárez D, Santana Rodríguez A, Loro Ferrer J, Serra-Majem L. Factors Associated with Stunting among Children Aged 0 to 59 Months from the Central Region of Mozambique. *Nutrients.* 2017 May 12;9(5):491.
30. Villagaray-Pacheco N, Villacorta-Landeo P, Mejía-Guerrero L, Virú Loza MA. Association between maternal depression and the nutritional status of children under five years old in Peru: An analysis of the Demographic and Health Survey. *medRxiv [Preprint].* 2021 Nov. doi:10.1101/2021.10.31.21265721.
31. Emmanuel A, Juliet NO, Adetunji E, Gotodok K. Malnutrition and associated factors among under-five children in a Nigeria Local Government Area. *Int J Contemp Med Res.* 2016;3(6):1766-8.
32. Kalinda C, Phri M, Qambayot MA, Ishimwe MCS, Gebremariam A, Bekele A, Wong R. Socio-demographic and environmental determinants of under-5 stunting in Rwanda: Evidence from a multisectoral study. *Front Public Health.* 2023 Mar 14;11:1107300. doi: 10.3389/fpubh.2023.1107300. PMID: 36998275; PMCID: PMC10043183

33. Shuvo SD, Khatun A, Zahid MA, Josy MSK, [fifth author's name if available]. Exploring the factors associated with undernutrition among 6–59 months children residing in slum areas of the south-western region, Bangladesh. *J Hunger Environ Nutr.* 2024;20(3):1-21. doi:10.1080/19320248.2024.2384996.
34. Mulu E, Mengistie B. Household food insecurity and its association with nutritional status of under five children in Sekela District, Western Ethiopia: a comparative cross-sectional study. *BMC Nutr.* 2017 Apr 8;3:35. doi: 10.1186/s40795-017-0149-z. PMID: 32153815; PMCID: PMC7050715.
35. Ali Z, Saaka M, Adams AG, Kamwininaang SK, Abizari AR. The effect of maternal and child factors on stunting, wasting and underweight among preschool children in Northern Ghana. *BMC Nutr.* 2017 Apr 4;3:31. doi: 10.1186/s40795-017-0154-2. PMID: 32153813; PMCID: PMC7050753.
36. Yisak H, Gobena T, Mesfin F. Prevalence and risk factors for under nutrition among children under five at Haramaya district, Eastern Ethiopia. *BMC Pediatr.* 2015 Dec 16;15:212. doi: 10.1186/s12887-015-0535-0. PMID: 26675579; PMCID: PMC4682239.
37. Nguyen PH, Saha KK, Ali D, Menon P, Manohar S, Mai LT, Rawat R, Ruel MT. Maternal mental health is associated with child undernutrition and illness in Bangladesh, Vietnam and Ethiopia. *Public Health Nutr.* 2014 Jun;17(6):1318-27. doi: 10.1017/S1368980013001043. Epub 2013 May 3. PMID: 23642497; PMCID: PMC10282455
38. Woldeamanuel BT, Tesfaye TT. Risk Factors Associated with Under-Five Stunting, Wasting, and Underweight Based on Ethiopian Demographic Health Survey Datasets in Tigray Region, Ethiopia. *J Nutr Metab.* 2019 Dec 20;2019:6967170.
39. Tesfaw LM, Dessie ZG. Multilevel multivariate analysis on the anthropometric indicators of under-five children in Ethiopia: EMDHS 2019. *BMC Pediatr.* 2022 Dec;22(1):162.
40. Girma S, Fikadu T, Abdisa E. Maternal Common Mental Disorder as Predictors of Stunting among Children Aged 6-59 Months in Western Ethiopia: A Case-Control Study. *Int J Pediatr.* 2019; 2019:1.

41. Abera M, Berhane M, Grijalva-Eternod CS, Abdissa A, Abate N, Hailu E, et al. Maternal mental health and nutritional status of infants aged under 6 months: A secondary analysis of a cross-sectional survey. Sayeed A, editor. PLOS Glob Public Health. 2024 Sep 13;4(9):e0003139.
42. Soboksa N, Gari SR, Beyene A, Alemu BM. Association of childhood undernutrition with water supply, sanitation and hygiene interventions in Kersa and Omo Nada districts of Jimma Zone, Ethiopia: A case-control study. Res Square [Preprint]. 2020 Feb. doi:10.21203/rs.2.24114/v2.
43. Saeed N, Wemakor A. Prevalence and determinants of depression in mothers of children under 5 years in Bole District, Ghana. BMC Res Notes. 2019 Jul 1;12(1):373.
44. Chee Din MA, Mohd Fahmi Teng NI, Abdul Manaf Z. Maternal depression and child feeding practices: Determinants to malnutrition among young children in Malaysian rural area. Womens Health (Lond). 2023 Jan-Dec;19:17455057221147800. doi: 10.1177/17455057221147800. PMID: 36633122; PMCID: PMC9982386.
45. Saeed Q, Shah N, Inam S, Shafique K. Maternal depressive symptoms and child nutritional status: A cross-sectional study in socially disadvantaged Pakistani community. J Child Health Care. 2017 Sep;21(3):331-342. doi: 10.1177/1367493517721063. Epub 2017 Aug 1. PMID: 29119823.
46. Ashaba S, Rukundo GZ, Beinempaka F, Ntaro M, LeBlanc JC. Maternal depression and malnutrition in children in southwest Uganda: a case control study. BMC Public Health. 2015 Dec 28;15:1303. doi: 10.1186/s12889-015-2644-y. PMID: 26712120; PMCID: PMC4693407.
47. Yenealem B, Nenko G, Nakie G, Getnet B. Prevalence and associated factors of maternal depression among mothers of children with undernutrition at comprehensive specialized hospitals in northwest, Ethiopia, 2023: a cross-sectional study [Internet]. 2024 [cited 2025 Jun 1]. Available from: <https://www.researchsquare.com/article/rs-3785410/v1>
48. Wemakor A, Iddrisu H. Maternal depression does not affect complementary feeding indicators or stunting status of young children (6-23 months) in Northern Ghana. BMC Res Notes. 2018 Jun 25;11(1):408.

49. Dessie ZB, Fentie M, Abebe Z, Ayele TA, Muchie KF. Maternal characteristics and nutritional status among 6–59 months of children in Ethiopia: further analysis of demographic and health survey. *BMC Pediatr.* 2019 Mar 20;19(1):83.
50. Ararsa GG, Getachew MT, Diddana TZ, Alemayehu FR. Prevalence of undernutrition and associated factors among children aged 6–23 months: a cross-sectional analysis from South-East Ethiopia. *J Nutr Sci.* 2023;12:e127.
51. World Health Organization. WHO child growth standards: length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: methods and development. Geneva: World Health Organization; 2006. 312 p. [Internet]. [Cited 2024 Dec 23]. Available from: <https://www.who.int/publications/i/item/924154693X>.
52. Gelaye B, Williams MA, Lemma S, Deyessa N, Bahretibeb Y, Shibre T, et al. Validity of the Patient Health Questionnaire-9 for Depression Screening and Diagnosis in East Africa. *Psychiatry Res.* 2013 Dec 15;210(2):10.1016/j.psychres.2013.07.015.
53. Ethiopian Public Health Institute (EPHI), ICF. Ethiopia mini demographic and health survey 2019: final report [Internet]. Maryland, USA: EPHI/ICF; 2021 [cited 2024 Dec 23]. Available from: <https://www.dhsprogram.com/pubs/pdf/FR363/FR363.pdf>
54. Coates J, Swindale A, Bilinsky P. Household Food Insecurity Access Scale (HFIAS) for measurement of food access: indicator guide. Version 3 [Internet]. Washington, DC: Food and Nutrition Technical Assistance III Project (FANTA), FHI 360; 2007 Aug [cited 2024Dec23]. Available from: [https://www.fantaproject.org/sites/default/files/resources/HFIAS\\_ENG\\_v3\\_Aug07.pdf](https://www.fantaproject.org/sites/default/files/resources/HFIAS_ENG_v3_Aug07.pdf)
55. Karim KMR, Islam MH, Tasnim T, Akter S. Child undernutrition is associated with maternal mental health and other sociodemographic factors in low-income settings in Dhaka, Bangladesh. Fufa DA, editor. *PLOS One.* 2025 May 2;20(5):e0322507.
56. Shriyan P, Khetrapal S, Van Schayck OCP, Babu GR. Maternal depressiveness and infant growth outcomes: Findings from the MAASTHI cohort study in India. *J Psychosom Res.* 2023 Jul; 170:111378.

## Annexes

### 8.3. Annex 1: The Prevalence of Maternal Depression by Residence, Maternal age, and Child age

Variables	Depressed (n=100)		Not depressed (n=527)		Survey total	Asymp sig(2-sided)
	N	%	N	%		p-value
Child age					627	0.669
12-23	45	16.7	225	83.3		
23-36	55	15.4	302	84.6		
Maternal age						0.626
≤24	17	16.5	86	83.5		
25-29	46	18.0	210	82.0	627	
30-34	19	14.2	115	85.8		
≥35	18	13.4	116	86.6		
Residence					627	0.001
Adama	3	2.0	148	98.0		
Addis Ababa	43	28.3	109	71.7		
Deber Berhan	54	16.7	270	83.3		

\*P-value, from  $\chi^2$  test of association, significant at p-value less than 0.05

#### 8.4. Annex 2: Cross tabulation result of wasting among children aged 12-36 months

Variables	Categories	Wasting		Not wasting		p-value
		N	%	No	%	
Maternal depression	Depressed	4	2.4	93	95.9	0.461*
	Non depressed	18	3.4	504	96.6	
Child sex	Male	12	3.7	313	96.3	0.845
	Female	10	3.4	284	96.4	
Child age(months)	12-36	12	4.5	254	95.5	0.265
	24-36	10	2.8	343	97.2	
Respondent age(years)	<24	2	1.9	101	98.1	0.570*
	25-29	12	4.7	241	95.3	
	30-34	3	2.3	128	97.7	
	>35	5	3.8	127	96.2	
Education status	Never attained	4	3.5	110	96.5	0.211
	Primary	6	2.2	256	97.8	
	Secondary and above	12	5.1	222	94.9	
Current Marital status	Married	17	4.0	413	96.0	0.418
	Not married	5	2.6	184	97.4	
HH headship	Male	4	2.4	166	97.6	0.321
	Female	18	4.0	413	96.0	
Total under 5 children	<2	17	3.4	489	96.6	0.373*
	≥2	5	4.4	108	95.6	
Family size	≤4	10	2.5	384	97.5	0.071
	>4	12	5.3	213	94.7	
Cough	Yes	6	4.2	137	95.8	0.636
	No	16	3.4	460	96.6	
Diarrhea	Yes	6	6.3	89	93.7	0.129*
	No	16	3.1	508	96.9	
Fever	Yes	7	3.6	187	96.4	0.961
	No	15	3.5	410	96.5	
Maternal BMI	Normal	13	3.1	403	96.9	0.171*
	Underweight	5	7.8	59	92.2	
	Overweight	4	2.9	135	97.1	
HH food security	Food secured	3	9.7	28	90.3	0.092*
	Food insecure	19	3.2	569	96.8	
Wealth index	Poor	12	5.8	194	94.2	0.029
	Medium	8	3.8	202	96.2	
	Rich	2	1	201	99	
Toilet Facility	Improved	7	1.8	377	98.2	0.003
	Unimproved	15	6.4	220	93.6	
Drinking water source	Improved	21	3.5	580	96.5	0.483*
	Unimproved	1	5.6	17	94.4	

P-value indicated by \*= fisher test value, p- value not indicated by \*=Pearson chi-square test value

### **8.5. Annex 3: Study information sheet and Oral Consent form**

Introduction/purpose: Good Morning/Good Afternoon. My name is.....I'm working for Addis Ababa University. We are conducting a survey on "Reducing women's care burden and improving their economic well-being through the establishment of community-based childcare centers". Procedure: If you agree to take part in this study, I would like to ask you about your household information and questions related to your child for about 30 minutes. During this survey, we may weigh and measure your child as well. I will document all the pertinent information you provided on this smartphone. The interview will be conducted face-to-face adhering to the COVID-19 precaution measures. Risks: We believe there are no risks to you and your family from participating in this study. Benefits: You will not directly benefit from participating in this study. However, the information you provide will help the government and other stakeholders to improve women's empowerment and child development. Confidentiality: We will keep your answers confidential and will not share them with anyone. Any information that might identify you will be kept separate from your answers, and your answers will be kept in a secure place for analyses by the researchers only. Voluntary participation and withdrawal: Taking part in this study is voluntary. You are free to choose not to answer any questions and you can also stop the interview at any time. If you do not want to participate, this will not affect you. Contact person: If you have any questions, I will be happy to answer them. In case you want to contact the principal investigator, you could call this number and ask for Dr. Tefera Darge; Mobile No.: +251 945 648355. If you want to contact the ethics committee that approved the research project, you could email [chs.irb@aau.et](mailto:chs.irb@aau.et); or call: +25111896139

**Are you willing to take part in the study?**

Yes

No

## 8.6. Annex 4: Data Extraction Tool in English

### Part I: Participant Identification

Code	Questions	Possible Answers
101	Date of interview	___/___/___
102	Survey started time	__:__(hh:mm)
103	Study area	1. Adama 2. Addis Ababa 3. Debre Birhan
104	Sub-city/woreda Name	_____
105	Ketena /Kebele Name	_____
106	Name of the respondent (mother/caregiver)	_____
107	Respondent's relationship to the child	1. Biological Mother 2. Adopted mother 3. Other relative

### Part II: Respondents Characteristics

Code	Questions	
201	Respondent's age (years)	_____
202	The highest level of school the respondent completed	1. Never attained 2. Primary 3. Secondary 4. Vocational Certificate 5. Higher level (degree or above)
203	Current marital status of the respondent	1. Married/cohabiting 2. single, never married 3. Divorced/separated 4. Widowed
205	The highest level of school the husband completed	1.Never attained 2.Primary 3.Secondary 4.Vocational 5.Higher level(degree or above)
206	Total number of HH members (lived for at least 6 months in the family)	_____
207	Number of children below five years of age	_____
208	Religion of the respondent	1. Muslim 2. Orthodox 3. Protestant 4. Catholic 5. Other (specify) _____

### **Part III: Housing and Household Wealth**

Code	Questions	Possible Answers
301	Do you rent or own your house?	<ol style="list-style-type: none"> <li>1. Own</li> <li>2. Rent</li> <li>3. Public house</li> <li>4. Other_____</li> </ol>
302	What is the main material of the walls?	<ol style="list-style-type: none"> <li>1. Wood and mud</li> <li>2. Mud bricks or burnt bricks</li> <li>3. Concrete blocks</li> <li>4. Wood</li> <li>5. Grass/bamboo</li> <li>6. Corrugated iron sheets</li> <li>7. Other_____</li> </ol>
303	What is the main material of the roof?	<ol style="list-style-type: none"> <li>1. Grass or leaf thatched</li> <li>2. Corrugated iron sheets</li> <li>3. Concrete slab</li> <li>4. Tiles (wood, bamboo, ceramic)</li> <li>5. Other_____</li> </ol>
304	What is the main floor material?	<ol style="list-style-type: none"> <li>1. Mud or dirt</li> <li>2. Brick/stones/cement</li> <li>3. Tiles (wood, bamboo, parquet, ceramic, carpet)</li> <li>4. Other_____</li> </ol>
305	What is the most common cooking fuel used in this household?	<ol style="list-style-type: none"> <li>1. Wood</li> <li>2. Charcoal</li> <li>3. Gas or biogas</li> <li>4. Electricity Dung</li> <li>5. Other_____</li> </ol>
306	What is your household's main source of fuel/energy for lighting?	<ol style="list-style-type: none"> <li>1. Electricity</li> <li>2. Kuraz</li> <li>3. Lantern or fanos</li> <li>4. Solar</li> <li>5. Open firewood place</li> <li>6. Other_____</li> </ol>
307	<p><b>Household Items</b></p> <p>(Tell me, please, if you or any member of your household own)</p>	

307(a)	Electricity	1. Yes 2. No
307(b)	Radio	1. Yes 2. No
307(c)	Television	1. Yes 2. No
307(d)	Computer	1. Yes 2. No
307(e)	Refrigerator	1. Yes 2. No
307(f)	Bed with cotton/spring mattress	1. Yes 2. No
307(g)	Watch or clock	1. Yes 2. No
307(h)	Mobile telephone	1. Yes 2. No
307(i)	Bicycle	1. Yes 2. No
307(j)	Motorcycle or scooter	1. Yes 2. No
307(k)	Animal-drawn cart	1. Yes 2. No
307(l)	Car or Truck	1. Yes 2. No
307(m)	Bajaj	1. Yes 2. No
308	Does your household own any livestock, herds, other farm animals, or poultry?	1. Yes 2. No

#### **Part IV: Water and Sanitation**

Code	Questions	Possible Answers
401	What is the main source of drinking water for members of your household?	<ol style="list-style-type: none"> <li>1. Piped distribution</li> <li>2. Protected well</li> <li>3. Unprotected well</li> <li>4. Protected spring</li> <li>5. Unprotected spring</li> <li>6. Surface water (river, pond, dam, etc.)</li> <li>7. Tanker truck</li> <li>8. Bottled water</li> <li>9. Other (specify) _____</li> </ol>
402	What kind of toilet facility do members of your household usually use?	<ol style="list-style-type: none"> <li>1. Pour-flush to pit/latrine</li> <li>2. Pit latrine with slab</li> <li>3. Pit latrine without slab</li> <li>4. VIP with floor/slab</li> <li>5. Composting/dry toilet</li> <li>6. Bucket latrine</li> <li>7. No facility/field/bush</li> <li>8. Other (specify other toilet facility) _____</li> </ol>
403	Do you have a confined space (beret/gate) to keep livestock?	<ol style="list-style-type: none"> <li>1. yes</li> <li>2. No</li> </ol>
404	Do you keep poultry on cages/confined spaces or kote?	<ol style="list-style-type: none"> <li>1. yes</li> <li>2. No</li> </ol>

#### **Part V: Household food security and social protection**

Code	Questions	Possible Answers
501	In the past four weeks, did you worry that your household would not have enough food?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>
502	If yes to question Q401, how often did this happen?	<ol style="list-style-type: none"> <li>1. Rarely (once or twice)</li> <li>2. Sometimes (3 to 10 times)</li> <li>3. Often (more than 10 times)</li> </ol>
503	In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>
505	If yes to Q403, how often did this happen?	<ol style="list-style-type: none"> <li>1. Rarely (once or twice)</li> <li>2. Sometimes (3 to 10 times)</li> <li>3. Often (more than 10 times)</li> </ol>
506	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>
507	If yes to Q406, how often did this happen?	<ol style="list-style-type: none"> <li>1. Rarely (once or twice)</li> </ol>

		2. Sometimes (3 to 10 times) 3. Often (more than 10 times)
508	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	1. Yes 2. No
509	If yes to Q408, how often did this happen?	1. Rarely (once or twice) 2. Sometimes (3 to 10 times) 3. Often (more than 10 times)
510	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	1. Yes 2. No
511	If yes Q410, how often did this happen?	1. Rarely (once or twice) 2. Sometimes (3 to 10 times) 3. Often (more than 10 times)
512	In the past four weeks, did you or any household member have to eat fewer meals in a day because there was not enough food?	1. Yes 2. No
513	If yes Q412, how often did this happen?	1. Rarely (once or twice) 2. Sometimes (3 to 10 times) 3. Often (more than 10 times)
514	In the past four weeks, was there ever no food to eat of any kind in your household because of a lack of resources to get food?	1. Yes 2. No
515	If yes Q414, how often did this happen	1. Rarely (once or twice) 2. Sometimes (3 to 10 times) 3. Often (more than 10 times)
516	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	1. Yes 2. No
517	If yes Q416, how often did this happen?	1. Rarely (once or twice) 2. Sometimes (3 to 10 times) 3. Often (more than 10 times)
518	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	1. Yes 2. No
519	If yes Q418, how often did this happen	1. Rarely (once or twice) 2. Sometimes (3 to 10 times) 3. Often (more than 10 times)

**Part VI: Mother's Health**

	Over the last two weeks, how often have you been bothered by any of the following problems?	
601	Little interest or pleasure in doing things?	1. Not at all 2. Several days 3. More than half the days

		4. Nearly every day
602	Feeling down, depressed, or hopeless?	1. Not at all 2. Several days 3. More than half the days 4. Nearly every day
603	Trouble falling or staying asleep, or sleeping too much?	1. Not at all 2. Several days 3. More than half the days 4. Nearly every day
604	Feeling tired or having little energy?	1. Not at all 2. Several days 3. More than half the days 4. Nearly every day
605	Poor appetite or overeating?	Not at all Several days More than half the days Nearly every day
606	Feeling bad about yourself - or that you are a failure or have let yourself or your family down?	Not at all Several days More than half the days Nearly every day
607	Trouble concentrating on things, such as watching television or reading the newspaper?	Not at all Several days More than half the days Nearly every day
608	Moving or speaking so slowly that other people could have noticed? Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual?	Not at all Several days More than half the days Nearly every day
609	Thoughts that you would be better off dead, or of hurting yourself in some way?	1. Not at all 2. Several days 3. More than half the days 4. Nearly every day

### **Part VII: Health Status of the Index Child**

Code	Questions	Possible Answers
701	Index child name	_____
702	Sex	1. Male 2. Female
703	Date of birth (Ethiopian calendar) (yy-mm-dd)	_____
704	Age of child (in months)	_____ months
705	Has had any illness in the past 2 weeks?	1. Yes 2. No 3. Don't know
706	Has had diarrhea at any time in the past 2 weeks? ( Diarrhea is defined as at least 3 loose stools in a day)	1. Yes 2. No 3. Don't know
707	Has been ill with a fever at any time in the past 2 weeks?	1. Yes 2. No 3. Don't know
708	Have you had an illness with a cough at any time in the past 2 weeks?	1. Yes 2. No 3. Don't know
709	Has had any other illness at any time in the past 2 weeks?	1. Yes 2. No 3. Don't know

**8.7. Annex 5: ስምምነት**

እንደምን አደርክ/ሽ /እንደምን አረፈድክ/ሽ። ስሜ \_ ይባላል፣ ለአዲስ አበባ ዩኒቨርሲቲ እየሰራሁ እገኛለሁ። ሊያናግሩኝ ፍቃደኛ ስለሆኑ አመሰግናለሁ። እኛ በአሁኑ ሰዓት እናቶች ህጻናት ልጅቻቸውን በመንከባከብ የሚሳልፉትን ጊዜ ስራ ላይ በማዋል የኢኮኖሚ ተጠቃሚ የሚሆኑበትን መንገድ ለማወቅ ጥናተ እያረግን ነው። እርሶም በዚህ ጥናት ቢሳተፉ በእጅጉ ደስተኛ እንሆናለን። እርሶ በእድል ላይ በተመሰረተ የናሙና አመራረጥ ዘዴ ለዚህ ጥናት ተመርጠዋል። በዚህ ጥናት ላይ

ለመሳተፍ ከተስማሙ የቤተሰብዎን ሁኔታ፣ የገቢዎን ሁኔታና ህጻን ልጆችን የተመለከተ አንዳንድ ጥያቄዎች ለ30 ደቂቃ ያክል እጠየቆታለሁ። እንዲሁም የልጆችንና የእርሶን ክብደትና ቁመት እለካለሁ። የሚሰጡትን መረጃዎች በተንቀሳቃሽ ስልክ ላይ የምንመዘግብ ይሆናል። በዚህ ጥናት ላይ በመሳተፍ የሚያጋጥሞት ምንም አይነት ችግር አይኖርም። ጥናቱ ለመንግስት እና ለባለድርሻ አካላት የእናቶችን ህይወት ለማሻሻል ለሚሰሩ ስራዎች የሚጠቅም መረጃ ይሰጣል። የሚነግሩንን መልሶች በሚስጥር እንይዛለን፣ ለማንኛውም ጎረቤት ሆነ የቤተሰብ አባል አናሳውቅም። ስምዎ እና የእርሶን ማንነት የሚያመለክቱ ማንኛውም መረጃዎች ጥናቱ በሚቀርብበት ጊዜ የሚከተት አይሆንም። ከእርሶ የተወሰደው መረጃ ተመራማሪዎች መረጃውን ለማቀናበር ብቻ በሚጠቀሙበት የሚስጥር ቦታ ይቀመጣል። በእዚህ ጥናት ላይ መሳተፍ በፈቃደኝነት ላይ የተመሰረተ ነው። መረጃ በምንሰበስብበት ወቅት የ COVID-19 ጥንቃቄዎች አይለዩንም።

ከላይ የገለፅኩት ማንኛውም ሀሳብ ግልፅ ካልሆነ ተጨማሪ ማብራሪያ ለመስጠት ዝግጁ ነኝ። ዋናውን ተመራማሪ ማግኘት ከፈለጉ በ +251945648355 ዶ/ር ተፈራ ብለው መደወል ይችላሉ። ጥናቱን ያወደቀውን ኮሚቴ ማግኘት ከፈለጉ በ chs.irb@aau.et ኢሜይል ማድረግ ወይንም በ +251118961396 መደወል ይችላሉ።

በጥናቱ ላይ ለመሳተፍ ፍቃደኛ ናት?

አዎን  የለም

### 8.8. Annex 6: Data extraction Tool in Amharic

**ክፍል 1: የጥናቱ ተሳታፊ መለያ**

መለያ	ጥያቄዎች	መልሶች
101	መጠይቁ የተደረገበት ቀን	___/___/___
102	ቃለ መጠይቁ የተጀመረበት ሰዓት	__:__(ሰአት:ደቂቃ)
103	ጥናቱ የሚደረግበት ቦታ	<ol style="list-style-type: none"> <li>1. አዳማ</li> <li>2. አዲስ አበባ</li> <li>3. ደብረ ብርሀን</li> </ol>
104	ጥናቱ የሚደረግበት ክ/ከተማ ስም	_____
105	ጥናቱ የሚደረግበት ቀበሌ/ቀጠና ስም	_____
106	የጥናቱ ተሳታፊ እናት ሙሉ ስም	_____
107	ከህጻኑ ጋር ያሉት ግንኙነት ምንድን ነው?	<ol style="list-style-type: none"> <li>1. የህጻኑ ወላጅ እናት</li> <li>2. የህጻኑ አሳዳጊ</li> <li>3. ሌላ ዘመድ</li> </ol>

**ክፍል 2: የጥናቱ ተሳታፊ መሰረታዊ መረጃዎች**

መለያ	ጥያቄዎች	መልሶች
201	እድሜዎ ስንት ነው? (በሙሉ ዓመት ይግለጹ)	_____
202	ያጠናቀቁትን ከፍተኛ የትምህርት ደረጃ ይጥቀሱ	<ol style="list-style-type: none"> <li>1. መደበኛ ትምህርት የለም</li> <li>2. የመጀመሪያ ደረጃ ትምህርት</li> <li>3. የሁለተኛ ደረጃ ትምህርት</li> <li>4. የቴክኒክና ሙያ</li> <li>5. ከፍተኛ (ዲፕሎማና ከዚያ በላይ)</li> </ol>

203	አሁን ያሉበትን የጋብቻ ሁኔታ ይጥቀሱ	<ol style="list-style-type: none"> <li>1. ያገባች ወይም አብራ የምትኖር</li> <li>2. ጨርሶ ያለገባ/ች</li> <li>3. የተፋታች ወይም የተለያየች</li> <li>4. ባለቤቷ የሞተባት</li> </ol>
205	የትዳር አጋርዎ እድሜ ስንት ነው? (በሙሉ ዓመት ይግለጹ)	_____
206	አጠቃላይ የቤተሰብ አባላት ብዛት ስንት ነው?	_____
207	ቤተሰቡ ውስጥ እድሜያቸው ከ 5 ዓመት በታች የሆኑ ልጆች ብዛት ስንት ነው?	_____
208	ሀይማኖትዎ ምንድን ነው?	<ol style="list-style-type: none"> <li>1. ሙስሊም</li> <li>2. ኦርቶዶክስ</li> <li>3. ፕሮቴስታንት</li> <li>4. ካቶሊክ</li> <li>5. ሌላ _____</li> </ol>
209	ከቤት ውስጥ ስራዎ ባሻገር፣ ባለፉት 12 ወራት ( 1 ዓመት) የሰሩት ስራ አለ?	<ol style="list-style-type: none"> <li>1. አዎን</li> <li>2. የለም</li> </ol>
210	ይህ ስራ/የገቢ ምንጭዎ ምንድን ነው?	<ol style="list-style-type: none"> <li>1. አንስተኛ ንግድ (ጉሊት መቸርቸር፣ ቡና ጠጡ፣ ሱቅ በደረቴ፣ ወዘተ)</li> <li>2. ሞያ የማይጠይቅ የጉልበት ስራ (የቤት ሰራተኛ፣ የጉልበት ስራ፣ ጥበቃ ወዘተ)</li> <li>3. ሞያ የሚጠይቅ ስራ (ሸክላ ስራ፣ ፀጉር ስራ፣ ሹፌር፣ ወዘተ)</li> <li>4. ግብርና/እርሻ</li> <li>5. የሽያጭ/የመስትንግዶ</li> <li>6. ሌላ _____</li> </ol>

**ክፍል 3: ቤትንና የቤተሰብ ሀብትን የተመለከቱ ጥያቄዎች**

መለያ	ጥያቄዎች	መልሶች
301	የሚኖሩበት ቤት ባለቤትነቱ የማን ነው?	<ol style="list-style-type: none"> <li>1. የግል</li> <li>2. ከግለሰብ ኪራይ</li> <li>3. የመንግስት (የቀበሌ)</li> <li>4. ሌላ _____</li> </ol>

302	አብዛኛው የቤቱ ግድግዳ የተሰራበት ቁስ?	<ol style="list-style-type: none"> <li>1. እንጨት እና ጭቃ</li> <li>2. የጭቃ ሸክላ/ያልተሸፈነ ሸክላ</li> <li>3. ብሎኬት/ድንጋይ እና ሲሚንት</li> <li>4. የተቆራረጡ እንጨቶች</li> <li>5. የዛፍ ቅርፊት/ቀርከሃ/ሸንቦቆ</li> <li>6. ቆርቆሮ</li> <li>7. ሌላ _____</li> </ol>
303	አብዛኛው የቤቱ ጣራ የተሰራበት ቁስ?	<ol style="list-style-type: none"> <li>1. ሰር/ቅጠል ቆርቆሮ</li> <li>2. ሲሚንት/ኮንክሪት</li> <li>3. ቀርከሃ/ሸንቦቆ</li> <li>4. ሌላ _____</li> </ol>
304	አብዛኛው የቤቱ ወለል የተሰራበት ቁስ?	<ol style="list-style-type: none"> <li>1. አፈር/አሸዋ</li> <li>2. ሲሚንት/ኮንክሪት</li> <li>3. ፓርኬ/ሴራሚክ ታይልስ/ቴራዘ/የተላገ ጣውላ</li> <li>4. ሌላ _____</li> </ol>
305	ይህ ቤተሰብ ምግብ ለማብሰል በአብዛኛው የሚጠቀመው የሃይል ምንጭ ምንድን ነው?	<ol style="list-style-type: none"> <li>1. እንጨት ከሰል</li> <li>2. ጋዝ/ባዮጋዝ</li> <li>3. ኤሌክትሪክ</li> <li>4. ፍግ/ኩቦት</li> <li>5. ሌላ _____</li> </ol>
306	ይህ ቤተሰብ ለብርሀን/ለሙብራት በአብዛኛው የሚጠቀመው የሃይል ምንጭ ምንድን ነው?	<ol style="list-style-type: none"> <li>1. ኤሌክትሪክ</li> <li>2. ኩራዝ</li> <li>3. ፋኖስ</li> <li>4. ሰላር</li> <li>5. እሳት</li> <li>6. ሌላ _____</li> </ol>
307	<p><b>የቤት ውስጥ መገልገያ ቁሳቁሶች</b></p> <p>በቤትዎ የእርስዎ ወይም የሌላ የቤተሰቡ አባል የሚከተሉት የቤት ውስጥ መገልገያ ቁሳቁሶች አሉ?</p>	

307(U)	Electricity ኤሌክትሪክ/ሙብራት	1. አዎን 2. የለም
307(ለ)	ሬዲዮ	1. አዎን 2. የለም
307(ሃ)	ቴሌቪዥን	1. አዎን 2. የለም
307(መ)	ኮምፒዩተር	1. አዎን 2. የለም
307(ሰ)	ማቀዝቀዣ/ፍሪጅ	1. አዎን 2. የለም
307(ረ)	የጥጥ፣ የእሰፖንጅ ወይም የእስፕሪንግ ፍራሽ ያለው አልጋ	1. አዎን 2. የለም
307(ሸ)	የግድግዳ ሰዓት	1. አዎን 2. የለም
307(ቀ)	ተንቀሳቃሽ ስልክ	1. አዎን 2. የለም
307(በ)	ብስክሌት	1. አዎን 2. የለም
307(ተ)	የሞተር ብስክሌት	1. አዎን 2. የለም
307(ቸ)	በእንሰሳት የሚጎተት ጋሪ	1. አዎን 2. የለም
307(ኀ)	የቤት ወይም የጭነት ሙኪና	1. አዎን 2. የለም
307(ኘ)	ባጃጅ	1. አዎን 2. የለም
308	ይህ ቤተሰብ ከብቶች፣ ዶሮችና ሌሎች የቤት እንስሳት ያረባል?	1. አዎን 2. የለም

**ቅጽ 4: ውሃና የአካባቢ ንጽህናን የተመለከቱ ጥያቄዎች**

መለያ	ጥያቄዎች	መልሶች
401	ቤተሰቡ በዋነኛነት የመጠጥ ውሃ የሚያገኘው ከምንድን ነው?	<ol style="list-style-type: none"> <li>1. የቧንቧ ውሃ</li> <li>2. የተጠበቀ ጉድጓድ</li> <li>3. ያልተጠበቀ ጉድጓድ</li> <li>4. የተጠበቀ ምንጭ</li> <li>5. ያልተጠበቀ ምንጭ</li> <li>6. የከርሰምድር ውሃ (ወንዝ፣ኩሬ፣ ግድብ)</li> <li>7. ታንክ</li> <li>8. የታሽገ ውሃ</li> <li>9. ሌላ_____</li> </ol>
402	ቤተሰቡ በዋነኛነት ምን ዓይነት የመጠጥ/ሽንት ቤት አለው?	<ol style="list-style-type: none"> <li>1. ደተቆፈረ ጉድጓድ በውኃ የሚጠጥ ሽንት ቤት</li> <li>2. መርገጫ ያለው የጉድጓድ ሽንት ቤት</li> <li>3. መርገጫ የሌለው የጉድጓድ ሽንት ቤት</li> <li>4. መርገጫና ማስተንፈሻ ያለው የጉድጓድ ሽንት ቤት</li> <li>5. ከምግብ/ ደረቅ መጠጥ ቤት</li> <li>6. ባልዳ (የባልዳ ሽንት ቤት)</li> <li>7. ሽንት ቤት የለም /ሜዳ/ ጫካ</li> <li>8. ሌላ. _____</li> </ol>
403	የከብቶች ማደሪያ ጋጣ/በረት አሉት?	<ol style="list-style-type: none"> <li>1. አዎን</li> <li>2. የለም</li> </ol>
404	የዶሮዎች ማደሪያ/ቆጥ አሉት?	<ol style="list-style-type: none"> <li>1. አዎን</li> <li>2. የለም</li> </ol>

**ክፍል 5: የምግብ ዋስትናን የተመለከቱ ጥያቄዎች**

መለያ	ጥያቄዎች	መልሶች
501	ባለፈው አንድ ወር ቤተሰብዎ በቂ ምግብ አይኖረውም ብለው ሰግተው/ተጨንቀው ያውቃሉ?	<ol style="list-style-type: none"> <li>1. አዎን</li> <li>2. የለም</li> </ol>
502	መልሶ አዎ ከሆነ ይህ ችግር ምን ያህል ጊዜ	1. አልፎ አልፎ (አንድ ወይም ሁለት ጊዜ)

	ተከስቷል?	<p>በአንድ ወር ውስጥ)</p> <ol style="list-style-type: none"> <li>እንዳንዴ (ከ3-10 ጊዜ በአንድ ወር ውስጥ)</li> <li>አብዛኛውን ጊዜ (ከ10 ጊዜ በላይ በአንድ ወር ውስጥ)</li> </ol>
503	ባለፈው አንድ ወር እርስዎ ወይም ሌላ የቤተሰብ አባል በአቅም ማነስ (በኢኮኖሚ) ምክንያት በየቀኑ አንድ ዓይነት ምግቦች ብቻ ተመግበው ያውቃሉ?	<ol style="list-style-type: none"> <li>አዎን</li> <li>የለም</li> </ol>
505	መልሶ አዎ ከሆነ ይህ ችግር ምን ያህል ጊዜ ተከስቷል?	<ol style="list-style-type: none"> <li>አልፎ አልፎ (አንድ ወይም ሁለት ጊዜ በአንድ ወር ውስጥ)</li> <li>እንዳንዴ (ከ3-10 ጊዜ በአንድ ወር ውስጥ)</li> <li>አብዛኛውን ጊዜ (ከ10 ጊዜ በላይ በአንድ ወር ውስጥ)</li> </ol>
506	ባለፈው አንድ ወር እርስዎ ወይም ሌላ የቤተሰብ አባል በአቅም ማነስ (በኢኮኖሚ) ምክንያት በየቀኑ አንድ ዓይነት ምግቦች ብቻ ተመግበው ያውቃሉ?	<ol style="list-style-type: none"> <li>አዎን</li> <li>የለም</li> </ol>
507	መልሶ አዎ ከሆነ ይህ ችግር ምን ያህል ጊዜ ተከስቷል?	<ol style="list-style-type: none"> <li>አልፎ አልፎ (አንድ ወይም ሁለት ጊዜ በአንድ ወር ውስጥ)</li> <li>እንዳንዴ (ከ3-10 ጊዜ በአንድ ወር ውስጥ)</li> <li>አብዛኛውን ጊዜ (ከ10 ጊዜ በላይ በአንድ ወር ውስጥ)</li> </ol>
508	ባለፈው አንድ ወር ውስጥ እርስዎ ወይም ሌላ የቤተሰብ አባል አቅም በማጣት (በኢኮኖሚ) ምክንያት የፈለጉትን ምግብ መመገብ ሳይችሉ ቀርተው ያውቃሉ?	<ol style="list-style-type: none"> <li>አዎን</li> <li>የለም</li> </ol>
509	መልሶ አዎ ከሆነ ይህ ችግር ምን ያህል ጊዜ ተከስቷል?	<ol style="list-style-type: none"> <li>አልፎ አልፎ (አንድ ወይም ሁለት ጊዜ በአንድ ወር ውስጥ)</li> <li>እንዳንዴ (ከ3-10 ጊዜ በአንድ ወር ውስጥ)</li> <li>አብዛኛውን ጊዜ (ከ10 ጊዜ በላይ በአንድ ወር ውስጥ)</li> </ol>
510	ባለፈው አንድ ወር ውስጥ እርስዎ ወይም ሌላ የቤተሰብ አባል በቂ ምግብ ባለመኖሩ ምክንያት በቀን ውስጥ ከሚያስፈልገው ያነሰ ምግብ ተመግበው ያውቃሉ	<ol style="list-style-type: none"> <li>አዎን</li> <li>የለም</li> </ol>

511	መልሶ አዎ ከሆነ ይህ ችግር ምን ያህል ጊዜ ተከስቷል?	<ol style="list-style-type: none"> <li>1. አልፎ አልፎ (አንድ ወይም ሁለት ጊዜ በአንድ ወር ውስጥ)</li> <li>2. 2. እንዳንዴ (ከ3-10 ጊዜ በአንድ ወር ውስጥ)</li> <li>3. 3. አብዛኛውን ጊዜ (ከ10 ጊዜ በላይ በአንድ ወር ውስጥ)</li> </ol>
512	ባለፈው አንድ ወር ውስጥ እርስዎ ወይም ሌላ የቤተሰብ አባል በቂ ምግብ ባለመኖሩ ምክንያት በቀን ውስጥ ያነሰ ግዜ ተመግበው ያውቃሉ?	<ol style="list-style-type: none"> <li>1. አዎን</li> <li>2. የለም</li> </ol>
513	መልሶ አዎ ከሆነ ይህ ችግር ምን ያህል ጊዜ ተከስቷል?	<ol style="list-style-type: none"> <li>1. አልፎ አልፎ (አንድ ወይም ሁለት ጊዜ በአንድ ወር ውስጥ)</li> <li>2. እንዳንዴ (ከ3-10 ጊዜ በአንድ ወር ውስጥ)</li> <li>3. አብዛኛውን ጊዜ (ከ10 ጊዜ በላይ በአንድ ወር ውስጥ)</li> </ol>
514	ባለፈው አንድ ወር ውስጥ እርስዎ ወይም ሌላ የቤተሰብ አባል ምንም አይነት ምግብ ባለመኖሩ ምክንያት ሳይመገቡ ቀርተው ያውቃሉ?	<ol style="list-style-type: none"> <li>1. አዎን</li> <li>2. የለም</li> </ol>
515	መልሶ አዎ ከሆነ ይህ ችግር ምን ያህል ጊዜ ተከስቷል?	<ol style="list-style-type: none"> <li>1. አልፎ አልፎ (አንድ ወይም ሁለት ጊዜ በአንድ ወር ውስጥ)</li> <li>2. እንዳንዴ (ከ3-10 ጊዜ በአንድ ወር ውስጥ)</li> <li>3. አብዛኛውን ጊዜ (ከ10 ጊዜ በላይ በአንድ ወር ውስጥ)</li> </ol>
516	ባለፈው አንድ ወር ውስጥ እርስዎ ወይም ሌላ የቤተሰብ አባል በቂ ምግብ ባለመኖሩ ምክንያት ሳይመገቡ እየራባቸው አድረው ያውቃሉ ?	<ol style="list-style-type: none"> <li>1. አዎን</li> <li>2. የለም</li> </ol>
517	መልሶ አዎ ከሆነ ይህ ችግር ምን ያህል ጊዜ ተከስቷል?	<ol style="list-style-type: none"> <li>1. አልፎ አልፎ (አንድ ወይም ሁለት ጊዜ በአንድ ወር ውስጥ)</li> <li>2. እንዳንዴ (ከ3-10 ጊዜ በአንድ ወር ውስጥ)</li> <li>3. አብዛኛውን ጊዜ (ከ10 ጊዜ በላይ በአንድ ወር ውስጥ)</li> </ol>
518	ባለፈው አንድ ወር ውስጥ እርስዎ ወይም ሌላ የቤተሰብ አባል በቂ ምግብ ባለመኖሩ ምክንያት ሳይመገቡ ውለው አድረው ያውቃሉ?	<ol style="list-style-type: none"> <li>1. አዎን</li> <li>2. የለም</li> </ol>
519	መልሶ አዎ ከሆነ ይህ ችግር ምን ያህል ጊዜ ተከስቷል?	<ol style="list-style-type: none"> <li>1. አልፎ አልፎ (አንድ ወይም ሁለት ጊዜ በአንድ ወር ውስጥ)</li> </ol>

		2. እንዳንዴ (ከ3-10 ጊዜ በአንድ ወር ውስጥ) 3. አብዛኛውን ጊዜ (ከ10 ጊዜ በላይ በአንድ ወር ውስጥ)
--	--	--

**ክፍል6: የእናትን ጤና የተመለከቱ ጥያቄዎች**

መለያ	ጥያቄዎች	መልሶች
	ባለፉት ሁለት ሳምንታት ውስጥ ለምን ያህል ጊዜ በሚከተሉት ምልክቶች ተረብሽው ያውቃሉ?	
601	ባለፉት ሁለት ሳምንታት ውስጥ ስራ ለመስራት/ነገሮችን ለማከናወን ተነሳሽነት ያለምኖር ስሜት ለምን ያህል ጊዜ ተሰምቶት ያውቃል?	<ol style="list-style-type: none"> <li>1. በጭራሽ</li> <li>2. ብዙ ቀናት (2-6ቀን)</li> <li>3. በአማካኝ ግማሹን ቀን (7-11ቀን )</li> <li>4. በአማካኝ ሁሉኑም ቀን (12-14ቀን)</li> </ol>
602	ባለፉት ሁለት ሳምንታት ውስጥ የመደበኛ የመሰላቸት፣ ወይም ተሰፋ የመቁረጥ ስሜት ለምን ያህል ጊዜ ተሰምቶት ያውቃል?	<ol style="list-style-type: none"> <li>1. በጭራሽ</li> <li>2. ብዙ ቀናት (2-6ቀን)</li> <li>3. በአማካኝ ግማሹን ቀን (7-11ቀን )</li> <li>4. በአማካኝ ሁሉኑም ቀን (12-14ቀን)</li> </ol>
603	ባለፉት ሁለት ሳምንታት ውስጥ በእንቅልፍ ማጣት ስሜት ወይም ከመጠን በላይ በመተኛት ምን ያህል ጊዜ ተረብሽው ያውቃሉ?	<ol style="list-style-type: none"> <li>1. በጭራሽ</li> <li>2. ብዙ ቀናት (2-6ቀን)</li> <li>3. በአማካኝ ግማሹን ቀን (7-11ቀን )</li> <li>4. በአማካኝ ሁሉኑም ቀን (12-14ቀን)</li> </ol>
604	ባለፉት ሁለት ሳምንታት ውስጥ የአቅም ማጣት ወይም የድካም ስሜት ለምን ያህል ጊዜ ተሰምቶት ያውቃል?	<ol style="list-style-type: none"> <li>1. በጭራሽ</li> <li>2. ብዙ ቀናት (2-6ቀን)</li> <li>3. በአማካኝ ግማሹን ቀን (7-11ቀን )</li> <li>4. በአማካኝ ሁሉኑም ቀን (12-14ቀን)</li> </ol>

605	ሁለት ሳምንታት ውስጥ በምግብ ፍላጎት ማጣት ወይም ከመጠን በላይ በመብላት ችግር ምን ያህል ጊዜ ተረብሸው ያውቃሉ?	1. በጭራሽ 2. ብዙ ቀናት (2-6ቀን) 3. በአማካኝ ግማሹን ቀን (7-11ቀን) 4. በአማካኝ ሁሉም ቀን (12-14ቀን)
606	ባለፉት ሁለት ሳምንታት ውስጥ እራስን በመጥላት፣ በተሸናፊነትና ቤተሰብን የማሳዘን ስሜት ምን ያህል ጊዜ ተረብሸው ያውቃሉ?	1. በጭራሽ 2. ብዙ ቀናት (2-6ቀን) 3. በአማካኝ ግማሹን ቀን (7-11ቀን) 4. በአማካኝ ሁሉም ቀን (12-14ቀን)
607	ሁለት ሳምንታት ውስጥ ቴሌቭዥን በማየት ወቅት ወይም ጋዜጣ/መፅሀፍ በማንበብ ወቅት በሀሳብ መበታተን ለምን ያህል ጊዜ ተረብሸው ያውቃሉ? ባለፉት	1. በጭራሽ 2. ብዙ ቀናት (2-6ቀን) 3. በአማካኝ ግማሹን ቀን (7-11ቀን) 4. በአማካኝ ሁሉም ቀን (12-14ቀን)
608	ሁለት ሳምንታት ውስጥ በጣም ቀስ ብሎ በመናገር ወይም ከወትሮው በተለየ በጣም በፍጥነት በማውራት ወይም በመቅበዝበዝ ስሜት ለምን ያህል ጊዜ ተረብሸው ያውቃሉ?	1. በጭራሽ 2. ብዙ ቀናት (2-6ቀን) 3. በአማካኝ ግማሹን ቀን (7-11ቀን) 4. በአማካኝ ሁሉም ቀን (12-14ቀን)
609	? ባለፉት ሁለት ሳምንታት ውስጥ እራስን በማጥፋት ስሜት ወይም እራስን በመጉዳት ስሜት ለምን ያህል ጊዜ ተረብሸው ያውቃሉ?	1. በጭራሽ 2. ብዙ ቀናት (2-6ቀን) 3. በአማካኝ ግማሹን ቀን (7-11ቀን) 4. በአማካኝ ሁሉም ቀን (12-14ቀን)

**ክፍል7: የጥናቱ ተሳታፊ ህጻን ጤናን የተመለከቱ ጥያቄዎች**

መለያ	ጥያቄዎች	መልሶች
701	የህጻኑ/ኗ ሙሉ ስም	_____
702	የ ፆታ	1. ወንድ 2. ሴት
703	የተወለደበት/ደኝበት ቀን (ቀቀ/ወወ/ዓዓ)	_____
704	የ እድሜ በወር	_____ ወር

705	ባለፉት ሁለት ሳምንታት ህመም ታሞ/ማ ያውቃል/ታወቃለች?	1. አዎን 2. የለም 3. አላውቅም
706	ባለፉት ሁለት ሳምንታት ውስጥ ተቅማጥ ይዞት/ይዟት ያውቃል?	1. አዎን 2. የለም 3. አላውቅም
707	ባለፉት ሁለት ሳምንታት ውስጥ ትኩሳት አሞት/አሟት ያውቃል?	1. አዎን 2. የለም 3. አላውቅም
708	ባለፉት ሁለት ሳምንታት ውስጥ ሳል ነበረው/ነበራት?	1. አዎን 2. የለም 3. አላውቅም

8.9. Annex 7: IRB Decision letter of the project



ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES (IRB)  
 አዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ  
 Institutional Review Board

ANNEX 3  
 Form AAUMF 03-008

IRB's Decision

Meeting No: 06/2022

Meeting Date: June 22, 2022

Protocol number: 053/22/SPH

<b>Protocol Title:</b> Reducing women's care burden and improving their economic wellbeing through establishment of community-based childcare centers	
Principal Investigator:	Dr. Tefera Darge
Institute:	College of Health Sciences, AAU
Elements Reviewed (AAUMF 01-008)	<input checked="" type="checkbox"/> Attached <input type="checkbox"/> Not attached
Review of Revised Application <input type="checkbox"/> Yes <input type="checkbox"/> No	Date of the Previous review:
Decision of the meeting:	<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Approved with Recommendation <input type="checkbox"/> Resubmission <input type="checkbox"/> Disapproved

- I. Elements approved-
1. Protocol Version No: 2
  2. Protocol Version Date:
  3. Informed consent Version No. 2
  4. Informed Consent Version Date:

- II. Obligations of the PI-
1. Should comply with the standard international & national scientific and ethical guidelines
  2. All amendments and changes made in protocol and consent form need IRB approval
  3. The PI should report SAE within 10 days of the event
  4. End of the study, including manuscripts and thesis works should be reported to the IRB
  5. The PI should report non-compliance and unanticipated events

III. TO NERC

Institution Review Board (IRB) Approval: Period from: July 11, 2022, to July 10, 2023

Follow up report expected in 3 Months \_\_\_ 6 months \_\_\_ 9 months  one year \_\_\_

Chairperson, IRB

Dr. Adamu Addissie

Signature:   
 Date: July 11, 2022 (IRB)  
 Institutional Review Board Office  
 Faculty of Medicine  
 ADDIS ABABA UNIVERSITY

### **8.10. Annex 8: Assurance of Principal Investigator**

I, the undersigned, hereby declare that the above is my sole and authentic thesis work, has not been submitted for academic credit at this university or any other and all sources of information used in this thesis have been duly acknowledged.

Name of the investigator: Sitota G/melak

Signature:



Date of submission: \_\_\_\_\_25/9/17\_\_\_\_\_

Place: Addis Ababa University

With my approval as an advisor, this thesis has been submitted for examination,

Name: Tefera Darge (PhD)