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**St. Paul's Hospital Millennium Medical College**

**Department of Public Health**

**Assessment of Food Insecurity and Associated Factors Among Adults  
Receiving Anti-Retroviral Therapy in Mettu Karl Specialized Hospital,  
Southwest Ethiopia**

**Investigator: Solomon BerhanuMengistu (Bsc.in Environmental Health)**

**A Research Thesis to be Submitted to Department of Public Health, St. Paul  
Hospital Millennium Medical College for the Partial Fulfillment of the  
Requirement for Degree of Master in Public Health Nutrition**

**March,2021  
Mettu, Ethiopia**

**St. Paul's Hospital Millennium Medical College**  
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**Advisors: -**

**1. Mr. TesfayeDagneWeldemarium (Mph)**

**2. Mr. AndamlakGizawAlamdo (Mph, Assistant Professor)**

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|                                           |                                                                                                                                                                   |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Name of the Investigator</b>           | <b>Solomon BerhanuMengistu</b>                                                                                                                                    |
| <b>Full title of the research project</b> | <b>Assessment of Food Insecurity and Associated Factors Among Adults Receiving Anti-Retroviral Therapy in Mettu Karl Specialized Hospital, Southwest Ethiopia</b> |
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| <b>Address of Investigator</b>            | <b>Tel:</b>                                                                                                                                                       |
|                                           | <b>Cell Phone: +251917792611</b>                                                                                                                                  |
|                                           | <b>Fax:</b>                                                                                                                                                       |
|                                           | <b>P.O. Box:</b>                                                                                                                                                  |
|                                           | <b>Email: <a href="mailto:solkik.2012@gmail.com">solkik.2012@gmail.com</a></b>                                                                                    |
| <b>Name of Advisor</b>                    | <b>1. Mr. TesfayeDagneWoldemarium</b><br><b>2. Mr. AndamlakGizawAlamdo</b>                                                                                        |

**March, 2021**  
**Mettu, Ethiopia**

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## List of Acronyms

AIDS: Acquired Immune Deficiency Syndrome

ART: Anti- Retroviral Therapy

ARV: Anti- Retroviral

HAART: Highly Active Anti- Retroviral Therapy

HIV: Human Immunodeficiency Virus

HDDS: Household Dietary Diversity Score

HFIAS: Household Food Insecurity Access Scale

PEPFAR: Presidents Emergency Plan for AIDS Relief

PLWHA: People Living with HIV/AIDS

RLS: Resource Limited Setting

SES: Socio Economic Status

SSA: Sub-Saharan Africa

UNAID: Joint United Nations Programme on HIV/AIDS

WFP: World Food Program

WHO: World Health Organization

## Abstract

**Introduction:** *In developing countries chronic underlying malnutrition and its intersection with food insecurity, poverty, and co-infections pose a serious threat to efforts to combat Human Immunodeficiency Virus /Acquired Immune Deficiency Syndrome. Lack of food security and poor nutritional status may hasten progression to AIDS-related illnesses, undermine adherence and response to antiretroviral therapy and exacerbate socioeconomic impacts of the virus. However, evidence remains limited on the prevalence, correlates and effects of food insecurity on treatment, as well as appropriate strategies to improve food security for people living with the pandemic.*

**Objectives:** *The aim of this study is to assess the magnitude and determinant of food insecurity among adults receiving ART in Mettu Karl Specialized hospital, Southwestern Ethiopia*

**Methods:** *Institution based cross-sectional study was conducted at antiretroviral therapy clinic of Mettu Karl Specialized Hospital among Adults Receiving ART from January 1/2021 to February 15/2021. 394 sample size of the study was calculated using single population proportion formula. The data were collected using interviewer administered questionnaires by two case managers working in ART clinics supervised by one bachelor nurse professionals. Household food insecurity was assessed by using Household Food Insecurity Access Scale (HFIAS) questionnaire. Binary logistic regression analysis was computed to assess the crude association between dependent and independent variables. Variables which have P-value <0.25 in binary logistic regression analysis were entered in to Multivariable logistic regression model, to identify significant factors associated with outcome variables by controlling confounding factors. Variables with a P value <0.05 was considered as statistically significant.*

**Result:** *The overall food insecurity in this study was 245 (65.7%). Respondents who do not have formal education [95% CI: AOR=4.78(1.6-14.28)], primary level education [95% CI: AOR=3.56(1.4-9.01)], and who use substances [95% CI AOR=3.97(2.91-5.84)]and inadequate dietary diversity [95% CI: AOR=2.33 (1.35-4)] were independent predictors of food insecurity.*

**Conclusion:** *The magnitude of food insecurity among adult ART attendants was relatively high therefore multi-sectorial collaboration is needed to alleviate the problem.*

# **1. Introduction**

## **1.1. Background of the Study**

Food insecurity, defined as “the limited or uncertain availability of nutritionally adequate, safe foods or the inability to acquire personally acceptable foods in socially acceptable ways” (1) has recently been identified as a key structural barrier to antiretroviral adherence and as a contributor to ARV treatment interruptions in resource-poor settings.

Common factors influencing food insecurity are household’s ability to pay for food, physical access to adequate food, health requirements for nutritious food, preferences for culturally appropriate food, income, the costs of food, geographic isolation, lack of transportation, and food literacy. High-risk populations are lone-parent families, women, and children; immigrants and elders are more likely affected by key risk factors (2).

Food insecurity and poor nutritional status causes lower CD4 cell counts, poor adherence to ART, decreased viral suppression, and increase morbidity and mortality. It can also accelerate the development of opportunistic infections and result in the progress of AIDS-related illnesses among People Living with HIV AIDS(3).

HIV/AIDS and food insecurity are two of the leading causes of morbidity and mortality that increase vulnerability and worsening the severity of one another. The prevalence of food insecurity among PLWHA was high in sub-Saharan Africa, particularly in Ethiopia(4).

In Ethiopia, about 1.5% of adult people aged 15-49 are infected with HIV that was intensely affected by food insecurity. It was estimated that almost 1 in 10 Ethiopians struggled to have access to safe, sufficient, and nutritious food for their families (5). Study showed that lower age, lower educational level, marital status, low health status, political, and demographic factors such as gender, income, body mass index, smoking, household composition, nutritional status, physical and mental development, social vulnerability to infectious, and chronic diseases are related to food insecurity (6).

## 1.2.Statement of the Problem

Lack of food security and poor nutritional status may hasten progression to AIDS-related illnesses, undermine adherence and response to antiretroviral therapy and exacerbate socioeconomic impacts of the virus(7).In developing countries chronic underlying malnutrition and its intersection with food insecurity, poverty, and co-infections pose a serious threat to efforts to combatHIV/AIDS. Adults living with HIV have 10–30%higher energy requirements than a healthy adult withoutHIV. In Ethiopia, approximately 49% of the general population is without adequate nutrition(8). In addition to this, study done in Jimma zone show that, the prevalence of food insecurity among People Living withHIV/AIDS [PLHIV] on ART 63%(4)which indicates adults on ART are suffering from malnutrition.HIV/AIDS has become one of the world's most serious health and development challenges. According to Studies done in different regions of Ethiopia, the prevalence of food insecurity among people living with HIV/AIDS ranged from 19.5% to87.4% that is, they have been 9 times more affected than the general population. Some of the factors were lower income, being female, higher/advanced HIVclinical stage, developing opportunistic infections, poor adherence to drugs, and absence of food support(9).Recently, food insecurity has emerged as a key structural barrier that affects adherence to ART in both resource-rich and constrained settings. The combined impacts of food insecurity and HIV/AIDS place further strain already limited householdresources as affected family members struggle to meethousehold food needs. However; little is known about the food insecurity and associated factors among adults PLWHA on ART in MettuKarlSpecialized Hospital This study is conducted to see the magnitude of food insecurity and associated factors among adult ART users.

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

Food insecurity defined as having uncertain or limited availability of nutritionally adequate or safe food or the inability to procure food in socially acceptable ways has been identified as the critical contributing factor for poor health outcome among adults living with HIV. The effect of nutritional factors on adherence to ART among HIV/AIDS subjects is not well explored, despite the critical role of nutrition in care, disease progression and ART adherence among HIV/AIDS cases. Therefore, the objective of this study is to assess the magnitude of food inadequacy and associated factors among adults on ART in Mettu Karl Specialized Hospital. The findings of this study could be useful evidence for scholars who are interested in this field, and for the ART and nutrition programs undertaken by government and other non-governmental organizations.

## **2. Literature Review**

### **2.1. Overview of Antiretroviral therapy**

Human immunodeficiency virus/acquired immunodeficiency syndrome is a disease that has no cure, but the global scale-up of ART has contributed to full preventive and therapeutic benefits. ART contributed to a 32% and 16% global decline in AIDS-related deaths and new HIV infections respectively between 2010 and 2016 (10).

Antiretroviral therapy (ART) has transformed HIV infection from a terminal disease into a manageable chronic illness. ART can also reduce viral load (i.e. HIV RNA levels) and the risk of secondary transmission, thus defining a new HIV prevention paradigm in which successful treatment scale up could help realize an end to AIDS(11). The vast majority of the 35 million people living with HIV (PLWH) are in resource limited settings (RLS), of whom an estimated 17 million were receiving ART in 2016 (up from 1.3 million people in 2006). Targets aim to increase the number on treatment to 20 million people by 2020(12). While this ART expansion represents one of the greatest public health achievements of our time, much remains to be done.

Consistent dosing without sustained gaps is critical for realizing both the individual and public health benefits of ART. ART adherence therefore plays a key role in achieving the second and third “90s” of the UNAIDS 90-90-90 campaign to end the AIDS epidemic (i.e. 90% on treatment and 90% virally suppressed)(13,14).

As ART access expands globally, medication adherence remains challenging. Factors associated with achieving and maintaining high ART adherence can be grouped according to the individual (e.g. knowledge, resources, mental health); interpersonal/network relationships (e.g. social support, stigma); the community (e.g. socio-cultural norms); health system factors (e.g. service provision) and structural issues (e.g. access to services). Levels of medication adherence are difficult to assess given variability across available measures; however, concern for incomplete adherence is high and estimates of non-adherence range widely from 2% to 70%(15).

## **2.2. Does food insecurity undermine ARV Adherence?**

The relationship between food insecurity and ARV non-adherence is robust in the literature and previous studies have extensively controlled for other indicators of socioeconomic status (SES). Previous work has also established the causal relationship between food insecurity and ARV non-adherence(16). A true test of whether medication non-adherence occurs on days with limited access to food requires data collection of both food insecurity and ARV adherence.

Food insecurity is prevalent among People Living with HIV/AIDS (PLWHA) in Sub Sahara African (SSA) countries. There, more than half of HIV-infected individuals are food insecure as well many studies done in Africa showed that about 52.2 % to 92 % of the people living with HIV/AIDS are struggling to have access to safe, sufficient and nutritious food for themselves and their families(17–19).

According to Studies done in Nigeria, Senegal, Namibia and Tanzania, the factors associated with food insecurity among HIV patients are low educational status; housewife/unemployed occupation; low socioeconomic status; older age; benefiting from food assistance; delaying drugs to prevent hunger; skipping drugs; taking two/less meal, lower household healthcare, lower CD4 count, longer duration on ART and exchanging sex for food(9,20).

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In Zambia, the belief that ARVs must be taken with food led individuals to skip doses when they could not access enough to eat (21). Lack of food was also among the key barriers to ARV adherence in a qualitative study from South Africa(22). While the World Health Organization(WHO), UNAIDS, and the World Food Program(WFP) have recommended integration of food assistance into HIV AIDS programming, (23) there has been little research on the mechanisms through which food insecurity may lead to gaps in treatment and compromise ARV effectiveness. Understanding such mechanisms is important for designing ARV treatment programs that incorporate food or nutritional supplementation and guiding policy decisions about intervention strategies. The current study grounded to assess food insecurity and factors associated with non-adherence and more specifically, documenting the prevalence of food insecurity, and its effect on ART adherence among HIV positive adults receiving ART in Mettu Karl Specialized Hospital. Such information is crucial for guiding context-specific interventions to promote patient adherence to ART.

## Conceptual Frameworks

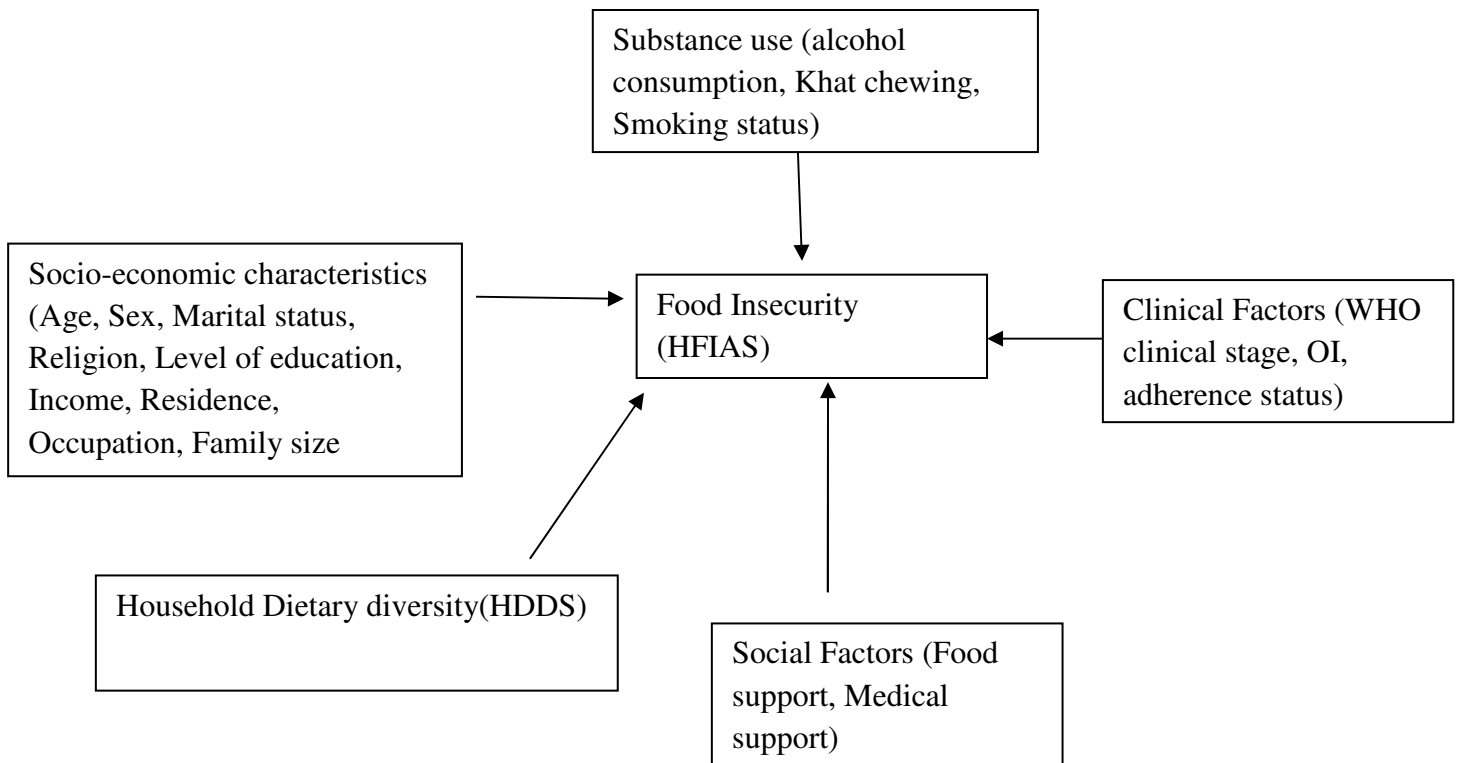


**Figure 1** Conceptual framework showing food insecurity and associated factor among patients on ART. (Developed 2021)

### **3. Objectives**

#### **3.1. General Objective**

The aim of this study was to assess magnitude and determinants of food insecurity among adults receiving ART in Mettu Karl Specialized Hospital from January 1/2021 to February 15/2021

#### **3.2. Specific Objectives**

To assess the magnitude of food insecurity among adults living with HIV who are register on ART in Mettu Karl Specialized hospital

To assess the determinants of food insecurity among ART user adults in Mettu Karl Specialized Hospital

## **4. Methods and Materials**

### **4.1. Study Area and Periods**

This study was conducted from January 1/2021 to February 15/2021 in antiretroviral therapy (ART) follow-up clinic of MettuKarl SpecializedHospital. Mettu Karl Specialized Hospital is found in Ilubabor Zone, Mettu town, Southwestern part of Ethiopia. This is 600 km far from the capital city. Mettu is known for its waterfalls such as Sor fall and surrounding evergreen forest. The hospital gives clinical service to a total population of about 2.5 million people. There are 1490 adult patients with HIV/AIDS (including those from the surrounding rural areas and nearby towns) who have an ART follow-up in the hospital from data obtained from Mettu Karl specialized smart case registration.

### **4.2. Study Design**

An institution based cross sectional study was carried out among adults on ART in Mettu Karl Specialized Hospital, Southwest Ethiopia.

### **4.3 Population**

#### **4.3.1 Source Population**

The source populations were all adult living with HIV/AIDS who are on ART follow up in Mettu KarlSpecialized Hospital

#### **4.3.2 Study Population**

Selected adults living with HIV/AIDS visiting ART clinic in Mettu Karl Specialized Hospital were considered as a study population.

## **4.4. Eligibility Criteria**

### **4.4.1 Inclusion Criteria**

The participants included in the study were adults aged 18 years and above on ART who are actively visiting ART clinic in Mettu Karl Specialized Hospital during data collection period.

### **4.4.2 Exclusion Criteria**

Adults living with HIV/AIDS on ART who are severely ill and unable to communicate, and those who are less than one month or newly started ART were excluded from the study.

## **4.5. Sample Size and Sampling Technique**

### **4.5.1. Sample Size Calculation:**

The sample size of the study was calculated using a formula for estimation of a single population proportion with the assumption of 95 Confidence Level, margin of error(d) of 0.05 and proportion of 0.63 (63%) taken from the previous study done in Jimma zone (4). After adding 10% for non-response, an overall sample size of 394 were obtained.

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

$$= 1.96^2 * 0.63 * (1-0.63) / 0.05^2$$

= 358, by adding 10% non-response rate the final sample size were **394**

#### **4.5.2 Sampling Techniques:**

The study participants were included by systematic random sampling techniques. The total sample size was included systematically by calculating constant  $k$  value from all study groups on follow up actively receiving antiretroviral therapy and the initial number was picked by lottery method from  $k$  interval

$k = N/n = 1490/394 \sim 4$ , where  $N$  is total population and  $n$  is sample size of the study

#### **4.5.3 Data Collection Tools and Procedures**

The data were collected using interviewer administered questionnaires by two case managers working in ART clinics supervised by one bachelor nurse professionals. The structured questionnaire consisted of socio-demographic, substance usage, adherence status, WHO staging, opportunistic infection condition, medical and food support, household dietary diversity and food insecurity assessment tool was used for the data collection. One-day training on the objective of the study, confidentiality of information, interviewing techniques and awareness on COVID 19 precaution were given. The interviews were conducted in Afan Oromo, the commonly used languages in Mettu district. Household food insecurity was assessed by using Household Food Insecurity Access Scale (HFIAS) questionnaire on Food and Nutrition Technical Assistance III (FANTA) that measures food insecurity in terms of 18 questions items. The 18 question items have two components. The first 9 items are occurrence questions responded in terms of yes = 1 or no = 0 which has minimum value 0 to maximum value 9. The second 9 items are frequency questions derived from occurrence questions with the response option of yes. The frequency questions have an option of rarely = 1 (once or twice in the past four weeks.), sometimes (three to ten times in the past four weeks.) =2, and often (more than ten times in the past four weeks) =3, which has a minimum value of 9 to maximum value of 27. The results were categorized in a format including 0) food secure, 1) mildly food insecure 2) moderately food insecure and 3) severely food insecure, which dichotomized into food insecure versus food secure.

Household dietary diversity was assessed using questions specifically covered food consumption during the past 24 hr period containing Cereals, Miscellaneous, Oils/Fats, Honey/Sugar, Legumes, Root/Tubers, Fruits, Vegetables, Meat, Milk/Milk products, Eggs, Fish/Sea foods that are commonly consumed in the study area.

## **4.6. Variables**

### **4.6.1. Dependent Variables**

-  Food insecurity

### **4.6.2. Independent Variables**

-  Socio-demographic characteristics (Sex, Marital status, family size etc)
-  Substance use (Alcohol consumption, smoking status etc)
-  Clinical factors (WHO Stage, ART adherence status, etc)
-  Social factors (Food support)
-  Dietary diversity

#### 4.7. Operational Definitions

**Adherence to ART:** is defined as taking one's medicine as prescribed and agreed between the patient and provider which is 95% or more adherences to ART. Which means taking doses no more than two hours before or two hours after the time of a doctor's advice to take doses (95% or more adherence = missing  $\leq 2$  doses of 30 doses or  $\leq 3$  doses of 60 doses)

**Non-adherence to ART:** is the condition of missing doses completely, not following information given by physician, as well as taking drugs inappropriately. Which means taking doses two or more hours before, and/or two or more hours after the time of a Doctor's advice to take doses or missing doses completely (less than 95% adherence = missing  $> 2$  doses of 30 doses or  $> 3$  doses of 60 doses)

**Dietary diversity:** is the number of reported different foods and food groups consumed in a household over a 24-hour period. This does not include food group consumed outside home. It is classified as low  $< 3$  food items, medium 4-6 food items and  $\geq 6$  food items as higher based on FANTA/FAO recommendations

**Mildly food insecure:** household worries about not having enough food sometimes or often, and/or is unable to eat preferred foods, and/or eats a more monotonous diet than desired and/or some foods considered undesirable, but only rarely. But it does not cut back on quantity nor experience any of three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating) and score HFIS 2-8.

**Moderately food insecure:** household sacrifices quality more frequently, by eating a monotonous diet or undesirable foods sometimes or often, and/or has started to cut back on quantity by reducing the size of meals or number of meals, rarely or sometimes. But it does not experience any of the three most severe conditions and have 9-17 HFIS.

**Severely food insecure:** household has graduated to cutting back on meal size or number of meals often, and/or experiences any of the three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating), even as infrequently as rarely. In other words, any household that experiences one of these three conditions even once in the last four weeks (30 days) or score more than 17 HFIS is considered severely food insecure.

**Food Secure:** is a household experiences none of the food insecurity (access) conditions, or just experiences worry, but rarely

#### **4.8. Data Quality Management/Quality Assurance**

Pre testing of the questionnaire was conducted on 5% of sample size on clients in Mettu Health Center a week prior to the actual study; and necessary modification was done according to the gap identified. Interview of participants were carried out in private room. Data collection processes were strictly followed day to day by the supervisor and principal investigators and the collected data was checked for completeness and consistency every day by supervisors and principal investigators.

#### **4.9 Data Processing & Analysis**

Pre-coding and manual checking of the questionnaire was done by the principal investigator before the data entry. Data was entered using Epi-data and exported to SPSS version 25 for further cleaning and analysis purpose. Descriptive statistics was done to assess basic client characteristics and proportion of food insecurity. Binary logistic regression analysis was computed to assess the crude association between dependent and independent variables. Variables which have P-value less than 0.25 in binary logistic regression analysis were entered in to Multivariable logistic regression model, to identify significant factors associated with outcome. Variables with a P value  $<0.05$  was considered as statistically significant.

#### **4.10. Plan for Data Dissemination**

The finding of this thesis serve as a pilot for addressing factors associated with food insecurity among adults on ART. The results of the assessment are disseminated for zonal health office to plan on the intervention of food insecurity among the study groups. Additional dissemination occurs through presentation at conference, such as zonal and colleges and through published article journal.

#### **4.11. Ethical Consideration**

The study was conducted after receiving ethical approval from Institutional Review Board of the Saint Paul Millennium Medical College of Public Health Department. Before the ethical approval, the proposal was provided to academic reviewers to assure the ethical issues. Finally, the ethical review committee approved the consent. Permission letter was obtained from the respective health institutions (Oromia Regional Health Office, Mettu Karl Specialized Hospital) persons in charge and from ART Clinic nurses and data managers. Study participants were informed the purpose of the study and obtain written informed consent. To ensure confidentiality, names was not mentioned in the data collection tools and result reports and the interview was conducted on the site ART clinic to ensure privacy

## 5. Result

### Socio-Demographic Characteristics

Out of the 394 study participants initially sampled in the study, 373 participated, making a response rate of 94.7 %. Of them 243 (65.1%) were females and 120(32.2%) were in the age group of 18-30years and 35.1% of them were with the range of 31-40years. Most of the participants were married 42.9%, 44% of respondent religion was orthodox and 74.8% dwell in urban area. Majority of participant education level were primary which accounts 161(43.2%). More than half of the family 62.5% earned less than 1000 ETB per month.

**Table 1.** Socio-demographic characteristics and food insecurity among Adults on ART in Mettu Karl Specialized Hospital, Southwest Ethiopia, 2021(n=373)

| Variables                |                | Frequency | Percentage |
|--------------------------|----------------|-----------|------------|
| Sex of client            | Male           | 130       | 34.9       |
|                          | Female         | 243       | 65.1       |
| Marital status of client | Single         | 54        | 14.5       |
|                          | Married        | 160       | 42.9       |
|                          | Widowed        | 78        | 20.9       |
|                          | Divorced       | 81        | 21.7       |
| Religion of client       | Orthodox       | 166       | 44.5       |
|                          | Muslim         | 80        | 21.4       |
|                          | Protestant     | 120       | 32.2       |
|                          | Other*         | 7         | 1.9        |
| Monthly income of        | Less than 1000 | 233       | 62.5       |

|                                     |                            |     |      |
|-------------------------------------|----------------------------|-----|------|
| <b>client</b>                       | Greaterthanorequalto1000   | 140 | 37.5 |
| <b>Family size of client</b>        | 1-4                        | 308 | 82.6 |
|                                     | greater than or equal to 5 | 65  | 17.4 |
| <b>Place of residence of client</b> | Urban                      | 279 | 74.8 |
|                                     | Rural                      | 94  | 25.2 |
| <b>Employment status of client</b>  | Unemployed                 | 263 | 70.5 |
|                                     | Employed                   | 110 | 29.5 |
| <b>Age category</b>                 | 18-30                      | 120 | 32.2 |
|                                     | 31-40                      | 131 | 35.1 |
|                                     | 41-50                      | 64  | 17.2 |
|                                     | >50                        | 58  | 15.5 |

Other\* were Catholics, Seven Day Adventist

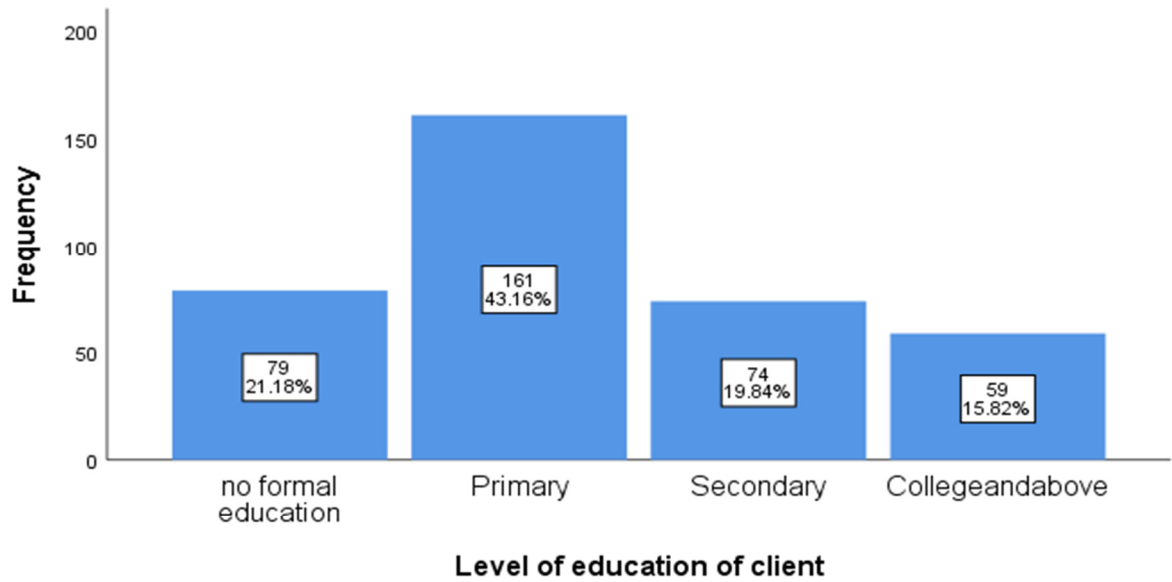


**Figure 2. Bar chart Showing Level of education of Adult ART users at Mettu Karl Specialized Hospital, southwestern Ethiopia, 2021(n=373)**

### **Dietary diversity**

The household dietary diversity was assessed using 12 food items. Dietary Diversity Score was categorized as low, medium and high dietary diversity accounting 9(2.4%), 211(56.4%) and 153(41%) respectively.

Concerning type of food households consumed in 24 hrs almost all households had consumed cereal based foods followed by condiments, vegetables, oil and fat, and legumes.

**Table 2.** Food consumed by Respondents on the Assessment of Food insecurity and associated factors among Adults on ART in Mettu Karl Specialized Hospital, Southwest Ethiopia, 2021(n=373)

| <b>Food type</b>      | <b>Yes</b> | <b>No</b>  |
|-----------------------|------------|------------|
| Cereal products       | 372(99.7%) | 1(0.3%)    |
| Root and Tubers       | 125(33.5%) | 248(66.5%) |
| Vegetables            | 360(96.5%) | 13(3.5%)   |
| Fruits                | 87(23.3%)  | 286(76.7%) |
| Eggs                  | 97(26%)    | 276(74%)   |
| Meats                 | 43(11.5%)  | 330(88.5%) |
| Fishes                | 3(0.8%)    | 370(99.2%) |
| Legumes               | 264(70.8%) | 109(29.2%) |
| Milk and its products | 88(23.6%)  | 285(76.4%) |
| Oil and Fat           | 357(95.7%) | 16(4.3%)   |
| Sweets                | 163(43.7%) | 210(56.3%) |
| Spices and Condiments | 367(98.4%) | 6(1.6%)    |

### WHO Clinical Stage and Adherence Status of study participant

Regarding WHO clinical staging secondary data from patient sheet revealed most of the study participants, 336 (90.1%) were stage I and II, and 339(90.9%) were good adherence status or missed less than 2 doses during the last 30 days. Respondents that had opportunistic infections of any kind were account120 (32.2%) and only 7% of the respondent got food support from organization like church aid.

### Substance use of the study participant

Most of the participants reported that they did not smoke cigarette (95.2%), not drink alcohol (88.2%), and not chew khat (87.4%). One-fifth of the respondents were substance user.

### The magnitude of food insecurity

Household food insecurity was assessed by using Household Food Insecurity Access Scale (HFIAS) questionnaire on Food and Nutrition Technical Assistance III (FANTA) that measures food insecurity in terms of 18 questions items. The overall food insecurity in this study was 245 (65.7%). Of which, 96(25.7%) were mildly insecure, 108 (29%) were moderately insecure, and 41 (11%) were severely insecure. 128 (34.3%) of the study participant were food secured.

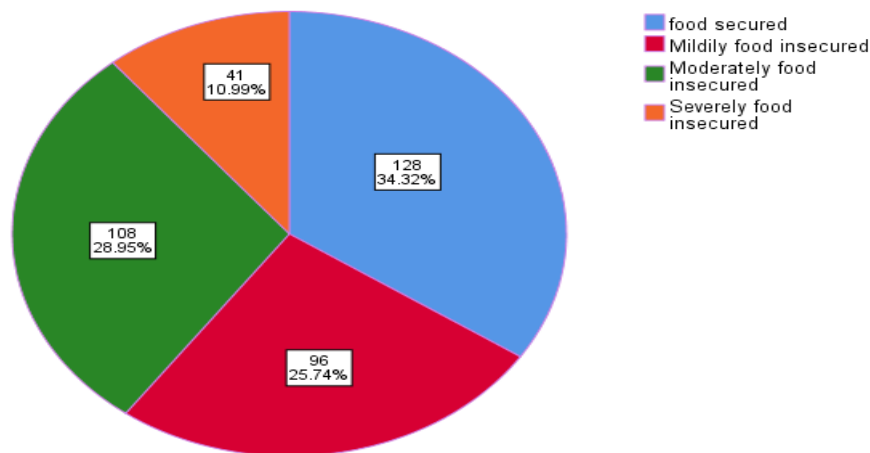


**Figure 3** Pie chart showing food insecurity status among adults receiving ART in Mettu Karl Specialized Hospital, Southwestern Ethiopia, 2021(n=373)

### **Factors associated with food insecurity among Adult on ART**

In this study, both binary and multivariate logistic regression analysis were computed. Binary logistic regression analysis was computed to show crude odds with food insecurity. Respondents who do not have formal education [95% CI: COR=9.18(4.13-20.41)] and primary level education [95% CI: COR=5.29(2.79-10.04)], substance users [95% CI: COR=2.21(1.23-3.97)], monthly income of less than 1000ETB [95%CI: COR=3(1.93-4.70)] and those who had inadequate diversity [95% CI: COR=3.93(2.50-6.10)]. Those who had no food support [95%: COR=0.32(0.11-0.97)] and bad adherence [95%CI: COR=19.76(2.67-146.3)]. WHO Clinical stage III&IV and who had opportunistic infection [95%CI: COR=10.5(2.48-44.40)], [95%CI: COR=2.44(1.47-4.03)] respectively. Multiple logistic regression was computed to identify independent predictors of food insecurity. Respondents who do not have formal education [95% CI: AOR=4.78(1.6-14.28)] and primary level education [95% CI: AOR=3.56(1.4-9.01)], Respondents who use substances [95% CI AOR=2.91(1.45-5.84)], and those who had inadequate diversity [95% CI: AOR=2.33(1.35-4.02)] were significantly associated with food insecurity.

**Table 3.** Binary and Multiple logistic results of the study on Assessment of Food insecurity and associated factors among Adult on ART at Mettu Karl Specialized Hospital, Southwest Ethiopia (2021)

| Variables          |                     | Food Insecure |            | COR   | 95% CI for COR |        | AOR   | 95% CI for AOR |        | P value |
|--------------------|---------------------|---------------|------------|-------|----------------|--------|-------|----------------|--------|---------|
|                    |                     | Yes           | No         |       | Lower          | Upper  |       | Lower          | Upper  |         |
| Sex                | Male                | 78(20.9%)     | 52(13.9%)  | 1     |                |        |       |                |        |         |
|                    | Female              | 167(44.8%)    | 76(20.4%)  | 1.465 | 0.94           | 2.283  |       |                |        |         |
| Marital status     | Single              | 34(9.1%)      | 20(5.4%)   | 1     |                |        | 1     |                |        |         |
|                    | Married             | 90(24.1%)     | 70(18.8%)  | 0.756 | 0.401          | 1.426  | 0.8   | 0.373          |        |         |
| Religion           | Widowed             | 55(14.7%)     | 23(6.2%)   | 1.407 | 0.674          | 2.937  | 0.761 | 0.316          | 1.834  |         |
|                    | Divorced            | 66(17.7%)     | 15(4%)     | 2.588 | 1.178          | 5.666  | 2.463 | 0.984          | 6.163  |         |
| Religion           | Orthodox            | 95(25.5%)     | 71(19%)    | 1.784 | 0.387          | 8.224  | 0.702 | 0.1            | 4.924  |         |
|                    | Muslim              | 57(15.3%)     | 23(6.2%)   | 3.304 | 0.685          | 15.935 | 1.578 | 0.215          | 11.585 |         |
| Religion           | Protestant          | 90(24.1%)     | 30(8%)     | 4     | 0.847          | 18.901 | 3.025 | 0.428          | 21.384 |         |
|                    | Other               | 3(0.8%)       | 4(1.1%)    | 1     |                |        | 1     |                |        |         |
| Monthly Income     | <1000               | 175(46.9%)    | 58(15.5%)  | 3.017 | 1.934          | 4.708  | 1.496 | 0.714          | 3.135  |         |
|                    | ≥1000               | 70(18.8%)     | 70(18.8%)  | 1     |                |        | 1     |                |        |         |
| Level of Education | No formal education | 66            | 13         | 9.187 | 4.134          | 20.416 | 4.783 | 1.602          | 14.282 | 0.005   |
|                    | Primary             | 120           | 41         | 5.296 | 2.792          | 10.045 | 3.56  | 1.406          | 9.016  | 0.006   |
| Level of Education | Secondary           | 38            | 36         | 1.91  | 0.947          | 3.851  | 1.548 | 0.675          | 3.551  |         |
|                    | College and above   | 21(5.6%)      | 28(10.2%)  | 1     |                |        | 1     |                |        |         |
| Family size        | 1-4                 | 205(55%)      | 103(27.6%) | 1     |                |        |       |                |        |         |

|                         |              |            |            |        |       |         |       |       |        |       |
|-------------------------|--------------|------------|------------|--------|-------|---------|-------|-------|--------|-------|
|                         | ≥5           | 40(10.7%)  | 25(6.7%)   | 0.804  | 0.462 | 1.397   |       |       |        |       |
| Place of Residence      | Urban        | 182(48.8%) | 97(26%)    | 1      |       |         |       |       |        |       |
|                         | Rural        | 63(16.9%)  | 31(8.3%)   | 1.083  | 0.66  | 1.778   |       |       |        |       |
| Age category            | 18-30        | 77(20.6%)  | 43(11.5%)  | 1      |       |         |       |       |        |       |
|                         | 31-40        | 86(23.1%)  | 45(12.1%)  | 1.067  | 0.635 | 1.793   |       |       |        |       |
|                         | 41-50        | 42(11.3%)  | 22(5.9%)   | 1.066  | 0.564 | 2.015   |       |       |        |       |
|                         | >50          | 40(10.7%)  | 18(4.8%)   | 1.241  | 0.635 | 2.425   |       |       |        |       |
| Employment status       | Unemployed   | 189(50.7%) | 74(19.8%)  | 2.463  | 1.554 | 3.903   | 0.844 | 0.375 | 1.901  |       |
|                         | Employed     | 56(15%)    | 54(14.5%)  | 1      |       |         | 1     |       |        |       |
| Medical support         | Yes          | 18(4.8%)   | 3(0.8%)    | 1      |       |         |       |       |        |       |
|                         | No           | 227(60.9%) | 124(33.5%) | 0.303  | 0.087 | 1.048   |       |       |        |       |
| Food support            | Yes          | 22(5.9%)   | 4(1.1%)    | 1      |       |         |       |       |        |       |
|                         | No           | 223(59.8%) | 124(33.2%) | 0.327  | 0.11  | 0.97    |       |       |        |       |
| Opportunistic Infection | Yes          | 94(25.2%)  | 26(7%)     | 2.442  | 1.479 | 4.033   | 1.248 | 0.673 | 2.315  |       |
|                         | No           | 151(40.5%) | 102(27.3%) | 1      |       |         | 1     |       |        |       |
| WHO Staging             | Stage I&II   | 210(56.3%) | 126(33.8%) | 1      |       |         | 1     |       |        |       |
|                         | Stage III&IV | 35(9.4%)   | 2(0.5%)    | 10.5   | 2.483 | 44.405  | 3.252 | 0.669 | 15.803 |       |
| Adherence               | Poor         | 33(8.8%)   | 1(0.3%)    | 19.769 | 2.671 | 146.301 | 4.208 | 0.495 | 35.795 |       |
|                         | Good         | 212(56.8%) | 127(34%)   | 1      |       |         | 1     |       |        |       |
| HDD                     | Inadequate   | 172(46.1%) | 48(12.9%)  | 3.937  | 2.503 | 6.102   | 2.332 | 1.352 | 4.023  | 0.002 |
|                         | Adequate     | 73(19.6%)  | 80(21.4%)  | 1      |       |         | 1     |       |        |       |
| Substance user          | Yes          | 62(16.6%)  | 17(4.6%)   | 2.212  | 1.231 | 3.975   | 2.913 | 1.451 | 5.848  | 0.003 |
|                         | No           | 183(49.1%) | 111(29.8%) | 1      |       |         | 1     |       |        |       |

## 6. Discussion

The prevalence of food insecurity among ART patients in this study was 65.7%. The magnitude is comparable with the ones found in studies done in Windhoek Namibia(67%)(24), in Hossana(67.5%) (25)and in Jimma Ethiopia(63%)(26). However, the prevalence was lower than reported from studies done British, Colombia, Canada (73%) (27), Nigeria (71.7%)(28)respectively. It also lower than other study in Ethiopia: Fiche (87.4%)(29) and Butajira(78.1%) (30). Consequently, the Magnitude was higher than those study done in Bengal (49.1%) (31) in Kembata (57.3%) (32) and in West shoa zone Ethiopia (35.2%)(33) A possible explanation may be differences in the socio-economic status, study time and area, the health intervention measurement taken and sample size of the studies.

Educational status was one of the predictors of food insecurity with PLWHA's whose educational status is lesser than elementary level being more likely to be food insecure than those who most educated. This finding is consistent with the findings of other reports (34)

Respondents who complete Primary level of education were 3.56 times more likely to be food insecure than those who complete colleges. Furthermore, low education level is also associated with higher likelihood of HIV as well as poverty which is also associated with food insecurity(35).

The study also showed that the presence of inadequate dietary diversity was associated with food insecurity. Participants who did not have adequate dietary diversity were 2.33 times more likely to be food insecure. This finding of the study was consistent with the finding of study conducted in Western Ethiopia. This similarity justifies the fact that lack of ingestion of a food variety leads to the development of food insecurity (36).

HDD and HFIS are intertwined one another's and one may be the other causes independently. The household food insecurity may increase, if the individuals are unable to acquire sufficient quality and quantity of food to meet household member need.

Respondents who were substance user were 2.9 times more likely to be food insecure compared with those who were non substance user. This finding was similar to a study conducted in the Portuguese population that revealed respondents who were substance user were 1.56 times more likely food insecure compared with those who were encounters and with that of study done in Western region which had 3.57 times likelihood (36). This similarity might be related to the fact that substance use decreases the individual income and expose to additional extravagancy through expending money for paying for behave (36).

### **Limitation of the Study**

The study design was cross-sectional and therefore by its nature limits information about cause and effect relationship in the majority of predictors. Assessment of HFIS and HDD depends on the past one-month period and 24-hour recall method, respectively; they may create a possibility of recall bias. This was minimized by probing the respondents about the event and by using well trained data collectors.

## **7. Conclusion**

Food insecurity is a critical contributing factor for poor health outcome among adults living with HIV. The magnitude of food insecurity among adult ART attendants was relatively high. Respondents who use substance, had primary level education and no formal education, and those who had inadequate dietary diversity were associated with food insecurity among the adults attending ART.

## 8. Recommendations

These results could call multi-sectorial collaboration to alleviate the problem among ART attendants. Based on this study finding the following way of forwards were made:

- Adult living with HIV/AIDS need to diversify their meals based on the available food nearby and cultivate in their compound, so that they can be productive to further reduce the reported food insecurity.
- Mettu Karl Specialized Hospital ART clinic staffs, routinely should deliver nutrition education during adherence counselling to medical treatment to improve health status including advice to tackle impact of substance use.
- Government and other stakeholders should call for integration of ART program with food security interventions and enhance level of education of ART users.

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## Annexes

### Annex.1.ENGLISH CONSENT FORM

Hello! My name is \_\_\_\_\_. I am Data Collectors for the study done by Mr, Solomon Berhanu from St Paul Hospital Millennium Medical College Department of Public Health for partial fulfillment of master degree.

This study is designed to generate information on the magnitude of food insecurity and associated factors among adults on ART and to forward recommendation for policy planners. You are selected to participate in this study based on systematic random selection.

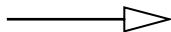
For fulfillment of the aim, your honest and genuine participation by responding to the questionnaire is very important.

Confidentiality and consent I would like to assure you that your personal issues, answers and ideas are kept secured. Your name will not be written on this form. Your participation in this study is completely voluntary and you can withdraw at any time. You are free to skip any question you choose. We appreciate your kindness to be part of the study. The interview will take maximum of 30 minutes.

If you have questions about this project or if you have a research-related problem, you may contact the researcher, [Mr. Solomon Berhanu (0917792611)]. If you have any questions concerning your rights as a research subject, you may contact the St Paul Millennium Medical College Department of Public Health

Are you willing to participate?

If the answer yes ☐  Continue

If the answer No ☐  stop

**I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this research.**

**Signature of Participant** \_\_\_\_\_ **Name of data collector** \_\_\_\_\_

**Date** ----- **Signature of data collector** \_\_\_\_\_

**Date** -----

## Annex 2. AFAN OROMO VERSION CONCENT

Nagaankoo isin haqqabu. Maqaankoo, -----jedhama. Ani raga funaanaa Koolleejii Fayyaa Hospitaala Miliniyemii Qiddus Phaawuloos Muummee Fayyaa Hawaa saattibarataadigriilammaaffaakantaheobbo Salamoona Birhanuuti if xumura barnootaaf qorannoo waa'ee bal'ina Hanqina Nyataa fi isawaliin hidhata qabandargaggoota dawaafarra HIV fudhatan irratti hagamak katahe irratti qorannoogaggeessuuf gara Hospitaala Ispeeshaala ayzii Kaarl Mattuud hufeera.

Qorannoon kunkani irratti fuullefatubal'ina Hanqinni Nyataa dargaggoota qorichafarra HIV fayya damani irratti mul'atuuf ragaasaa buuf ragaalee kan irratti hundaa'uun jarreeni maammata baasa niif kallatti kennuudha. Galma qorannichaati if hirmaannaan keessan baayye barbaachisaa fi murteessaa akka katahe ibsa.

Iccitiin kan ee game yommuu tahu waaheen raga dhuunfaa jechuunis maqaankan hin barreeffamnee fi deebiinis inlaattan qaama qorannoogaggeessuun alatti dabarfamee kan hin laatan netahuunis iniif mirkaneessa.

Gaaffii kamillee deebisuudhiisuun mirga akka katahe ibsaaf dhakeessanyoo hintaanegaaffii kamirra yuudaru buu akkadeessan raga isiniif ba'a. Qorannichairratti hirmaanna keessani if singalateeffachaagaaffiin qorannichaayoo baayyateda qiiqaa 30 kan hin caalletahuusaa isiniif mirkaneessa.

Qorannichairratti hirmaachuuf eeyyamamaadhaa?

Eeyyee Lakk

Bu'aa qorannichaahubachuun hirmaannaafeeyyamamaatahuukoo nan mirkaneessa

Mallatto hirmaata qorannichaa-----Guyyaa-----

Maqaa raga funaanaa----- Mallatto----- Guyyaa-----

### Annex 3. QUESTIONERES

#### ENGLISH VERSION

| S.No | Questions              | Option of answers                                                                               | Skip |
|------|------------------------|-------------------------------------------------------------------------------------------------|------|
| I.   | SOCIO DEMOGRAPHIC DATA |                                                                                                 |      |
| 101  | Age                    | ____( Years)                                                                                    |      |
| 102  | Sex                    | 1. Male<br>2. female-                                                                           |      |
| 103  | Marital status         | 1. Single<br>2. Married<br>3. Widowed<br>4. Divorced                                            |      |
| 104  | Religion               | 1. Orthodox<br>2. Muslim<br>3. Protestant<br>4. Other                                           |      |
| 105  | Income                 | 1. <1000 ETB<br>2. ≥1000 ETB                                                                    |      |
| 106  | Level of education     | 1. Unable to read and write<br>2. Primary school<br>3. Secondary school<br>4. College and above |      |
| 107  | Family size            | 1. 1-4<br>2. ≥5                                                                                 |      |
| 108  | Residence              | 1. Urban<br>2. Rural                                                                            |      |
| 109  | Occupation             | 1. Unemployed<br>2. Employed                                                                    |      |
| II.  | BEHAVIORAL FACTORS     |                                                                                                 |      |

|                            |                        |                                  |  |
|----------------------------|------------------------|----------------------------------|--|
| 201                        | Drinking Alcohol       | 0-No<br>1-Yes                    |  |
| 202                        | Chewing Khat           | 0-No<br>1-Yes                    |  |
| 203                        | SmokingCigarette       | 0-No<br>1-Yes                    |  |
| III. CLINICAL FACTORS      |                        |                                  |  |
| 301                        | OI                     | 1 –Yes<br>2-No                   |  |
| 302                        | Adherence status       | 1–poor<br>2-Fair<br>3-Good       |  |
| 303                        | WHO clinical stage     | 1. Stage I&II<br>2. Stage III&IV |  |
| IV. SOCIAL SUPPORT/FACTORS |                        |                                  |  |
| 401                        | Health care support    | 0-No<br>1- Yes                   |  |
| 402                        | Food/Nutrition support | 0-No<br>1- Yes                   |  |

## Food security status

### Household Food Insecurity Access Scale (HFIAS) Measurement Tool

|      |                                                                                                                                           |                                                                                                                                                                          |                       |
|------|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| 501  | In the past four weeks, did you worry that your household would not have enough food?                                                     | 0-No<br>1-Yes                                                                                                                                                            | If No<br>SKIP<br>Q502 |
| 501a | How often this happen?                                                                                                                    | 1=Rarely (ones or twice in the past four weeks)<br>2=Sometimes (three to ten times in the past four weeks)<br>3=Often (more than ten times in the past four weeks)       |                       |
| 502  | In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources? | 0-No<br>1-Yes                                                                                                                                                            | If No<br>SKIP<br>Q503 |
| 502a | How often did this happen?                                                                                                                | 1 = Rarely (once or twice in the past four weeks)<br>2 = Sometimes (three to ten times in the past four weeks)<br>3 = Often (more than ten times in the past four weeks) |                       |
| 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?                | 0-No<br>1-Yes                                                                                                                                                            | If No<br>SKIP<br>Q504 |
| 503a | How often did this happen?                                                                                                                | 1 = Rarely (once or twice in the past four weeks)<br>2 = Sometimes (three to ten times in                                                                                |                       |

|      |                                                                                                                                                                                  |                                                                                                                                                                          |                       |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|      |                                                                                                                                                                                  | the past four weeks)<br>3 = Often (more than ten times in the past four weeks)                                                                                           |                       |
| 504  | 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? | 0-No<br>1-Yes                                                                                                                                                            | If No<br>SKIP<br>Q505 |
| 504a | How often did this happen?                                                                                                                                                       | 1 = Rarely (once or twice in the past four weeks)<br>2 = Sometimes (three to ten times in the past four weeks)<br>3 = Often (more than ten times in the past four weeks) |                       |
| 505  | 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?                                   | 0-No<br>1-Yes                                                                                                                                                            | If No<br>SKIPQ506     |
| 505a | How often did this happen?                                                                                                                                                       | 1 = Rarely (once or twice in the past four weeks)<br>2 = Sometimes (three to ten times in the past four weeks)<br>3 = Often (more than ten times in the past four weeks) |                       |
| 506  | In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?                                                | 0-No<br>1-Yes                                                                                                                                                            | If No<br>SKIP<br>Q507 |
| 506a | How often did this happen?                                                                                                                                                       | 1 = Rarely (once or twice in the past four weeks)<br>2 = Sometimes (three to ten times in                                                                                |                       |

|      |                                                                                                                                             |                                                                                                                                                                          |                       |
|------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|      |                                                                                                                                             | the past four weeks)<br>3 = Often (more than ten times in the past four weeks)                                                                                           |                       |
| 507  | In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?               | 0-No<br>1-Yes                                                                                                                                                            | If No<br>SKIP<br>Q508 |
| 507a | How often did this happen?                                                                                                                  | 1 = Rarely (once or twice in the past four weeks)<br>2 = Sometimes (three to ten times in the past four weeks)<br>3 = Often (more than ten times in the past four weeks) |                       |
| 508  | In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?                      | 0-No<br>1-Yes                                                                                                                                                            | If No<br>SKIP<br>Q509 |
| 508a | How often did this happen?                                                                                                                  | 1 = Rarely (once or twice in the past four weeks)<br>2 = Sometimes (three to ten times in the past four weeks)<br>3 = Often (more than ten times in the past four weeks) |                       |
| 509  | In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food? | 0-No<br>1-Yes                                                                                                                                                            |                       |
| 509a | How often did this happen?                                                                                                                  | 1 = Rarely (once or twice in the past four weeks)<br>2 = Sometimes (three to ten times in the past four weeks)<br>3 = Often (more than ten times in the past four weeks) |                       |

### Dietary Diversity Questionnaire

| Question Number | Food group                           | Examples                                                                                                                                                                                           | YES=1<br>NO=0 |
|-----------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1               | CEREALS                              | corn/maize, rice, wheat, sorghum, millet or any other grains or foods made from these (e.g. bread, noodles, porridge or other grain products) + <i>insert local foods e.g. , porridge or paste</i> |               |
| 2               | WHITE ROOTS AND TUBERS               | white potatoes, white yam, or other foods made from root                                                                                                                                           |               |
| 3               | VITAMIN A RICH VEGETABLES AND TUBERS | pumpkin, carrot, squash, or sweet potato that are orange inside + <i>other locally available vitamin A rich vegetables (e.g. red sweet pepper)</i>                                                 |               |
| 4               | DARK GREEN LEAFY VEGETABLES          | dark green leafy vegetables, including wild forms + <i>locally available vitamin A rich leaves such as kale, spinach</i>                                                                           |               |
| 5               | OTHER VEGETABLES                     | other vegetables (e.g. tomato, onion, eggplant) + <i>other locally available vegetables</i>                                                                                                        |               |
| 6               | VITAMIN A RICH FRUITS                | ripe mango, ripe papaya, and 100% fruit juice made from these + <i>other locally available vitamin A rich fruits</i>                                                                               |               |
| 7               | OTHER FRUITS                         | other fruits, including wild fruits and 100% fruit juice made from these                                                                                                                           |               |
| 8               | ORGAN MEAT                           | liver, kidney, heart or other organ meats or blood-based foods                                                                                                                                     |               |
| 9               | FLESH MEATS                          | beef, pork, lamb, goat, chicken,                                                                                                                                                                   |               |

|                         |                                                                                                 |                                                                                                                           |  |
|-------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|--|
| 10                      | EGGS                                                                                            | eggs from chicken,                                                                                                        |  |
| 11                      | FISH AND<br>SEAFOOD                                                                             | fresh or dried fish or shellfish                                                                                          |  |
| 12                      | LEGUMES,<br>NUTS<br>AND SEEDS                                                                   | dried beans, dried peas, lentils, nuts, seeds<br>or foods made from these (eg. hummus,<br>peanut butter                   |  |
| 13                      | MILK AND<br>MILK<br>PRODUCTS                                                                    | milk, cheese, yogurt or other milk<br>products                                                                            |  |
| 14                      | OILS AND FATS                                                                                   | oil, fats or butter added to food or used for<br>cooking                                                                  |  |
| 15                      | SWEETS                                                                                          | sugar, honey, sweetened soda or sweetened<br>juice drinks, sugary foods such as<br>chocolates, candies, cookies and cakes |  |
| 16                      | SPICES,<br>CONDIMENTS,<br>BEVERAGES                                                             | spices (black pepper, salt), condiments<br>(soy sauce, hot sauce), coffee, tea, alcoholic<br>Beverages                    |  |
| Household<br>level only | Did you or anyone in your household eat anything (meal or<br>snack) OUTSIDE the home yesterday? |                                                                                                                           |  |

AFAN OROMO VERSION

| Lakk.                     | Gaaffii            | Filannoodeebii                                                                                                | Utaalcha |
|---------------------------|--------------------|---------------------------------------------------------------------------------------------------------------|----------|
| I. SOCIO DEMOGRAPHIC DATA |                    |                                                                                                               |          |
| 101                       | Umurii(waggaan)    | _____                                                                                                         |          |
| 102                       | Saala              | 1. Dhiira<br>2. Dhalaa                                                                                        |          |
| 103                       | Haalagaahilaa      | 1. Kanhinfuune/hinheerumne<br>2. Kanfuudhe/heerume<br>3. Du'aankangargarba'an<br>4. Kanwalhiikan              |          |
| 104                       | Amantii            | 1. Ortodooksii<br>2. Musliima<br>3. Piroteestaantii<br>4. Kanbiro                                             |          |
| 105                       | Galii(jihaan)      | 1. <1000 ETB<br>2. ≥1000 ETB                                                                                  |          |
| 106                       | Sadarkaabarnootaa? | 1. Dubbisuu fi barreessuukanhindandeenye<br>2. Sadarkaa 1ffaa<br>3. Sadarkaa 2ffaa<br>4. Koolleejii fi isaaol |          |
| 107                       | Baay'inamaatii     | 1. 1-4<br>2. ≥5                                                                                               |          |
| 108                       | Bakkajireenyaa     | 1. Magaalaa<br>2. Baadiyyaa                                                                                   |          |
| 109                       | Haalahojii?        | 1. Hojiihinqabu<br>2. Hojjataadha                                                                             |          |

|                                  |                         |                                        |      |
|----------------------------------|-------------------------|----------------------------------------|------|
|                                  |                         |                                        |      |
| <b>II. BEHAVIORAL FACTORS</b>    |                         |                                        |      |
| 201                              | Alkooliidhuguu          | 0-Lakki<br>1-Eeyyee                    | Skip |
| 202                              | Jimaa/Caatiiqama'uu     | 0-Lakki<br>1-Eeyyee                    |      |
| 203                              | Tamboo/sijaaraaxuuxuu   | 0-Lakki<br>1-Eeyyee                    |      |
| <b>III. CLINICAL FACTORS</b>     |                         |                                        |      |
| 301                              | Dhibeeleewalqabattoo    | 0-Lakki<br>1-Eeyyee                    |      |
| 302                              |                         | 1-<250cells/mm3<br><br>2-≥250cells/mm3 |      |
| 303                              | WHO clinical stage      | 1. Stage I&II<br>2. Stage III&IV       |      |
| <b>IV Social Support/Factors</b> |                         |                                        |      |
| 401                              | Gargaarsakunuunsafayyaa | 0-Lakki<br>1-Eeyyee                    |      |
| 402                              | GargaarsaNyaataa        | 0-Lakki<br>1-Eeyyee                    |      |

## Food security status

### Household Food Insecurity Access Scale (HFIAS) Measurement Tool

|      |                                                                                                                                         |                                                                                                            |                |
|------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|----------------|
| 501  | Torbanarfandarbankeessatti sis<br>ta'eemaatiikeenyaatagahaahinqabnujettaniicinqam<br>taniibeektuu?                                      | 0-Lakki<br>1-Eeyyee                                                                                        | Irradarbi<br>i |
| 501a | Si'ahagam?                                                                                                                              | 1=yeroomuraasa(si'a 1 ykn 2)<br>2=darbeedarbee(si'a 3 hanga<br>10)<br>3=yeroobaay'ee(si'a 10 fi<br>isaaol) |                |
| 502  | Torbanarfandarbankeessatti sis<br>ta'eemaatiikeegosanyaataanyaachuuffeetansababa<br>qarshiidhabuutiinosoohinnaatiinhaftaniittu?         | 0-Lakki<br>1-Eeyyee                                                                                        |                |
| 502a | Si'ahagam?                                                                                                                              | 1=yeroomuraasa(si'a 1 ykn 2)<br>2=darbeedarbee(si'a 3 hanga<br>10)<br>3=yeroobaay'ee(si'a 10 fi<br>isaaol) |                |
| 503  | Torbanarfandarbankeessatti sis<br>ta'eemaatiikeenyaatagosagosiinhanqinaqabusababa<br>qarshiidhabuutiinosoonyaachuunisinnuudateeraa<br>? | 0-Lakki<br>1-Eeyyee                                                                                        |                |
| 503a | Si'ahagam?                                                                                                                              | 1=yeroomuraasa(si'a 1 ykn 2)<br>2=darbeedarbee(si'a 3 hanga<br>10)                                         |                |

|      |                                                                                                                                        |                                                                                                      |  |
|------|----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--|
|      |                                                                                                                                        | 3=yeroobaay'ee(si'a 10 fi isaaol)                                                                    |  |
| 504  | Torbanarfandarbankeessatti sis ta'eemaatiikesababaqarshiidhabuutiingosanyaata nyaachuuffedhahinqabneenyaattanii?                       | 0-Lakki<br>1-Eeyyee                                                                                  |  |
| 504a | Si'ahagam?                                                                                                                             | 1=yeroomuraasa(si'a 1 ykn 2)<br>2=darbeedarbee(si'a 3 hanga 10)<br>3=yeroobaay'ee(si'a 10 fi isaaol) |  |
| 505  | Torbanarfandarbankeessatti sis ta'eemaatiikesababahanqinanyaataatiinhanganya atanyaachuufbarbaaddanirraaxiqqoo/hir'iftaniinya attanii? | 0-Lakki<br>1-Eeyyee                                                                                  |  |
| 505a | Si'ahagam?                                                                                                                             | 1=yeroomuraasa(si'a 1 ykn 2)<br>2=darbeedarbee(si'a 3 hanga 10)<br>3=yeroobaay'ee(si'a 10 fi isaaol) |  |
| 506  | Torbanarfandarbankeessatti sis ta'eemaatiikesababahanqinanyaataatiinguyyaattis ihamuraasaqofanyaachuunisinnuudateeraa?                 | 0-Lakki<br>1-Eeyyee                                                                                  |  |
| 506a | Si'ahagam?                                                                                                                             | 1=yeroomuraasa(si'a 1 ykn 2)<br>2=darbeedarbee(si'a 3 hanga 10)<br>3=yeroobaay'ee(si'a 10 fi isaaol) |  |
| 507  | Torbanarfandarbankeessattisababaqarshiidhabuuti innyaatnikamiyyuu mana                                                                 | 0-Lakki<br>1-Eeyyee                                                                                  |  |

|      |                                                                                                                            |                                                                                                      |  |
|------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--|
|      | keessadhabameebeekaa?                                                                                                      |                                                                                                      |  |
| 507a | Si'ahagam?                                                                                                                 | 1=yeroomuraasa(si'a 1 ykn 2)<br>2=darbeedarbee(si'a 3 hanga 10)<br>3=yeroobaay'ee(si'a 10 fi isaaol) |  |
| 508  | Torbanarfandarbankeessatti sis ta'eemaatiikesababanyaatanigahaanjiraachuudhab uunhalkanosoobeeloftaniiraftanii?            | 0-Lakki<br>1-Eeyyee                                                                                  |  |
| 508a | Si'ahagam?                                                                                                                 | 1=yeroomuraasa(si'a 1 ykn 2)<br>2=darbeedarbee(si'a 3 hanga 10)<br>3=yeroobaay'ee(si'a 10 fi isaaol) |  |
| 509  | Torbanarfandarbankeessatti sis ta'eemaatiikesababanyaatanigahaanjiraachuudhab uunguyyaasstahehalkanosoohinnaatiinhaftanii? | 0-Lakki<br>1-Eeyyee                                                                                  |  |
| 509a | Si'ahagam?                                                                                                                 | 1=yeroomuraasa(si'a 1 ykn 2)<br>2=darbeedarbee(si'a 3 hanga 10)<br>3=yeroobaay'ee(si'a 10 fi isaaol) |  |

## **Declaration**

I the undersigned agree to accept all responsibilities for the scientific and ethical conduct of the research project. I will provide timely progress report to my advisor and seek the necessary advice and approval from my primary advisors in the course of the research. I will communicate timely to my advisors all stakeholders involved in the study including any source of funding for this research.

Name of the student: Solomon Berhanu Mengistu

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## **Approval of the Primary Advisor**

Name of the primary advisor: Mr. Tesfaye Dagne (MPH)

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## **Approval of the Co-Advisor**

Name of the co-advisor: Mr. Andamlak Gizaw (MPH, Ass. Prof)

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

