ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

Assessment on food security, nutritional status and their association with HAART adherence among adult PLWHA in public hospitals of Addis Ababa, Ethiopia

By:

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ABSTRACT

Background: Morbidity and mortality related to HIV/AIDS remain unacceptably high in developing countries, despite major advance in HIV therapy and increased international funding on HIV/AIDS. Individual's ability to obtain, consume and utilize food is compromised by HIV/AIDS. It causes morbidity and mortality as a result of poor nutritional status and weight loss. Interactions between antiretroviral therapy (ART) and nutrition can affect medication efficacy, nutritional status, and adherence to drug regimens. The concept of enhancing access to food among PLWHA and managing the interactions between ART and food and nutrition is critical remains critical.

Objective: To assess food security, nutritional status and their association with adherence of HAART among adult People living with HIV/AIDS.

Methods: A hospital based cross-sectional survey was conducted between December 2010 and February 2011 among adult (≥18 years) PLWHA on HAART with a complementary qualitative interview among HAART adherence supporters at selected public hospitals of Addis Ababa, Ethiopia. A total of 394 adult PLWHA systematically selected and participated in the study having a 100% response rate. Semi structured and structured questionnaires, adopted from FANTA were used to collect data on food security. BMI measurements were taken to assess nutritional status. Univariate, bivariate and multivariate logistic regression analysis was done using SPSS version 16. Qualitative content analysis was done after importing the transcribed text onto the Open code program.

Result: Majority 252 (65%) of the study participants were females, 305 (77%) in the age group 25-44 years. Overall 293(74.4%) PLWHA were food insecure with 95% CI: (70.09, 78.71). And the rate of self reported adherence based on the combined indicator of the dose and time adherence measurement was 321(81.5%) with 95% CI: (77.67, 85.33). Only 61(16.5%) with 95% CI: (12.83, 20.17) were underweight. Household's monthly income (≤500 ETB) predicted food insecurity (AOR, 6.37; 95% CI, 2.98-13.63). And there was no statistical significant association between food security and self reported HAART adherence.

Conclusions & recommendations: Large number of adult PLWHA was food insecure. Wide ranges of coping strategies were taken to cope with food insecurity. Self reported HAART adherence was high. Medium to long term intervention aiming at generating and diversifying income to improve self reliance of PLWHA would help mitigate the food insecurity problem.

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I thank all those who helped me throughout the process.

DEDICATION

I am dedicating this to my mother Fanaye Adugna. Things were possible because of her. She is my Hero.

ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
ALERT	All African Leprosy Education training and Research Center
AOR	Adjusted odds ratio
ART	Anti Retroviral Treatments
ARVs	Anti Retro Virals
BMI	Body Mass Index
CDC	Center for Diseases Control
CI	Confidence Interval
EDHS	Ethiopian Demographic and Health Survey
ETB	Ethiopian Birr
FANTA	Food and Nutrition Technical Assistance
FAO	Food and Agriculture Organization
FI	Food Insecurity
GDP	Gross Domestic Product
HAART	Highly Active Anti Retro viral Treatment
HDDS	Household dietary diversity score
HFIAS	Household Food Insecurity Access Scale
HIV	Human Immunodeficiency Virus
IDDS	Individual Dietary Diversity Score
OR	Odds Ratio
OVC	Orphans and vulnerable children
PLWHA	People Living With HIV/AIDS
SPSS	Statistical Package for Social Science
UNAIDS	Joint United Nation Program on HIV/AIDS
US	United States
USAIDS	United State Agency for International Development
WFP	World Food Program
WHO	World Health Organization

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1. INTRODUCTION

1.1 Background information

Millions of people have died of HIV during the last 25 years. The highest number of deaths occurred in poor African countries where antiretroviral therapy was introduced only recently[1]. The broader relationships and interactions between HIV/AIDS, food security, and nutrition are complex. Food insecurity and poverty may lead to high-risk sexual behaviors and migration, increasing the risk of acquiring HIV. At the same time, HIV weakens a household's ability to provide for basic needs. When a PLWHA cannot work, food production or earnings may decrease. Healthy family members may need to stop work to care for sick family members. Household labor constraints can lead to reductions in cultivated land; shifts in crops; and depletion of livestock. For households that are food insecure prior to a member's falling ill, the effects can be devastating[2].

HIV/AIDS is associated with biological and social factors that affect the individual's ability to obtain, consume and utilize food. These factors lead to poor nutritional status and weight loss, which are important causes of morbidity in individuals infected with HIV, resulting in a poor quality of life. The links between nutrition and HIV/AIDS amplify the negative effects of HIV infection on human development at individual, household, community and national levels.[3].

At biological level, HIV/AIDS and malnutrition interact in a vicious cycle. HIV-induced immune impairment and heightened risk of infection can worsen nutritional status, lead to nutritional deficiencies through decreased food intake, mal-absorption, and increased utilization and excretion of nutrients. These processes in turn hasten the progression of HIV infection to AIDS, while HIV infection exacerbates malnutrition by attacking the immune system and by negatively impacting nutrient intake, absorption and the body's use of food[2].

The most common physical sign of nutrition inadequacy in HIV/AIDS is weight loss. The pattern of weight loss in individuals infected with HIV has been shown to be different from

that of a healthy individual suffering from an acute illness. When an individual who is not infected with the HIV virus experiences an illness there is a protein sparing effect in which fat stores are the first to be broken down to meet the elevated energy requirements associated with the illness. In HIV infection the opposite is true; body proteins are more likely to be the first to be broken down, to provide amino acids to fuel energy needs[4, 5]. Weight loss is associated with significant morbidity and mortality in populations living with HIV/AIDS. A 5% loss in weight is associated with risk for wasting, mortality and opportunistic infections[6].

Interactions between ARVs and nutrition can also significantly influence the success of ART by affecting drug efficacy, adherence to drug regimens, and the nutritional status of PLWHA. In return, poor adherence is linked to the development of drug resistance, higher mortality rates, lower rates of increment in CD4 cell count, lower rates of undetectable viral load, lower therapeutic success and increased hospital days. [7].

A groundbreaking study done in 2006 found that those starting Antiretroviral Therapy (ART) who was moderately to severely malnourished were twice as likely to die as those who were not malnourished. Malnutrition decreases survival in patients starting ART and HAART for several possible reasons: impairment of immune reconstitution and in turn a prolonged period of opportunistic infection risk; adverse effects on drug absorption; lower threshold for drug toxicity; and/or decreased physical function[8].

When patients adhere to ART, the treatment will most often suppress viral replication, slow disease progression, and improve nutritional status. People initiating ARV treatment may experience increased appetite, thus requiring dietary counseling on how to meet nutrient needs with available foods. For food-insecure people, food support may be needed in order to act on dietary counseling recommendations. While they save lives, ARVs may cause adverse side effects. They may negatively interact with food, affecting nutritional and treatment outcomes. In addition, ARVs may cause lipodystropy, or fat redistribution, and associated metabolic changes or anemia may occur. Long-term elevated risks for diabetes,

cardiovascular disease, and osteoporosis may also sometimes be associated with HIV and ARVs, and require nutritional management[7].

A qualitative research was undertaken on a short-term nutrition intervention linked to the provision of free antiretroviral treatment for people living with HIV in western Kenya in late 2005 and early 2006. The study shows that patients enrolled in the food program while on treatment regimens self-reported greater adherence to their medication, fewer side effects, and a greater ability to satisfy increased appetite. Most clients self-reported weight gain, recovery of physical strength, and the resumption of labor activities while enrolled in dual (food supplementation and treatment) programs. Such improvements were seen to catalyze increased support from family and community[9].

Due to this relationship, nutritional interventions are critical to fighting HIV and AIDS in threefold, i.e. nutrition interventions for antiretroviral therapy (ART), nutrition supplements for malnutrition in HIV and AIDS patients, and nutrition interventions for orphans and vulnerable children (OVCs) [10]. Managing the interactions between ART and food and nutrition is critical in improving the effectiveness of ARVs while minimizing their negative nutritional impact and increasing adherence to drug regimens.

2. LITERATURE REVIEW

Definition of Food and Nutrition Security

According to World food summit plan of action; food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life[11]

As broadly defined by Rainer.G; food security is achieved, if adequate food (quantity, quality, safety, socio-cultural acceptability) is available and accessible for and satisfactorily utilized by all individuals at all times to live a healthy and happy life. The definition of food security stated above emphasizes 'Availability', 'Accessibility', and 'Utilization' of food. The inclusion of utilization underlines that 'Nutrition Security' is more than 'Food Security.' Two determinants influence the framework: a physical and a temporal determinant [12].

The physical determinant is the food flow: Availability, Accessibility, and Utilization. Availability is achieved if adequate food is ready to have at people's disposal. Access is ensured when all households and all individuals within those households have sufficient resources to obtain appropriate foods (through production, purchase or donation) for a nutritious diet. Adequate Utilization refers to the ability of the human body to ingest and metabolize food. Nutritious and safe diets, an adequate biological and social environment, a proper health care to avoid diseases ensure adequate utilization of food. In most cases, utilization is only discussed from a biological perspective. However, food also has an important social role keeping families and communities together. This role can be achieved only when sufficient culturally adapted food is available within households and communities to meet its biological and social needs. Stability refers to the temporal determinant of food and nutrition security and affects all three physical elements.[12]

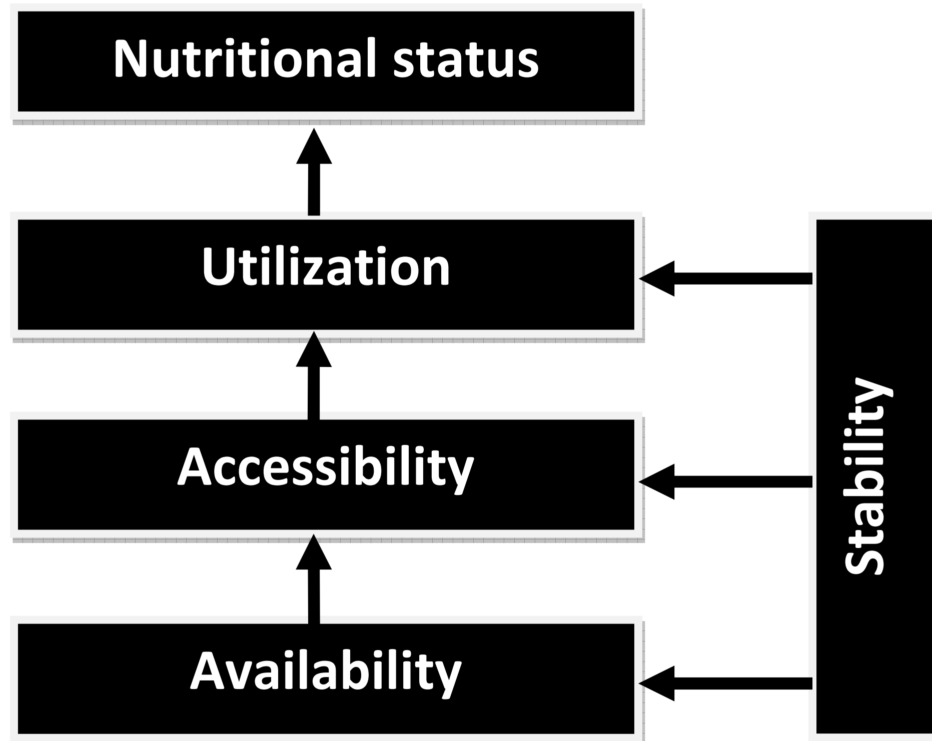


Figure 1 Illustrates the relationship among the categorical elements within the conceptual framework of food security: The four dimensions of food and nutrition security: Definition and Concepts adapted from Rainer Gross.

Prevalence of food and nutrition insecurity

The most recent estimate, released in 2009 by FAO, says that 1.02 billion people are undernourished globally, a sizable increase from its 2006 estimate of 854 million people. Of this, 265 million people are undernourished in sub Saharan African countries[13]. According to EDHS 2005, 47% of under five children experiences chronic and 24% of them severe malnutrition. One in four women of reproductive age has chronic energy deficiency and 27% have anemia[14].

HIV Epidemic and People living with HIV/AIDS

UNAIDS estimated that, globally around 33.3 million people living with HIV at the end of 2009. During this year, about 2.6 million people are newly infected with HIV and 1.8 million deaths occurred due to AIDS related deaths. In sub- Saharan Africa, where the majority of

new HIV infections continue to occur, an estimated 1.8 million people became newly infected, which brings the total number of people living with HIV to 22.5 million and estimated AIDS-related deaths of 1.4 million occurred in this region during the year 2009[15]. According to 2007 single point HIV prevalence estimate, our nation adult HIV estimated prevalence would be 2.4% in the year 2010. Of the estimate, females would have a prevalence of 2.9% which is one percent higher than in males. While, Urban and rural would have a prevalence of 7.7% and 0.9% respectively. It is also estimated that around 1.2 million people would be living with HIV. Of this, 760,475 were in urban which nearly twice that of in rural. And around 28,073 AIDS-related deaths would occur for this year. A new single point estimate of HIV prevalence will be generated following the completion of a population-based sero-survey in late 2010 [16]

Food and nutrition Security and HIV/AIDS

A survey that was undertaken to establish how HIV affected households in an urban Ugandan setting responded to food shortages, revealed the inability of affected households to put enough food on the table. Moreover, households with high numbers of dependants were more at risk of food insecurity [r (n = 144) = -0·165, P=0·04]. Households that had low food security scores (therefore being more vulnerable to food insecurity) also reported reducing household size to cut down on food costs ($F_{1,\ 143}$ = 14·465, P=0·000) and selling off non-productive household assets to buy food (F1, 143 = 14·148, P=0·000). More than half of the study households (59%) reported consuming fewer than six food groups in the 24 h prior to the survey[17].

Similarly, a study was done to compare food consumption, dietary habits and nutritional status among HIV-positive adult PLWHA with those HIV status is not established in Kenya. Of the HIV-positive adults, 23.6 % (Thika 20.0 % and Bungoma 25.7 %) had a BMI less than or equal to 18.5 kg/m2. Of those adults whose status is not established, 13.9 % (Thika 9.3 % and Bungoma 16.7 %) had a BMI less than or equal to 18.5 kg/m2. More adults who are HIV-positive are undernourished than those whose status is not established[18].

Another survey done on the effect of household food and nutrition security on ART adherence among PLWHA in Dire Dawa, Ethiopia, revealed that 72.4% of the households were food insecure with moderate or severe hunger and majority of them eat less than the mean meal frequency (63.6%) and less than the mean dietary diversity (47.1%) in the preceding 24 hours of the survey. The observed nutritional status showed that 15.8% had mild malnutrition and 14.3% of the PLWHA had moderate to severe malnutrition[19].

In addition, a study done on to assess food and nutrition security status and its relationship with adherence of HAART among PLWHA in Jimma, Ethiopia, revealed that about 63% of PLWHA were food insecure and 59.6% had a meal frequency less than the mean value. About 56% eat less than the mean dietary diversity score in the past 24 hours. Assessing anthropometric measurements shows that 19.8% had BMI less than 18.5 kg/m^2 [20].

HAART adherence and its association with food and nutrition security

A cross-sectional survey was done to evaluate adherence to HAART in adults in Jamaica. Based on self-report of seven-day adherence, 54.8% of persons were 95-100% adherent, 37.5% were 80-94% adherent and 7.7% were < 80% adherent. Having interacted with an adherence counselor was not associated with adherence levels. Factors associated with no adherence were: being away from home (38%), sleeping through dose-time (37%), forgetfulness (37%) and running out of pills (31%). Having no food (26.9%), not wanting to be seen taking medication (200%) and intolerable side effects (18.8%) were also reasons given. Only 44% of persons used aids to remind them of dose times[21].

Whereas, a study done to examine the adherence level and associated factors to antiretroviral therapy (ART) among these patients in the health care centers of the association "Espoir Vie Togo" in Togo, West Africa showed a total of 99 patients were enrolled. And the average adherence rate was 89.8% of the total doses prescribed while 62.62% of patients showed an adherence rate of 95% or above. However, patients reported forgetting (34.9%), travel (25.6%), cost of treatment (13.9%) and side effects (11.6%) as the main factors of missing at least once a dose intake [22].

Likewise, a survey done on the effect of household food and nutrition security on ART adherence among PLWHA in Dire Dawa, Ethiopia, revealed that out of the total PLWHA interviewed 96.6% of them reported having complied to ≥ 95% of their drugs prescribed in the past 7 days. Food and nutrition security indicators analysis against 100% adherence status of PLWHA on ART showed that there was no statistically significant association between food security, meal frequency or dietary diversity of households and 100% adherence status of PLWHA on ART living in the respective households. BMI score of PLWHA on ART was also found to have no statistically significant association with 100% adherence status of PLWHA on ART[19].

Correspondingly, a study done on the food and nutrition security PLWHA on ART in Jimma, Ethiopia, shows that rate of self reported adherence in the study areas based on the combined indicator of the dose, time and food adherence measurement was 72.4% and there was no clearly identified association between food security items and adherence to HAART[20].

On contrary, a study done to examine the relationship between food insufficiency and antiretroviral therapy (ART) adherence on cohort of HIV-infected adults in urban Peru showed that participants who reported food insufficiency in the month prior to interview were more likely to experience suboptimal adherence than those who did not (OR=2.4; 95% CI:1.4, 4.1), even after adjusting for baseline social support score (OR=0.91; 95% CI: 0.85, 0.98) and good baseline adherence self-efficacy (OR=0.25; CI:0.09, 0.69)[23].

In addition, a study done on status of food insecurity and ART adherence among PLWHA in Hawassa City South Ethiopia showed that the prevalence of ART adherence were 90.4% and food insecurity was found as a single independent predictor of non adherence to ART (AOR= 2.78; 95%CI: 1.163, 6.66), p-value=0.021). This study found food insecurity associated with worse treatment outcomes and an important barrier to ART adherence[24].

Indicators to assess food security, nutritional status and ART Adherence

Because of its complex multidimensional concept of food security, measuring food insecurity has been difficult until recently. FANTA (Food and nutrition technical assistant) and its partners have identified a set of Household food insecurity access scale (access) questions that have been used in several countries and appear to distinguish the food secure from the insecure households across different cultural contexts. These questions provide the access component of household food insecurity. Whereas, utilization component of food insecurity is better accomplished using other measurement tools, such as anthropometric indicators like BMI[25].

Household food insecurity access scale (HFIAS)

A study done to assess the validity and dependability of the Household Food Insecurity Access Scale (HFIAS) among community health volunteers in Addis Ababa, Ethiopia showed that HFIAS performed according to the standard. The study was done in repeated measurements across different data collection rounds and accounted for intra-individual difference. While, overtime minor increment in food insecurity were show and this could attributed to difficulty of accessing food due to inflating prices and cessation of food aid[26].

Meal frequency or daily eating occasion

Meal frequency may be a good indicator of household strategies to cope with transitory food insecurity, and it is less sensitive as an indicator of changes in situations of chronic food insecurity. Moreover, interpreting data derived from this indicator is often complicated by cultural factors. In cultures where consumption of three meals per day is customary, household rationing in the face of food shortages can take the form of a reduction in the number of meals consumed. However, in cultures where households consume one primary meal per day, the volume, rather than the frequency, of meals tends to decline as food shortages develop. Thus measuring only the number of eating occasions will not yield significant information on household food consumption [27]

Food or dietary diversity

Evidence from multi-country analysis suggests that household-level dietary diversity is strongly associated with energy availability, suggesting that dietary diversity could be a useful indicator of household food security (defined in relation to energy availability)[28]. The individual dietary diversity score (IDDS) aims to capture nutrient adequacy. Many studies in several different age groups have shown that an increase in individual dietary diversity score is related to increased nutrient adequacy of the diet. Dietary diversity scores have been positively correlated with increased mean micronutrient density adequacy of complementary foods[29].

Nutritional status

Body Mass Index (BMI) is the most commonly used tool to assess one's nutritional status. BMI is based on a weight-to-height ratio that is considered a good index of body fat and protein stores. Body stores are of interest because they reflect the stores needed to cope with physiological stress due to reduced intake and increased demands due to increased activity, pregnancy and diseases. Adults who have a healthy nutritional status would be expected to have body stores or BMI within a certain range. BMI, also known as "Quetelet's index," is summarized as; Body mass index (BMI) = Weight/ $(\text{height})^2$ [30].

Self reported HAART adherence

A study done on validation of a self-reported questionnaire assessing adherence to antiretroviral medication indicated that the questionnaire had adequate validity (sensitivity, 71%; specificity, 72%; correct classification, 72%). The study showed that this questionnaire has satisfactory psychometric qualities to assess non-adherence to antiretroviral medication among patients with HIV. The questionnaire is brief, simple, and can be used in both clinical or research settings regardless of the patients' antiretroviral regimens[31]. To summarize, the interaction between food insecurity, nutritional status and ART adherence among adult PLWHA are complex and non definitive.

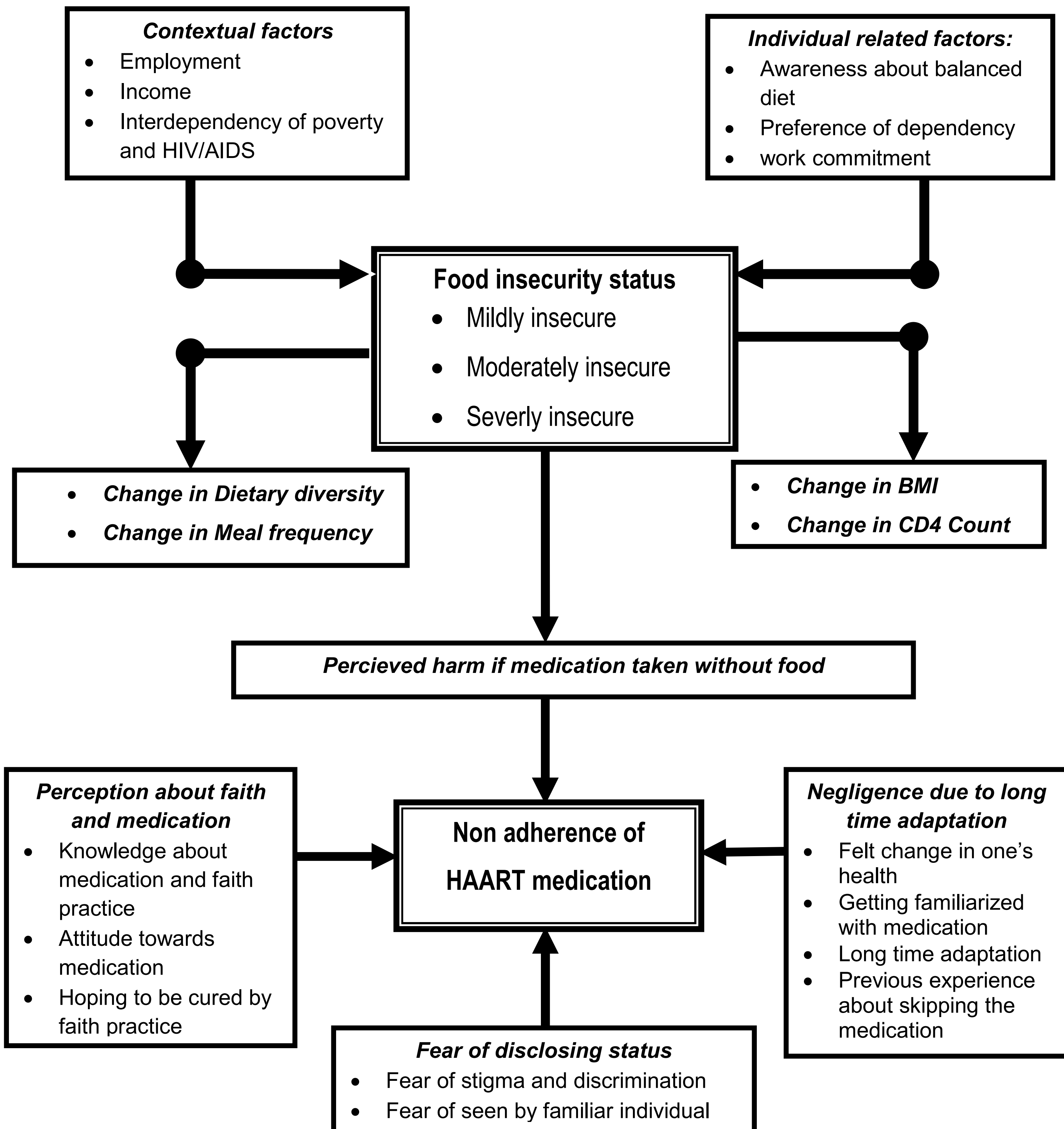


Figure 2 Conceptual Framework of Food Security, Nutrition Status and its relationship with Adherence to HAART from different literatures, quantitative and qualitative findings.

3. RATIONALE OF THE STUDY

Even though there are studies done in similar setup food elsewhere in the country, little is known about the prevalence of food and nutrition security status and their association with HAART adherence among PLWHA in our setting especially after the continuing increment of food price. Therefore, it is quiet important to undertake a scientific based evidence to uncover the status of food and nutrition security and their association with HAART adherence among PLWHA..

The study also intended to serve as baseline information for further study and can also help to support the consistency of research findings on the status of food and nutrition security and its association with HAART adherence evidenced locally and elsewhere in the world.

4. OBJECTIVES

4.1 General objective

- To assess food security, nutritional status and their association with HAART adherence among adult PLWHA on HAART.

4.1 Specific objectives

- To measure the prevalence of food insecurity among adult PLWHA on HAART.
- To measure the prevalence of malnutrition among adult PLWHA on HAART
- To determine HAART adherence among adult PLWHA on HAART.
- To determine the association between food security, nutritional status and adherence to HAART among adult PLWHA on HAART.

5. METHODS

5.1 Study area and Period

The study was conducted between December 2010 and February 2011 in public hospitals of Addis Ababa. Addis Ababa is the Federal Capital of Ethiopia and a Chartered City; having three layers of Government: City Government at the top, 10 Sub City Administrations in the Middle, and 99 Kebele Administrations at the bottom[32].

Currently, there are a total of 50 sites in the city which provide ART services. Of these, 9 are in public hospitals; 14 are in the private facilities; 24 are in the health centers; and the rest are in NGO's and uniformed forces hospitals. The study focused on two public hospitals namely ALERT and Zewditu memorial Hospitals[33].

5.2 Study design

A hospital based cross-sectional study was done among adult PLWHA on HAART complemented with qualitative methods among HAART adherence supporters. The method was conducted to triangulate and increases our understanding the study results by exploring HAART adherence supporter's views about their experience on food insecurity and HAART adherence, perceived barriers and opinion about for food security and HAART adherence.

5.3 Population

5.3.1 Source population

The source population were all adult PLWHA (≥18 years of age) on HAART in ALERT and Zewditu memorial hospital in Addis Ababa, Ethiopia.

5.3.2 Study population

All inclusion criteria satisfying adult PLWHA (≥18 years of age) on HAART in ALERT and Zewditu memorial hospital who were available during data collection period were the study population.

5.4 Inclusion and Exclusion criteria

Study participant whose age is 18 and above and on HAART for more than 3 month were included in the study. Whereas, children below 18 and pregnant mothers were excluded. Mentally and severely ill PLWHA on screening and also those who refuse to participate in the study were also excluded to participate in the study.

For the qualitative study, to account for information richness a HAART adherence supporter who have been working for at least 6 month in public health facilities while providing HAART counseling and support to the affected individuals were considered in to the study.

5.5 Sample size and Sampling technique

5.5.1 Sample size

The sample size was calculated using Epi Info 3.5.1 with the following assumptions:

- P: - Assuming proportion of PLWHA who were food insecure to be 63% based on the study conducted in Jimma specialized hospital among adult PLWHA attending HAART units.
- d:- Margin of error of 5%
- $Z_{\alpha/2} = 1.96$ or 95% confidence level

Adding a 10% allowance for possible non response rate, the total calculated sample size required to be taken were 394. Since the two hospitals have comparable number of adult PLWHA on HAART, equal proportion of study participants was drowned from the two hospitals i.e. 200 from Zewditu Memorial hospital and the rest from ALERT hospital.

For the qualitative study, it was conducted with 10 HAART adherence supporters, where equal proportion of adherence supporters were taken from each hospital.

5.5.2 Sampling technique

Since ALERT and Zewditu memorial hospitals were Pioneers in providing free ART service to the public and also have the highest number of PLWHA who were currently on HARRT

treatment as compared to other public hospitals in Addis Ababa, ALERT and Zewditu memorial hospitals were selected. Moreover, some of the patients taking ART in other hospitals were transferred from this hospital (personal communication with ART unit heads). After listing eligible PLWHA using their unique ART identification numbers for the period of two weeks, study participants were selected using systematic sampling technique. In which, every other participant in list were included in the study.

For the qualitative study, eligible HAART adherence supporters were selected purposively using convenience sampling method.

5.6 Measurement

5.6.1 Study variables:

- Dependent variables
  - Individual food security status (secure, insecure)
    - Dietary diversity and meal frequency
  - HAART adherence (adherent, non adherent)
  - Nutritional status(underweight, normal, overweight)
- Independent variables
  - socio demographic factors - age, sex, marital status, ethnicity, educational status of PLWHA
  - Socio-economic status – household and self monthly income, having monthly income, financial support, and food aids.
  - Psychosocial support and disclosure status
  - Clinical characteristics - CD4 cells/mm^3 count.

5.6.2 Data collection instrument

Data collection instruments were semi structured and structured which is adopted from different literatures. Then, the instruments was pretested using in-depth interview with HAART adherence supporters and was translated in to Amharic and back translated to English by other person to check for its consistency.

The questionnaire has three parts. The first part was interview and consists of three sections i.e. socio demographic and economic characteristics items; dietary related items; drug adherence related items. The FANTA (Version 3) HFIAS 9 item instrument; FANTA (Version 2) HDDS 15 item instrument and FANTA: Increased Daily Eating Occasion 7 item instrument was employed to determine the prevalence and score of the individual food insecurity access scale used to determine the score of the individual dietary diversity score and score of individual meal frequency respectively.

The second part was done by taking anthropometric measurements of the subjects. Weight and height was measured by using UNICEF's Seca digital electronic scale and Stadiometer respectively. While, the third part reviewed patient's card and took different clinical outcomes using a check list and forms.

For the qualitative study, in-depth interview topic guide was used. It was an open ended guide which was prepared from different literatures for the purpose of exploring the experience of HAART counselors regarding the food insecurity and their interrelation with HAART adherence.

5.6.3 Data collection procedures

Six HAART adherence supporters and two supervisors were trained for 2 days with the objective of standardizing the date collection instrument among the data collectors and providing them with basic skill of communicating with the study participants. They interviewed and filled the questionnaire after obtaining an informed consent from eligible patients. A single interview took to 10-15 minutes. Due to the reason that food consumption pattern is affected by those who fast on Wednesday and Friday, 48hr recall period was employed on Thursday and Saturday.

In addition, Weight was measured for participants with minimum clothing and no shoes. And Height was measured with the participant's heels, buttocks and shoulder blades touching the base of the vertical stand and by positioning him/her on the Frak fert plane. The moveable

headboard was brought to the most superior point on the head, with sufficient pressure to compress the hair.

For the qualitative part, informants were forwarded with guiding questions or issues. The interview was undertaken by interviewer taking note and accompanying with tape recorder after the study participants briefly consented about the use of tape recorder on responses given by them. The interview continued until the interviewer feels that the issue and question were fully touched.

5.7 Data Analysis Procedure

After the data were entered and cleaned using Epi info 3.5.1, it was exported to and analyzed using SPSS version 16. Data analysis was performed to show associations between food security, nutritional status, HAART adherence, and several independent variables of interest using univariate analysis, bivariate and multivariate logistic regression analysis. Odds Ratios (OR) and their 95% CI was used to define statistical association between variables and also used to look into the strength of association between the dependent and independent variables in multivariate logistic regression analysis.

There were 31 questions intended to assess dietary related information among adult PLWHA in the previous 24 hr and 4 weeks recall period. Of them, ten questions were intended to measure the prevalence of food security. It is calculated into four major themes i.e. food secure, mildly, moderately and severely food insecure based on different scale measurements. Seven of the questions indicating number of meal frequency and fourteen indicating dietary diversity.

To look for adherence of HAART, self reported adherence was used after combining self reported missed doses and self reported schedule/time adherence. A person is said to be adherent when he/she took ≥95% of the prescribed doses and at the same time adhered to schedule/time all the time correctly in the previous seven days and was used for comparison.

For the qualitative part, the interviews with adherence supporters were analyzed using content analysis. First, the interview was transcribed locally later translated. Analysis was started by importing the transcribed text into the Open code program to facilitate the coding process. Unit of relevant meaning were examined line by line. Later data were coded and categorized into broader concepts. The concepts were refined into major themes and presented with the quantitative data as deemed appropriate

5.8 Data quality management

To assure quality of the data the following measures were taken: The questionnaire was translated to Amharic and back translated to English by translators who were blind to the original questionnaire. Data collection instruments was pretested on 5% of PLWHA i.e. 20 individuals that were not included in the final study. And modifications were incorporated to the questionnaire accordingly. The final version of the questionnaire was used for the data collection. The interview was conducted in private room to create an atmosphere of empathy and confidence within a secure environment. Accuracy of anthropometric measurement was assessed by evaluating the largest acceptable difference in repeated measurements i.e. 0.5 kg and 1cm for weight and height respectively.

An intensive 2 days training was given for all supervisors and data collectors before the process of data collection. The overall activity was controlled by the principal investigator of the study and proper designing of the data collection materials and continuous supervision during data collection was performed. All completed questionnaires were examined for completeness and consistency during data management, storage and analysis.

5.9 Operational definitions

Food Secured: When a PLWHA experiences none of the food insecurity (access) conditions (Q2003-2020), or just experiences worry (Q2003), but rarely (Q2004)

Food In-Secured: When a PLWHA experiences at least one food insecurity (access) conditions (Q2003-2020), or experiences worry (Q2003), but not rarely (Q2004).

Adherent: When a PLWHA took ≥95% of the prescribed doses (without missing a single dose) and at the same time adhered to schedule/time all the time correctly.

Non-Adherent: When a PLWHA not able to take more than 95% (missing at least one dose of all prescribed doses of ART) of the prescribed drug or failed to follow the schedule/time of the medication.

Underweight: If subject's BMI is 18.49 kg/m^2 or below that.

Normal/adequate nutritional status: If patient's BMI is between 18.5 and 24.9 $kg/m^{2.}$

Overweight: If patient's BMI is 25 kg/m^2 and above.

Meal frequency (Daily eating occasion): Is the number of reported daily meal frequency by PLWHA experienced within the last 24 hours.

Low meal frequency: When PLWHA had a meal frequency less than the mean meal frequency value.

High meal frequency: When PLWHA had a meal frequency or meal frequency greater than or equal to the mean meal frequency value.

Dietary diversity: Is the number of reported different foods and food groups consumed by PLWHA within the last 24 hours.

Low Dietary diversity: When PLWHA ate less than the mean dietary diversity score

High dietary diversity: When PLWHA ate greater than or equal to the mean dietary diversity score

5.10 Ethical considerations

The study was presented and obtained permission from research and ethical committee of school of Public health, Addis Ababa University; Addis Ababa Health Bureau and AHRI/ ALERT ethics review committee. Due care was taken to ensure that all those who were eligible to participate in the study did so voluntarily after having informed consent. They have the right not to answer individual question or all of the questions and withdrew during the survey. Confidentiality was maintained by assuring them that their responses will be strictly confidential throughout the process.

6 RESULT

Socio demographic and economic characteristics

A total of 394 adult PLWHA in the age group of 18-70 years participated in the study making the response rate at 100%.

As presented in Table 1, the majority 252 (65%) of study participants were females and around 305 (77%) were in the age group 25-44 years with a mean age (sd) of 36.9 (8.8) years. Majority were Orthodox Christians 261 (66.2%), and from Amhara 191 (48.5%) followed by Oromo 105 (26.6%) ethnic groups. Around 227(57.6%) of them have had secondary and above level education. One hundred eighty (46%) were currently married. And around 182 (46.1%) were employed in government and private organization and 149(37.8) live with their spouse and children. Almost all of them, 367(93.1%) and 358 (90.9%) had never received any money and food aid respectively. Median (IQR) monthly income of the study participants and their household were 570(600) ETB and 700 (1100) ETB respectively.

Table 1 Distribution of demographic and socio-economic characteristics of adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011.

CHARACTERSTICS (N=394)	FREQUENCY (%)
AGE	
18-24	16(4.1)
25-34	153(38.8)
35-44	152(38.6)
45^{+}	73(18.5)
SEX	
Male	137(34.8)
Female	257(65.2)
ETHNICITY	
Amhara	191(48.5)
Oromo	105(26.6)
Tigre	41(10.4)
Gurage	45(11.4)
Others[¥]	12(3.0)
RELIGION	
Orthodox	261(66.2)
Muslim	55(14.0)
Protestant	71(18.0)

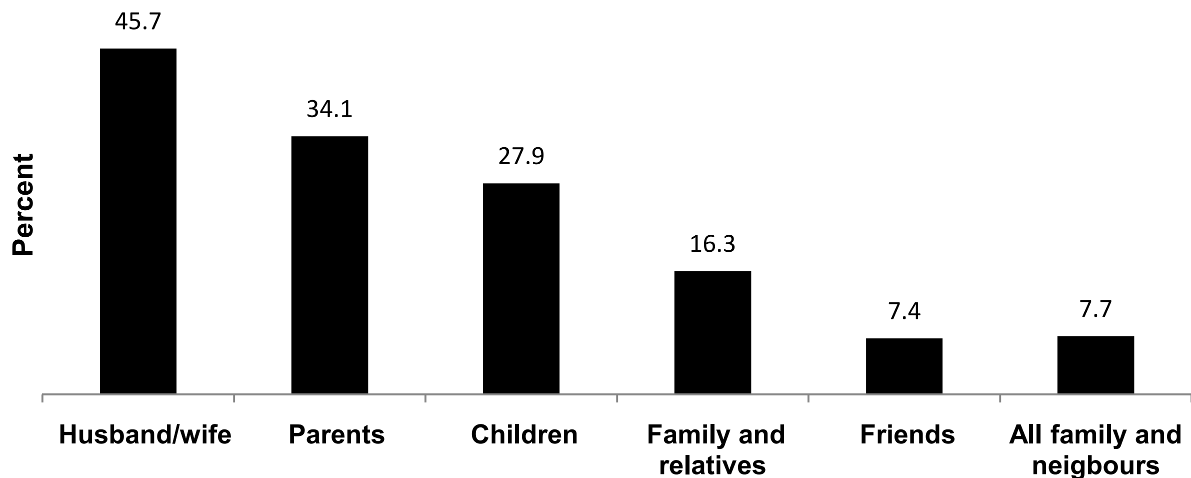
Catholic	5(1.3)
No religion	2(0.5)
MARITAL STATUS	
Married	180(45.7)
Unmarried	87(22.1)
Divorced/separated	37(9.4)
Widowed	90(22.8)
EDUCATIONAL STATUS	
Illiterate	25(6.3)
Only Read and write	12(3.0)
Primary (1-8)	130(33.0)
Secondary (9-12)	166(42.1)
Post-secondary (12^+)	61(15.5)
OCCUPATION	
Employed	182(46.1)
Merchant	46(11.7)
Housewife	66(16.8)
Daily laborer	38(9.6)
Unemployed	54(13.7)
Others[€]	8(2.0)
LIVING ARRANGMENT	
Alone	65(16.5)
Husband/wife & child	149(37.8)
Husband/wife only	28(7.1)
Child only	84(21.3)
With parents	50(12.7)
With family and relatives	18(4.6)
AVERAGE MONTHLY INCOME (N=256)	
≤450 Birr	90(35.2)
451-800 Birr	88(34.4)
≥801 Birr	78(30.5)
AVERAGE HOUSEHOLD INCOME (N=322)	
≤500 Birr	136(42.2)
501-1000 Birr	90(28.0)
≥1001 Birr	96(29.8)
FOOD AID	
Present	36(9.1)
Absent	358(90.9)
MONEY AID	
Present	27(6.9)
Absent	367(93.1)
HOUSEHOLD SIZE	
≤2	114(28.9)
3-4	175(44.4)
>5	105(26.6)

[¥] *Somali, silte, Sidama, Gamo, Gofa, Kembata, Wolayta, Hadya, Keffa*

[€] *Retired, housemaid, farmer*

Disclosure and psychosocial characteristics

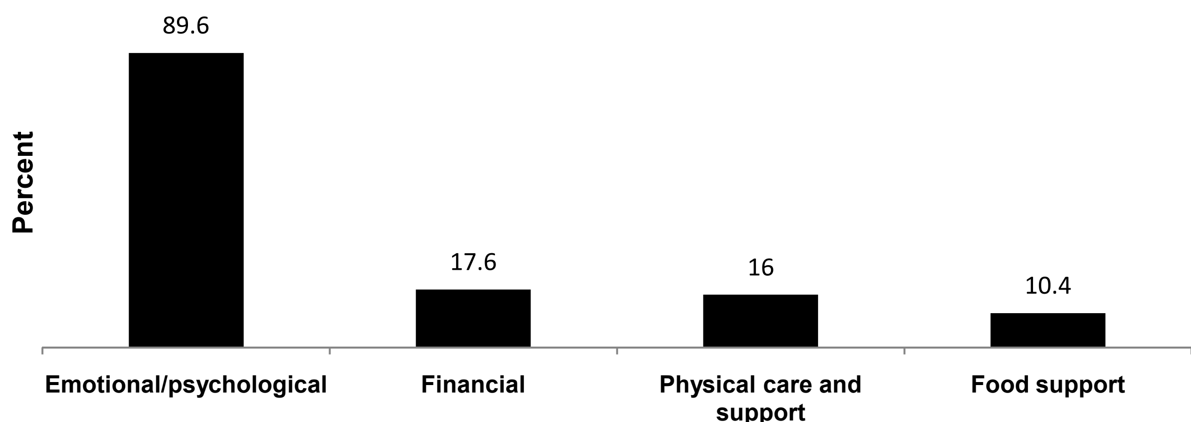
Three hundred thirty seven (85.5%) disclosed their HIV result to at least one significant other. Among them, 154(45.7%) disclosed their HIV result to their spouse. (Figure 3)



More than one answer is possible.

Figure 3 Percent distribution of disclosure status of adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011.

Majority of study participants 250(63.5%) reported to have obtained at least one form of family support. Almost all, 224(89.6) have had an emotional or psychological support from family and relatives. (Figure 4)



More than one answer is possible.

Figure 4 Percent distribution of kind of support received from family and relatives of adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011.

Food security (access) and coping strategy characteristics

The overall food insecurity was 293(74.4%) with 95% CI: (70.1, 78.7). The mean (sd) food insecurity score was 9.9(7.9). Among the food insecure, majority 176(44.7%) were severely insecure and the rest 29(7.4%) and 88(22.3%) were mildly and moderately food insecure respectively. Females were significantly more likely to be food insecure compared to males [132(51.4%) females versus 44(32.1%) males having P-value = 0.032]. (Figure 5)

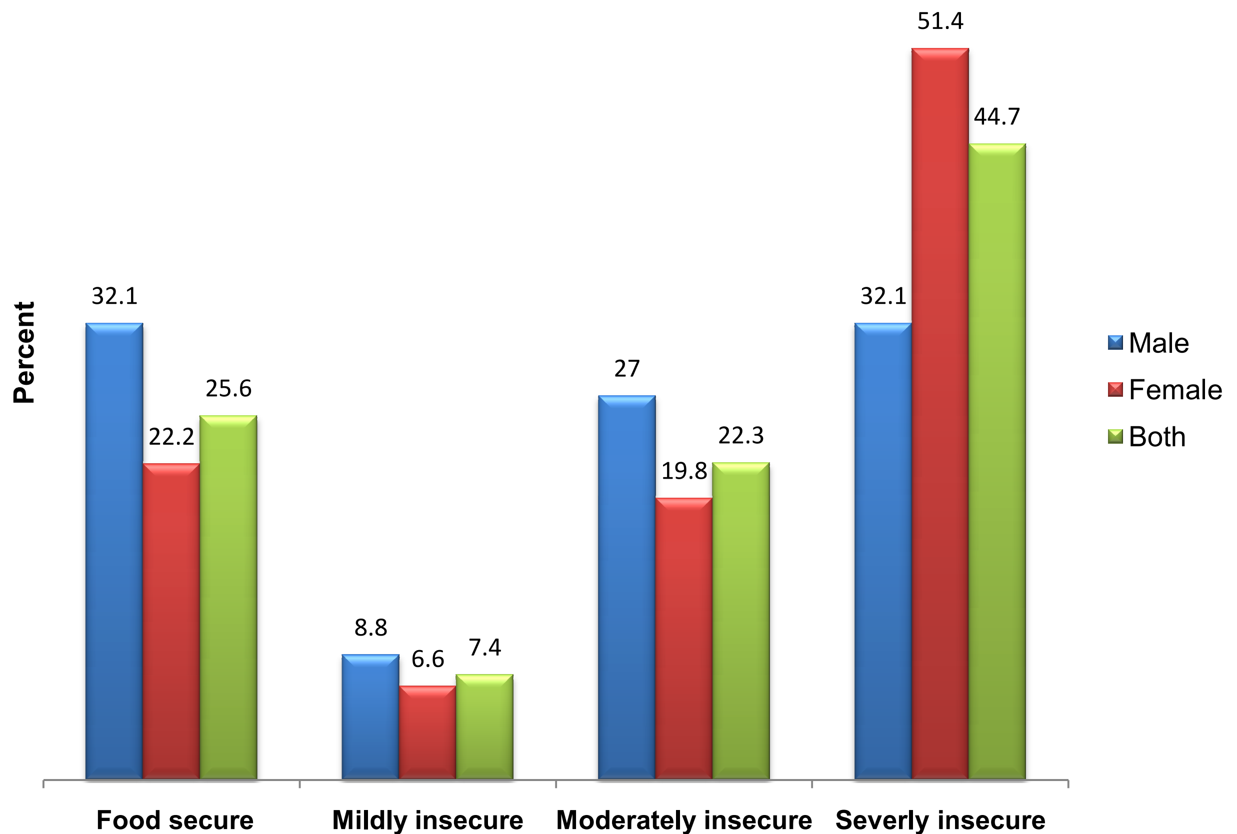


Figure 5 Sex distribution of food security (access) status of adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011.

Two hundred and forty one (61.2%) had a meal frequency less than the mean value of 3.5 meal in the previous 24 hours. It varied little across sex [(56.9%) male & (63.4%) female]. Majority 226 (57.4%) ate less than the mean dietary diversity score of 6 food groups in previous 24 hours. It is also varied across sex [(51.8%) male & (60.3%) female]. (Figure 6)

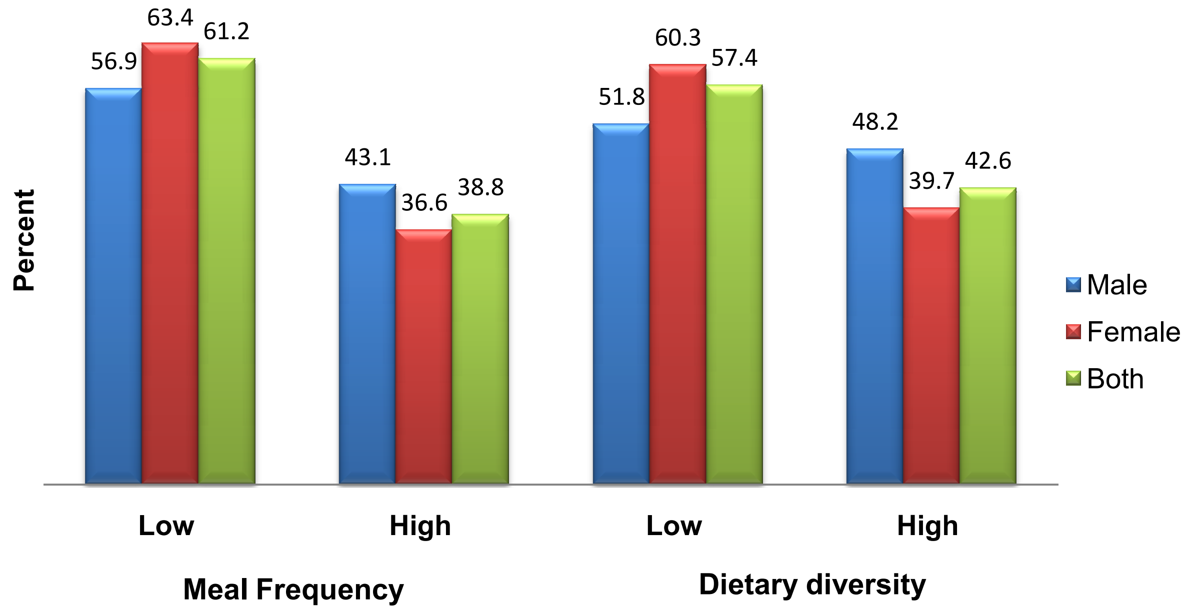
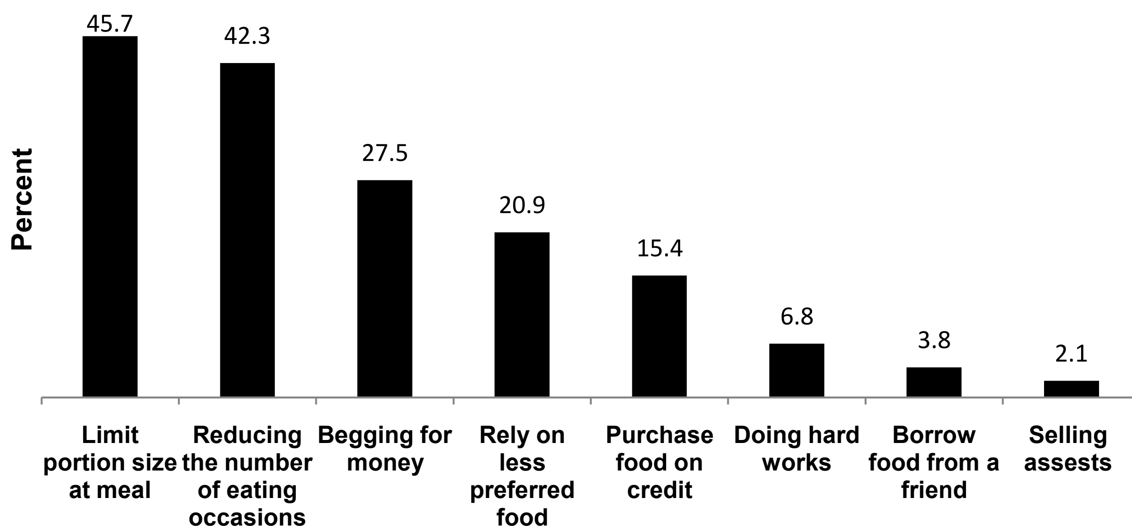


Figure 6 Sex distribution of meal frequency and dietary diversity of adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011.

To cope with the food insecurity, majority of food insecure PLWHA 134(45.7%) limited the portion size of their meal and 124(42.3%) reduce their number of eating occasions. And 60(20.9%) relied on less preferred food, 45(15.4%) purchased food on credit and 22(7.5%) begged for money. (Figure 7)



More than one answer is possible

Figure 7: Percent distribution of coping strategies taken by food insecure adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011.

Types of food groups eaten

Nearly all of the study participants 375(95.2%) ate cereals and 352(89.3%) miscellaneous (condiment, coffee, tea). Unlike, only 151(38.3%) ate meat, 135(34.3%) milk and 102(25.9%) eggs. (Figure 8)

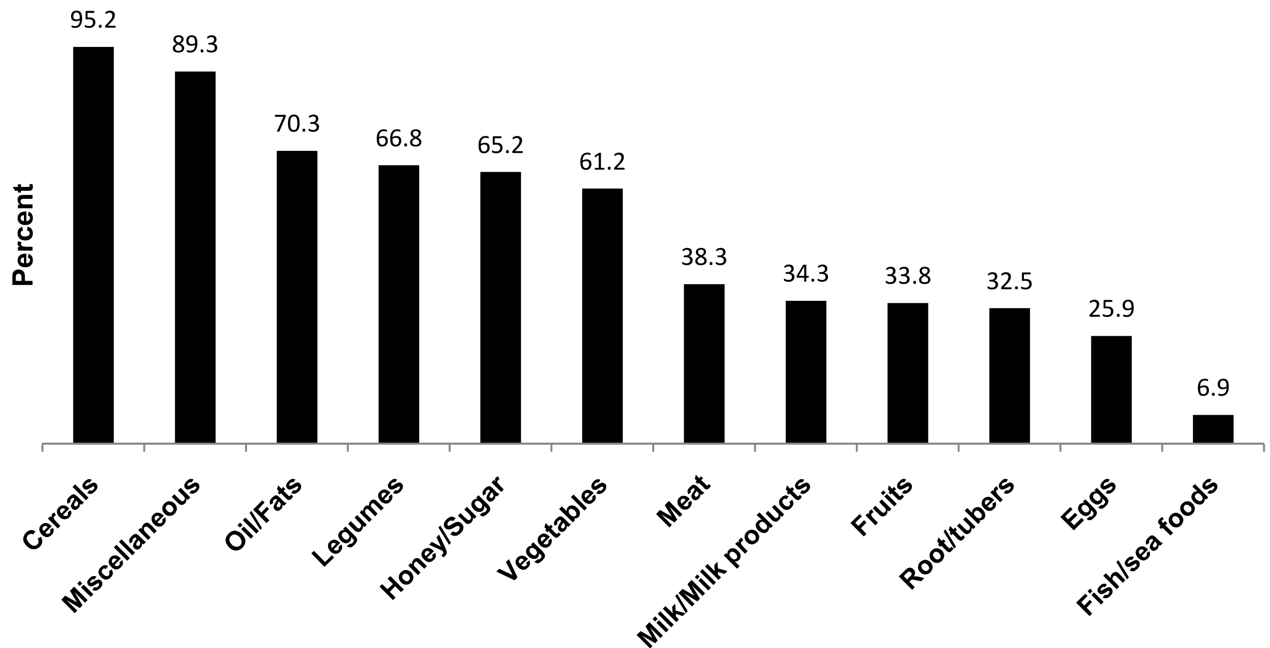


Figure 8 Percent distribution of types food groups eaten by adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011.

Table 2: Socio-demographic profile of the HAART adherence supporters interviewed for the qualitative study in public hospitals, Addis Ababa, Ethiopia, 2011

Respondent	Respondent's health facility	Age	Sex
1	Zewditu Memorial Hospital	32	Female
2	Zewditu Memorial Hospital	37	Female
3	Zewditu Memorial Hospital	46	Male
4	Zewditu Memorial Hospital	35	Female
5	Zewditu Memorial Hospital	31	Female
6	ALERT Hospital	44	Female
7	ALERT Hospital	38	Male
8	ALERT Hospital	29	Female
9	ALERT Hospital	32	Female
10	ALERT Hospital	32	Female

Perception of magnitude of lack of food and balanced diet

In interviews, the HAART adherence supporters were asked about the extent of food insecurity among PLWHA. Most of the respondents reflected that majority of them face food insecurity as illustrated by a 37 years old female adherence support with the following quote:-

> *"Food insecurity problem occurs not only among HIV positive individuals but also in any individuals. However, people living with HIV/AIDS are more seriously affected by food insecurity. There are too many food insecure HIV positives. Most of them don't have enough food and don't have anything."*

Adherence supporters reflected on situations of getting balanced diet by PLWHA. They claimed that most of them wouldn't get a balanced diet. As illustrated by a 46 years old male adherence supporter with the following quote:-

> *"Most of PLWHA wouldn't get a variety of foods, since HIV and poverty are mostly interrelated. Owing to our country's current economic problem, most people are below poverty line and there is a difficulty of getting a variety food and also even getting a regular meal. These are important problems".*

Table 3 The theme, categories and codes as identified from qualitative data regarding contextual factors for food insecurity of adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011.

<table>
<tr><td colspan="3">Theme: Problem of employment, inadequacy of income and relatedness of poverty and HIV/AIDS as contextual factors for food insecurity.</td></tr>
<tr><td>Category: Problem of employment</td><td>Category: Inadequacy of income</td><td>Category: Interdependency of poverty, lack of food and HIV/AIDS</td></tr>
<tr><td>➢ Lack of job
➢ Difficulty of getting even a housemaid job
➢ Lack of adequate income and work</td><td>➢ Poor income
➢ Even those working face food insecurity
➢ Incompatibility of income with expense
➢ Large family size</td><td>➢ HIV affects the lower class or below poverty line
➢ HIV is a disease of poor
➢ Country's economic condition
➢ Poverty and poor living condition</td></tr>
</table>

Problem of employment

Some of the adherence supporters claimed that lack of job or problem of employment is an important reason for being food insecure among PLWHA. As illustrated by a 38 years old male adherence supporter with the following quote:-

> *"…I can tell you that they (PLWHA) can't get even a housemaid job because they are likely to be discriminated by employer who may fear that the diseases could be transmitted to. For example; while chopping onion they could cut their hand. Unless their employer is HIV positive, this is a big problem…"*

Inadequacy of income

They also indicated that insufficiency of income and its incompatibility with expense is the most common reason for being food insecure among PLWHA. As illustrated by a 29 years old female adherence supporter with the following quote:-

> *"Firstly the work you do and the money you earn are not compatible. For example, let say you get 400 or 500 birr as monthly salary but this wouldn't cover your food, rental and other expenses. Unless your living situation is higher, it would be difficult to have food security.*

Interdependency of poverty, lack of food and HIV/AIDS

Another reason suggested by adherence supporters was the relatedness of poverty, lack of food and HIV/AIDS. As illustrated by a 32 years old female adherence supporter with the following quote:-

> *"In my opinion the diseases are related with food because for a person having healthy eating, his health would be normal. But those having a problem of getting a balance diet, if you see them they look deprived (goskala), their CD4 does not increase this is because the diseases alone needs food very much as I see it in my experience….poverty is the cause of food insecurity"*

Table 4 The theme, categories and codes as identified from qualitative data regarding individual's related factors for food insecurity of adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011.

Theme: Misconception about balanced diet and aid preference as individual related factors for food insecurity.	
Category: Misconception about balanced diet	**Category:** Aid preference
➢ Lack of awareness how to eat balanced diet ➢ Lack of knowledge how to cultivate land ➢ Wrong perception ➢ Believing to eat only meat or higher foods	➢ Rely on Aid ➢ Dependency on aid ➢ Unable to work committed ➢ Not willing to work that are believed to be lower jobs ➢ Fear of harm if one works

Lack of awareness about balanced diet

Most of adherence supporters claimed that lack of awareness about balanced diet and wrong perception regarding different kinds of foods were likely reasons for not having a balanced diet among PLWHA. As illustrated by a 44 years old female adherence supporter with the following quote:-

> *"Most of the time they (PLWHA) say balanced diet is eating meat and butter. But they don't know that they could get a protein from legumes(tera tere)… and this what I benefited; my income is very small and if I go out with 10 birr, I would buy and eat tomato and green vegetables (gomen) today; tomorrow I will eat potato and carrot with different things, and also I will eat beans…".*

Aid Preference

Likewise, adherence supporters claimed that individuals who are living with HIV/AIDS were reluctant to work and become self sufficient. As illustrated by a 37 years old female adherence supporter with the following quote:-

> *"…and the other thing is unable to work committed (PLWHA) rather to rely on AID. If you give an individual a job at one hand and AID at other hand, he will choose AID and say I will be harmed if I work."*

HAART adherence related characteristics

Three hundred and thirty five (85%) of the study subjects reported to have adhered to their ART regimen based on self report of dose adherence in a previous seven days. And 314(79.7%) of the study subjects always followed the schedule or time adherence agreed upon with their providers. Hence, self reported missed doses and self reported schedule/time adherence were combined to assess self reported adherence. And the combined self reported adherence in the study was 321(81.5%) with 95% CI: (77.67, 85.33). (Table 5)

Table 5 Self reported dose, schedule and food related adherence of adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011.

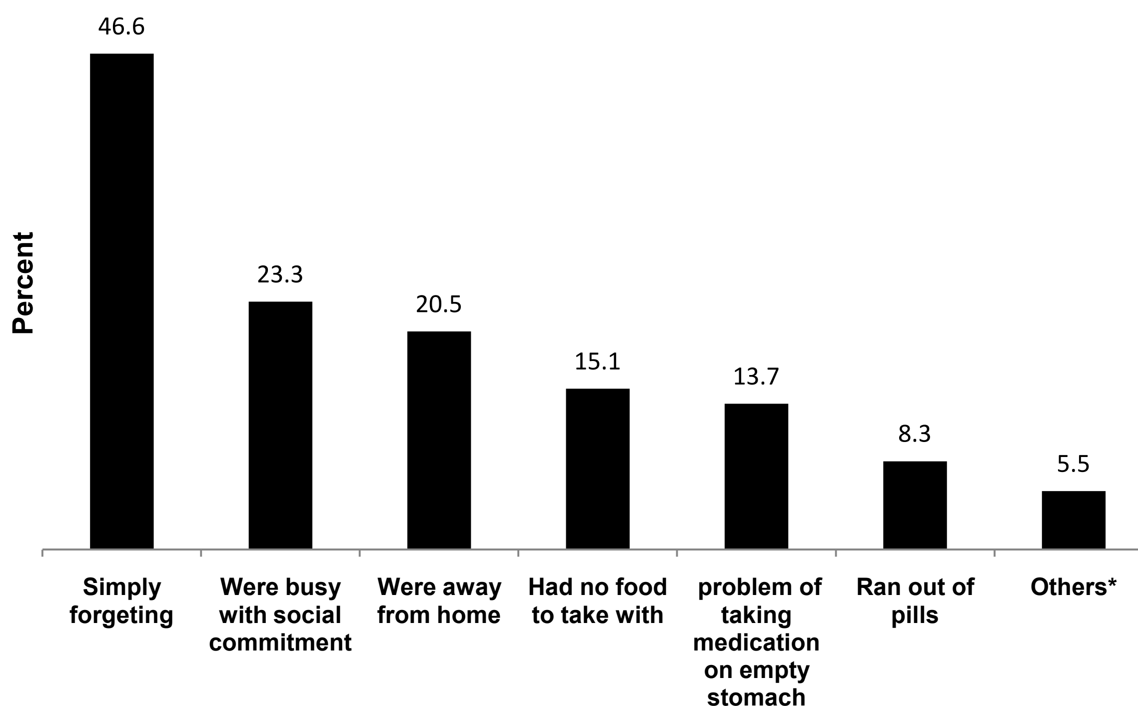
CHARACTERSTICS	FREQUENCY (%)
SELF REPORTED DOSE ADHERENCE (LAST 7 DAYS)	
Adhered	335(85.0)
Not adhered	59(15.0)
SELF REPORTED SCHEDULE ADHERENCE (LAST 7 DAYS)	
Adhered	314(79.7)
Not adhered	80(20.3)
OVER ALL SELF REPORTED ADHERENCE	
Adhered	321(81.5)
Not adhered	73 (18.5)

Missing or terminating medication:

Majority of the adherence supporters agree on status of skipping of medication. They replied that now is better than before in adhering to the medication. As illustrated by a 35 years old female adherence supporter with the following quote:-

> *"Failure to take Anti HIV medication appropriately is not much common among PLWHA… now we could find three out of 100 who skip their medication but in the past their awareness was to go to tsebele and faith organization and skip their medication …"*

Majority of study participants' reason for missing HAART medication were, 34(46.6%) simply forgetting the medication, 17(23.3%) being busy with social commitment and 15(20.5%) were away from home. (Figure 9)



Felt like sick or ill and Felt like the drug was toxic/harmful

More than one answer is possible

Figure 9 Percent distribution of reasons given for missing HAART medication of adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011.

Table 6 The theme, categories and codes as identified from qualitative and quantitative data regarding hindering factors for compliance of medication of adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011.

Theme: Compliance of medication is hindered by wrong perception, fear of disclosure and negligence.		
Category: Wrong perception about faith and medication	**Category:** Fear of disclosing status	**Category:** Negligence due to long time adaptation.
➢ Lack of broad knowledge about medication and faith practice ➢ Wrong attitude towards medication by faith organization ➢ Hoping to be cured by faith practice.	➢ Fear of stigma and discrimination ➢ Fear of seen by familiar individual	➢ Felt change in one's health ➢ Getting familiarized with medication ➢ Long time adaptation ➢ Previous experience about skipping the medication

Wrong perception about faith and medication

As some of adherence supporters replied wrong perception or lack of broad knowledge were the reasons for skipping their medication. As illustrated by a 32 years old female adherence supporter with the following quote:-

> *"Major problems for not taking anti HIV drugs are religion related factors. There is a narrow thinking in faith like taking holy water (tsebele) and stopping medication; hoping to be cured and the other is during fasting (tsom), they will not take their medication. Those who have such kind of perception, their fasting (tsom) and holy water (tsebele) will have conflict with their medication time. And this…"*

Fear of disclosing status

Fear of disclosing HIV status were mentioned as reasons for missing medication by some of the adherence supporters and this could be one of the many reasons. As illustrated by a 29 years old female adherence supporter with the following quote:-

> *"…the reason could be fear of stigma and discrimination and may be someone could come to their home and they are not willing to face in person; or may be due to unexpected funeral and not want to be seen taking their medication…"*

Negligence due to long time adaptation

Another reason given by some of adherence supporters for missing medication was individual's negligence due to long time familiarization or adaptation with the medication. As illustrated by a 44 years old female adherence supporter with the following quote:-

> *"As they get familiar with the medication, it didn't mean anything to them. Now they are in peace but in that time when they came weak they receive anti HIV medication and adapted with medication. This is like eating enjera with shiro that we become familiar with is and we said we shall eat after little time or after finishing this work or after we came back from where we go and it is like that missing medication. I think there is negligence…"*

Nutritional status and clinical characteristics

Sixty five (16.5%) of the study participants with 95% CI: (12.83, 20.17) were underweight. While, 61(15.5%) of them were overweight with mean (sd) BMI of 21.8(3.6) Kg/m^2. Based on review of the patient's records, the median (IQR) CD4 count was 368(206) cell/mm^3. Two hundred fifty nine (65.7%) of the study participants had a recent CD4 count of 200-499 cell/mm^3 . Majority 244(61.9%) of them received HAART for a duration of more than 24 month with mean (sd) duration of 40.3(2.4) month. (Table 7)

Table 7 Nutritional status and clinical characteristics of adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011

CHARACTERSTICS (N=394)	FREQUENCY (%)
BMI	
≤18.4	65(16.5)
18.5-24.9	268(68)
≥25	61(15.5)
RECENT CD4 COUNT IN CELLS/MM^3	
<200	48(12.2)
200-499	259(65.7)
≥500	87(22.1)
DURATION OF THE TREATMENT IN MONTH	
3.0-24.0	150(38.1)
≥24.1	244(61.9)

Determinants food security

Bivariate analysis showed that study participant's sex, educational status, marital status, household size, self and household average monthly income were significantly associated with food security ($P < 0.05$). (Table 8)

Table 8 Determinants of food security status among adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011.

CHARACTERSTICS (N=394)	FOOD SECURITY STATUS		COR (95% CI)
	FOOD IN SECURE N (%)	FOODSECURE N (%)	
SEX			
Male	93(67.9)	44(32.1)	1.00
Female	200(77.8)	57(22.2)	1.66 (1.04-2.64)*
EDUCATIONAL STATUS			
Elementary or less	142(85.0)	25(15.0)	2.86(1.72-4.75)*
Secondary and above	151(66.5)	76(33.5)	1.00
MARITAL STATUS			
Unmarried	57(65.5)	30(34.5)	0.21(0.09-0.48)*
Married	130(72.2)	50(27.8)	0.29(0.14-0.62)*
Divorced/Separated	25(67.6)	12(32.4)	0.23(0.09-0.61)*
Widowed	81(90.0)	9(10.0)	1.00
HOUSEHOLD SIZE			
≤3 individual	162(78.6)	44(21.4)	1.00
≥4 individual	131(69.7)	57(30.3)	1.60(1.02-2.53)*
AVERAGE MONTHLY INCOME (N=256)			
≤450 ETB	80(88.9)	10(11.1)	5.83(2.82-12.06)*
≥451 ETB	96(57.8)	70(42.2)	1.00
AVERAGE HOUSE HOLD MONTHLY INCOME (N=322)			
≤500 ETB	125(91.9)	11(8.1)	7.68(3.88-15.19)*
≥ 501 ETB	111(59.7)	75(40.3)	1.00

$* P<0.05$

Economic dependents and those having family pressure are mostly affected groups

Adherence supporters were asked about which groups of individuals is mostly affected and replied that females, children, elderly and disabled are the most vulnerable groups. And they claimed economic dependency and family pressure as possible reason. As illustrated by a 29 years old female adherence supporter with the following quote:-

> *"…women are mostly affected by food insecurity than men since they are economically dependent on men. And as a result of the pressure from families and their surrounding they may have too many children. Most of the time, they worry about whether the food is enough or not. As I have seen before if you ask them the question (about food security), they cry and say" I will not eat unless my children had enough food…"*

Predictors of food insecurity

Characteristics which were associated on the bivariate analysis were re-evaluated independently using multivariate logistic regression analysis to control for potential confounding. In the multiple logistic regression analysis, only one variable was found to be independent predictor of food security status of PLWHA. Households earning (≤500 ETB) were more likely to be food insecure than those who earn more than 500 ETB (AOR, 6.37; 95% CI, 2.98-13.63). (Table 9)

Table 9 Predictors of food security status of adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011.

CHARACTERSTICS (N=394)	FOOD SECURITY STATUS		ODDS RATIO AND ITS 95% CI	
	FOOD INSECURE N (%)	FOOD SECURE N (%)	CRUDE	ADJUSTED
HOUSE HOLD MONTHLY INCOME (N=322)				
≤500 ETB	125(91.9)	11(8.1)	7.68(3.88-15.19)*	6.37(2.98-13.63)*
≥ 501 ETB	111(59.7)	75(40.3)	1.00	1.00
HOUSEHOLD SIZE				
≤3 individual	162(78.6)	44(21.4)	1.00	1.00
≥4 individual	131(69.7)	57(30.3)	1.60(1.02-2.53)*	1.00(0.57-1.75)
MARITAL STATUS				
Unmarried	57(65.5)	30(34.5)	0.21(0.09-0.48)*	0.27(0.11-0.70)*
Married	130(72.2)	50(27.8)	0.29(0.14-0.62)*	0.55(0.24-1.27)
Divorced/Separated	25(67.6)	12(32.4)	0.23(0.09-0.61)*	0.54(0.57-1.75)
Widowed	81(90)	9(10)	1.00	1.00
EDUCATIONAL STATUS				
Elementary or less	142(85%)	25(15%)	2.86(1.72-4.75)*	1.68(0.87-3.27)
Secondary and above	151(66.5%)	76(33.5%)	1.00	1.00
SEX				
Male	93(67.9)	44(32.1)	1.00	1.00
Female	200(77.8)	57(22.2)	1.66 (1.04-2.64)*	0.91(0.51-1.61)
BMI				
≤18.4 Kg/M^2	52(80.0%)	13(20.0%)	1.46(0.76-2.81)*	1.00(0.46-2.14)
≥18.5 Kg/M^2	241(73.3%)	88(26.7%)	1.00	1.00

*** P<0.05**

Determinants of nutritional status as measured by BMI

The only variables which were significantly associated with BMI were dietary diversity status. Those PLWHA who had dietary diversity lower than the mean value were more likely to be underweight than those who had more than the mean diversity value (OR, 2.00; 95% CI, 1.13-3.57). (Table 10)

Table 10 Determinants of nutritional status of adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011.

CHARACTERSTICS	BMI		OR (95% CI)
	$\leq$18.4 Kg/M^2 N (%)	$\geq$18.5 Kg/M^2 N (%)	
DIETARY DIVERSITY STATUS			
Low	46(20.4)	180(79.6)	2.00 (1.13-3.57)*
High	19(11.3)	149(11.3)	1.00

*** P<0.05**

Association between HAART adherence, BMI and food security status

Bivariate logistic regression analysis showed that there was no significant association between self reported adherence and food security status. Similarly, BMI less than 18.4 Kg/m^2 was not significantly associated with food security status. (Table 11)

Table 11 Association between self reported HAART adherence; nutritional status and food security status of adult PLWHA in public hospitals, Addis Ababa, Ethiopia, 2011.

CHARACTERSTICS	*SELF REPORTED ADHERENCE*		OR (95% CI)
	NOT ADHERED N (%)	ADHERED N (%)	
FOOD SECURITY STATUS			
Food insecure	51(17.4%)	242(82.6%)	0.76 (0.43-1.33)*
Food secure	22(21.8%)	79(78.2%)	1.00
BMI			
$\leq$18.4 Kg/M^2	12(18.5%)	53(81.5%)	0.99(0.50-1.97)*
$\geq$18.5 Kg/M^2	61(18.5%)	268(81.5%)	1.00

*** P≥0.05**

Perceived harm about taking medication without of food

Interviews with HAART adherence supporters stressed that there is no relationship between lack of food and missing medication. But, they said there is a perceived relation in the HIV community. As illustrated by a 44 years old female adherence supporter with the following quote:-

"There is a Perception in the community saying that one cannot take medication without having food. The medication alone will harm/hurt someone…If they didn't eat their breakfast, they will leave their medication…I say there is no relation between lack of food and missing anti HIV medication I will take the medication even in empty stomach. I know there is no harm. But, in the past I thought that the medication would harm me if the medication alone touches my stomach (chegora), thought that it has some side effect…"

7 DISCUSSION

The study aimed at revealing the status of food security, nutritional status and their associations with HAART adherence.

Food insecurity situation

Three quarter of PLWHA in the present study were food insecure which is higher than studies done in Jimma and Hawassa, Ethiopia (63% and 43.6% respectively) [20, 24]. This might be due to relatively high food price and other expenses around the capital recently However, it is lower than study done in Dire Dawa Ethiopia where close to 90% were food insecure [19]. This might be due to usage of different food security assessment tools rather than HFIAS.

And among the food insecure in the study, only 7.4% were mildly food insecure which is lower than the study done in (17.4%) Dire Dawa Ethiopia[19]. Similarly, 44.7% were severely food insecure in the study which is higher than in the previous study. Even though the two studies used different food security assessment tools, again this might be due to relatively high food price and other expenses around the capital recently.

The mean food security score in the present study was 9.9 which is higher than a study done in Urban Ethiopia with a score 3.8 indicating the severity of situation[26].

The proxy indicators showed that large number 61.2% of PLWHA consumed less than the mean meal frequency which is consistent with (59.6%) Jimma and (63.6%) Dire Dawa, Ethiopia. In the present study, 57.4% of PLWHA ate less than the mean dietary diversity score which is comparable with studies done in urban Uganda and Jimma Ethiopia[17, 20]. Similarly, the mean dietary diversity score was 6.1 in this study which is consistent with 6.2 mean dietary diversity score in urban Ethiopian[26]. The fact that the majority have difficulty of getting a balanced diet was also suggested in the qualitative study.

Furthermore, majority of PLWHA limit portion size of their meal; reduce their number of eating occasion; begging for food or money and rely on friend or relatives help to cope with food insufficiency. This is in agreement with a study done in Jimma Ethiopia having coping mechanisms of relying on friends or relatives help, limit portion size of their meal and reduce their number of eating occasion[20].

Nutritional status and stage of HIV/AIDS

In the present study, 16.5% of PLWHA were underweight (BMI less than 18.4 kg/m^2) which is lower than study done in two districts of Kenya where 23.6% (Thika 20.0% and Bungoma 25.7%) of PLWHA were underweight. It is lower than findings from a study done in (25.7%) Dire Dawa and (19.8%) Jimma, Ethiopia[19, 20]. This could be due to improved health condition of PLWHA secondary scaled up and increased duration on HAART treatment.

The median CD4 count in the present study was 368 counts/mm^3 which is comparable with the other figure in Jimma Ethiopia[20]. However, it is higher than the result form Dire Dawa with median CD4 counts/mm^3 of 249[19]. Again this could be explained by the fact that the improved health condition of PLWHA following the scaled up HAART treatment recently. Likewise, majority 61.9% of PLWHA received HAART for duration of 25 months and above. This is supported by the study done in Jimma Ethiopia where 59.9% of PLWHA received HAART for duration of 25 months and above[20].

HAART adherence situations

Highly active antiretroviral therapy (HAART) has proved effective in prolonging survival and improving the quality of life of the people living with HIV/AIDS (PLWHA). For the successful treatment of HIV infection, at least 95% adherence to HAART is required. The overall self reported adherence was (81.5%). Self reported dose adherence with in the previous seven days was 85% which is comparable with study done in Togo (West Africa) (89.8%), Dire Dawa (86.4%), Jimma (72.4%) and Hawassa (90.4%), Ethiopia [19, 20, 22, 24].

Contrary to studies in the above countries, a study done in Jamaica revealed 54.8% of persons were 95-100% adherent based on self-report of seven-day adherence. The possible explanation could be unlike the other studies Jamaica's study was conducted in 2006 shortly after the introduction of the 2005 adherence support program in the country[21].

Majority of the principal reasons given for skipping the medication were (46.6%) simply forgetting taking the medication, (23.3%) being busy with social commitment and (20.5%) being away from home which are consistent with studies done elsewhere [19, 21, 22].

Association between food insecurity and HAART adherence

There was no significant association between self reported adherence and food security status among study subjects, which is consistent with studies done in Jimma and Dire Dawa Ethiopia[19, 20]. On the contrary, a study done in urban Peru showed that participants who reported food insufficiency in the month prior to interview were more likely to experience suboptimal adherence than those who did not (OR=2.4; 95% CI:1.4, 4.1) [23]. Likewise, a study done in Hawassa showed food insecurity was found as a single independent predictor of non adherence to ART (AOR=2.78, 95%CI: 1.163, 6.66), p-value=0.021). It is difficult to justify for the inconsistency of the findings.

8 STRENGTHS AND LIMITAIONS OF THE STUDY

Strengths

The strength of the study:

- Qualitative methods with content analysis were used to triangulate and interpret the findings of the quantitative method.
- Different instruments were used to assess food security
- Fairly large sample size was used to represent adult PLWHA on HAART in public hospitals of Addis Ababa, Ethiopia.

Limitations

In this study the limitations are:

- Though HFIAS was used to evaluate individual food insecurity status in the present study, the tools was developed with the intention to address households. Measures were taken to adjust the tools to address individual food insecurity status.
- Interviewer bias could also be another possibility, as the interviewers will have a predetermined understanding of food security, adherence and other issues. However, these issues were included in the training of data collectors and the purpose of the study communicated adequately.
- Though there is no gold standard for measuring adherence, our measurement of adherence was only based on patients' declarations of missed doses and scheduling instructions. This may be subjected to social desirability and recall biases.
- Excluding those within the first three months of initiation of HAART medication would affect the overall HAART adherence rate.
- Since it is a cross-sectional study, it is might be difficult to see cause and effect relationship between the outcome and predictor variables in logistic regression analysis. The findings of this study must be interpreted in light of its limitations.

9. CONCLUSIONS

The conclusions of the study are:

- Large number of adult PLWHA was food insecure. Where, majority were severely food insecure.
- The proxy indicators (HDDS and meal frequency) showed that significant number of adult PLWHA took less than the mean dietary diversity and meal frequency.
- Wide range of coping strategies were taken to cope with food insecurity, majorly by limiting portion size of their meal and reducing number of eating occasion.
- Household's income predicted food insecurity status.
- The combined indicator of self reported dose and schedule adherence was high.
- Though there was no significant association between food insecurity status and HAART medication adherence, there are some indications from qualitative findings where some could relate lack of food as reason for skipping medication.

10. RECOMMENDATIONS

Based on the findings, the following recommendations are forwarded for better food and nutrition security and adherence of HAART medication:

To Government stakeholders and partners:

- Targeted food aid program should be established for those who are weak and not able to work.
- Medium to long term intervention aiming at generating income to improve self reliance of PLWHA. Since, food aid won't solve the problem permanently rather than encouraging food aid dependency habit.

To Health Care Providers:

- Continuous awareness about balanced diet and self dependency skill should be given to PLWHA through morning health education and patient physician counseling sessions.
- A way of sharing experiences and measures taken to avoid about the perceived relation between medication adherence and lack of food should be made available. And also about the hindrance factors for non adherence like fear of discrimination, faith related practices and negligence due to long time adaptation should also be made available to PLWHA.

To Researchers:

- Further study needed with comparative design to drclearly differentiate the interaction between food security and adherence.

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Addis Ababa University

College of Health Science

School of Public Health

INFORMATION SHEET

Good morning/good afternoon.

My name is ________________________. We came from Addis Ababa University, college of health science. We are working for an investigator doing his thesis for the partial fulfillment of master's degree in public health. The purpose of this study is to have insight about the overall food and nutritional status of PLWHA and its association with ART Adherence.

We would like to ask you about your current dietary habit, treatment follow up and related personal information. In addition, we will be taking measurements of your body weight, height. And they are taken in a place where other people or conditions couldn't interfere. We would like to assure you that all of your responses to our questions will be kept strictly confidential and will not be shown to other individuals throughout the study process. Participation in this survey is voluntary, and you can choose not to answer any individual question or all of the questions and withdraw during the survey. We look forward for your full participation as the answers you give on this form and your participation in taking your measurements are important to design appropriate nutritional intervention and HIV treatment for future. We need also to take some information from your files and records archived in the ART Unit of _________________ Hospital.

Your participation/ non-participation, or refusal to answer questions will have no effect now or in the future on services that you or any member of your family may receive from health service providers or any organization. We would be very thankful if you spend 20-30 minutes with us. If you have any uncertainty or question about the request you can contact the principal investigator or research and ethical committee of school of Public health, Addis Ababa University:

Principal investigator: cell phone: 0911367407 email: solenteze@gmail.com

SPH, AAU:

May I get your permission to continue my interview?

Check box (✓) Yes ☐ → Go to the Consent form

No ☐ → Stop

Thank you!!!

CONSENT FORM

I the undersigned have been informed that this interview is part of the study that assess the overall food and nutritional status of PLWHA and its association with ART Adherence in public hospitals of Addis Ababa. I have been told that the study will help in design appropriate nutritional intervention and HIV treatment for future which benefits all stalk holders. In addition, I have been told about how the data collection is proceed with taking interview, measurements and record reviewing of my archive of records. And also have been told about the time it took to complete the data collection i.e. 20-30 minutes. I clearly understand that my participation/ non-participation, or refusal to answer questions will have no effect now or in the future on services that I or any member of my family may receive from health service providers or any organization. At last, I am assured that confidentiality of my response is maintained. Therefore, I am consented to participate in the study by signing this form.

The Study participant's Signature ________________________________

Date_______________

ANNEX 1– ENGLISH VERSION QUESTIONNAIRE

INSTRUCTION:

Data collector: This is first part (from Section I to IV) is filled by interview with the patient who started HAART and took at least for 3 month priority to involving in this study. Please follow the instructions and read the consent form for the patient on page 20 before interview.

For respondent responses make (✓) sign on the check box and fill with their responses.

PART ONE

SECTION I. SOCIO-DEMOGRAPHIC & ECONOMIC CHARACTERISTICS

Information obtained from interview with the patient

No	*QUESTIONS AND FILTERS*	*CODING CATEGORIES*	*SKIP*
Q1001	Age of the study participant	☐ Years	
Q1002	Sex of the study participants	☐ 1.Male ☐ 2.Female	
Q1003	Religion	☐	
Q1004	Ethnic group	☐ 1.Amhara ☐ 2.Oromia ☐ 3.Tigre ☐ 4.Gurage 5.Others(S)_________	
Q1005	Marital status	☐ 1.Married ☐ 2.Unmarried ☐ 3.Divorced ☐ 4.Separated ☐ 5.Widowed	
Q1006	Religion	☐ 1.Orthodox ☐ 2.Muslim ☐ 3.Protestant ☐ 4.Catholic 5.Others(S)_____________	
Q1007	Education	☐ 1.Illiterate ☐ 2.Read & write ☐ 3.Elementary ☐ 4.High school ☐ 5.Diploma + 6.Others(S)_____________	

Q1008	Whom do you live with?	1.Alone 2.My family 3.My parents 4.Others (S)__________________ 9Don't Know	
Q1009	How many people live in your household including you?	1. Children(<15 years) 2.Adult (≥ 15-64 years) 3.Elderly(≥ 65 years) 4.Total ____ __________________	
Q1010	Do you earn/make money by yourself?	1.Yes 2.No → 99.Don't Know →	GOTO Q1012
Q1011	IF YES, what is your average Monthly income (Birr) you get?	Birr/Month	
Q1012	What is the monthly income (on average) of your household including your own?	Birr/Month	
Q1013	Are you receiving any money or support from any organization?	1.Yes 2.No → 99.Don't Know →	GOTO Q1015
Q1014	IF YES, what type of organization?	1.Governmental 2.Non government 3.Faith based 4.Others(S)_____________	
Q1015	Are you receiving any food ration from any organization?	1.Yes 2.No → 99.Don't Know →	GOTO Q1017
Q1016	IF YES, what type of organization?	1.Governmental 2.Non government 3.Faith based 4.Others(S)_____________	
Q1017	If yes, what is the type of food you are receiving?		
Q1018	Does anyone else know about your HIV status?	1.Yes 2. No 99.Don't Know	
Q1019	If yes who? *(Multiple responses possible. After respondent answers, probe by asking for any others)* *Do NOT read out answers*	1.Wife/husband 2.Own child 3.Parents 4.Brothers/sisters 5.Relatives 6.Friends 7.Neighbors 8.Others(Specify)____________	

Q1020	Do you receive support from your family?	1.Yes 2.No → 99.Don't Know →	GOTO Q2001
Q1021	IF YES, What kind of support do you get from your family? *(Multiple responses possible. After respondent answers, probe by asking for any others)* *Do NOT read out answers.*	1.Emotional / psychological support 2.Financial support 3.Physical care and support 4.providing food 5.Other (specify)_______________	

SECTION II. DIETARY RELATED INFORMATION

No	*QUESTIONS AND FILTERS*	*CODING CATEGORIES*	*SKIP*
Q2001	*During the previous 24-hours period (yesterday day and night), did you Consume any of the following meals:*		
Q2001A	Any food before a morning meal	1.Yes 2. No 99.Don't Know	
Q2001B	A morning meal	1.Yes 2. No 99.Don't Know	
Q2001C	Any food between morning and midday meals	1.Yes 2. No 99.Don't Know	
Q2001D	A midday meal	1.Yes 2. No 99.Don't Know	
Q2001E	Any food between midday and evening meal	1.Yes 2. No 99.Don't Know	
Q2001F	Any evening meal	1.Yes 2. No 99.Don't Know	
Q2001G	Any food after the evening meal	1.Yes 2. No 99.Don't Know	
Q2002	*During the previous 24-hours period (yesterday day and night), did you consume?*		
Q2002A	Bread, 'Ambasha', rice noodles, biscuits, cookies, Enjera or any other foods made from millet, sorghum, maize, rice, wheat, barley, Teff?	1.Yes 2. No 99.Don't Know	
Q2002B	Any pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside?	1.Yes 2. No 99.Don't Know	

Q2002C	Any white potatoes, white yams, manioc, 'Adenguare' or any other foods made from roots or tubers?	☐ 1.Yes ☐ 2. No ☐ 99.Don't Know	
Q2002D	Any dark, green, leafy vegetables such as cauliflower, tomato, bean leaves, kale, spinach, pepper leaves, taro leaves, and amaranth leaves and other vegetable?	☐ 1.Yes ☐ 2. No ☐ 99.Don't Know	
Q2002E	Any other vegetables? (e.g. tomato, onion, eggplant) ,including wild vegetables	☐ 1.Yes ☐ 2. No ☐ 99.Don't Know	
Q2002F	Any ripe mangoes, avocado, banana, pineapple, ripe papayas or orange?	☐ 1.Yes ☐ 2. No ☐ 99.Don't Know	
Q2002G	Any other fruits?	☐ 1.Yes ☐ 2. No ☐ 99.Don't Know	
Q2002H	Any beef, pork, lamb, goat, rabbit wild game, chicken, duck, or other birds, liver, kidney, heart, or other organ meats?	☐ 1.Yes ☐ 2. No ☐ 99.Don't Know	
Q2002I	Any eggs?	☐ 1.Yes ☐ 2. No ☐ 99.Don't Know	
Q2002J	Any fresh or dried fish or shellfish?	☐ 1.Yes ☐ 2. No ☐ 99.Don't Know	
Q2002K	Any foods made from beans, peas, lentil, or nuts?	☐ 1.Yes ☐ 2. No ☐ 99.Don't Know	
Q2002L	Any cheese, yogurt, milk or other milk products?	☐ 1.Yes ☐ 2. No ☐ 99.Don't Know	
Q2002M	Any foods made with oil, fat, or butter?	☐ 1.Yes ☐ 2. No ☐ 99.Don't Know	
Q2002N	Any sugar or honey?	☐ 1.Yes ☐ 2. No ☐ 99.Don't Know	
Q2002O	Any other foods, such as condiments, soft drink, coffee, or tea?	☐ 1.Yes ☐ 2. No ☐ 99.Don't Know	
Q2002P	Did you eat anything (meal or snack) outside of the home yesterday?	☐ 1.Yes ☐ 2. No ☐ 99.Don't Know	
Q2003	In the past four weeks, did you worry that you would not have enough food?	☐ 1.Yes ☐ 2.No → ☐ 99.Don't Know →	GOTO Q2005

Q2004	How often did this happen?	☐ 1.Rarely (once or twice in the past four weeks) ☐ 2.Sometimes (three to ten times in the past four weeks) ☐ 3.Often (more than ten times in the past four weeks)	
Q2005	In the past four weeks, were you not able to eat the kinds of foods you preferred because of a lack of resources?	☐ 1.Yes ☐ 2.No → ☐ 99.Don't Know →	GOTO Q2007
Q2006	How often did this happen?	☐ 1.Rarely (once or twice in the past four weeks) ☐ 2.Sometimes (three to ten times in the past four weeks) ☐ 3.Often (more than ten times in the past four weeks)	
Q2007	In the past four weeks, did you have to eat a limited variety of foods due to a lack of resources?	☐ 1.Yes ☐ 2.No → ☐ 99.Don't Know →	GOTO Q2009
Q2008	How often did this happen?	☐ 1.Rarely (once or twice in the past four weeks) ☐ 2.Sometimes (three to ten times in the past four weeks) ☐ 3.Often (more than ten times in the past four weeks)	
Q2009	In the past four weeks, did you have to eat some foods that you really did not want to eat because of a lack of resources to obtain types of food?	☐ 1.Yes ☐ 2.No → ☐ 99.Don't Know →	GOTO Q2011
Q2010	How often did this happen?	☐ 1.Rarely (once or twice in the past four weeks) ☐ 2.Sometimes (three to ten times in the past four weeks) ☐ 3.Often (more than ten times in the past four weeks)	
Q2011	In the past four weeks, did you have to eat a smaller meal than you felt you needed because there was not enough food?	☐ 1.Yes ☐ 2.No → ☐ 99.Don't Know →	GOTO Q2013
Q2012	How often did this happen?	☐ 1.Rarely (once or twice in the past four weeks) ☐ 2.Sometimes (three to ten times in the past four weeks) ☐ 3.Often (more than ten times in the past four weeks)	
Q2013	In the past four weeks, did you have to eat fewer meals in a day because there was not enough food?	☐ 1.Yes ☐ 2.No → ☐ 99.Don't Know →	GOTO Q2015

Q2014	How often did this happen?	1. Rarely (once or twice in the past four weeks) 2. Sometimes (three to ten times in the past four weeks) 3. Often (more than ten times in the past four weeks)	
Q2015	In the past four weeks, was there ever no food to eat of any kind in your home because of lack of resources to get food?	1.Yes 2.No → 99.Don't Know →	GOTO Q2017
Q2016	How often did this happen?	1. Rarely (once or twice in the past four weeks) 2. Sometimes (three to ten times in the past four weeks) 3. Often (more than ten times in the past four weeks)	
Q2017	In the past four weeks, did you go to sleep at night hungry because there was not enough food?	1.Yes 2.No → 99.Don't Know →	GOTO Q2019
Q2018	How often did this happen?	1. Rarely (once or twice in the past four weeks) 2. Sometimes (three to ten times in the past four weeks) 3. Often (more than ten times in the past four weeks)	
Q2019	In the past four weeks, did you go a whole day and night without eating anything because there was not enough food?	1.Yes 2.No → 99.Don't Know →	GOTO Q2021
Q2020	How often did this happen?	1.Rarely (once or twice in the past four weeks) 2.Sometimes (three to ten times in the past four weeks) 3.Often (more than ten times in the past four weeks)	
Q2021	*In the past four weeks, how did you manage to cope with food insufficiency?*		
Q2021A	Rely on less preferred food	1. Yes 2. No 99. Don't Know	
Q2021B	Limit portion size at meal time	1. Yes 2. No 99. Don't Know	
Q2021C	Reducing the number of meals eaten in day	1. Yes 2. No 99. Don't Know	
Q2021D	Borrow food or rely on help for friend or relative	1. Yes 2. No 99. Don't Know	

Q2022E	Purchase food on credit	1. Yes 2. No 99. Don't Know	
Q2021F	Begging for money or food	1. Yes 2. No 99. Don't Know	
Q2021G	Selling essential assets like land, house…	1. Yes 2. No 99. Don't Know	
Q2021H	Having sex for money	1. Yes 2. No 99. Don't Know	
Q2021I	Doing Hard works	1. Yes 2. No 3. Don't Know	

SECTION III. DRUG ADHERENCE RELATED INFORMATION

No	*QUESTIONS AND FILTERS*	*CODING CATEGORIES*	*SKIP*
Q3001	Did you miss taking any of your HAART drugs:		
Q3001A	Yesterday?	1. Yes 2. No 99. Don't Know	
Q3001B	In the last 3 days?	1.Yes 2. No 99.Don't Know	
Q3001C	In the last 7 days?	1. Yes 2. No 99. Don't Know	
Q3002	IF YES, to any options of Q3001, how many doses did you missed taking:		
Q3002A	Yesterday?		
Q3002B	In the last 3 days?		
Q3002C	In the last 7 days?		
Q3003	Most anti-HIV medications need to be taken on a schedule, such as "2 times a day" or "3 times a day" or "every 8 hours." How closely did you follow your specific schedule over the last four days?	1. Never 2. some of the time 3. About half the time 4. Most of the time 5. All of the time 99. Don't Know	
Q3004	Does any of your anti-HIV medications have special instructions, such as "take with food" or "on an empty stomach" or "with plenty of fluids?"	1. Yes 2. No → 99. Don't Know →	GOTO Q3006

Q3005	IF YES, how often did you follow those special instructions over the last four days?	1. Never 2. some of the time 3. About half the time 4. Most of the time 5. All of the time 99. Don't Know	
Q3006	Some people find that they forget to take their pills on the weekend days. Did you miss any of your anti-HIV medications last weekend— last Saturday or Sunday?	1. Yes 2. No 99. Don't Know	
	What caused you to miss dosage of ARV medications? *(Multiple responses possible. After respondent answers, probe by asking for any others.)* *Do NOT read out answers.*	1. Had no food to take with medication 2. Were away from home 3. Were busy with other things 4. Simply forgot 5. Had too many pills to take 6. Wanted to avoid side effects 7. Did not want others to notice you taking medication 8. Felt like the drug was toxic/harmful 9. Fell asleep/slept through dose time 10. Felt sick or ill 11. Felt depressed/ overwhelmed 12. Had problems taking pills at specified times (with meals, on empty stomach, etc.) 13. Ran out of pills 14. Felt good 15. Had alcohol at specified times 16. Other(specify)________________	

THANK YOU!!!

Data collector:

The following few questions on this page are to be filled by you:

- Date of interview: *(dd/mm/yyyy)* ____/_________/_________
- Name of Interviewer: ______________________________
- Signature of the Interviewer: ________________________

Supervisor:

The following few questions on this page are to be filled by supervisor:

- Name of the Supervisor: _______________________________
- Signature of the Supervisor: ____________________________

PART TWO

SECTION I. ANTHROPOMETRIC MEASUREMENT

INSTRUCTION:

Data collector: This section (from question number 101 - 102) is to be completed by you though measurement of the patient body weight and height. Inform the patient as we are going to measure his/her body weight and height while he/she wears light clothes and his/her height without shoe or wearing a clabbered slipper and if he wants to know his measurements, he/she can be informed.

No	***QUESTIONS AND FILTERS***	***CODING CATEGORIES***	***SKIP***
Q101	The Current body weight of the patient	☐ Kg	
Q102	The Current height of the patient	☐ Cm	

SECTION I. ART RECORDS REVIEW

INSTRUCTION:

Data collector: This first section (from question number 11 to 13) is to be completed by you from ART registers for all PLWHA who started HAART and took at least for 3 month priority to involving in this study. After completion of the information, please conduct the interview with the patient for whom you have already completed the information. Please follow the instructions and read the consent form for the patient on page 20 before interview.

For respondent responses/records make (✓) sign on the check box.

No	***QUESTIONS AND FILTERS***	***CODING CATEGORIES***	***SKIP***
11	Patient's age in years at ART starting.	☐ Years	
12	Current Regimen Recommended for the patient in ART Register	AZT/3TC/NVP 1 ☐ AZT-3TC-EFV 2 ☐ D4T/3TC/NVP 3 ☐ D4T/3TC/EFV 4 ☐ Other 5 ☐ Second line regimen 6 ☐	
13	Latest CD4 count.	____________/mm³	

THANK YOU!!

<u>የጥናቱ መረጃ ቅፅ</u>

<u>ጤና ይስጥልኝ/ እንደምን ዋሉ /እንደምን ሊደሩ</u>

የእኔ ስም ___________ እባላለሁ የ________ሆስፒታል ሰራተኛ ስሆን፣ በአሁኑ ወቅት በ አዲስ አበባ ዩኒቨርሲቲ፣ የጤና ሳይንስ ኮሌጅ ለማስተር ዲግሪ ማሟያ የሚሆን መረጃ እየሰበሰብኩ እገኛለሁ፡፡ይህ ጥናት የሚያተኩረው ከ ኤችአይቪ ጋር በሚኖሩ ሰዎች ምግብ አመጋገባቸው እና ፀረ-ኤችአይቪ ህክምና አጠቃቀማቸው ላይ ነው፡፡ በዚህ ጥናት ከአመጋገብዎ፣ ከፀረ-ኤችአይቪ ህክምና እና ተያያዥነት ያላቸው የግል ህይወቶን የሚዳስሱ መጠይቆች ተካተዋል፡፡ በተጨማሪም ክብደቶትን፣ የላይኛው ክንድ ስፍቶን እና ቁመቶን እንለካለን፡፡ እንዲሁም ከ መከታተያ ካርድዎ ላይ አንዳንድ መረጃዎችን አብረን እንወስዳለን፡፡ ማንኛውም እርሶ የሚሰጡን መረጃ ሚስጥራዊነቱ የሚጠበቅ ሲሆን ለማንም ሰው አይገለፅም፡፡ በዚህ ጥናት ላይ መሳተፍ በበጎ ፍቃደኝነት ላይ የተመረኮዘ ሲሆን ማንኛውንም ጥያቄ ያለመመለስ ብሎም ያለመሳተፍ መብት አሎ፡፡ ነገር ግን በዚህ ጥናት ላይ በንቃት እንደሚሳተፉ ተስፋ እናደርጋለን ምክንያቱም ይህ ጥናት ለወደፊት በሚደረጉ ስለምግብ እና ፀረ-ኤችአይቪ ህክምና ላይ የራሱ የሆነ እገዛ ስለሚያበረክት ነው፡፡ ጥናቱ የሚደረገው በቃለ ምልልስ እና በመለካት ሲሆን ከ25-30 ደቂቃ ሊፈጅ ይችላል፡፡ በዚህ ጥናት ላይ መሳተፎም ሆነ አለመሳተፎ በርሶም ሆነ ቤተሰቦ አሁን ሆነ ወደፊት በሚያገኙት ምንም አይነት አገልግሎት ላይ ተፅዕኖ የለውም፡፡ በ ማንኛውም ጊዜ ጥያቄ ወይም ቅሬታ ሲኖሮት ዋና አጥኝውን ወይም የተቋዋሙን ጥናት መርማሪና ፈቃጅ ክፍል በ ሚከተለው አድራሻ ማግኘት ይችላሉ፡፡

- ዋና አጥኝው: ስልክ ቁጥር: 0911367407 ወይም email solenteze@gmail.com
- የተቋዋሙን ጥናትና ምርምር ፈቃጅ ክፍል:

በዚህ ጥናት ለመሳተፍ ፍቃደኛ ኖት?

ይህን ምልክት (✓) አኑሩ ፍቃደኛ ነኝ ☐ → ወደ ፈቃደኝነት ማረጋገጫ ቅፅ

ፍቃደኛ አይደለሁም ☐ → አቁም

<u>**ፈቃደኝነት ማረጋገጫ ቅፅ**</u>

እኔ በዚህ ጥናት እንድሳተፍ ስጠየቅ ጥናቱ ከ ኤችአይቪ ጋር በሚኖሩ ሰዎች ምግብ አመጋገባቸው እና ፀረ-ኤችአይቪ ህክምና አጠቃቀማቸው ላይ የሚደረግ ጥናት እንደሆነ ተነግሮኛል ፡፡ ጥናቱ ለወደፊት በሚደረጉ ስለምግብ እና ፀረ-ኤችአይቪ ህክምና ላይ የራሱ የሆነ አገዛ እንደሚያበረክት ተነግሮኛል፡፡ በዚህ ጥናት ከ አመጋገቤ፣ ከፀረ-ኤችአይቪ ህክምአጠቃቀሜ ና እና ተያያዥነት ያላቸው የግል ህይወቴን የሚዳስሱ መጠይቆች እንደ ምጠየቅ ተነግሮኛል፡፡ በተጨማሪም ክብደቴን፣ የላይኛው ክንድ ስፍቴን እና ቁመቴን እንምለካ ተነግሮኛል፡፡ እንዲሁም ከ መከታተያ ካርድዬ ላይ እንዳንድ መረጃዎችን አብረው እንደሚወስዱ ተነግሮኛል፡፡ እኔም የምሰጠው ማንኛውም መረጃ ሚስጥራዊነቱ እንደሚጠበቅ ተለጋግጦልኛል፡፡ በ ዚህም መሰረት በ ጥናቱ ላይ ለመሳተፍ ሙሉ ፈቃደኛ ሆኜ በ ፊርማዬ አረጋግጣለሁ፡፡

የ ጥናቱ ተሳታፊ ፊርማ______________________

ቀን____________

ANNEX 2 – **AMHARIC VERSION QUESTIONNAIRE**

ክፍል አንድ

ማሳሰቢያ ለመረጃ ሰብሳቢዎች:-

የሚከተለው ክፍል ከ(ክፍል 1-4) በእናንተ አማካኝነት የሚሞላ ሲሆን፤ በዚህ ጥናት ላይ የሚሳተፉ የፀረ-ኤችአይቪ መድሀኒት ለ3ወር እና ከዚያ በላይ የወሰዱ እና እድሚያቸው 18 እና ከዚያ በላይ መሆን ይጠበቅባቸዋል፡፡

- *መረጃ ሰጪው በሰታቸው አማራጮች ላይ (✓) ምልክት ያኑሩ፡፡*

ማህበራዊ ና ዲሞግራፊ ሁኔታ			
ተ.ቁ	***ጥያቄ***	***የጥያቄዉ መልስ***	***እለፍ***
1001	የተሳታፊው እድሜ?	☐ ዓመት	
1002	የተሳታፊው ፆታ?	☐ 1 ወንድ ☐ 2 ሴት	
1003	የጋብቻ ሆኔታ ?	☐ 1 ያላገባ/ች ☐ 2 ባለትዳር ☐ 3 ፈት/ የተለያዩ ☐ 4 ባሏ/ሚስቱ የሞተችበት/ ባት	
1004	ሃይማኖት?	☐ 1 ኦርቶዶክስ ☐ 2 ሙስሊም ☐ 3 ፕሮቴስታንት ☐ 4 ካቶሊክ ☐ 5 ሌላ (ይገለፅ)___________	
1005	ብሄረሰብዎ ምንድነዉ ?	☐ 1 አማራ ☐ 2 ኦሮሞ ☐ 3 ትግሬ ☐ 4 ጉራጌ 5 ሌላ (ይገለፅ) ___________	
1006	የስራ ሁኔታ ?	☐ 1 የመንግስት ሰራተኛ ☐ 2 የግል (መንግስታዊ ያልሆነ) ድርጅት ሰራተኛ ☐ 3 ነጋዴ ☐ 4 የቤት እመቤት ☐ 5 የቀን ሰራተኛ ☐ 6 ተማሪ ☐ 7 ስራ አጥ 8 ሌላ (ይገለፅ)___________	
1007	የትምህርት ሁኔታ "እስከ ስንት ክፍል ተምረዋል?"	☐ 1 በማንኛውም ቋንቋ መፃፍ እና ማንበብ አልችልም? ☐ 2 በማንኛውም ቋንቋ መፃፍ እና ማንበብ እችላሉ? ☐ 3 አንደኛ ደረጃ (ከ1-8 ክፍል) ☐ 4 ሁለተኛ ደረጃ (ከ9-12 ክፍል) ☐ 5 ከፍተኛ ተቋም (ከ12 በላይ)	
1008	የሚኖሩት ከማን ጋር ነው?	☐ 1 ለብቻዬ ☐ **5.**ከባለቤቴ ጋር ብቻ ☐ 2 ከወላጆቼ ☐ **6.** ዘመዶቼ/ቤተሰቦቼ ☐ 3 ከባለቤቴ እና ከልጆቼ ጋር ☐ 4 ከልጆቼ ጋር ብቻ **7.** ሌላ (ይገለፅ)___________	

1009	በሚኖሩበት ቤቶ ስንት ሰው ይኖራል?	A ልጆች (ከ18 ዓመት በታች) ___________ B አዋቂዎች (ከ 18---64ዓመት)___________ C አዛውንቶች (65 ዓመት እና ከዛ በላይ)_______ D አጠቃላይ ብዛት ____________________	
1010	በግልዎት የሚያገኙት ገቢ አለ?	☐ 1 አዎን ☐ 2 የለም →	**ወደ ተ.ቁ 1012**
1011	ለጥያቄ 1010 አዎን ከሆነ መልስዎ ፤ አማካይ የወር ገቢ ስንት ነው?	_____________ብር/ በወር	
1012	አማካይ የቤተሰቦ (የእርስዎን ጨምሮ) የወር ገቢ ምን ያህል ነው?	_____________ብር/ በወር	
1013	የገንዘብ ድጋፍ የሚያደርግሎት ድርጅት አለ?	☐ 1 አዎ አለ ☐ 2 የለም →	**ወደ ተ.ቁ 1015**
1014	በጥያቄ 1013 መልስዎ አዎ ከሆነ ፤ ድጋፍ የሚያደርግሎት ድርጅት አይነት?	☐ 1 መንግስታዊ ድርጅት ☐ 2 መንግስታዊ ያልሆነ ድርጅት ☐ 3 የእምነት ድርጅት 4 ሌላ (ይገለፅ)_________	
1015	ከቤተሰብ ውስጥ ስለእርስዎ የኤችአይቪ ዉጤት የሚያውቅ አለ?	☐ 1 አዎን ☐ 2 የለም → ☐ 3 አላውቅም →	**ወደ ተ.ቁ 1017**
1016	ለጥያቄ 1015 መልስዎ አዎን ከሆነ ፤ ማነው ስለእርሦ የኤችአይቪ ሆኔታ የሚያውቀው ***(ከአንድ በላይ መልስ ሊኖረው ይችላል:: ከመልሱ በኀላ ተጨማሪ መልስ ካለ ይጠይቁ)*** ***መልስ ከመስጠታቸው በፊት አማራጮችን አይግለፁላቸው::***	☐ 1 ባለቤቴ ☐ 2 ቤተሰቦቼ ☐ 3 ልጆቼ ☐ 4 ጎረቤቶቼ ☐ 5 ጓደኞቼ ☐ 6 ዘመዶቼ ☐ 7 ሁሉም ጎረቤቶቼ እና ዘመዶቼ ☐ 8 ሌላ (ይገለፅ)_________	
1017	ከቤተሰብ የሚያገኙት ድጋፍ አለ?	☐ 1 አዎን ☐ 2 የለም → ☐ 3 አላውቅም →	**ወደ ተ.ቁ 1019**
1018	ለጥያቄ 1017 መልስዎ አዎ ከሆነ ፤ ምን አይነት ድጋፍ ነው የሚያገኙት? ***(ከአንድ በላይ መልስ ሊኖረው ይችላል::ከመልሱ በኀላ ተጨማሪ መልስ ካለ ይጠይቁ) መልስ ከመስጠታቸው በፊት አማራጮችን አይግለፁላቸው::***	☐ 1 የሞራል ድጋፍ ☐ 2 የገንዘብ ድጋፍ ☐ 3 የአካላዊ ድጋፍ እና እንክብካቤ ☐ 4 የምግብ ድጋፍ 5 ሌላ (ይገለፅ)_________	
1019	የምግብ ድጋፍ የሚሰጦት ድርጅት አለ?	☐ 1. አዎን ☐ 2. የለም →	**ወደ ክፍል ሁለት**
1020	ለጥያቄ 1019 መልስዎ አዎ ከሆነ መልሦ፤ ድጋፍ የሚያደርግሎት ምን አይነት ድርጅት ነው?	☐ 1. መንግስታዊ ድርጅት ☐ 2. መንግስታዊ ያልሆነ ድርጅት ☐ 3. የእምነት ድርጅት 4. ሌላ (ይገለፅ)_________	
1021	ለጥያቄ 1019 መልስዎ አዎን ከሆነ ፤ የሚሰጦትን የምግብ አይነት ይግለፁ	**1** ______________________ **2** ______________________ **3** ______________________ **4** ______________________	

ክፍል ሁለት

ከአመጋገብ ጋር ተያያዥነት ያላቸው መጠይቆች			
ተ.ቁ	ጥያቄ	የጥያቄዉ መልስ	እለፍ
2001	*ባለፈው 24 ሰዓት ውስጥ (ከትላንት በዚህ ሰዓት እስከ አሁን ድረስ) ከታች ከተዘረዘሩት (የመመገቢያ ጊዜያት ምግብ ተመግበዋል? (መጠጥ ነገሮች ለምሳሌ፡- ወተት ፣ ጭማቂ፣ አልኮል ወዘተ ይጨምራል)*		
A.	ማንኛውም ምግብ ከቁርስ በፊት	1. አዎን 2. አልተመገብኩም	
B.	ቁርስ	1. አዎን 2. አልተመገብኩም	
C.	ማንኛውም ምግብ በቁርስ እና ምሳ መካከል	1. አዎን 2. አልተመገብኩም	
D.	ምሳ	1. አዎን 2. አልተመገብኩም	
E.	ማንኛውም ምግብ በምሳ እና እራት መካከል	1. አዎን 2. አልተመገብኩም	
F.	እራት	1. አዎን 2. አልተመገብኩም	
G.	ማንኛውም ምግብ ከእራት በኋላ	1. አዎን 2. አልተመገብኩም	
2002	*ባለፈው 24 ሰዓት ውስጥ (ከትላንት በዚህ ሰዓት እስከ አሁን ድረስ) ከነዚህ ምግብ ውስጥ ማንኛቸውን ምግብ ተመግበዋል?*		
A.	ዳቦ፣ አንባሻ፣ ሩዝ፣ ብስኩት፣ ኩኪስ ፣ እንጀራ፣ ማንኛውም ምግብ ከማሽላ፣ ከዳጉሳ፣ ከበቆሎ፣ ከስንዴ፣ ከጤፍ ወይም ከሩዝ የተሰራ	1. አዎን 2. አልተመገብኩም	
B.	ዱባ፣ ካሮት፣ ስካር ድንች	1. አዎን 2. አልተመገብኩም	
C.	ድንች፣ ጎደሬ፣ ማንኛውም ከስራስር የሚሰራ ምግብ	1. አዎን 2. አልተመገብኩም	
D.	ጥቅል ጎመን፣ ያበሻ ጎመን፣ አበባ ጎመን፣ ቲማቲም፣ ሰላጣ	1. አዎን 2. አልተመገብኩም	
E.	ከላይ ከተጠቀሱት ተጨማሪ አትክልት ካለ ____________	1. አዎን 2. አልተመገብኩም	
F.	የበሰለ ማንጎ፣ አቮካዶ፣ ሙዝ፣ አናናስ፣ ፓፓያ ወይንም ብርቱካን	1. አዎን 2. አልተመገብኩም	
G.	ከላይ ከተጠቀሱት ተጨማሪ ፍራፍሬ ካለ ____________	1. አዎን 2. አልተመገብኩም	
H.	የበሬ ስጋ፣ የአሳማ ስጋ፣ የፍየል/የበግ ስጋ፣ ዶሮ፣ ወይንም ሌላ የስጋ ውጤቶች	1. አዎን 2. አልተመገብኩም	
I.	እንቁላል፣ የእንቁላል ውጤቶች	1. አዎን 2. አልተመገብኩም	
J.	አሳ እና የአሳ ውጤቶች	1. አዎን 2. አልተመገብኩም	
K.	አተር፣ ባቄላ፣ ምስር፣ አደንጓሬ	1. አዎን 2. አልተመገብኩም	
L.	ወተት፣ አይብ፣ እርጎ፣ ቅቤ፣ ማንኛውም የወተት ውጤቶች	1. አዎን 2. አልተመገብኩም	

No.	Question	Response	Skip
M.	ከዘይት፣ ከቅቤ፣ ከለውዝ የተሰራ ምግብ	1. አዎን 2. አልተመገብኩም	
N.	ማር፣ ስካር	1. አዎን 2. አልተመገብኩም	
O.	ሻይ፣ ቡና፣ የለስላሳ መጠጦች	1. አዎን 2. አልተመገብኩም	
2003A	በአለፉት አራት ሳምንታት፤ በቂ ምግብ ላይኖረኝ ይችላል ብለው ተጨንቀው ያቃሉ?	1. አዎን 2. አላውቅም →	**ወደ ተ.ቁ 2004A**
2003B	ለጥያቄ 2003A መልስዎ አዎ ከሆነ ፤ ምን ያህል ጊዜ ተከስቶል?	**1.** ጥቂት ጊዜ(1 ወይም 2 ጊዜ በዕለፉት 4 ሳምንት) **2.** አልፎ አልፎ (3-10 ቀን በዕለፉት 4 ሳምንት) **3.** ብዙ ጊዜ(ከ 10 ቀን በላይ በዕለፉት 4 ሳምንት)	
2004A	በአለፉት አራት ሳምታት፤ በገንዘብ እጥረት ምክንያት የሚፈልጉትን ምግብ መመገብ ሣይችሉ ቀርተዋል?	1. አዎን 2. አልቀረሁም →	**ወደ ተ.ቁ 2005A**
2004B	ለጥያቄ 2004A መልስዎ አዎን ከሆነ ፤ ምን ያህል ጊዜ ተከስቷል?	**1.** ጥቂት ጊዜ(1 ወይም 2 ጊዜ በዕለፉት 4 ሳምንት) **2.** አልፎ አልፎ (3-10 ቀን በዕለፉት 4 ሳምንት) **3.** ብዙ ጊዜ(ከ 10 ቀን በላይ በዕለፉት 4 ሳምንት)	
2005A	ባለፉት አራት ሳምንታት፤ በገንዘብ እጥረት ምክንያት የተመጣጠነ ምግብ ለማግኘት ተቸግረው ያቃሉ?	1. አዎን 2. አላውቅም →	**ወደ ተ.ቁ 2006A**
2005B	ለጥያቄ 2005A መልስዎ አዎን ከሆነ ፤ ምን ያህል ጊዜ ተከስቷል?	**1.** ጥቂት ጊዜ(1 ወይም 2 ጊዜ በዕለፉት 4 ሳምንት) **2.** አልፎ አልፎ (3-10 ቀን በዕለፉት 4 ሳምንት) **3.** ብዙ ጊዜ(ከ 10 ቀን በላይ በዕለፉት 4 ሳምንት)	
2006A	በአለፉት አራት ሳምንታት፤ በገንዘብ እጥረት ምክንያት መመገብ የማይፈልጉት ምግብ ተመግበዋል ?	1. አዎን 2. አልተመገብኩም →	**ወደ ተ.ቁ 2007A**
2006B	ለጥያቄ 2006A መልስዎ አዎን ከሆነ፤ ምን ያህል ጊዜ ተከስቷል?	**1.** ጥቂት ጊዜ(1 ወይም 2 ጊዜ በዕለፉት 4 ሳምንት) **2.** አልፎ አልፎ (3-10 ቀን በዕለፉት 4 ሳምንት) **3.** ብዙ ጊዜ(ከ 10 ቀን በላይ በዕለፉት 4 ሳምንት)	
2007A	ባለፉት አራት ሳምንታት፤ በምግብ አቅርቦት እጥረት ምክንያት ከሚያስፈልጎት የምግብ መጠን በታች ተመግበው ያቃሉ?	1. አዎን 2. አላውቅም →	**ወደ ተ.ቁ 2008A**
2007B	ለጥያቄ 2007A መልስዎ አዎን ከሆነ መልእሦ፤ ምን ያህል ጊዜ ተከሰቷል?	**1.** ጥቂት ጊዜ(1 ወይም 2 ጊዜ በዕለፉት 4 ሳምንት) **2.** አልፎ አልፎ (3-10 ቀን በዕለፉት 4 ሳምንት) **3.** ብዙ ጊዜ(ከ 10 ቀን በላይ በዕለፉት 4 ሳምንት)	
2008A	ባለፉት አራት ሳምንታት፤ በአቅርቦት እጥረት ምክንያት መመገብ ከነበረቦት ጊዜያት(ድግግሞሽ) ቀንሰው (ዘለው) ያቃሉ?	1. አዎን 2. አላውቅም →	**ወደ ተ.ቁ 2009A**
2008B	ለጥያቄ 2008A መልስዎ አዎን ከሆነ፤ ምን ያህል ጊዜ ተከሰቷል?	**1.** ጥቂት ጊዜ(1 ወይም 2 ጊዜ በዕለፉት 4 ሳምንት) **2.** አልፎ አልፎ (3-10 ቀን በዕለፉት 4 ሳምንት) **3.** ብዙ ጊዜ(ከ 10 ቀን በላይ በዕለፉት 4 ሳምንት)	
2009A	ባለፉት አራት ሳምንታት፤ በአቅርቦት እጥረት ምክንያት ምንም ዓይነት ምግብ ያላገኙበት ወቅት አለ?	1. አዎን 2. የለም →	**ወደ ተ.ቁ 2010A**
2009B	ለጥያቄ 2009A መልስዎ አዎን ከሆነ፤ ምን ያህል ጊዜ ተከሰቷል?	**1.** ጥቂት ጊዜ(1 ወይም 2 ጊዜ በዕለፉት 4 ሳምንት) **2.** አልፎ አልፎ (3-10 ቀን በዕለፉት 4 ሳምንት) **3.** ብዙ ጊዜ(ከ 10 ቀን በላይ በዕለፉት 4 ሳምንት)	
2010A	ባለፉት አራት ሳምንታት፤ በቂ የምግብ አቅርቦት ባለመኖሩ ምክንያት እየራቦት ወደ መኝታ ሄደው ያቃሉ?	**1.** አዎን **2.** አላውቅም →	**ወደ ተ.ቁ 2011A**
2010B	ለጥያቄ 2010A መልስዎ አዎን ከሆነ፤ ምን ያህል ጊዜ ተከሰቷል?	**1.** ጥቂት ጊዜ(1 ወይም 2 ጊዜ በዕለፉት 4 ሳምንት) **2.** አልፎ አልፎ (3-10 ቀን በዕለፉት 4 ሳምንት)	

		3. ብዙ ጊዜ(ከ 10 ቀን በላይ በዕለፉት 4 ሳምንት)	
2011A	ባለፉት አራት ሳምንታት፤ በቂ ምግብ ባለመኖሩ ምክንያት ቀኑን እና ሌሊቱን ምንም ሳይመገቡ ያሳለፉበት ወቅት ነበር?	☐ 1. አዎን ☐ 2. የለም →	**ወደ ተ.ቁ 2012**
2011B	ለጥያቄ 2011A መልስዎ አዎን ከሆነ፤ ምን ያህል ጊዜ ተከስቷል?	☐ **1.** ጥቂት ጊዜ(1 ወይም 2 ጊዜ በዕለፉት 4 ሳምንት) ☐ **2.** አልፎ አልፎ (3-10 ቀን በዕለፉት 4 ሳምንት) ☐ **3.** ብዙ ጊዜ(ከ 10 ቀን በላይ በዕለፉት 4 ሳምንት)	
2012	ባለፉት አራት ሳምንታት፤ የምግብ ፍጆታ መጉአደል ሲያጋጥሞት ምን አይነት የመቆቆሚያ እርምጃ ወሰዱ? ***(ከአንድ በላይ መልስ ሊኖረው ይችላል፡፡ ከመልሱ በኃላ ተጨማሪ መልስ ካለ ይጠይቁ) መልስ ከመስጠ ታቸው በፊት አማራጮችን አይግለፁላቸው፡፡***	☐ **A.** ቡዙ የማይፈልጉትን ምግቦች ምርጫ በማድረግ ☐ **B.** ለአንድ ጊዜ የሚቀርበዉ የምግብ መጠን መቀነስ ☐ **C.** በቀን ውስጥ የምመገብባቸውጊዜያት (ድግግሞሽ) በመቀነስ ☐ **D.** ምግብ በመበደር ወይም ጉደኞች ፣ ዘመዶች ላይ መደገፍ ☐ **E.** ምግብ በብድር በመግዛት ☐ **F.** ምግብ ወይም ገንዘብ በመለመን ☐ **G.** ተቀማጭ ንብረቶች እንደ መሬት ቤት በመሸጥ ☐ **H.** ለምግብ ወይም ለገንዘብ ብለው ግብረ ስጋ ግንኙነት በማድረግ ☐ **I.** ከአቅም በላይ ከባድ ስራ በመስራት **J.** ሌላ (ይጠቀስ) ________________	

ክፍል ሶስት

ከፀረ- ኤችአይቪ መድሀኒቶች ጋር ተያያዥነት ያላቸው መረጃዎች

ተ.ቁ	***ጥያቄ***	***የጥያቄዉ መልስ***	***እለፍ***
3001	ፀረ-ኤችአይቪ መድሀኒት መውሰድ ከጀመሩ ጀምሮ ሳይወስዱ ያለፉበት ጊዜ አለ?	☐ **1.** አዎን ☐ **2.** አይደለም ☐ **99.** መልስ የለም	***ወደ ተ.ቁ*** **3006**
A.	ለጥያቄ 3001 መልስዎ አዎ ከሆነ፤ ዛሬ መድሀኒቶችን ሳይወስዱ ቀርተዋል?	☐ **1.** አዎን ☐ **2.** አይደለም ☐ **99.** መልስ የለም	
B.	ለጥያቄ 3001 መልስዎ አዎ ከሆነ፤ ትናንት መድሀኒቶችን ሳይወስዱ ቀርተዋል?	☐ **1.** አዎን ☐ **2.** አይደለም ☐ **99.** መልስ የለም	
C.	ለጥያቄ 3001 መልስዎ አዎ ከሆነ፤ በአለፉት 3 ቀናት መድሀኒቶችን ሳይወስዱ ቀርተዋል?	☐ **1.** አዎን ☐ **2.** አይደለም ☐ **99.** መልስ የለም	
D.	ለጥያቄ 3001 መልስዎ አዎ ከሆነ፤ ባለፉት 7 ቀናት መድሀኒቶችን ሳይወስዱ ቀርተዋል?	☐ **1.** አዎን ☐ **2.** አይደለም ☐ **99.** መልስ የለም	

E.	ለጥያቄ 3001 መልስዎ አዎ ከሆነ፤ ባለፉት 30 ቀናት መድሀኒቶችን ሳይወስዱ ቀርተዋል?	**1.** አዎን **2.** አይደለም **99.** መልስ የለም	
3002	ምን ያህል መድሀኒቶች ነዉ ሳይወስድ የቀሩት?	**A.** ዛሬ የአልወሰዱት መድሀኒት ብዛት__________ **B.** ትላንት የአልወሰዱት መድሀኒት ብዛት __________ **C.** ባለፉት 3 ቀናት የአልወሰዱት መድሀኒት ብዛት________ **D.** ባለፉት 7 ቀናት የአልወሰዱት መድሀኒት ብዛት________ **E.** በአለፉት 30 ቀናት የአልወሰዱት መድሀኒተ ብዛት_______	
3003	አንዳንድ ሰዎች በሳምንቱ መጨረሻ ቀናት መድሀኒቶቻቸውን መዉሰዳቸውን ይዘነጋሉ፡፡ እርሦ ባለፈው ቅዳሜ ወይንም እሁድ መድሀኒቶን ሳይወስዱ ቀርተው ነበር?	**1.** አዎን **2.** አይደለም **99.** መልስ የለም	
3004	መድሀኒቶን ሳይወስዱ የቀሩበት ምክንያት ምንድን ነው? ***(ከአንድ በላይ ምላሽ ሊኖረው ይችላል፡፡ ከምላሹ በኃላ ተጨማሪ ምላሽ ካለ ይጠይቁ) ምላሽ ከመስጠታቸው በፊት አማራጮችን አይግለፁላቸው፡፡***	**A.** ከመደሀኒቱ ጋር የምወስደው ምግብ ስላልነበረኝ **B.** ከቤት እርቄ ሄጄ ስለ ነበር **C.** በሌሎች ማህበራዊ ጉዳዮች ተይዥ ስለነበር **D.** እንደ አጋጣሚ ተረስቶኝ ነው **E.** የመድሀኒቱ የጎንዮሽ ጉዳት ለማስወገድ ስል **F.** መድሀኒቱ ይጎዳኛል/ይመርዘኛል ብዬ ስለፈራሁ **G.** የህመም ስሜት ይሰማኝ ስለ ነበር **H.** በባዶ ሆድ ለመስወድ ያስቸግረኛል ብዬ ስለምፈራ **I.** መድሀኒት ጨርሼ ስለነበር **J.** የድብርት ስሜት ስለነበረኝ **K.** ጤንነት ስለ ሚሰማኝ **L.** ሌሎች መድሀኒት እንደምወስድ እንዳያውቁብኝ **M.** አልኮል መጠጥ የምጠጣበት ስአት ስለ ነበረ **N.** ሌላ (ይጥቀሱ) ____________	
3005	አብዛኞች የፀረ-ኤችአይቪ መድሀኒቶች በ <ፕሮግራም> መውሰድ ይኖርባቸዋል፤ ለምሳሌ በቀን 2 ጊዜ፡ በአለፉት 7 ቀናት ምን ያህል በትክክል ይህንን ፕሮግራም ተከታትለዋል፡	**1** ፈፅሞ ተከታትዬ አላውቅም **2** አልፎ አልፎ **3** በከፊል (ወደ 4 ቀናት) **4** አብዛኛውን ቀናት **5** ሁሉንም (7) ቀናት **99** ምላሽ የለም	
3006	እርሦ ከሚወስዱት ማንኛቸውንም ፀረ-ኤችአይቪ መድሀኒቶች ልዩ ማሳሰቢያ የአሉት አለ? ለምሳሌ ከምግብ ጋር ይወሰድ፤ በባዶ ሆድ ይወሰድ፤ ከብዙ ፈሳሽ ጋር ይወሰድ	**1** አዎን **2** አይደለም → **99** መልስ የለም →	**ወደ ክፍል አራት**

3007	ለጥያቄ 3007 አዎን ከሆነ መልሦ፤ እነዚህ ልዩ ትዕዛዛት ባለፉት 7 ቀናት ምን ያህል ጊዜ ተከትለዋቸዋል?	☐ **1.** ፈፅሞ ተከታትዬ አላውቅም ☐ **2.** አልፎ አልፎ ☐ **3.** በከፊል (ወደ 4 ቀናት) ☐ **4.** አብዛኛውን ቀናት ☐ **5.** ሁሉንም (7) ቀናት ☐ **99** ምላሽ የለም	

ስለትብብሮት እናመሰግናለን!!!

<u>ማሳሰቢያ ለመረጃ ሰብሳቢዎች፡-</u>

የሚከተለው ክፍል በእናንተ አማካኝነት ክብደትና ቁመት በመለካት የሚሞላ ነው፡፡ ለመረጃ ሰጪዎች ክብደታቸው እና ቁመታቸው ከበድ ያሉ ልብሳቸው ከአወለቁ በኋላ ልንለካ እንደሆነ ይግለፅላቸው መረጃው ከፈለጉ ይገልፅላቸው፡፡

ክፍል አራት

የሰዉነት ይዘቶችን በመለካት የሚሞላ			
ተ.ቁ	***ጥያቄ***	***የጥያቄዉ መልስ***	***እለፍ***
4001	በአሁኑ ሰዓት ያላቸው ክብደት	______________ ኪግ	
4002	በአሁኑ ሰዓት ያላቸው ቁመት	______________ሴሜ	

<u>ማሳሰቢያ ለመረጃ ሰብሳቢዎች፡-</u>

የሚከተለው ክፍል በእናንተ አማካኝነት የበሽተኛውን ካርድ በማገናዘብ የሚሞላ ይህንን መረጃ ከበሽተኛ መከታተያ ካርድ ላይ ከሞላችሁ በኋላ መረጃዉን ለሞላችሁለት/ላት ግለሰብ ቃለ መጠይቅ አድርጉለት/ላት፡፡

ክፍል አምስት

ከህክምና መስጫ ካርድ ላይ የሚሰበሰብ			
ተ.ቁ	***ጥያቄ***	***የጥያቄዉ መልስ***	***እለፍ***
5001	ፀረ-ኤችአይቪ መድህኒት በጀመረበት ወቅት ታካሚዉ የነበረው እድሜ	______________ ዓመት	
5002	እንዲወስድ የታዘዘለት የፀረ-ኤችአይቪ መድህኒት ዓይነት	☐ AZT/3TC/NVP ☐ AZT-3TC-EFV ☐ D4T/3TC/NVP ☐ D4T/3TC/EFV ☐ Other ☐ Second line regimen	
5003	የቅርብ ጊዜ CD_4 መጠን	______________/ mm^3	

<u>ለመረጃ ሰብሳቢዎች፡-</u>

መጠይቁ የሞላው ሰው ስም ______________ **ፊርማ**_________________

<u>ለመረጃ ተቆጣጣሪ፡-</u>

የተቆጣጣሪው ስም ______________________ **ፊርማ** _______________________

Addis Ababa University

College of Health Science

School of Public Health

INFORMATION SHEET FOR THE INDEPTH INTERVIEW

***Good morning/good afternoon*.**

My name is ________________________. We came from Addis Ababa University, college of health science. We are working for an investigator doing his thesis for the partial fulfillment of master's degree in public health. The purpose of this study is to have insight about the overall food and nutritional status of PLWHA and its association with ART Adherence.

We would like to ask you about the dietary habit, treatment follow up and related information about PLWHA. While particpating in this study you will be asked with issues and questions and with the help of notetaker accompanying with taperecorder, your responses will be taken down. We would like to assure you that all of your responses to our questions will be kept strictly confidential and will not be shown to other individuals throughout the study process. Participation in this survey is voluntary, and you can choose not to answer any individual question or all of the questions and withdraw during the survey.

We look forward for your full participation as the answers you give us are important to design appropriate nutritional intervention and HIV treatment for future.

Your participation/ non-participation, or refusal to answer questions will have no effect now or in the future on services that you or any member of your family may receive from health service providers or any organization. We would be very thankful if you spend 10-20 minutes with us.
If you have any uncertainity or question about the request you can contact the principal investigator or the college of health science IRB (Institution Review Board) with the following address:
Principal investigator: cell phone: 0911367407 email: solenteze@gmail.com
IRB:

May I get your permission to continue my interview?
Check box (✓) Yes ☐ → Go to the Consent form
No ☐ → Stop

Thank you!!!

CONSENT FORM FOR THE INDEPTH INTERVIEW

I undersigned have been informed that this interview is part of the study that overall food and nutritional status and its association with ART Adherence of PLWHA. I have been told that the study will help in design appropriate nutritional intervention and HIV treatment for future which benefits all stalk holders. In addition, I have been told about how the data collection is proceeding with indepth interview.which is underaking by answering to guiding questions and issues that will be recorded with notetaker accompaying with tape recorder. And also have been told about the time it took to complete the data collection i.e. 10-20 minutes. I clearly understand that my participation/ non-participation, or refusal to answer questions will have no effect now or in the future on services that I or any member of my family may receive from health service providers or any organization. At last, I am assured that confidentiality of my response is maintained. Therefore, I am consented to participate in the study.

The Study participant's Signature ________________________________

Date_______________

ANNEX 3 – ENGLISH VERSION INDEPTH INTERVIEW GUIDE

1. How common is food insecurity among adult PLWHA on HAART?
2. What do you think about the reasons for not being food secured among adult PLWHA?
3. How common is eating less diverse food groups among adult PLWHA on HAART?
4. What do you think about the reasons eating less diverse food groups among adult PLWHA?
5. Which groups of people are affected by food insecurity and low dietary diversity consumption?
6. What should be done to encourage eating diverse food groups and become food secured among adult PLWHA on HAART?
7. How common is missing HAART drugs among adult PLWHA on HAART?
8. What do you think about the reasons for missing HAART drugs among adult PLWHA on HAART?
9. What should be done to encourage adherence to HAART among adult PLWHA on HAART?
10. What do you think about the relationship between HAART adherence and food security?
11. Do you have any additional general comment regarding what we have so far covered?

የጥናቱ መረጃ ቅፅ ለጥልቅ መጠይቅ

ጤና ይስጥልኝ/ እንደምን ዋሉ /እንደምን ኣደሩ

የእኔ ስም ___________ እባላለሁ በ አዲስ አበባ ዩኒቨርሲቲ፣ የጤና ሳይንስ ኮሌጅ ለማስተር ዲግሪ ማሟያ የሚሆን መረጃ እየሰበሰብኩ እገኛለሁ፡፡ በዚህ ጥናት ከ ኤችአይቪ ጋር የ ሚኖሩ ሰዎች አመጋገብ፣ የ ፀረ-ኤችአይቪ ህክምና እና ተያያዥነት ያላቸው የግል ህይወታቸውን የሚዳስስ መጠይቆች ተካተዋል፡፡ ጥናቱ የሚካሄደው እርሶ የሚሰጡንን ምላሽ በድምጽ መቅረጫ በመቅርፅ ነው፡፡ ማንኛውም እርሶ የሚሰጡን መረጃ ሚስጥራዊነቱ የሚጠበቅ ሲሆን ለማንም ሰው አይገለፅም፡፡ በዚህ ጥናት ላይ መሳተፍ በበጎ ፍቃደኝነት ላይ የተመረኮዘ ሲሆን ማንኛውንም ጥያቄ ያለመመለስ ብሎም ያለመሳተፍ መብት አሎት፡፡ ነገር ግን በዚህ ጥናት ላይ በንቃት እንደሚሳተፉ ተስፋ እናደርጋለን ምክንያቱም ይህ ጥናት ለወደፊት በሚደረጉ ስለምግብ እና ፀረ-ኤችአይቪ ህክምና ላይ የራሱ የሆነ እገዛ ስለሚያበረክት ነው፡፡ ጥናቱ የሚደረገው በ ጥልቅ መጠይቅ ሲሆን ከ10-20 ደቂቃ ሊፈጅ ይችላል፡፡ በዚህ ጥናት ላይ መሳተፎም ሆነ አለመሳተፎ በርሶም ሆነ ቤተሰቦ አሁን ሆነ ወደፊት በሚያገኙት ምንም አይነት አገልግሎት ላይ ተፅዕኖ የለውም፡፡በማንኛውም ጊዜ ጥያቄ ወይም ቅሬታ ሲኖሮት ዋና እጥኚውን ወይም የተቋዋሙን ጥናት መርማሪና ፈቃጅ ክፍል በ ሚከተለው አድራሻ ማግኘት ይችላሉ፡፡

- ዋና እጥኚው: ስልክ ቁጥር: 0911367407 ወይም email solenteze@gmail.com
- የተቋዋሙን ጥናትና ምርምር ፈቃጅ ክፍል:

በዚህ ጥናት ለመሳተፍ ፍቃደኛ ኖት?

ይህን ምልክት (✓) አኑሩ   ፍቃደኛ ነኝ ☐ → ወደ ፈቃደኝነት ማረጋገጫ ቅፅ

ፍቃደኛ አይደለሁም ☐ → አቁም

ፈቃደኝነት ማረጋገጫ ቅፅ ለጥልቅ መጠይቅ

እኔ በዚህ ጥናት እንድሳተፍ ስጠየቅ ጥናቱ ከ ኤችአይቪ ጋር በሚኖሩ ሰዎች ምግብ አመጋገባቸው እና ፀረ-ኤችአይቪ ህክምና አጠቃቀማቸው ላይ የሚደረግ ጥናት ፡፡ ጥናቱ ለወደፊት በሚደረጉ ስለምግብ እና ፀረ-ኤችአይቪ ህክምና ላይ የራሱ የሆነ እገዛ እንደሚያበረክት ተነግሮኛል፡፡ ጥናቱ የሚደረገው በጥልቅ መጠይቅ እደሆነና ጥናቱ የሚካሄደው እኔ የምሰጠውን ምላሽ በድምጽ መቅረጫ በመቅርፅ እንደሆነ ተነግሮኛል፡፡ ከ10-20 ደቂቃ ሊፈጅ እንደሚችል ተነግሮኛል፡፡ እኔም የምሰጠው ማንኛውም መረጃ ሚስጥራዊነቱ እንደሚጠበቅ ተረጋግጦልኛል፡፡ በ ዚህም መሰረት በ ጥናቱ ላይ ለመሳተፍ ሙሉ ፈቃደኛ ሆኘ በ ፊርማዬ አረጋግጣለሁ፡፡

የ ጥናቱ ተሳታፊ ፊርማ_______________________

ቀን____________

ANNEX 4 – AMHARIC VERSION INDEPTH INTERVIEW GUIDE

1. ከ ኤችአይቪ ጋር በሚኖሩ ሰዎች ላይ የምግብ ዋስትና ችግር ምን ያህል የተለመደ ነው?
2. በ ምግብ ዋስትና ችግር ምክንያት ሊሆን የሚችሀው ምንድን ነው?
3. ከ ኤችአይቪ ጋር በሚኖሩ ሰዎች የተመጣጠነ ምግብ የማይመገቡበት ጊዜአት ምን ያህል የተለመደ ነው?
4. የተመጣጠነ ምግብ የማይመገቡበት ምክንያት ሊሆን የሚችለው ምንድን ነው?
5. የትኞቹ ከኤችአይቪ ጋር የሚኖሩ የህብረተሰብ ክፍል ናቸው በዚህ በምግብ ዋስትና ችግር በበለጠ የሚጠቁት?
6. የተመጣጠነ ምግብ እንዲመገቡ ምን መፍትሄ መወሰድ አለበት ትላላችሁ?
7. ከ ኤችአይቪ ጋር በሚኖሩ ሰዎች ፀረ- ኤችአይቪ መዴሀኒቶቻቸውን በአግባቡ ሳይወስደ የሚቀሩበት ጊዜአት ምን ያህል የተለመደ ነው?
8. ፀረ- ኤችአይቪ መዴሀኒቶቻቸውን በአግባቡ ሳይወስዱ የሚቀሩበት ምክንያት ሊሆን የሚችለው ምንድን ነው?
9. ፀረ- ኤችአይቪ መዴሀኒቶቻቸውን በ አግባቡ ሳያቆርጡ እንዲወስዱ ምን መፍትሄ መወሰድ አለበት ትላላችሁ?
10. በ ምግብ ዋስትና ችግር እና ፀረ- ኤችአይቪ መዴሀኒቶችን በአግባቡ ያለመውስድ ችግር ላይ ያለው ቁርኝነት ምን ይመይስላቹሀል?
11. እስካሁን ካነሳናቸው በተጨማሪ የሚጨምሩት አስተያየት: ሀሳብ ካለ?

DECLARATION

I the undersigned, declare that this thesis is my original work, has never been presented in this or any other university. All sources of materials used for this thesis has been fully acknowledged.

Name: Solen Tezera, BSc

Signature:_______________________

Place: Addis Ababa University, Ethiopia.

Date of Submission: July, 2011

This thesis has been submitted for examination with my approval as a university advisor.

Name: Dr. Solomon Shiferaw (MD, MPH, Assistant Proffessor)

Signature:_______________________________

Date:_______________