Determinants of Undernutrition Among Adult People on Antiretroviral Therapy in Goba Hospital, Southeast Ethiopia: A Case Control Study

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Abstract

Background: Undernutrition significantly affects the effectiveness and adherence to antiretroviral therapy (ART), survival status and quality of life in people living with HIV. Prevalence of undernutrition among HIV infected people in Ethiopia ranges from 12.3-55.6%. Limited case-control studies conducted on this topic, and factors like food insecurity, dietary diversity, depression and substance use were not adequately addressed.

Objective: To identify determinants of undernutrition among adult people on antiretroviral therapy in Goba Hospital, Southeast Ethiopia.

Methods: A facility-based case-control study was conducted from March 16 to May 26, 2019. Consecutive sampling method was used to select 92 cases and 184 controls. Cases were undernourished (Body Mass Index (BMI) < 18.5 kg/m^2) adult people living with HIV attending antiretroviral therapy. Controls were well-nourished (BMI=18.5-24.9 kg/m^2) adult people living with HIV who are on antiretroviral therapy. A pretested structured questionnaire was used to collect data by face-to-face interviewer and checklist was used collect clinical data from medical records. Data were entered into Epi-data version 4.4 & then exported to SPSS version 23 for analysis. Bivariate logistic regression was computed and candidate variables with $p \leq 0.20$ were entered to multivariable logistic regression model. Absence of multicollinearity and interaction was checked using variance inflation factor and *Breslow-Day test* of homogeneity respectively. P-value <0.05 was considered statistically significant and Adjusted Odds Ratio (AOR) at 95% Confidence Interval (CI) was used to assess the strength of association.

Results: Factors independently associated with undernutrition were household food insecurity [AOR=3.24, 95% CI:(1.72–6.08)], having depression [AOR=2.07, 95% CI:(1.16–3.72)], current alcohol consumption [AOR=3.80, 95% CI:(1.71–8.43)] and non-adherence to antiretroviral therapy [AOR=2.61, 95% CI:(1.28–5.30)].

Conclusions: Household food insecurity, having depression, alcohol consumption and non-adherence to ART were independently associated with undernutrition in adult PLHIV. Integrating food insecurity interventions to HIV program at the hospital level is required. Strategies and program targeting PLHIV need to consider psychosocial problem like depression and alcohol consumption. Healthcare providers need to strengthen awareness creation activity on adherence and psychosocial factors that can affect nutritional status of adult PLHIV.

Keywords: Undernutrition, HIV, Antiretroviral therapy, Goba Hospital, Bale, Ethiopia

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List of Acronyms and Abbreviations

AIDS	Acquired Immune Deficiency Virus
ART	Antiretroviral Therapy
AUDIT	Alcohol Use Disorder Identification Test
BMI	Body Mass Index
CD4	Compact Disc
CI	Confidence Interval
DDS	Dietary Diversity Score
DHS	Demographic and Health Survey
EDHS	Ethiopian Demographic and Health Survey
ETB	Ethiopian Birr
FANTA	Food and Nutrition Technical Agency
FAO	Food and Agricultural Organization
FMOH	Federal Ministry of Health
HAART	Highly Active Anti-Retroviral Therapy
HFIAS	Household Food Insecurity Access Scale
HIV	Human Immune-deficiency Virus
IRB	Institutional Review Board
MOH	Ministry of Education
OIs	Opportunistic Infections
OR	Odds Ratio
PHQ	Patient Health Questionnaires
PLHIV	People Living With HIV
RUTF	Ready to Use Therapeutic Feeding
SPSS	Statistical Package for Social Science
UNAIDS	Joint United Nation Programme on HIV/AIDS
w/CC	with Continuity Correction
WHO	World Health Organization
ZHD	Zonal Health Department

Chapter One: Introduction

1.1. Background

Malnutrition occurs in various forms; including nutritional deficiencies, excess or imbalance of energy, protein, and other nutrients, which causes measurable adverse effects on the body (1). For Human Immunodeficiency Virus (HIV) infection; weight loss, micronutrient deficiencies, and deficiencies of other nutrients that affect the immune system are referred as undernutrition (2).

Acquired Immune Deficiency Syndrome (AIDS), is a disease caused by a retrovirus known as the HIV, which attacks and impairs the body's natural defense system against disease (3). HIV/AIDS has become one of the daunting challenges to socio-economic development in the world. The first cases were reported in 1981 and now nearly 36.9 million people are living with HIV and many had died of AIDS and associated morbidity since the start of the pandemic (4). The HIV/AIDS epidemic continues to have a devastating impact on health, nutrition, food security and overall socioeconomic development in sub-Saharan Africa (4).

Adequate nutrition is necessary in comprehensive care, support and treatment of people living with HIV (PLHIV). Undernutrition, especially through its negative effects on the immune system, further aggravates HIV infection by increasing the risk of opportunistic infections and increasing its energy and nutrient demand, thereby accelerating disease progression. People with HIV have increased risk of malnutrition because of reduced food intake, poor absorption of nutrients, and increased energy needs as a result of virus replication and opportunistic infections (OIs) and changes in the metabolism (2,5).

Nutrition play an important role in the comprehensive care and management of HIV (6). Furthermore, for people on Antiretroviral Therapy (ART), adequate nutrition is important to enhance the effectiveness of antiretroviral drugs, improve adherence to treatment and reduce the complications of opportunistic infections (2,6). Hence, nutritional interventions are essential besides antiretroviral treatment in adult PLHIV with undernutrition (2).

HIV-infected adult needs additional nutrient requirement. World Health Organization (WHO) recommends that people with HIV consume more energy to meet the increased nutritional need resulting from infection and metabolic changes caused by HIV. An HIV positive adult with no symptom (asymptomatic) require 10 percent more energy over the level recommended for the healthy non-HIV-positive adults. An HIV positive adult with symptom (symptomatic) require 20-30 percent more energy over the level recommended for the healthy non-HIV-positive adults (3,6).

Identifying determinant factors of undernutrition will provide valuable information to strengthen nutrition care and support for PLHIV by preventing and/or early detection and managing of risk factors. Furthermore, it will also helpful in improving treatment adherence and survival status of PLHIV.

1.2. Statement of the Problem

Worldwide, 795 million people are undernourished and approximately 462 million adults are underweight, and these mostly occur in low and middle income countries (7,8). Sub-Saharan Africa (SSA) in particular has the highest prevalence estimates of undernutrition in the world, with 23.2% of its population affected and greater than 33 million are living with HIV infection (7). According to a meta-analysis conducted in sub-Saharan Africa countries, the pooled prevalence of HIV related undernutrition was 10.3% (9). The region remains the highest burden of HIV, with nearly 4.1% adults living with HIV and accounting for nearly two-thirds of the PLHIV worldwide (10). Studies done in developing countries reported that, the prevalence of malnutrition among HIV infected adults were ranges from 19.4% in Tanzania to 43% in Brazil (11–14).

Studies in different parts of Ethiopia reported high prevalence of undernutrition among adult people living with HIV. The prevalence of undernutrition among adult PLHIV ranges from 12.3% in Dilla University Referral Hospital to 55.6% in Amhara region referral hospital (15–21). Ethiopia is one of the sub-Saharan countries most severely affected by the HIV. According to 2017 HIV Related Estimates and Projections for Ethiopia, prevalence of HIV among adults was 1.16% in 2017 and 1.15% in the year 2018. Similarly, the prevalence of HIV among adult in Oromia region was 0.79 and 0.78 in 2017 and 2018 respectively (22).

Malnutrition both contribute to and result from the progression of HIV. Malnutrition increases susceptibility to infection, morbidity and mortality through opportunistic infections. Furthermore, leads to immune impairment, worsens the effect of HIV and contributes to more rapid progression to AIDS (2,5). Malnutrition is one of the common finding which determine adherence to ART among HIV infected people (23,24). HIV affects nutritional status by increasing energy requirements, reducing food intake, and adversely affecting nutrient absorption and metabolism (2,5,7). Undernourished PLHIV are less likely to adhere to ART treatment because many of the antiretroviral drugs must be taken with food and poor treatment adherence is associated with worse disease outcomes (25). According to the 2016 Global Nutrition Report, the economic consequences of malnutrition represent losses of 11% of Gross Domestic Product (GDP) every year in Africa and Asia (26).

Socio-economic factors, dietary related factors (food insecurity, eating difficulty, poor dietary diversity), psychosocial related factors (substance use, depression) and, disease and treatment

related (opportunistic infections, adherence to ART) were possible risk factors for undernutrition in PLHIV (1,25).

The rapidly expanding access to ART is changing the global HIV epidemic in momentous ways and AIDS-related mortality rates have been declining rapidly. So far, the scaling up of ART averted an estimated 6.6 million AIDS-related deaths worldwide, predominantly in low- and middle-income countries and increases productivity and quality of life among PLHIV (27). However, the effectiveness of ART in achieving the intended goals can be affected by various factors. Nutritional status is one of the factors that significantly affect the effectiveness of ART, survival status and quality of life among people living with HIV (3,7,23,24).

Nutrition assessment, counselling and supports improves the quality of care and aims to decrease morbidity and mortality associated with HIV (3,25). The WHO recommends the integration of nutrition support as part of a comprehensive response to HIV/AIDS (3,6). Though many advances in the fight against HIV have been made in Ethiopia, sufficient efforts have not been put into promoting adequate nutrition for people living with HIV. Thus, Federal Ministry of Health of Ethiopia has launched the National Nutrition Program (NNP) in 2006 to address nutrition problems in a comprehensive manner by including nutrition and HIV/AIDS as part of its complete service delivery, and emphasizes the importance of linking the nutrition and HIV/AIDS program with other livelihood programs. There is also a guideline named 'National Guidelines for HIV/AIDS and Nutrition' aimed to provide a standardized nutrition care and support for PLHIV.

Despite the effort made by government and advancements in the treatment modality, undernutrition in PLHIV is still a public health problem (2,5), and significantly affects adherence to antiretroviral therapy and constitutes an important threat to the success of HIV programs in SSA (2,3,7,23,24). Identifying determinants of undernutrition will help to strengthen nutrition care and support for PLHIV which will improve survival status and their quality of life. Most of studies conducted on this topic in Ethiopia were used cross-sectional design (15–21). A few case-control studies (28–30) conducted on this topic were not adequately addressed nutritional factors like food insecurity, dietary diversity, and psychosocial factors like depression and substance use. Therefore, this study aimed to identify the determinants of undernutrition among adult people on antiretroviral therapy in Goba Hospital, Southeast Ethiopia.

1.3. Significance of the study

Identifying determinants of undernutrition will serve as an additional evidence to improve nutritional status of adult people attending antiretroviral therapy (ART), which will help to improve treatment adherence, support recovery and return to a productive life. Knowledge on determinants of undernutrition in adult PLHIV will be essential particularly for Goba Referral Hospital during designing strategies and planning nutritional interventions relevant to the context. The findings obtained from this study will also help as an input for Bale Zonal Health Department in planning nutritional program and interventions for adult people living with HIV.

Furthermore, the findings of this study will help managers at different levels and concerned partners during planning and implementation of program that target nutritional care and support for PLHIV.

Moreover, the results of this study will serve as an additional evidence for further studies.

Chapter Two: Literature Review

2.1. Overview

Nutritional status is one of the factors that significantly affect the effectiveness of ART, survival status and quality of life among people living with HIV (2,5). Nutritional problem may occur at any stage of the disease & can contribute to immune impairment, accelerate disease progression, increase the frequency & severity of opportunistic infections, & impede the success of ART medications (3). Evidence reported multiple determinants of undernutrition in people living with HIV. In this study, determinants of undernutrition are grouped into socio-demographic and economic factors, nutritional related factors, psychosocial related factors, and disease and treatment related factors.

2.2. Socio-demographic and economic factors

Various studies reported that age is significantly associated with undernutrition among adult PLHIV. According to cross-sectional study conducted at the reference hospital for infectious diseases in Salvador, Brazil in 2012, older age of above 36 years were found to be positively associate with undernutrition among PLHIV (11). On the other hand, the cross-sectional study conducted among HIV-positive adults enrolled at antiretroviral therapy clinics in Zimbabwe in 2013 revealed that, being older age group of 35-44 years and above 44 years were protective for undernutrition compared with age group of 15-24 years (32). A case-control study conducted among adult patients receiving antiretroviral therapy at Debre Markos referral hospital in 2016 reported that being older patients had slightly increased odds of developing undernutrition (29). In contrary, the studies conducted in Dembia district, Northwest Ethiopia in 2015 found that, PLHIV who are in age group of 18-29 were almost three times at higher risk of undernutrition compared with older age of 45 and above (33).

Epidemiological studies found that, sex is significantly associated with undernutrition among HIV infected adults. According to the cross-sectional study conducted in Dares-Salaam, Tanzania in 2014, PLHIV who are male were more likely to have undernutrition compared to female (13). Likewise, the study conducted among HIV-positive adults enrolled at ART clinics in Zimbabwe in 2013 reported also female PLHIV were found to be 59% less likely to have undernutrition compared to male (32). Again, the cross-sectional study conducted in Wolaita Sodo teaching and referral hospital, Ethiopia in 2015, found male PLHIV are more likely to have undernutrition

compared to the female possibly due to female might get committed to adhere to antiretroviral treatment, and/or to the counseling given and factors that could lead to undernutrition such as alcohol consumption, cigarette smoking, are not practiced by females as compared to males (19).

Regarding association between residence and undernutrition in PLHIV, studies reported inconsistent findings. The cross-sectional study conducted in 2013 among PLHIV in ART clinics in Zimbabwe found no significant association between residence are and undernutrition (32). A case-control study conducted among adults living with HIV in Shebel Berenta District, East Gojjam, Ethiopia in 2017 reported that being rural residence is protective for undernutrition (28). On the other hands, the cross-sectional study conducted in Butajira Hospital, Southern Ethiopia in 2014 revealed that, patients living in rural area were two times more likely to be malnourished as compared to those living in urban areas, that might be due to reduced awareness about nutrition, lower food access and diversity, and less accessible to water, and sanitation services in rural dwellers than people living in urban (21).

Marital status is one of independent predictors of undermatron in PLHIV. According to the cross-sectional study conducted in Porto, Portugal in 2010, being single/divorced/widowed were positively associated with undernutrition (35). Similarly, the cross-sectional study conducted in Amhara National Regional State Referral Hospitals, Ethiopia in 2014, reported that single and divorced PLHIV were two and three times more likely to have undernutrition compared to married (17). Again, the cross-sectional study done in Dembia district, Northwest Ethiopia in 2015 found, widowed women were at higher risk of having undernutrition compared to married women, which might be due to the emotion and grief encountered, lack of emotional support and higher risk of stress (33).

Studies reported that Educational status is significantly associated with undernutrition in PLHIV. The cross-sectional study conducted among PLHIV attending ART in Nepal in 2013 and Portugal in 2010 revealed that, illiterate people were more likely to be undernourished compared to literate (12,35). Similarly, the cross-sectional studies conducted in Jimma town in 2017 and Amhara Regional State Referral Hospitals in 2014 reported, PLHIV who have no formal education were more likely to be malnourished compared to who have formal education (16,17). Again, cross-sectional study done in Gondar University Referral Hospital, Northwest Ethiopia in 2016 found

that, PLHIV who have no formal education were two time at higher risk of having undernutrition compared to secondary and above educational level (36).

Occupational status is found to be significantly associated with undernutrition among adult PLHIV. According to systematic review conducted in eleven Sub-Saharan Africa countries in 2008, unemployed PLHIV were more likely to be undernourished compared with employed (9). Likewise, cross-sectional study conducted in Dilla University Referral Hospital in 2012 found that, higher risk of developing undernutrition among unemployed PLHIV, which is due to unemployment promotes poverty, which in turn limits the ability of individual to expend money for food consumption (18). Again, the cross-sectional study conducted in West Shewa zone, Central Ethiopia in 2016, found the risk of undernutrition among unemployed PLHIV were three times higher compared to employed peoples (20).

Socioeconomic status is significantly associated with undernutrition in PLHIV. According to cross-sectional study conducted at the reference hospital for infectious diseases in Salvador, Brazil in 2012, individual with monthly income of less than two dollars per day were two times higher risk of having undernutrition compared to income of greater than 10$ per day (11). A case-control study conducted among adults living with HIV in Shebel Berenta District, East Gojjam, Ethiopia in 2017 reported that HIV patients with monthly income less than 500 ETB were almost seven times more likely to have undernutrition compared to those earn above 1500 ETB (28). Similarly, the cross-sectional studies conducted in Jimma in 2017 and Arbaminch town in 2016 reported that, PLHIV who has monthly income of less than 1380 and 1000 Ethiopian Birr (ETB) were more likely to have undernutrition compared with those individual with monthly income of above 13,800 and 2000 ETB (37,38). A cross-sectional study conducted in Dilla, South Ethiopia in 2012, also reported that less likelihood of developing undernutrition among respondents in the moderate economic status compared with lower economic status (20). Studies conducted in health facilities found in Shebel Berenta District, East Gojjam reported less risk of developing undernutrition among HIV positive patient with 3 or less family size compared to those with more than 5 family size (28).

2.3. Nutritional related factors

Food insecurity was found to be positively association with undernutrition in PLHIV. Various cross-sectional studies conducted in the developing countries revealed that, food insecure household were increased odd of developing undernutrition compared to food secure (12,32,39). Similarly, the cross-sectional studies conducted in West Shewa in 2016 and Hosanna town of Ethiopia in 2014, reported, household food insecurity found to be strong risk factor for having undernutrition in PLHIV (20,40). Again, the cross-sectional studies conducted among adult patient living with HIV in East Hararghe zone in 2016 found that patient with severe food insecurity was almost twice at higher risk of developing undernutrition compared to food insecure households (15).

Adequate nutrition is vital for the health and survival of all individuals regardless of HIV status (41). Inadequate dietary diversified food intakes were positively associated with undernutrition among PLHIV. The cross-sectional study conducted in Nairobi-Kenya in 2016 shows, positive association between inadequate dietary diversity and undernutrition in PLHIV (41). Similarly, the cross-sectional study done in Uganda in 2010 revealed that, individual with high dietary diversified food intake (DDS of 4 and above) were 44% less likely to have undernutrition compared with low dietary diversity (39). Likewise, the study conducted in health facilities of Hosanna town in 2014, Southern Ethiopia, shows participants who had adequate diversified food were 56% less likely to be malnourished than who had inadequate diversified food (40). Again, the cross-sectional studies conducted in Jimma town in 2015 and Amhara Regional State Referral Hospitals in 2014, Ethiopia reported PLHIV who had low dietary diversity were more than three times more likely to be undernourished than those patients' with high dietary diversity (17,42).

Nutrition counseling is necessary to enhance individual's ability to consume and utilize the required nutrients. Interventional study conducted in South India, has shown macronutrient supplementation alone did not result in significantly increased weight gain without counseling (43). Likewise, according to review of nutritional interventions in Africa in 2014, Nutritional counseling was found to be significantly associated with nutritional status of PLHIV (44). Again, the cross-sectional study conducted in Silte zone, south Ethiopia in 2015 revealed that, HIV positive adults who didn't received dietary counseling were almost two times more likely to develop undernutrition than who didn't received dietary counseling (44).

Meal frequency is one of independent predictors of undernutrition in PLHIV. A cross-sectional study conducted in Tanzania in 2014 indicate that, PLHIV who had meal frequency of less than three per day were three times more likely to have undernutrition compare to those who had three or more meal frequency (13). Similarly, the cross-sectional studies conducted at Hosanna in 2014 and Silte town in 2015 shows, respondents with high meal frequency of three or more per day were 71% likely to be malnourished than who had low meal frequency (less than three) (40,45).

Eating difficulties like loss of appetite, nausea, vomiting, swallowing difficulty are found to be positively associated with undernutrition. According to study in Uganda in 2010, Reduction of food consumption due to loss of appetite, vomiting and nausea due to the side effects of ART drugs, and swallowing difficulty due to oral thrush or ulcer lead to reduced energy intake and may also be the main reasons for the loss of weight among PLHIV (46). Similarly, the multicenter cross-sectional study done in Democratic Republic of Congo in 2016 indicate, PLHIV who had loss of appetite were three times more likely to be malnourished (14). Similarly, A case-control study conducted among adult patients receiving antiretroviral therapy at Debre Markos referral hospital in 2016 reported that, PLHIV who had eating problem was more than three folds at higher risk of developing undernutrition (29). Likewise, the cross-sectional study conducted at Butajira Hospital in 2014, Ethiopia also found that individuals who had eating difficulty were at higher risk of having undernutrition (21).

2.4. Psychosocial related factors

Living condition of HIV infected people was significantly associated with undernutrition. Residing with family members were found to be a protective effect against under-nutrition. According to cross-sectional study conducted in Nepal in 2013, those participants who resided alone were more than four times more likely to be undernourished than those living with their family members (12).

Depression was significantly associated with undernutrition among people living with HIV enrolled on ART. Depression accelerates disease progression among people living with HIV, which can affect their appetite, food security status and eventually results in undernutrition in particular and lower quality of life in general (47). It may be also due to the association of depression and substance use such as alcohol, khat, cigarette and smoking (47). A cross-sectional study done in Congo in 2016 revealed, positive association between depression and loss of appetite (14). Similarly, A case control study conducted in the central zone of Tigray, Northern Ethiopia in

2014 indicate, depressed PLHIV on ART was almost three-folds higher risk of developing undernutrition compared to those individual without depression (30). Again, the cross-sectional study conducted at Fiche Zonal Hospital of Ethiopia in 2012 indicate positive association between depression and food insecurity (48).

Disclosure status of HIV in PLHIV were found to be protective for undernutrition. According to the cross-sectional study conducted in rural Uganda in 2011, individual who had disclosed their HIV status were 13% less likely to have food insecurity compared to those who didn't disclosed their HIV status (49).

Substance use one of independent predictors of undernutrition in PLHIV. Various studies revealed that substance use have negative effect on dietary intake due to reduced appetite, drug adherence and leading to poor nutritional outcomes (14,30,50). According to study conducted in India in 2014, the risk of undernutrition was higher among PLHIV who ever alcohol consumer (51). Similarly, the case control study conducted in Tigray in 2014 and Jimma in 2015, indicates that, PLHIV who are ever and current consumers (at least once per week) were more likely to develop undernutrition compared to the non-alcohol consumers (30,42). A case control study conducted in the Central zone of Tigray and cross-sectional study in Hossana town in 2016 and in Arbaminch area, southern Ethiopia in 2017 also revealed that, PLHIV who had smoke cigarette were more than six times risk of having undermatron (30,52,53). On the other hand, khat chewing also found to be independent predictors of undernutrition. A cross-sectional study conducted in East Harerghe zone in 2016, Ethiopia reported negative association between current khat chewing and undernutrition among PLHIV (15).

2.5. Disease and treatment related factors

It is known that as the patient moves from the lowest to the highest clinical stage of the disease, it is expected that they will be more vulnerable to different opportunistic infection which will have a direct and indirect effect on the person nutritional status. WHO clinical stage is one of the independent predictors of undernutrition. Several studies conducted in the developing countries reported, patients who were in WHO clinical stage III or IV were more likely to develop undernutrition than a patient in stage I or II (12,32,54). A case-control study conducted among adults living with HIV in Shebel Berenta District, East Gojjam, Ethiopia in 2017 reported that HIV patients in WHO clinical stage I and stage II was found to be less risk of developing undernutrition

compared to those in stage III (28). Likewise, various cross-sectional studies conducted in different part of Ethiopia indicates, advanced WHO clinical stage (III/IV) were positively associated with undernutrition in PLHIV (20,36,40,42).

CD4 count of the PLHIV was found to be a significant factor associated with undernutrition. According to the cross-sectional studies conducted in Nepal in 2013 and India in 2014, PLHIV with CD4 counts of greater than 350 cells/μl were 74% and 11% less likely to develop undernutrition respectively (12,54). Likewise, a case-control study conducted among adults living with HIV in Shebel Berenta District health facilities, East Gojjam reported that patient with CD4 count below 500 cells/µl were at higher risk of developing undernutrition compared to patient with CD4 count above 500 cells/µl (28). Similarly, the cross-sectional studies conducted in West Shewa in 2016 and Jimma in 2014, Ethiopia indicates patients with CD4 count below 350 cells/µl and 200 cells/µl had two and six folds chance of being malnourished compared to those with CD4 count >350 cells/µl and >200cells/µl respectively (20,55).

Non-adherence to ART among PLHIV were positively associated with undernutrition. Finding of case-control study conducted in Tigray in 2014 indicate, people living with HIV who were non-adherent to ART was about seven-fold at higher risk of developing undernutrition compared to adherents (30). In addition, A case-control study conducted among adult patients receiving antiretroviral therapy at Debre Markos referral hospital in 2016 found that fair or poor adherence to ART is positively associated with undernutrition (29).

Several studies reported that opportunistic infections were strong predictors of undernutrition in PLHIV. A cross-sectional studies conducted Brazil in 2009 and China in 2010 revealed that, PLHIV who had opportunistic infections were at higher risk of developing undernutrition (56,57). Again, study conducted in Nepal in 2013 indicates, HIV patient who are co-infected with tuberculosis were three-fold higher risk of developing undernutrition (12). Similarly, the retrospective cohort study conducted in Denpasar City of India in 2015 and cross-sectional study done in Brazil in 2012 found that, HIV patients who had chronic diarrhea were more likely to have undernutrition (11,54). A case-control study conducted among adult patients receiving antiretroviral therapy at Debre Markos referral hospital in 2016 reported the presence of opportunistic infections significantly associated with undernutrition (29). Similarly, several

studies conducted in Ethiopia found positive association between diarrhea and undernutrition in PLHIV (15,36,40).

Duration of ART treatment was significantly associated with nutritional status of HIV/AIDS. According to cross-sectional study the study conducted in East Harerghe zone in 2016 and Arba-minch area, Southern Ethiopia in 2017, HIV patients who were on ART for less than one year were at higher risk of developing undernutrition compared to who were on ART for more than one year duration (15,53). Again, the cross-sectional study done in West Shewa in 2016, Ethiopia revealed that, PLHIV who were on ART for less than 44 months duration were almost two folds at higher risk of developing undernutrition compared to duration of 44 months and above (20).

Anemia is one of independent predictor of undernutrition in PLHIV. Studies reported that, association of anemia with malnutrition might be due to alterations in bone marrow and spleen erythropoiesis, diminution in reticulocyte as a result of protein-energy malnutrition. According to study conducted in Eldoret, Kenya, HIV positive patient who had adequate iron intake were 88.9% lower chances of developing undernutrition (58). Similarly, A case-control study conducted among adult patients receiving antiretroviral therapy at Debre Markos referral hospital in 2016 reported that, patients who had anemia were almost two times increased odd of developing undernutrition (29). Also, the studies conducted in Butajira in 2014 and Humera in 2012 reported, PLHIV who had anemia were almost two times higher risk of developing undernutrition compared to who are not anemic (21,59). Again, study conducted in Dembia, Southern Ethiopia in 2015 reported that PLHIV who had anemia were three folds more likely to develop undernutrition compared to those without anemia (30).

In summary, various literature showed that undernutrition in people living with HIV is a public health concern in sub Saharan Africa which is significantly affect the effectiveness of antiretroviral therapy and survival status of adults living with HIV. Majority of conducted studies used cross sectional design. only three case-control studies conducted in Ethiopia as far as searched literature and all are conducted in the Northern part of Ethiopia (28–30), and the nutritional determinants like food insecurity, dietary diversity which determine nutritional status not adequately addressed. In addition, the psychosocial determinants like depression, substance use problem were not included comprehensively with other factors.

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2.6. Conceptual Framework

Determinants of undernutrition was classified into four groups; socio-demographic and economic factors, nutritional related factors, psychosocial related factors, and disease and treatment related factors (figure 1).

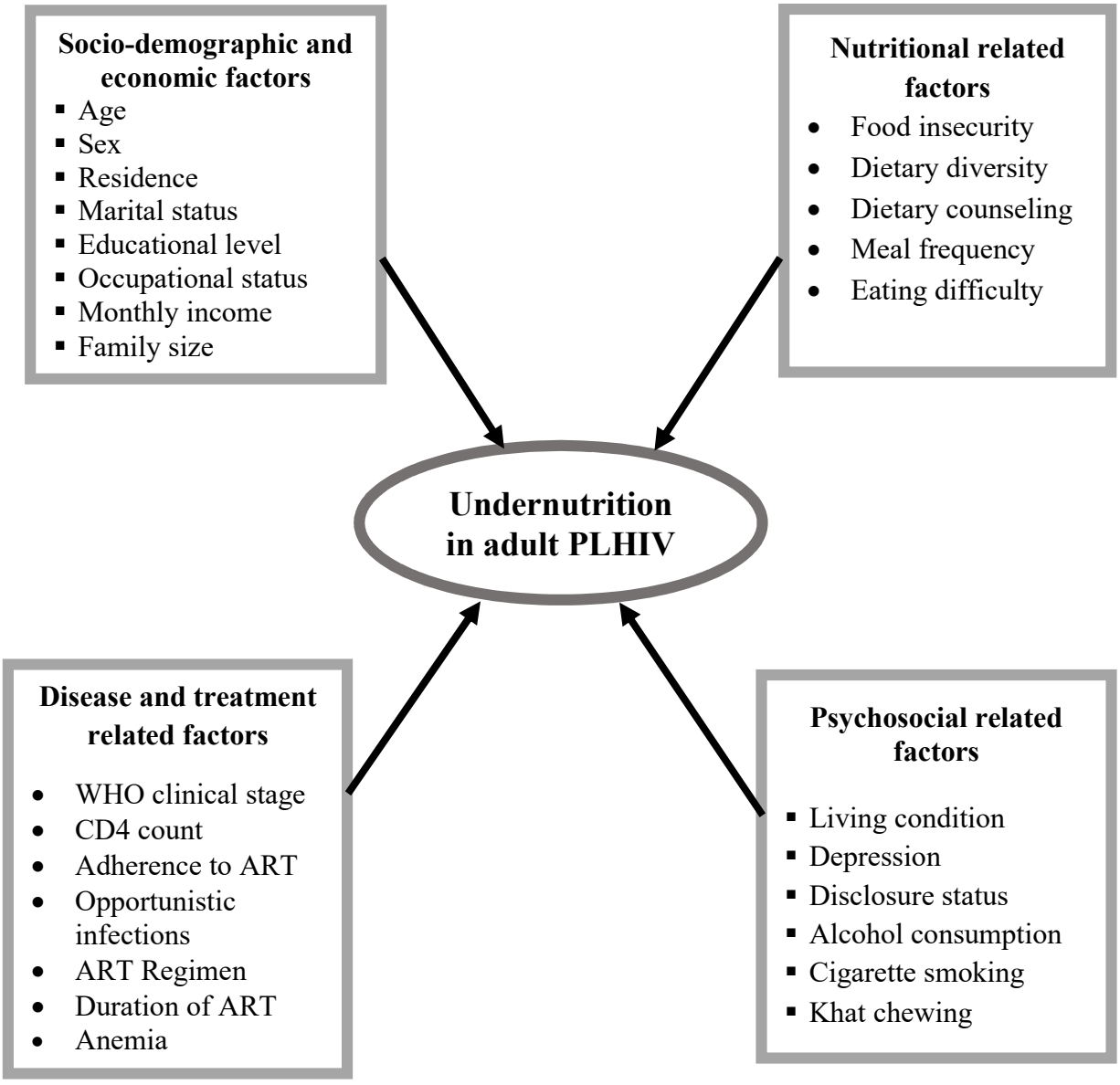

Figure 1: Conceptual framework of determinants of undernutrition among adult people on antiretroviral therapy at Goba Hospital, Bale, Ethiopia, March 16 to May 26, 2019.

Adapted from different literatures (12,15-21,24-25,28–30,33–42,45,53-59)

Chapter Three: Objectives

3.1. Objective

To identify the determinants of undernutrition among adult people on antiretroviral therapy in Goba Hospital, Bale zone, Southeast Ethiopia, March 16 to May 26, 2019.

Chapter Four: Methods and Materials

4.1. Study area and period

The study was conducted in Meda-Welabu University Goba Referral Hospital which is found in Goba town, Bale zone, Southeast Ethiopia. It is located at 445 km from the capital city Addis Ababa, Ethiopia. Goba Referral Hospital is the one of the five hospitals in Bale zone and serves as a teaching and referral hospital for Meda-Welabu University medical and health sciences students. The hospital serves a population of about 1.5 million from Bale and neighboring zones. The ART clinic of the hospital was established in 2005/6 after the Ethiopian government launched free ART service and currently providing basic HIV care and treatment for 2127 individuals, of which 2076 are adults of 15 years and above. The study was conducted from March 16 to May 26, 2019.

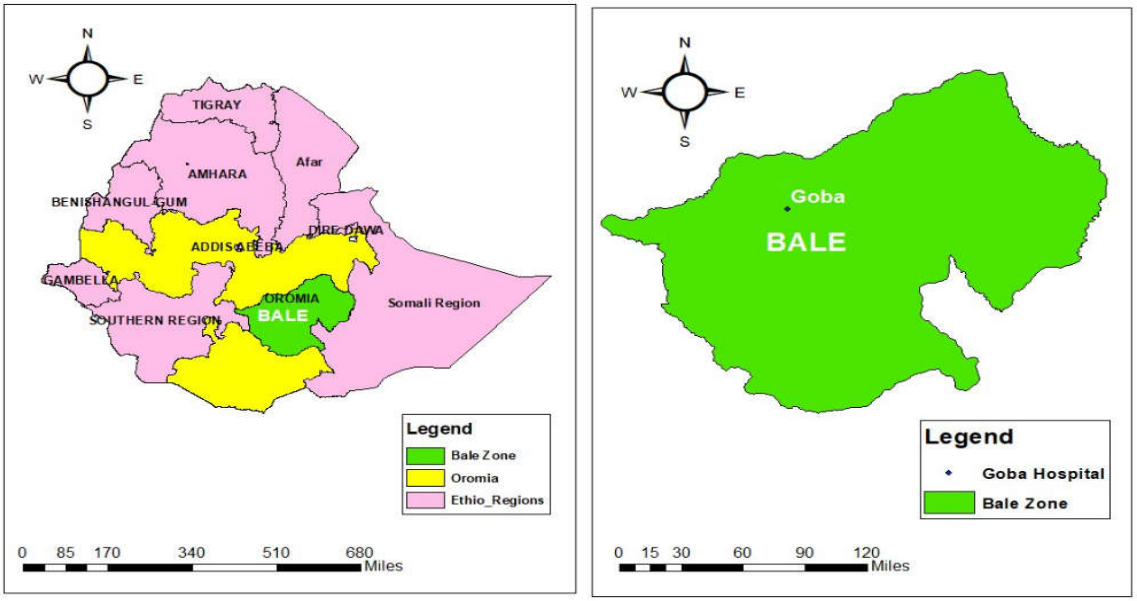

Figure 2. Map showing location of Goba Hospital, Bale zone, Southeast Ethiopia.

4.2. Study design

Facility based case-control study was conducted.

4.3. Population

4.3.1. Source population

All adult (≥18 years old) people living with HIV who are attending antiretroviral therapy at ART clinic of Goba Referral Hospital.

4.3.2. Study population

Adults who fulfilled the inclusion criteria and attending antiretroviral therapy at ART clinic of Goba Referral Hospital during data collection period.

Cases: Undernourished (Body Mass Index, BMI < 18.5kg/m^2) adult people living with HIV who were enrolled on antiretroviral therapy.

Controls: Well-nourished (BMI = 18.5–24.9 kg/m^2) adult people living with HIV who were enrolled on antiretroviral therapy.

4.4. Eligibility criteria

4.4.1. Inclusion criteria

Adult people living with HIV who were on ART in Goba Referral Hospital at least for one month.

4.4.2. Exclusion criteria

Critically sick patients who cannot able to respond during data collection and pregnant women were excluded from the study since weight gain during pregnancy introduces measurement bias (5,25).

4.5. Sample size determination and Sampling procedures

4.5.1. Sample size determination

The sample size was computed by Epi-Info version 7.2 software (*fleiss w/CC*) using formula for unmatched case control study. The calculation was made for several predictors of undernutrition identified from previous studies (28-30), and the larger sample size was considered as the final sample size. The computation was made using assumption of 95% confidence level, 80% power, case to control ratio of 1:2 (Table 1). The largest sample size was obtained using the proportion of well-nourished PLHIV (controls) who had depression (32.9%) and Adjusted Odds Ratio (AOR) of 2.14. After adding 10% for non-response, an overall sample size of 276 (92 cases and 184 controls) was obtained.

Table 1. Sample size determination for the study of determinants of undernutrition among adult people on antiretroviral therapy at Goba Hospital, Bale, Ethiopia, March 16 to May 26, 2019.

SN	Independent risk factors	% of exposure in control	AOR	No. Cases	No. Controls	Total	Ref.
1	Non-adherence to ART	4.7	6.8	39	78	129	(30)
2	Eating problem	26	3.4	39	78	130	(29)
3	Depression (yes)	32.9	2.14	84	168	276	(30)
4	WHO clinical stage II	52	0.41	70	140	231	(28)
5	Ever cigarette smoking after starting ART	4.7	7.6	34	68	112	(30)
6	Rural residence	70	0.376	58	116	191	(28)
7	Ever use of alcohol after starting ART	13.5	4.7	32	64	106	(30)

4.5.2. Sampling procedures

Consecutive sampling method was employed until the required sample size of the case and the controls achieved. Cases were selected consecutively as they occur, and then two subsequent controls visited ART clinic after the case were included.

4.6. Study variables

4.6.1. Dependent variable

Undernutrition among adult people on ART (present/absent).

4.6.2. Independent variables:

Socio-demographic and economic factors: Age, sex, residence, marital status, educational level, occupational status, average monthly income and family size.

Nutritional related factors: Household food insecurity, dietary diversity, dietary counseling, meal frequency, and eating difficulty.

Psychosocial related factors: Living condition, depression, disclosure status, alcohol consumption, cigarette smoking and khat chewing.

Disease and treatment related factors: WHO clinical stage, CD4 cell count, adherence to ART, opportunistic infections (OIs), ART regimen, duration of ART and hemoglobin level.

4.7. Data collection procedures

Structured questionnaire adapted from different literatures was used to collect data on the socio-demographic characteristics, dietary related factors such as; dietary counseling, meal frequency, eating difficulty and psychosocial factors; such as living condition and disclosure status through face-to-face interview. Checklist was used to collect clinical data such as; WHO clinical stage, CD4 cell count, opportunistic infections, duration of ART, hemoglobin level, ART regimen and ART adherence status from the patient's ART follow-up medical record. Data were collected by three trained health professionals (two BSc. nurses from TB clinic and one diploma nurse from HMIS section) under the supervision of two senior clinical nurses from ART clinic. Prior to data collection, the study subjects were identified as cases and controls based on anthropometric measurements by two senior clinical nurses from ART clinic, then sent to private rooms for interview after received their routine service. The data collectors were blinded to the nutritional status of the respondent and not participated in identifying the study subject as case and control. Depression was assessed using Patient Health Questionnaire (PHQ-9) score for depression (60,61).

Measurements

Anthropometries was measured following standardized techniques (5). Weight of the study participant was measured to the nearest 0.1kg using standing beam balance. Each participant was asked to remove heavy clothes and shoes. The scale was calibrated to zero before each measurement. Height of the participant was measured using portable Stadiometer vertical height measuring scale. During height measurement, the participants were asked to remove shoes, pins and braids from the hair that could affect the measurement. Participant will stand upright in the middle of board. Height was measured with the head of participant at the Frankfurt plane, looking straight in horizontal plain, knees straight and the occiput, heels, buttocks, and the shoulders blades touching the measuring board. The measurement was recorded to the nearest 0.5cm. Body mass index was calculated as weight in kilograms divided by the square of height in meters (kg/m^2).

The household food insecurity status of participant was assessed using a short version of the Household Food Insecurity Access Scale (HFIAS). The tool is developed by the Food and Nutrition Technical Assistance (FANTA) project and adapted to individual level (62,63). Each question is within a recall period of four weeks (30 days). There are nine occurrence questions that ask whether a specific condition associated with the experience of food insecurity ever occurred

during the previous four weeks. The respondents were first asked an occurrence question and if the respondent answer is “yes” to an occurrence question, a frequency-of-occurrence were asked to determine whether the condition happened rarely (once or twice), sometimes (three to ten times) or often (more than ten times). The highest score for HFIAS is 27. Food insecurity is considered when the individuals HFIAS score is above 1 (63).

Tool for measuring the dietary diversity was adopted from the Food and Agricultural Organization (FAO) Guidelines for measuring individual dietary diversity (64,65). Dietary Diversity Score (DDS) was determined by asking the respondents to list all the food items consumed in the previous 24 hours preceding the assessment date, starting with the first food consumed the previous morning. If a mixed dish was eaten, participants were asked about all the ingredients of the dish. Once the recall is finished, participant was probed for food groups to ask for food that was not mentioned. The reported food items were categorized into 9 food groups: Starchy staples, Dark green leafy vegetables, Other vitamin A rich fruits and vegetables, Other fruits and vegetables, Organ meat, Meat and fish, Eggs, Legumes, nuts and seeds, and Milk and milk products. The DDS was calculated as the sum of the food groups consumed over 24 hours and the score ranged from 1-9 (65). Locally available food items were identified from agricultural research center experts of the study area and included according to the food group.

Cigarette smoking, khat chewing and alcohol consumption were assessed using structured questionnaire adopted from STEPS survey on NCDs risk factors in Ethiopia and WHO STEPwise approach to chronic disease risk factor surveillance. Alcohol use problem was considered as consuming >30g of pure alcohol (>3 standard drinks) on average per day for men, and >20g for women (66,67). Locally, different receptacles, including ‘melekiya’, ‘borde’ and ‘berele’ are used when drinking ‘Areke’, ‘Tella’ and ‘Tej’ respectively. Local alcohol drinks, for example, ‘Tella’ has about 4%, ‘Tej’ has about 10%’ and ‘Areke’ has 40-45%, bottle of regular Beer (330 ml) has 4.5% and glass of Wine (120ml) has 12% alcohol content (67-69). All alcoholic beverages was converted into a standard drink, for example, one ‘melekiya’ of ‘Areke’ (30ml) contain 40-45% volume by volume of alcohol, to calculate the content of alcohol in a drink, 30ml*42.5%*0.79 ≈ 10.1g of alcohol in one ‘melekiya’ of ‘Areke’ (68).

4.8. Operational definitions

Undernutrition: - The body mass index less than 18.5 kg/m^2.

Dietary diversity: - Dietary diversity is a qualitative measure of food consumption that reflects access to a variety of foods and is also a proxy for nutrient adequacy of the diet of individuals. In the current study, a DDS of 4 or above is considered as adequate dietary diversity and a DDS of less than 4 is inadequate dietary diversity (64,65).

Food security: - Is defined as a state in which "all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life" Food insecurity is considered when the individual HFIAS score is >1 (63).

Meal frequency: - The number of reported daily eating occasions by individual within 24-hour.

Eating difficulty: - Defined as if a person experienced one of the following conditions: loss of appetite, nausea, vomiting or swallowing difficulty in the past six months.

Depression: – Individual is considered to have depression if PHQ-9 score is above 4. Based on Scores, the patient was classified as no depression (0-4), Mild depression (5-9), Moderate depression (10-14), Moderately severe depression (15-19), Severe depression (20-27) (61).

Alcohol consumption: - Individual is considered as 'current alcohol drinker' if S/he consume more than 21 standard drinks/week for men and more than 14 standard drinks /week for women in the past 30 days. 'Alcohol consumption in the past 12 months' is defined as, if S/he consume more than 21 standard drinks/week for men and more than 14 standard drinks /week for women in the past 12 months (66).

One standard drink of alcohol: - 'Tella' (1 glass 'borde' or 'cheka' or 'korefe') or 'Tej '(1/2 'Berele') or 'Areke'(1 'melkiya') or regular Beer (330 ml beer or 1 bottle) or Draft (1 Single), or Spirits (30 ml of Whisky or Gin or Uzo or Vodka) or 1 glass of wine (120ml) which is generally defined as net alcohol content of a standard drink is approximately 10g of ethanol (67,68,70).

Cigarette Smoking: – Individual is considered 'current cigarette smoker,' if S/he had smoked minimum of one stick of cigarette (manufactured type like Nyala, Rothman, etc.) per week within

the last 30 days preceding the study and 'Ever cigarette smoking after starting ART' is defined as if S/he had smoked minimum of one stick of cigarette per week since starting ART.

Khat chewer: - Individual is considered as 'current khat chewer,' if he/she had chewed at least one bundle of khat per week within the last 30 days and 'Ever chat chewer after starting ART' is defined if S/he had chewed at least one bundle of khat per week since starting ART.

ART adherence status: - The adherence to ART was assessed using the number of missed doses for the last one month. Adherence status was classified as 'Good' if a person took ≥95% (missed ≤2 dose) of prescribed drug, 'Fair' if adherence is 85-94% (missed 3-5 doses) and 'poor' if a person took below 85% (missed ≥6 doses) of prescribed drug for one month (71). Adherent to ART was considered if a person took ≥95% (missed ≤2 dose) of prescribed drug for one month.

Adjusted hemoglobin level: - The adjustment was made for altitude and smoking. The adjustment was subtracted from each individual's observed hemoglobin level to calculate the adjusted hemoglobin. The altitude of Goba town is 2540 meter above sea level which was adjusted by subtracting 1.3 g/dl from the observed hemoglobin and 0.03g/dl for smokers. Anemia is defined as hemoglobin level of <12.0 gm/dl for female and <13.0gm/dl for male (72).

4.9. Data quality management

To ensure the quality of data the questionnaire which initially prepared in English was translated to Afan Oromo and Amharic local language, and then back translated to English to check for consistency by two different language experts. A two days training was given to the data collectors and supervisors by principal investigator on the objective of the study, the questionnaire content, method of data collection, anthropometric measurement and data recording. The questionnaire was pre-tested on 5% of the sample size (16 persons) at Bale Robe Hospital prior to the actual data collection. Accordingly, based on the feedback obtained from the pre-test, questionnaire was revised. The scale was calibrated to zero every 5 measurement of weight. The study subject was identified as cases and controls by senior nurses from ART clinic. The data collectors were not participated in identifying the study subject as case and control to minimize interviewer bias, and they were selected from outside of ART clinic to minimize social desirability bias. The data were strictly checked for completeness, accuracy, clarity and consistency by supervisors on daily bases. Furthermore, the data were checked for completeness, coded and carefully entered into computer using Epi-data, and data cleaning was done before analysis.

4.10. Data analysis procedures

Data were checked for completeness and consistencies, and then coded and entered using Epi-data version 4.4, and then exported to SPSS version 23 for analysis. The entered data were cleaned, edited, recoded and computed before analysis. Normal distribution of continuous variables was checked statistically using the *Kolmogorov–Smirnov* test and graphically using histogram. Descriptive statistics was computed for outcome and all explanatory variables. The p-value of Kolmogorov–Smirnov test for continuous variables such as: age, income, family and sum of DDS was below 0.05 (not normally distributed). Accordingly, the characteristics of study participants were described in terms of median and Interquartile Range (IQR) for continuous data, and all categorical variables were cross-tabulated with outcome variable, and described by their frequencies and proportion for cases and controls groups. The reliability (internal consistency) of items of the scale used in this study (HFIAS, Dietary diversity score and PHQ-9 score of depression) were assessed using Cronbach's alpha.

Bivariate logistic regression was computed between all explanatory variables (one-by-one) and outcome variable to identify candidate variables for the final model. The absence of multicollinearity and interaction between explanatory variables was checked using variance inflation factor (VIF) and *Breslow-Day* test of homogeneity. Accordingly, the VIF of variables included in the final model were between 1.017-1.043. All explanatory variables that were significantly associated with the outcome variable in the bivariate logistic regression at $p \leq 0.20$ were entered into multivariable logistic regression model using backward stepwise likelihood ratio method to identify factors independently associated with undernutrition in adult PLHIV. The model adequacy was checked using *Hosmer and Lemeshow* goodness-of-fit test (p=0.607). Adjusted odds ratios (AORs) with their corresponding confidence intervals (CIs) were used to assess the strength of associations between the outcome and explanatory variables at p-value <0.05.

4.11. Ethical consideration

Ethical clearance was obtained from Institutional Review Board (IRB) of Institute of Health, Jimma University. Official letter of cooperation was obtained from Bale Zonal Health Department (ZHD) and given to Goba Referral Hospital. Written informed consent was obtained from each participant after the purpose of the study was explained. Participants were told they had full right

to participate and the data obtained from them would be kept confidential using codes instead of any personal identifiers.

4.12. Dissemination plan

This study will be presented and submitted to Department of Epidemiology, Faculty of Public Health, Institute of Health, Jimma University. In addition, it will also be shared to Goba Referral Hospital and Bale ZHD. This study was presented on the 6th National Scientific Conference organized by Arsi University from December 20-21, 2019 at Asella, Ethiopia. The manuscript of this study was prepared and will be sent to peer reviewed scientific journal after the final defense. Efforts will also be made to present at other scientific conferences.

Chapter Five: Results

5.1.1. Socio-demographic and economic characteristics of the respondent

A total of 89 cases and 175 controls participated in the study, making the response rate of 96% among cases and 95% among controls. The reason for non-response was refusal to participate. Of the total participants included in this study, 58 (65.2%) of cases and 95 (54.3%) of controls were females. The median age (IQR) was 38 years (30-44.5 years) for cases and 35 years (30-45 years) for controls. Near to two-thirds of cases, 57 (64%) and more than two-thirds controls, 122 (69.7%) were urban dwellers. One-third of cases 30 (33.7%) and more than one-fifth, 37 (21.1%) of controls had no formal education. More than half of cases, 51 (57.3%) and 108 (61.7%) of controls were married. Near to one-third of cases, 28 (31.5) and near to one-fourth of controls, 42 (24%) were housewives. The median (IQR) of monthly income for cases and controls was 1000 ETB (725-1500 ETB) and 1200 ETB (800-1600 ETB) respectively (Table 2).

Table 2. Socio-demographic and economic characteristics of adult people on antiretroviral therapy at Goba Hospital, Bale, Southeast Ethiopia, March 16 to May 26, 2019.

Characteristics	Category	Cases (89) No. (%)	Controls (175) No. (%)
Age group	18-24	6 (6.7)	9 (5.1)
	25-34	24 (27.0)	68 (38.9)
	35-44	37 (41.6)	53 (30.3)
	≥45	22 (24.7)	45 (25.7)
Sex	Female	58 (65.2)	95 (54.3)
	Male	31 (34.8)	80 (45.7)
Residence	Urban	57 (64.0)	122 (69.7)
	Rural	32 (36.0)	53 (30.3)
Marital status	Married	51 (57.3)	108 (61.7)
	Divorced/separated	13 (14.6)	21 (12.0)
	Widowed	13 (14.6)	20 (11.4)
	Single	12 (13.5)	26 (14.9)
Educational status	Not able to read & write	20 (22.5)	26 (14.9)
	Able to read & write only	10 (11.2)	11 (6.3)
	Primary	39 (43.8)	79 (45.1)
	Secondary	15 (16.9)	25 (25.7)
	Collage and above	5 (5.6)	14 (8.0)
Occupation	Housewife	28 (31.5)	42 (24)

	Farmer	17 (19.1)	33 (18.9)
	Daily laborer	15 (16.9)	34 (19.1)
	Merchant	14 (15.7)	30 (17.1)
	Jobless	9 (10.1)	22 (12.6)
	Gov't employee	6 (6.7)	14 (8)
Average monthly income (ETB)	≤ 1000	50 (56.2)	75 (42.9)
	1001-2000	24 (27.0)	68 (38.9)
	>2000	15 (16.9)	32 (18.3)
Family size	≤ 3	52 (58.4)	115 (65.7)
	>3	37 (41.6)	60 (34.3)

ETB: Ethiopian birr

5.1.2. Nutrition-related factors

More than one-third of cases, 36 (40.4%) and 28 (16%) of controls were living in households with food insecurity. The median (IQR) of individual dietary diversity score was 4.0 (3.0-5.0). Near to half of the cases, 42 (47.2%) and 63 (36%) of controls had inadequate dietary diversity. The Cronbach's Alpha values for the scale used for household food insecurity and dietary diversity was 0.907 and 0.515 respectively. The great majority of cases, 78 (87.6%) and 159 (90.9%) of controls had meal frequency of at least 3 times within 24 hours (Table 4).

5.1.3. Psychosocial factors

Majority of the cases, 70 (78.7%) and 128 (73.1%) of controls were living with their family, while 14 (15.7%) of cases and 34 (19.4%) of controls were living alone. Nearly half of cases, 42 (47.2%) and 45 (25.7%) had depression. The Cronbach's Alpha of PHQ-9 score of depression was 0.866. Majority of the cases, 69 (67.4%) and 111 (63.4%) of controls were disclosed their HIV status to others (sexual partner or family member). One-fourth of the cases, 22 (24.7%) and 14 (8%) of controls were consume alcohol currently. Moreover, 23 (25.8%) of cases and 19 (10.9%) of controls had history of alcohol consumption in the last 12 months (Table 5).

5.1.4. Disease and treatment related factors

The CD4 cell count of 49 (55%) of cases and 79 (45.1%) of controls were between 200-500 cell/µl. Near to two-third of cases, 57 (64%) and more than half of controls, 97 (55.4%) were received ART for more than 3 years. More than one-fourth of cases, 25 (28.1%) and 22 (12.6%) of controls were non-adherent to ART. Twenty-seven (30.3%) of cases and 28 (16%) of controls had experienced opportunistic infections in the last 6 months. Of these, 11 (12.4%) of cases and 8

(4.6%) of controls had tuberculosis in the last 6 months. More than one-third of cases, 33 (37.1%) and 47 (26.9%) of controls had anemia (Table 6).

5.2. Bivariate analysis

5.2.1. Socio-demographic and economic characteristics

Bivariate logistic regression was employed for each variable to select candidate variables for multivariable logistic regression. From socio-demographic and economic variables, sex and educational level were significant at $p \leq 0.02$ and selected as candidate for multivariable logistic regression (Table 3).

Table 3: Bivariate logistic regression of socio-demographic and economic factors among adult people on antiretroviral therapy at Goba Hospital, Bale zone, Southeast Ethiopia, March 16 to May 26, 2019.

Characteristics	Cases No. (%)	Controls No. (%)	COR (95% CI)	P-value
Age group				
18-24	6 (6.7)	9 (5.1)	1.36 (0.43-4.32)	0.598
25-34	24 (27)	68 (38.9)	0.72 (0.36-1.44)	0.355
35-44	37 (41.6)	53 (30.3)	1.43 (0.75-2.76)	0.290
≥45	22 (24.7)	45 (25.7)	1	
Sex				
Female	58(65.2)	95(54.3)	1	
Male	31(34.8)	80(45.7)	0.64 (0.37-1.10)	0.091*
Residence				
Urban	57 (64)	122 (69.7)	1	
Rural	32 (36)	53 (30.3)	1.29 (0.75-2.22)	0.352
Educational status				
Not able to read & write	20 (22.5)	26 (14.9)	1	
Able to read & write only	10 (11.2)	11 (6.3)	1.18 (0.42-3.33)	0.752
Primary	39 (43.8)	79 (45.1)	0.64 (0.32-1.29)	0.213
Secondary	15 (16.9)	25 (25.7)	0.43 ()0.19-0.99)	0.047*
Collage and above	5 (5.6)	14 (8.0)	0.46 (0.14-1.51)	0.201

Occupation				
Housewife	28 (31.5)	42 (24)	1	
Farmer	17 (19.1)	33 (18.9)	0.77 (0.36-1.65)	0.504
Daily laborer	15 (16.9)	34 (19.1)	0.66 (0.31-1.43)	0.295
Merchant	14 (15.7)	30 (17.1)	0.70 (0.32-1.55)	0.379
Jobless	9 (10.1)	22 (12.6)	0.61(0.25-1.53)	0.293
Gov't employee	6 (6.7)	14 (8)	0.64 (0.22-1.87)	0.418
Average monthly income (ETB)				
≤ 1000	50 (56.2)	75 (42.9)	1.42 (0.69-2.89)	0.331
1001-2000	24 (27)	68 (38.9)	0.75 (0.35-1.63)	0.470
>2000	15 (16.9)	32 (18.3)	1	
Family size				
≤ 3	52 (58.4)	115 (65.7)	1	
>3	37 (41.6)	60 (34.3)	1.36 (0.81-2.30)	0.246

*, *p<0.20, **p<0.05, ETB: Ethiopian birr, COR: Crude odds ratio*

5.2.2. Nutrition-related factors

Among nutrition related factors, household food insecurity was associated with undernutrition among adult PLHIV in bivariate logistic regression at p-value less than 0.05. Moreover, dietary diversity, dietary counselling and eating difficulty were other variables significantly associated with undernutrition in PLHIV in bivariate analysis at $p \leq 0.02$ (Table 4).

Table 4: Bivariate logistic regression of nutrition-related characteristics among adult people on antiretroviral therapy at Goba Hospital, Bale zone, Southeast Ethiopia, March 16 to May 26, 2019.

Characteristics	Cases No. (%)	Controls No. (%)	COR (95% CI)	P-value
Household food insecurity				
Food secure	53 (59.6)	147 (84.0)	1	
Mildly food insecure	11 (12.3)	6 (3.4)	5.09 (1.79-14.43)	0.002**
Moderately food insecure	17 (19.1)	14 (8.0)	3.37 (1.55-7.30)	0.002**
Severely food insecure	8 (9.0)	8 (4.6)	2.77 (0.99-7.76)	0.052*
Dietary diversity				
Inadequate	42 (42.7)	63 (36.0)	1.59 (0.95-2.67)	0.080*
Adequate	47 (52.8)	112 (64.0)	1	
Dietary counseling				
No	31 (34.8)	41 (23.4)	1.75 (0.99-3.01)	0.051*
Yes	58 (65.2)	134 (76.6)	1	
Meal frequency				
<3/day	11 (12.4)	16 (9.1)	1.40 (0.62-3.16)	0.416
≥3/day	78 (87.6)	159 (90.9)	1	
Eating difficulty				
No	64 (71.9)	141 (80.6)	1	
Yes	25 (28.1)	34 (19.4)	1.62 (0.89-2.94)	0.112*

**p<0.20, **p<0.05, COR: Crude odds ratio*

5.2.3. Psychosocial factors

From psychosocial factors, three variables were associated with undernutrition in bivariate logistic regression at p<0.05. These are depression, current alcohol consumption and alcohol consumption in the last 12 months (Table 5).

Table 5: Bivariate logistic regression of psychosocial factors among adult people on antiretroviral therapy at Goba Hospital, Bale zone, Southeast Ethiopia, March 16 to May 26, 2019.

Characteristics	Cases No. (%)	Controls No. (%)	COR (95% CI)	P-value
Living condition				
Family	70 (78.7)	128 (73.1)	1	
Alone	14 (15.7)	34 (19.4)	0.75 (0.38-1.49)	0.418
Parent	5 (5.6)	13 (7.5)	0.70 (0.24-2.05)	0.520
Depression (PHQ score)				
No (<5 point)	47 (52.8)	130 (74.3)	1	
Yes (≥5 point)	42 (47.2)	45 (25.7)	2.58 (1.51-4.42)	0.001**
Disclosure status				
No	29 (32.6)	64 (36.6)	1	
Yes	60 (67.4)	111 (63.4)	1.19 (0.69-2.05)	0.522
Current alcohol consumption (in the last 30 days)				
No	67 (75.3)	161 (92.0)	1	
Yes	22 (24.7)	14 (8.0)	3.78 (1.82-7.82)	0.00035**
Alcohol consumption in the last 12 months				
No	66 (74.2)	156 (89.1)	1	
Yes	23 (25.8)	19 (10.9)	2.86 (1.46-5.61)	0.0022**
Current cigarette smoking (in the last 30 days)				
No	83 (93.3)	168 (96.0)	1	
Yes	6 (6.7)	7 (4.0)	1.74 (0.56-5.33)	0.336
Ever smoking cigarette after starting ART				
No	81 (91.0)	163 (93.1)	1	
Yes	7 (7.9)	11 (6.3)	1.27 (0.48-3.41)	0.631
Current khat chewing (in the last 30 days)				
No	83 (93.3)	168 (96.0)	1	
Yes	6 (6.7)	7 (4.0)	1.74 (0.57-5.33)	0.336
Ever khat chewing after starting ART				
No	83 (93.3)	165 (94.3)	1	
Yes	6 (6.7)	10 (5.7)	1.19 (0.42-3.39)	0.741

*** p<0.05, ART: Antiretroviral therapy, PHQ: Patient health questionnaire, COR: Crude odds ratio*

5.2.4. Disease and treatment related factors

Under this category, four variables were associated with undernutrition in adult PLHIV in bivariate logistic regression and selected for the final model. These variables include; non-adherence to ART and tuberculosis which is significantly associated with undernutrition in PLHIV at $p < 0.05$. In addition, CD4 cell count and anemia is other variables selected for multivariable logistic regression at $p \leq 0.02$ (Table 6).

Table 6: Bivariate logistic regression of disease & treatment related factors among adult people on antiretroviral therapy at Goba Hospital, Bale zone, Southeast Ethiopia, March 16 to May 26, 2019.

Characteristics	Cases No. (%)	Controls No. (%)	COR (95% CI)	P-value
WHO clinical stage				
Stage I	51 (57.3)	110 (62.9)	1	
Stage II	15 (16.9)	30 (17.1)	1.08 (0.53-2.18)	0.833
Stage III	14 (15.7)	21 (12.0)	1.44 (0.68-3.05)	0.345
Stage IV	9 (10.1)	14 (8.0)	1.39 (0.56-3.41)	0.477
CD4 cell count				
<200 cell/µl	15 (16.9)	24 (13.7)	1.80 (0.82-3.96)	0.144*
200-500 cell/µl	49 (55.0)	79 (45.1)	1.79 (1.00-3.18)	0.049**
>500 cell/µl	25 (28.1)	72 (41.1)	1	
ART Regimen				
AZT + 3TC + EFV	6 (6.7)	9 (5.1)	1	
AZT + 3TC + NVP	12 (13.55	24 (13.7)	0.75 (0.22-2.60)	0.650
TDF + 3TC + NVP	15 (16.9)	33 (18.9)	0.68 (0.21-2.26)	0.532
TDF + 3TC + EFV	51 (57.3)	105 (60.0)	0.73 (0.25-2.14)	0.568
Second line	5 (5.6)	4 (2.3)	1.88 (0.35-9.98)	0.461
Duration of ART				
<12 months	3 (3.4)	10 (5.7)	0.51 (0.14-1.93)	0.322
12-36 months	29 (32.6)	68 (38.9)	0.73 (0.42-1.25)	0.248
>36 months	57 (64.0)	97 (55.4)	1	
Adherence to ART				

Adherent		64 (71.9)	153 (87.4)	1	
Non-adherent		25 (28.1)	22 (12.6)	2.72 (1.43-5.17)	0.002**
Opportunistic Infections (In the past 6 months					
Tuberculosis	No	78 (87.6)	167 (95.4)	1	
	Yes	11 (12.4)	8 (4.6)	2.94 (1.14-7.61)	0.026**
Chronic diarrhea	No	83 (93.3)	168 (96)	1	
	Yes	6 (6.7)	7 (4)	1.74(0.56-5.33)	0.336
Oral candidiasis	No	84 (94.4)	170 (97.1)	1	
	Yes	5 (5.6)	5 (2.9)	2.02(0.57-7.18)	0.275
Oral thrush/ulcer	No	85 (95.5)	170 (97.1)	1	
	Yes	4 (4.5)	5 (2.9)	1.60(0.42-6.11)	0.492
Pneumocystis carinii	No	87 (97.8)	171 (97.7)	1	
Pneumonia (PCP)	Yes	2 (2.2)	4 (2.3)	0.98(0.18-5.47)	0.984
Anemia					
No		56 (62.9)	128 (73.1)	1	
Yes		33 (37.1)	47 (26.9)	1.61 (0.93-2.77)	0.089*

**p<0.20, **p<0.05, ART: Antiretroviral therapy, COR: Crude odds ratio*

5.3. Factors significantly associated with undernutrition in multivariable logistic regression

In multivariable logistic regression, four variables (household food insecurity, depression, current alcohol consumption and non-adherence to ART) were significantly associated with undernutrition in adult PLHIV (Table 7). Food insecure adult people living with HIV were three times more likely to develop undernutrition compared to food secure PLHIV [AOR=3.24, 95% CI: (1.72–6.08)]. Similarly, adult PLHIV who had depression were two times more likely to develop undernutrition compared to those without depression [AOR=2.07, 95% CI: (1.16–3.72)]. Adult PLHIV who currently consume alcohol were almost four times more likely to develop undernutrition compared to those PLHIV who didn't currently consume alcohol [AOR=3.80, 95% CI: (1.71–8.43)]. In addition, adult PLHIV who were non-adherent to ART were almost three times more likely to develop undernutrition compared to adherent individual [AOR=2.61, 95% CI: (1.28–5.30)].

Table 7: Multivariable logistic regression of determinants of undernutrition in adult people on antiretroviral therapy at Goba Hospital, Bale zone, Southeast Ethiopia, March 16 to May 26, 2019

Characteristics		Cases No. (%)	Controls No. (%)	AOR (95% CI)
Household food insecurity	Food secure	53(59.6)	147(84.0)	1
	Food insecure	36(40.4)	28(16.0)	3.24(1.72-6.08) **
Depression (PHQ score)	No (<5 point)	47(52.8)	130(74.3)	1
	Yes (≥5 point)	42(47.2)	45(25.7)	2.07(1.16-3.72) *
Current alcohol consumption	No	67(75.3)	161(92)	1
	Yes	22(24.7)	14(8.0)	3.80(1.71-8.43) **
Adherence to ART	Adherent	64(71.9)	153(87.4)	1
	Non-adherent	25(28.1)	22(12.6)	2.61(1.28-5.30) **

**p<0.05, **p<0.01, AOR: Adjusted odds ratio, Hosmer and Lemeshow Test (p=0.607)*

Chapter Six: Discussion

This study focused on identifying the determinant factors of undernutrition among adult PLHIV attending antiretroviral therapy in Goba Referral Hospital. Results from this study showed that household food insecurity, having depression, current alcohol consumption and non-adherence to ART were significantly associated with undernutrition among adult PLHIV.

Food insecurity, the condition of not having economic access to sufficient food to meet dietary needs for a productive and healthy life is significantly associated with undernutrition. The odd of developing undernutrition among food insecure adult people living with HIV were three times higher compared to food secure PLHIV. This finding is consistent with a studies conducted in East Harerghe and West Shewa zone of Oromia region, Ethiopia, indicating that PLHIV who were food insecure have higher odds of being undernourished compared to food secure (15,20). Similarly, our finding is supported by the study conducted in Hossana town, Ethiopia which reported increased odd of undernutrition among food insecure people enrolled on antiretroviral therapy (40). Likewise, the study conducted in Nepal and Zimbabwe shows positive association between household food insecurity and undernutrition (12,32). This is due to the fact that lack of access to sufficient food to meet dietary needs for healthy life, which leads to deficiency of macro and micronutrient (2). Moreover, food insecure individuals are more vulnerable to poor quality and less nutritious foods (25). The implication of this finding is a need to establish and strengthen programs that target food assistance for undernourished adult PLHIV.

Depression was significantly associated with undernutrition among adult PLHIV enrolled on ART. Adult PLHIV who had depression were two times more likely to develop undernutrition compared to those without depression. This is in line with the finding of case control study conducted in the central zone of Tigray, Northern Ethiopia, which shows the odds of developing undernutrition among PLHIV with depression was almost three-folds higher compared to those without depression (30). Depression accelerates disease progression among people living with HIV, which can affect their appetite, food security status and eventually results in undernutrition in particular and lower quality of life in general (47). It may be also due to the association of depression and substance use such as alcohol consumption, khat, and cigarette smoking (50,74). Moreover, the finding of study conducted in Congo in 2016 revealed positive association between depression and loss of appetite, which result in reduced food intake (14). This result implies the need to strengthen

programs that target psychosocial problems like depression and nutritional status in adult PLHIV enrolled on ART.

In this study alcohol consumption was independent factor significantly associated with undernutrition among adult PLHIV enrolled on ART. The odd of developing undernutrition among adult PLHIV who currently consume alcohol were almost four times higher as compared to the non-consumers of alcohol currently. This finding is consistent with the studies conducted in the central zone of Tigray and in Jimma University Specialized Hospital, Ethiopia which shows positive association between alcohol consumption and undernutrition in PLHIV (30,42). Similarly, a study done in Rwanda reported higher rates of food insufficiency among alcohol users (77). This could be due to the fact that alcohol consumption alters the metabolism of vitamins and minerals leading to poor nutritional outcomes (78). Besides this, it could also be due to the negative effect of alcohol on dietary intake due to reduced appetite (51). This result implies the need for strengthening of comprehensive nutritional assessment and considering avoidance of alcohol consumption during nutritional counseling provided for adult PLHIV

Furthermore, non-adherent to antiretroviral therapy was positively associated with undernutrition in PLHIV. Adult PLHIV who were non-adherent to ART were almost three times more likely to develop undernutrition as compared to adherent. This is in line with the finding of case control study conducted in the central zone of Tigray, Northern Ethiopia which shows, PLHIV who were non-adherent to ART were almost seven times at higher risk of developing undernutrition (30). Similarly, a case-control study conducted among adult patients receiving antiretroviral therapy at Debre Markos referral hospital in 2016 found that poor adherence to ART is increased odd of developing undernutrition by five-folds (29). This could be due to the negative impact of poor ART adherence on viral suppression and disease progression which may eventually result in undernutrition (79). The implication of this finding is adherence to ART and nutritional status of adult people living with HIV enrolled on ART should be considered in the HIV care and support programs.

The findings of this study should be interpreted with some limitations. Recall bias is potential limitations that might have affected the accuracy of information related to household food security status, 24-hours dietary recall and substance use. To minimize recall bias, standardized structured questionnaire was used to assess food security and dietary diversity, and data collectors were well

trained. Once the recall of food items was finished, the participant was probed for food items that was not mentioned. There might also socially desirable responses by the participant regarding to substance use questions even if it was minimized by different strategy like interviewing in private rooms, informing about the purpose of the study and reassuring about the confidentiality. In addition, selecting data collectors outside of ART clinic also minimized social desirability bias due to less familiarity of respondent with data collectors. Using dietary measurement as a proxy measure for undernutrition, and measuring the current status of substance use and meal frequency is another limitation. Despite the above limitations, the study addressed an important issue in developing country, and included several variables that determine undernutrition. In addition, using pretested structured questionnaires, blinding data collectors to the nutritional status of the respondent and measuring household food insecurity and depression using tool validated in Ethiopian context increase the internal validity.

Chapter Seven: Conclusions and Recommendations

7.1. Conclusions

Different factors were studied to identify the factors associated with undernutrition among adult people living with HIV enrolled on ART. This study revealed that, household food insecurity, having depression, current alcohol consumption and non-adherence to ART were factors independently associated with undernutrition among adult PLHIV enrolled in ART.

7.2. Recommendations

Ministry of health

- Integration of food security interventions in HIV program at health facilities is required.
- Strengthening strategies and program targeting PLHIV by considering psychosocial factors (depression, alcohol consumption) that can affect nutritional status of PLHIV.

Gobba Referral Hospital

- Integrating food insecurity interventions to HIV program at the hospital level is required.
- Health care providers working in ART clinic are required to address adherence to antiretroviral therapy, avoidance of alcohol consumption and psychosocial problems like depression during nutritional counseling for adult people living with HIV.

Partners

- Strengthening nutritional care and support provided for adult people living with HIV is required by the partners working on nutrition interventions through collaborating with health facilities.

Researcher

- Further longitudinal studies which determine cause and effect relationship is recommended.

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Annexes

Annex 1. Consent Form and Information Sheet.

Good morning/good afternoon. My name is _____. We came from Jimma University, Institute of Health, Faculty of Public Health and Department of Epidemiology. We are working for an investigator doing this research for the partial fulfillment of master degree in Field Epidemiology. You are selected for the interview by chance. We would like to ask you few questions. This will help us to identify some of the factor affecting nutritional status of PLHIV based on your answer. We will also take some measurements including weight and height from you. If you are interested, we can tell you your weight and height measurements. You have full right to refuse, withdraw or completely reject part or all of your participation in the study. But we encourage your full participation, as the answers you give on this form and your participation in taking your measurements are very important to this study

We would like to assure you that all of your responses to our questions will be kept confidential throughout the study process. Any of information you provide will be used only by the research team and, by no means, revealed to a third party. We will ask you questions and take measurements in a place where other people or conditions couldn't interfere. We would like to assure you that your participation on this research will not affect any of your treatment and other benefit that you get from any organization. The questions and measurements will take 30-45 minutes. If you have any questions about this study, you can ask me. Do you agree to participate in this study?

Yes _____ 2. No_____ Thank you for help!

If yes, signature of the participant_____

Participant's Unique ART ID No. _____

Questionnaire code _____ Date _____

Supervisor's Name _____ Sign. _____

Data collector's Name _____ Sign. _____

Annex 2. English version questionnaire for the study of determinants of undernutrition in adult people on antiretroviral therapy at Goba Hospital, Southeast Ethiopia, March 16 to May 26, 2019.

Note the inclusion criteria:	
1. Is the participant less than 18 years?	**1. Yes 2. No**
2. Is the participant pregnant mother?	**1. Yes 2. No**
3. Is the participant postpartum women within six weeks?	**1. Yes 2. No**
4. Does the participant have spinal deformity like kyphosis, scoliosis or lordosis?	**1. Yes 2. No**
5. Is the participant on ART for less than 1 months?	**1. Yes 2. No**
➢ **If "Yes" to any one of the above questions, stop the data collection.**	

PART - I. Anthropometric assessment			
No.	**Questions**	**Categories**	**Skip to**
101	Measure the current weight of participants (in Kg)?	_____ kg	
102	Measure the current height of participants (in meter)?	_____ meter	
103	Calculate current BMI (Kg/m2)	_____Kg/m^2	
General direction: ➢ **Please, ask each question exactly as it is and circle it as per response of the participants**			
PART- II. Socio-demographic characteristics			
201	Sex of study participant	1. Male 2. Female	
202	Please state your age in year?	_____years 99. I don't know/not sure	
203	What is your current marital status?	1. Single 2. Married 3. Divorced 4. Widowed 5. Separated 6. Others (specify)_____ 99. Refused	
204	Have you attended formal education/school?	1. Yes ⟶ 2. No	Go to 206
205	If no to Qn. 206, are you able to read and write?	1. Yes 2. No	

206	If yes to Qn. 206, What is the highest level of education you have attained?	_____	
207	Where is your current residence?	1. Rural 2. Urban	
Part III- Socioeconomic information			
301	How many persons live in your household?	_____ person	
302	What is your occupation? That is, what kind of work do you mainly do?	1. Government employee 2. Non-government Employee 3. Private employee 4. Farmer 5. Trader/Merchant 6. Housewife 7. Daily laborer 8. Unemployed 9. Others (specify) _____ 99. Refused	
303	How much is your monthly income in Ethiopian Birr?	_____Ethiopian birr 98. I don't know 99. Refused	
PART IV- dietary related factors			
401	Have you ever got nutritional counseling at your health facility? On these key messages: *(the need for periodic weight monitoring; how to increase the energy density of diets at home; how to manage diet-related symptoms; any possible drug-food interactions, and sanitation and hygiene)*	1. Yes 2. No	
402	What is your daily eating occasions over the 24-hour period including additional snacks?	_____ times per 24hours	
403	Do you have eating difficulty in the last 6 months?	1. Yes 2. No →	Go to 501
404	If yes, what type of eating difficulty?	1. Loss of appetite 2. Nausea 3. Vomiting 4. Swallowing difficulty 5. Other (specify) _____	
PART V -Psychosocial related factors			
501	With whom you are living currently?	1. Alone 2. Family	

		3. Parent 4. Spouse 5. Relative 6. Other (specify)_____	
502	Are you disclosed your HIV serotype status to any one?	1. Yes 2. No →	Go to 504
503	To whom you have disclosed?	1. Partner 2. Parents 3. Own child(ren) 4. Brothers/sisters 5. Relatives 6. Friends 7. Others (Specify)_____	
504	Have you ever smoked cigarette? (manufactured type like Nyala, Rothman, etc)	1. Yes 2. No → 98. I don't know/not sure 99. Refused	Go to 509
505	Have you smoked cigarettes in the past 30 days?	1. Yes 2. No → 98. I don't know 99. Refused	Go to 507
506	During the past 30 days, on average, how many of the cigarette did you smoked in a week?	_____ number per week	
507	Have you ever smoking cigarette after starting ART?	1. Yes 2. No → 98. I don't know/not sure 99. Refused	Go to 509
508	If yes to question number 507, Since starting ART, how many of the cigarette did you smoked in a week?	_____ per week [if not] _____ per month	
509	Have you ever chewed Khat?	1. Yes 2. No → 98. I don't know 99. Refused	Go to 514
510	Have you chewed at least a bundle khat in the past 30 days?	1. Yes 2. No → 98. I don't know/not sure 99. Refused	Go to 512
511	On average, how many occasions did you chew at least bundles of Khat?	1. Daily 2. 3-6 times per week 3. 1-2 times per week 4. Less than once a week	

512	Have you ever chewed at least a bundle khat after starting ART?	1. Yes 2. No ⟶ 98. I don't know/not sure 99. Refused	Go to 514
513	Since starting ART, on average, how many occasions did you chew at least bundles of Khat	1. Daily 2. 5-6 days/ week 3. 3-4 days/ week 4. 1-2 days/ week 5. 1-3 days per month 6. Less than once a month	
514	Have you ever consumed an alcoholic drink?	1. Yes 2. No ⟶ 98. I don't know/not sure 99. Refused	Go to 601
515	What was the type of alcoholic drink you usually had?	1. Beer 2. Wine 3.Areki (Spirit) 4.Tella 5.Tej 6.Other _____	
516	Have you consumed any alcohol within the past 30 days?	1. Yes 2.No ⟶ 98. I don't know/not sure 99. Refused	Go to 519
517	During the past 30 days, on how many occasions did you have at least one alcoholic drink?	1. Daily 2. 5-6 days/ week 3. 3-4 days/ week 4. 1-2 days/ week 5. Less than once a week	
518	During the past 30 days, when you drank alcohol, how many drinks on average did you have during one drinking occasion?	Number of drinks _____	
519	Have you consumed any alcohol in the past 12 months?	1. Yes 2.No ⟶ 98. I don't know/not sure 99. Refused	Go to 601
520	During the past 12 months, how frequently have you had at least one alcoholic drink?	1. Daily 2. 5-6 days/ week 3. 3-4 days/ week 4. 1-2 days/ week 5. 1-3 days per month 6. Less than once a month	
521	During the past 12 months, when you drank alcohol, on average, how many standard	Number of drinks_____	

	alcoholic drinks did you have during one occasion?		
➢ **PART VI – Disease and treatment related factors** ➢ **<u>This data will be collected from the patient medical record</u>**			
601	WHO clinical AIDS staging of a patients	1. Stage I 2. Stage II 3. Stage III 4. Stage IV	
602	What is the CD4 cell count of the study participants	_____cells/mm^3	
603	ART duration	_____months or _____ years	
604	Current opportunistic infections within the last 6 months	1. Tuberculosis 1. Yes 2. No 2. Chronic diarrhea 1. Yes 2. No 3. Oral candidiasis 1. Yes 2. No 4. Oral thrush 1. Yes 2. No 5. Oral ulcer 1. Yes 2. No 6. Esophageal candidiasis 1. Yes 2. No 7. Pneumocystis carini pneumonia 1. Yes 2. No 8. Other (specify)_____	
605	hemoglobin level	_____ g/dl	
606	The number of missed pills of ART in the last one month from patient ART follow-up form	_____ doses of 30 doses	
607	Treatment Regimen	1. AZT + 3TC + EFV 2. AZT + 3TC + NVP 3. TDF + 3TC + NVP 4. TDF + 3TC + EFV 5. Second Line	

Part VII - Food Insecurity Measurement Tool

direction:

- The HFIAS consists of two types of related questions.
- The first question type is called an occurrence question.
- There are nine occurrence questions that ask whether a specific condition associated with the experience of food insecurity *ever* occurred during the previous four weeks (30 days).
- Each severity question is followed by a frequency-of-occurrence question, which asks ***how often***a reported condition occurred during the previous four weeks. Each occurrence question consists of the stem (timeframe for recall), and two response options (0 = No, 1 = Yes).
- There is also a 'skip code' next to each "no" response option. There are three response options representing a range of frequencies (1 = rarely, 2 = sometimes, 3 = often).

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)

Household Food Insecurity Access Scale (HFIAS) Measurement Tool

No.	Question	Response Options	Skip to
1	In the past four weeks, did you worry that your household would not have enough food?	0 = No → 1 = Yes	**Skip to 2**
1.a.	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	
2	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	0 = No → 1 = Yes	**Skip to 3**
2.a.	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	
3	In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?	0 = No → 1 = Yes	**Skip to 4**
3.a.	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	
4	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	0 = No → 1 = Yes	**Skip to 5**
4.a.	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	
5	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	0 = No → 1 = Yes	**Skip to 6**

5.a.	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	
6	In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	0 = No ⟶ 1 = Yes	**Skip to 7**
6.a.	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	
7	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	0 = No ⟶ 1 = Yes	**Skip to 8**
7.a.	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	
8	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	0 = No ⟶ 1 = Yes	**Skip to 9**
8.a.	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	
9	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	0 = No ⟶ 1 = Yes	**finished**
9.a.	How often did this happen?	1 = Rarely 2 = Sometimes 3 = Often	

Part VIII - Dietary Diversity Questionnaire

direction:

- Please describe the foods (meals and snacks) that you ate or drank yesterday during the day and night, whether at home or outside the home.
  - Start with the first food or drink of the morning.
  - Write down all foods and drinks mentioned.
  - When composite dishes are mentioned, ask for the list of ingredients.
  - When the respondent has finished, probe for meals and snacks not mentioned.

Breakfast	Snack	Lunch	Snack	Dinner	Snack

When the respondent recall is complete, fill in the food groups based on the information recorded above. For any food groups not mentioned, ask the respondent if a food item from this group was consumed.			
Qn. No.	**Food Groups**	**Examples**	**YES=1 NO=0**
1	Cereals	corn/maize, rice, wheat, sorghum, millet or any other grains or foods made from these (e.g. bread, Kitta/ambasha, Nifro, porridge,) + insert local foods e.g., enjera, chechebsa, besso, chuko, oats (kinche), soup	
2	White roots And tubers	white potatoes, white yam, Sweet potato	
3	Vitamin A rich Vegetables **a**nd tubers	Ethiopian kale, carrot, squash, or sweet potato, red sweet pepper, pumpkin	
4	Dark green Leafy Vegetables	kale, spinach, Cabbage,	
5	Other Vegetables	tomato, onion, potato	
6	Vitamin A rich Fruits	ripe mango, apricot (fresh or dried), ripe papaya, dried peach, avocado, and 100% fruit juice made from these + other locally available vitamin A rich fruits	
7	Other fruits	other fruits, including wild fruits and 100% fruit juice made from these. (banana, orange, pineapple, apple, watermelon)	
8	Organ meat	liver, or other organ meats or	
9	Flesh meats	beef, lamb, goat, chicken, camel	
10	Eggs	eggs from chicken	
11	Fish & Sea food	fresh or dried fish or shellfish	
12	Legumes, nuts And seeds	dried beans, dried peas, lentils, nuts, seeds like kolo or foods made from these (e.g. Shiro)	
13	Milk and milk Products	milk, cheese, yogurt or other milk products	
Finally ask: did you ate anything (meal or snack) OUTSIDE the home yesterday?			

Aggregation of food groups from the questionnaire to create DDS

Question Number	Food Groups	DDS Score*
1,2	Starchy staples	
4	Dark green leafy vegetables	
3,6 and red palm oil if applicable.	Other vitamin A rich fruits and vegetables	
5,7	Other fruits and vegetables	
8	Organ meat	
9,11	Meat and fish	
10	Eggs	
12	Legumes, nuts and seeds	
13	Milk and milk products	
	Total score =	

***Score 1 for food group eaten, score 0 for food group not eaten**

Part IX - Depression Measurement Questionnaire

Patient Depression Questionnaire (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems?
(circle the number to indicate your answer)

No	Questions	Not at all	Several days	More than half the days	Nearly every day
1	Little interest or pleasure in doing things	0	1	2	3
2	Feeling down, depressed, or hopeless	0	1	2	3
3	Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4	Feeling tired or having little energy	0	1	2	3
5	Poor appetite or overeating	0	1	2	3
6	Feeling bad about yourself or that you are a failure or have let yourself or your family down	0	1	2	3
7	Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8	Moving or speaking so slowly that other people could have noticed. Or the opposite being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9	Thoughts that you would be better off dead, or of hurting yourself	0	1	2	3
	Add columns				
	Total				

Thank You.

Annex 3. Afan Oromo version questionnaire for the study of determinants of undernutrition in adult people on antiretroviral therapy at Goba Hospital, Southeast Ethiopia, March 16 to May 26, 2019.

Unkaa eyyama hirmaattotaa fi odeeffannoo qorannoo

Ani maqaan koo_____ yommuun jedhamu, Yuunivarsiitii Jimmaa, Dipaartmantii Ippidimooloojii irraan dhufe. Kayyoon qorannoo kanaa Hoospitaala Goobbaatti, namoota dhibee HIV waliin jiraatan kan qoricha farra HIV fudhachaa jiran irratti sababoota/taateewwan hanqina nyaataa fidan qorachuudhaafi.

Qorannoo kana irratti akka hirmaattaniif carraadhaan filatamtanii jirtu. Qorannoo kana irratti hirmaachuun fedha keessaniin yommuu ta'u, gaaffilee qorannoo kana irratti dhiyaataniif deebii kennuu diduu ykn addaan kutuuf mirga kan qabdan yommuu ta'u, odeeffannoon isin nuuf kennitan garuu namoota dhibee HIV waliin jiraatan kan qoricha farra HIV fudhachaa jiran irratti, sababoota/taateewwan hanqina nyaata fiidan addan baasuuf baay'ee kan nu gargaaruu dha.

Odeeffannoo isin nuuf kennitan irratti maqaan keessan akka hin barreeffamnee fi odeeffannoon isin keennitan kunis iccitiin isaa kan eegamee fi faayidaa qorannoo kanaaf qofa kan oluu ta'u isaa isiniif mirkaneessina. Qorannoo kan irratti gaaffilee muraasa isin gaafanna, akkasumas ulfaatina fi hojjaa keessan ni safarra, kun walumaagalatti daqiiqaa 25-30 fudhata. Gaaffii yoo qabaattan nu gaafachuu dandeessu.

Qorannoo kana irratti hirmaachuuf fedhii qabduu?

Eeyyee_____ Lakkii _____

Eeyyee yoo ta'e, mallatteessaa _____

Lakk. ID (ART ID No.) _____

Kodii gaaffii kanaa _____ Guyyaa_____

Maqaa ogeessa too'atuu_____ Mallattoo _____

Maqaa ogeessaodeeffannoo sassaabuu_____Mallattoo_____

Odeeffanoo sassaabuun dura gaaffilee kana mirkaneessi:

1. Waggaa 18 gadi? **1. Eeyyee** **2. Lakkii**
2. Dubartii ulfa qabduu? **1. Eeyyee** **2. Lakkii**
3. Erga deesse torbaan ja'a (6) keessa yoo ta'e? **1. Eeyyee** **2. Lakkii**
4. Rakkoo lafee dugdaa qabuu (spinal deformity like kyphosis, scoliosis, lordosis)? **1. Eeyyee** **2. Lakkii**
5. Erga qoricha farra HIV jalqabanii ji'a 1 gadi? **1. Eeyyee** **2. Lakkii**

- **Gaaffilee kana keessaa 1 yoo 'eeyyee' ta'e, ragaan hin sassaabamu.**

KUTAA - I. Safartuulee qaamaa fudhachuuf			
No.	**Gaaffiilee**	**Iddoo deebii**	**Dabraa**
101	Ulfaatina (kiloogiraamaan)	_____ kg	
102	Dheerina/hojjaa (meetiraan)	_____ meter	
103	BMI isaanii meeqa? (Kg/m^2) (ulfaatina/dheerina^2)	_____Kg/m^2	
Kutaa- II. Gaaffilee haala hawaasummaa fi dimoogiraafii			
201	Saala	1. Dhiira 2. Dubartii	
202	Umriin keessan meeqa (waggaadhaan)?	Waggaa_____ 99. Hin beeku/hin yaadadhu	
203	Haala fuudhaa/heeruma keessanii kan ammaa?	1. Kan hin fuudhin/hin heerumne 2. Kan fudhe/heerumte 3. Kan hike/hiikte 4. Kan jalaa du'e 5. Kan addaan bahan 6. Kan biraa (ibsi)_____ 99. Deebisuu hin barbaanne	
204	Mana baruumsaa galtee ni beektaa?	1. Eeyyee → 2. Lakkii	Gara 206 dabri
205	Barreessuu fi dubbisuu ni dandeessuu?	1. Eeyyee 2. Lakkii	
206	Sadarkaa baruumsa keessanni kan dhumaa nuuf himi	_____	
207	Iddoo jireenya kan ammaa nuuf ibsaa?	1. Baadiyyaa 2. Magaalaa	
Kutaa III- Gaaffiile haala hawaasummaaf diinagdee			
301	Maatii keessan keessa namoota meeqatu jiraata?	Lakkoofsaan _____	

302	Hojiin yeroo ammaa hojjattan maali?	1. Hojjataa mootummaa 2. Hojjataa miti-mootummaa 3. Hojjataa dhuunfaa 4. Qotee bulaa 5. Daldalaa 6. Haadha manaa/ Giiftii manaa 7. Hojii guyyaa 8. Kan hojii hin qabne 9. Kan biraa _____ 99. Deebisuu hin barbaanne	
303	Galiin ji'atti jiddu galeessaan argattan meeqa?	Qarshii_____ 98. Hin beeku/hin yaadadhu 99. Deebisuu hin barbaanne	
Kutaa IV- Gaaffilee nyaataan wal qabatan			
401	Dhaabbata fayyaatti gorsa waa'ee nyaataa fudhattanii beektuu? **<u>On this key message:</u>** *(the need for periodic weight monitoring; how to increase the energy density of diets at home; how to manage diet-related symptoms; any possible drug-food interactions, and sanitation and hygiene)*	1. Eeyyee 2. Lakkii	
402	Guyyaatti (sa'atii 24 keessatti) yeroo meeqa nyaattu?	Yeroo (si'a)_____	
403	Ji'oota 6 dabran keessatti, rakkoon nyaata nyaachuu qabdanii?	1. Eeyyee 2. Lakkii →	Gara 501 dabri
404	Nyaata nyaachuudhaan walqabtee rakkoo kam qabdan?	1. Fedhii nyaataa hir'isuu/dhabuu 2. Lolloca 3. Haqqee/haqqisaa 4. Nyaata liqimsuu dadhabuu 5. Kan biraa _____	
Kutaa V – Gaaffiilee Psychosocial wal qabatan			
501	Yeroo ammaa kana eenyu waliin jiraattu?	1. Kophaa 2. Maatii 3. Haadha fi/ykn abbaa 4. Ilmaan 5. Fira 6. Kan biraa _____	

502	HIV waliin akka jiraattu namootatti himtee ni beektaa?	1. Eeyyee 2. Lakkii →	Gara 504 dabri
503	Eenyuuf himtee beekta?	1. Haadha/abbaa manaa ykn hiriyaa jaalaalaatiif 2. Haadha ykn abbaa 3. Ilmaan keetiif 4. Obboleessa/obboleettii 5. Fira 6. Hiriyaa/saahiba 7. Kan biraa _____	
504	Sigaaraa xuuxxee ni beektaa? (fkn. Kan akka Niyaalaa, Roozmaan…)	1. Eeyyee 2. Lakkii → 98. Hin beeku/hin yaadadhu 99. Deebisuu hin barbaanne	Gara 509 dabri
505	Guyyoota 30 dabran keessatti, Sigaaraa xuuxxee ni beektaa?	1. Eeyyee 2. Lakkii → 98. Hin beeku/hin yaadadhu 99. Deebisuu hin barbaanne	Gara 507 dabri
506	Guyyoota 30 dabran keessatti, giddu galeessaan torbaanitti sigaaraa xuuxxee beekta?	_____torbaanitti	
507	Erga qoricha farra HIV jalqabdee, Sigaaraa xuuxxee ni beektaa??	1. Eeyyee 2. Lakkii → 98. Hin beeku/hin yaadadhu 99. Deebisuu hin barbaanne	Gara 509 dabri
508	Erga qoricha farra HIV jalqabdee, giddu galeessaan torbaanitti sigaaraa xuuxxee beekta?	_____torbaanitti [ykn] _____ji'atti	
509	Jimaa/caatii qaamaatanii beektuu?	1. Eeyyee 2. Lakkii → 98. Hin beeku/hin yaadadhu 99. Deebisuu hin barbaanne	Gara 514 dabri
510	Guyyoota 30 dabran keessatti, yoo xiqqaate jimaa/caatii feestaala/qabaa 1 qamaatanii beektuu?	1. Eeyyee 2. Lakkii → 98. Hin beeku/hin yaadadhu 99. Deebisuu hin barbaanne	Gara 512 dabri

511	Giddu galeessaan, yoo xiqqaate jimaa feestaala/qabaa 1 yeroo hagam qamaatu?	1. Guyyaan 2. Torbaanitti si'a 3-6 3. Torbaanitti si'a 1-2 4. Torbaanitti si'a tokkoo gadi	
512	Erga qoricha farra HIV jalqabdeeyoo xiqqaate jimaa/caatii feestaala/qabaa 1 qamaatanii beektuu?	1. Eeyyee 2. Lakkii ⟶ 98. Hin beeku/hin yaadadhu 99. Deebisuu hin barbaanne	Gara 514 dabri
513	Erga qoricha farra HIV jalqabdee yoo xiqqaate jimaa feestaala/qabaa 1 yeroo hagam qamaatu?	1. Guyyaa guyyaan 2. Torbaan keessaa guyyaa 5-6 3. Torbaan keessaa guyyaa 3-4 4. Torbaan keessaa guyyaa 3-4 5. Ji'atti guyyoota 1-3 6. Ji'atti guyyaa 1 gadi	
514	Dhugaatii alkoolii dhugdanii beektuu?	1. Eeyyee 2. Lakkii ⟶ 98. Hin beeku/hin yaadadhu 99. Deebisuu hin barbaanne	Gara 601 dabri
515	Gosa alkoolii kam yeroo baay'ee dhugdu?	1. Biiraa 2. Weynii 3. 3.Araqee 4. 4.Xallaa 5. 5.Xajjii 6. 6.Kan biraa (ibsi)_____	
516	Guuyyoota 30 dabran keessatti, alkoolii dhugdee beektaa?	1. Eeyyee 2. Lakkii ⟶ 98. Hin beeku/hin yaadadhu 99. Deebisuu hin barbaanne	Gara 519 dabri
517	Guuyyoota 30 dabran keessatti, yeroo hammam yoo xiqqaate aalkoolii tokko dhugdan?	1. Guyyaa guyyaan 2. Torbaan keessaa guyyaa 5-6 3. Torbaan keessaa guyyaa 3-4 4. Torbaan keessaa guyyaa 1-2 5. Torbaaanitti guyyaa tokkoo gadi	
518	Guuyyoota 30 dabran keessatti, yeroo aalkoolii dhugdan, si'a tokkotti giddu galeessaan aalkoolii meeqa dhugdu?	Lakkoofsaan* _____	
519	Jioota 12 dabran keessatti, alkoolii dhugdee beektaa?	1. Eeyyee 2. Lakkii ⟶	

		98. Hin beeku/hin yaadadhu 99. Deebisuu hin barbaanne	Gara 601 dabri
520	Jioota 12 dabran keessatti, yeroo hammam yoo xiqqaate aalkoolii tokko dhugdan?	1. Guyyaa guyyaan 2. Torbaan keessaa guyyaa 5-6 3. Torbaan keessaa guyyaa 3-4 4. Torbaan keessaa guyyaa 1-2 5. Ji'atti guyyaa 1-3 6. Ji'atti guyyaa tokkoo gadi	
521	Jioota 12 dabran keessatti, yeroo aalkoolii dhugdan, si'a tokkotti giddu galeessaan aalkoolii meeqa dhugdu?	Lakkoofsaan* _____	
Kutaa VI – dhukkuboota fi yaalan walqabatee ➢ **Ragaalee galmee irraa kan funaanamu**			
601	WHO clinical AIDS staging	1. Stage I 2. Stage II 3. Stage III 4. Stage IV	
602	CD4 dhiheenya kanatti hojjatame	_____cells/mm^3	
603	Yeroo hammamiif qoricha farra HIV (ART) fudhattan?	Ji'a _____ or Waggaa _____	
604	'Opportunistic infection' ji'a 6 dabran keessatti ni qabuu? 1. Tuberculosis 2. Chronic diarrhea (>1 month) 3. Oral candidiasis 4. Oral thrush 5. Oral ulcer 6. Esophageal candidiasis 7. Pneumocystis carini pneumonia 8. Kan biraa (ibsi)_____	 1. Eeyyee 2. Lakkii 1. Eeyyee 2. Lakkii 1. Eeyyee 2. Lakkii 1. Eeyyee 2. Lakkii 1. Eeyyee 2. Lakkii 1. Eeyyee 2. Lakkii 1. Eeyyee 2. Lakkii _____	
605	hemoglobin dhiheenyaa	_____ g/dl	
606	Qoricha farra HIV (ART) ji'a dabre isaaniif ajajame keessaa, firii meeqa osoo hin liqimsin hafe (number of missed pills of ART)?	Firii 30 keessaa _____	
607	Gosa qoricha fudhachaa jiranii	1. AZT + 3TC + EFV 2. AZT + 3TC + NVP 3. TDF + 3TC + NVP 4. TDF + 3TC + EFV 5. Second Line	

Kutaa VII -Gaaffiilee wabii nyaataan walqabatan (food security)

Household Food Insecurity Access Scale (HFIAS) Measurement Tool			
No.	**Gaaffiilee**	**Iddoo deebii**	**Dabraa**
1	Guyyoota 30 dabran keessatti, maatiin koo nyaata gahaa hin qabu jettee yaaddooftee ni beektaa?	0 = Lakkii ⟶ 1 = Eeyyee	**Gara 2 dabri**
1.a.	Si'a meeeqaaf kun kan tahe?	1 =Yeroo muraasa (yeroo 1-2) 2 =Dabree dabree (yeroo 3-10) 3 =Yeroo baay'ee (yeroo >10)	
2	Guyyoota 30 dabran keessatti, sababa maallaqa dhabuutiin yeroon isin ykn miseensi maatii keessanii nyaata nyaachuu barbaaddan itti dhabdan jiraa?	0 = Lakkii ⟶ 1 = Eeyyee	**Gara 3 dabri**
2.a.	Si'a meeeqaaf kun kan tahe?	1 =Yeroo muraasa (yeroo 1-2) 2 =Dabree dabree (yeroo 3-10) 3 =Yeroo baay'ee (yeroo >10)	
3	Guyyoota 30 dabran keessatti, sababa maallaqa dhabuutiin, yeroon isin/miseensi maatii keessanii dirqamtanii gosa nyaata muraasa itti nyaattan jiraa?	0 = Lakkii ⟶ 1 = Eeyyee	**Gara 4 dabri**
3.a.	Si'a meeeqaaf kun kan tahe?	1 =Yeroo muraasa (yeroo 1-2) 2 =Dabree dabree (yeroo 3-10) 3 =Yeroo baay'ee (yeroo >10)	
4	Guyyoota 30 dabran keessatti, sababa maallaqa dhabuutiin isin/miseensi maatii keessanii dirqamtanii gosa nyaataa nyaachuu hin barbaadin yeroon itti nyaattan jiraa?	0 = Lakkii ⟶ 1 = Eeyyee	**Gara 5 dabri**
4.a.	Si'a meeeqaaf kun kan tahe?	1 =Yeroo muraasa (yeroo 1-2) 2 =Dabree dabree (yeroo 3-10) 3 =Yeroo baay'ee (yeroo >10)	
5	Guyyoota 30 dabran keessatti, sababa nyaatni gahaan hin jirreef, isin/miseensi maatii keessanii dirqamtanii nyaata muraasa/xiqqaa (kan na gaha jettanii yaaddanii gadi) yeroon itti nyaattan jiraa?	0 = Lakkii ⟶ 1 = Eeyyee	**Gara 6 dabri**
5.a.	Si'a meeeqaaf kun kan tahe?	1 =Yeroo muraasa (yeroo 1-2) 2 =Dabree dabree (yeroo 3-10) 3 =Yeroo baay'ee (yeroo >10)	
6	Guyyoota 30 dabran keessatti, sababa nyaatni gahaan hin jirreef, isin/miseensi maatii keessanii dirqamtanii guyyaa tokkkotti nyaata muraasa/xiqqaa (kan guyyaa biraa iraa gadi) yeroon itti nyaattan jiraa?	0 = Lakkii ⟶ 1 = Eeyyee	**Gara 7 dabri**
6.a.	Si'a meeeqaaf kun kan tahe?	1 =Yeroo muraasa (yeroo 1-2) 2 =Dabree dabree (yeroo 3-10)	

		3 =Yeroo baay'ee (yeroo >10)	
7	Guyyoota 30 dabran keessatti, sababa maallaqa dhabuutiin, yeroon nyaatni mana keessan keessa hi jirre jiraa?	0 = Lakkii ⟶ 1 = Eeyyee	**Gara 8 dabri**
7.a.	Si'a meeeqaaf kun kan tahe?	1 =Yeroo muraasa (yeroo 1-2) 2 =Dabree dabree (yeroo 3-10) 3 =Yeroo baay'ee (yeroo >10)	
8	Guyyoota 30 dabran keessatti, sababa nyaatni gahaan hin jirreef, yeroon isin/miseensi maatii keessanii osoo beelli isinitti dhagayamaaa jiruu halkan raftan jiraa?	0 = Lakkii ⟶ 1 = Eeyyee	**Gara 9 dabri**
8.a.	Si'a meeeqaaf kun kan tahe?	1 =Yeroo muraasa (yeroo 1-2) 2 =Dabree dabree (yeroo 3-10) 3 =Yeroo baay'ee (yeroo >10)	
9	Guyyoota 30 dabran keessatti, sababa nyaatni gahaan hin jirreef, yeroon isin/miseensi maatii keessanii guyyaa fi halkan guutuu osoo nyaata tokkollee hin nyaatin dabarsitan jiraa?	0 = Lakkii ⟶ 1 = Eeyyee	**Xumura -me.**
9.a.	Si'a meeeqaaf kun kan tahe?	1 =Yeroo muraasa (yeroo 1-2) 2 =Dabree dabree (yeroo 3-10) 3 =Yeroo baay'ee (yeroo >10)	

Kutaa VIII - Gaaffiilee nyaata madaalamaan walqabatan (dietary diversity)

Qajeelfama:

- Nyaata guyyaa kaleessaa (halkanii fi guyyaa) sa'aa 24 keessatti nyaatte ykn dhugde (maksasii dabalatee), mana keessatti ykn manaa ala nyaatte nuuf ibsaa.
  - Nyaata jalqaba ciree irratti nyaatan irraa haa jalqaban.
  - Nyaata fi dhugaatii isaan ibsan kana iddoo qophaa'e irratti barreessaa.
  - Yeroo gosa nyaataa adda addaa yeroo tokkotti nyaachuu isaanii ibsan, gosa nyaataa sanii gaafadhaa.
  - Yeroo isaan ibsanii xumuran, gosa nyaataa isaan hin ibsin sana gaafadhaa. (probe for meals and snacks not mentioned)

Ciree	Maksasii	Laaqana	Maksasii	Irbaata	Maksasii

Erga isaan ibsan booda, akkaataa asii olitti ibsameen, gosa nyaataa isaan nyaatan kana guutaa. Gosa nyaataa hin ibsamin yoo jiraate, gosa nyaataa hin nyaatami kana gaafachuudhaan mirkaneeffadhaa.

Qn. No.	Garee nyaataa	Fakkeenya	Eeyyee=1 Lakkii=0
1	Midhaan	Boqqoolloo, ruuzii,qamadii, bishingaa, millet, garbuudaagussaa, xaafii ykn nyaata midhaan kanarraa hojjatamu(fkn. daabboo, qiixxaa, caccabsaa, bassoo, ambaashaa, nifro (shummo), marqaa, biddeena, qincee, shoorbaa, cukkoo	
2	Hidda adii (white root and tuber)	Dinnicha, mixaaxish	
3	Kuduraa fi hidda Vit. A qaban	Kaaarootii, goommana (raafuu), dubbaa, mixaaxish, barbaree	
4	Kuduraa baala magariisa qaban	Raafuu (goommana), raafuu maramaa, salaaxaaa	
5	Kuduraa biroo	Timaatim, shunkurtaa, shunkurtaa adii (qullubbii)	
6	Muuduraa Vit. A qaban	Maangoo bilchaate, papaya bilchaate, avokaadoo, ficuunfaa 100% muduraa kanarraa hojjatame	
7	Muduraa biroo	Muduraa biraa fkn. Muuzii, burtukaana, aappilii, ananaasii, habab, loomii, gishxaa, kookiificuunfaa 100% muduraa kanarraa hojjatame	
8	Foon oorgaanii (organ meat)	Tiruu, kale, onnee	
9	Foon fileeshii	Foon kan loonii, re'ee, hoolaa, lukkuu, gaala	
10	Killee	Killee/hanqaaquu/buuphaa	
11	qurxummii	Qurxummii dheedhii ykn gogaa	
12	Legumes, nuts and seeds	Baaqelaa, atara, missira, loozii, qoloo, talbaa fi nyaata midhaan kanarraa hojjatame fkn (shiroo)	
13	Aannan fi oomisha aannanii	Aannan, itittuu, areeraa, ayibii, fi oomisha aannaanii kan biroo	
<u>Dhumarratti:</u> guyyaa kaleessaa nyaata manatti qophaa'een alatti (manaa ala) iddoo birootii nyaachuu isaanii gaafadhaa.			

Kutaa 9. Gaaffilee Yaaddoo'n (depression) walqabatan

- Torbaan lameen dabran keessatti (Guyyoota 14), mallatoolee/rakkinoota gaditti tuqaman kana guyyoota meeqaaf qabaattan?

N	Gaaffiilee	Lakkii, hin qabu	Guyyoota muraasa (1-7)	Guyyoota baay'ee (8-12)	Guyyoota mara/hunda
1	Yeroo hajjattan fedhii ykn gammachuu xiqqoo qabaachuu	0	1	2	3
2	Hamileen isin cabuu ykn abdii dhabuu	0	1	2	3
3	Hirriiba yeroo dheeraaaf rafuu	0	1	2	3
4	Dadhabuu ykn humna/hamilee dhabuu	0	1	2	3
5	Fedhii nyaataa dhabuu ykn baay'ee nyaachuu	0	1	2	3
6	Sadarkaa keessan gadi buusuu ykn namoota kan biraa irraa gadi jedhanii of ilaaluu	0	1	2	3
7	Xiyyaffachuu dadhabuu fkn, waantoota hojjattanitti, dubbisarratti, TV yeroo laaltan	0	1	2	3
8	Namootni biraa na hordofaa jiran jechuudhaan, sagalee suuta dubbachuu ykn suuta deemuu YKN baay'ee saffisuu/ boqonnaa dhabuu, saffisaan dubbachuu	0	1	2	3
9	Of miidhuuf ykn of ajjeesuuf yaaduu	0	1	2	3

Galatoomaa.

Annex 4. Amharic version questionnaire for the study of determinants of undernutrition in adult people on antiretroviral therapy at Goba Hospital, Southeast Ethiopia, March 16 to May 26, 2019.

ጅማ ዩኒቨርሲቲ የህብረተሰብ ጤና እና ሕክምና ሳይንስ ኮሌጅ

የኢፒዲሞሎጂ ትምህርት ክፍል

የጥናቱ ርእስ: የምግብ እጥረት መንስኤዎች ጥናት በአዋቂ ጸረ ኤች አይ ቪ መድሃኒት ተጠቃሚዎች በጎባ ሆስፒታል

የስምምነት ፎርም

የተከበራችሁ የጥናቱ ተሳታፊዎች

እኔ ---------- በጅማ ዩኒቨርሲቲ ኢፒዲሞሎጂ ትምህርት ክፍል የሁለተኛ ዲግሪ ተማሪ በሚስራው ጥናት ላይ መረጃ እሰበስባለሁ:: ከላይ በርዕሱ ለመጥቀስ እንደተመከረው ይህ ጥናት ትኩረት ያደረገው በአዋቂ ጸረ ኤች አይ ቪ መድሃኒት ተጠቃሚዎች የስነ ምግብ ሁኔታ ላይ ነው :: ለዚህም ጥናት የእናንተ የችግሩ ተጋሪዎች ቀና ተሳትፎ በእጅጉ ጠቀሚታ አለው:: እናንተ በዚህ መጠይቅ የምትሰጡት መረጃ ለምርምር እና ለጥናት ከመሆንም አልፎ በችግሩ ዙሪያ ለሚሰሩ መንግስታዊ እና መንግሰታዊ ላልሆኑ ድርጅት አንደ አንድ ግብዓት ከማገልገሉ በላይ በአርሰዎ ላይ ምንም አይነት ተፅዕኖ የለውም:: ሚስጥርን ከመጠበቅም አንፃር በቃለ መጠየቁ ላይ ስምአይፃፍም:: ስለሆነም እርሰዋም በዚህ ጥናት ውስጥ ለተጠየቁት መጠይቆች መልስ እንዲሰጡን በትህትና እጠይቃለሁ:: በመጠይቁ ላይ ላሉ ጥያቄዎችን ያለመመለስ ሙሉ መብት አለዎት:: መጠየቁንም በምትፍልጉበት ሰዓት መተው ይችላሉ:: ይህ መጠየቅ በአጠቃላይ ከ 25-30 ደቂቃ የሚወስድ ይሆናል። ጥያቄ ካላችሁ መጠየቅ ይችላሉ።

አመሰግናለሁ።

በጥናቱ ላይ ለመሳተፍ ተሳሞምተዋል? አዎ ------ አልተሰማማሁም ------

ካልተስማሙ እናመሰግናለን

አዎ ከሆነ ፍርማ _____

የ ኤ አይ ቪ ቁጥር (ART ID No.) _____

የመጠይቁ መለያ ቁጥር _____ ቀን _____

የጠያቂ ስም _____ ፍርማ _____

የተቆጣሪ ስም _____ ፍርማ _____

ጥያቄ ከመጀመር በፍት ማረጋገጥ ያለባችሁ፡ ከነዚህ ዉስጥ ብያንስ ኣንድ ካላቸዉ መጠየቁን ኣይጀምሩ።

1. እድሜየቸዉ ከ 18 ዐመት በታች ከሆነ
2. ነብሰ ጡር እናት ወይም ከወለዱ 6 ሳሚንት ካልሞላ
3. የአከርካር አጠንት ችግር ካላቸዉ
4. ጸረ ኤች አይ ቪ መድሃኒት ከጀመሩ 1 ወር ካልሞላ

ክፍሌ አንድ ፡ ኣንትሮፖሜትርይ በተመለከተ		
ተ.ቁ	**ጥያቄ**	**መልስ**
101	አሁን ያለዎት ክብደት	_____ኪሎግራም
102	አሁን ያለዎት የቁመት ሊኬት	_____ ሜትር
103	ቢ መ ኣይ (BMI) ስንት ነዉ (Kg/m2)	
ክፍሌ ሁለት ፡ ሶሽዮ ድሞግራፊን በተመለከተ		
201	ጻታ	1. ወንድ 2. ሴት
202	እዴሜ (በአመት) ስንት ነው?	_____
203	እባክዎ የጋብቻ ሁኔታዎ ምንዴን ነዉ?	1. ያላገባ/ች 2. ያገባ/ች 3. አግብታ/ቶ የየተፋታ/ች 4. ባላ/ሚስቱ ሞተበት/ባት 5. የተለያዩ 6. ሌላ ከሆነ ግለፁ _____
204	መደበኛ ትምርት ተከታትለዋል?	1.አዎ 2.አይደለም
205	206 አዎ ከሆነ ከፍተኛ የትምርት ደረጃ ይንገሩኝ	_____
206	206 አይደለም ከሆነ ማንቡብና መፃፍ ይችላሉ	1.አዎ 2.አይደለም
207	የመኖሪያ አድራሻ ?	1.ከተማ 2. ገጠር
ክፍሌ ሶስት ፡ ሶሽ ኢኮኖሚክ መጠይቅ		
301	የቤተሰብ ብዛት ስንት ነው?	_____በቁጥር ይገለፅ

302	በምን ስራ ነው የ ሚኖሩት?	1. የመንግስት ሰራተኛ 2. መንግስት ያልሆነ ተቀጣር 3.የግል ስራ 4.ገበሬ 5.ነጋዴ 6.የቤት እመቤት 7.የቀን ሰራኛ 8.ስራ አጥ 9. ሌላ (ይጠቀስ) _____
303	በወር ምን የህል ገቢ ያገኛሉ	_____ ብር
ክፍል አራት፡ ምግብ ነክ ጉዲዮች		
401	በጤና ተቛም ስለ ምግብ የምክር አገልግሎት አግኝተዉ ያውቃሉ	1.አዎ 2.አይደለም
402	በቀን (24 ሰዓት) ስንት ጊዜ ይመገባለ	_____
403	ላለፉት 6 ወራት የምግብ መመገብ ችግር ገጥመዎታሌ?	1.አዎ 2.አይደለም
404	403 አዎ ከሆነ፣ ምን አይነት ችግር ነዉ?	1. የምግብ ፍላጎት አለመኖር 2. ማቅለሽለሽ 3. ትዉከት 4. የመዋጥ ችግር የአፍ ወይም የጉሮሮ 5. ሌላ ከሆነ ይግ□ጹ_____
ክፍል አምስት : ሳይኮሶሻል በተመለከተ		
501	ከማን ጋር ነዉ የሚኖሩት ?	1. ለብቻ 2. ከ በተሰብ 3. ከአባት/ እናት 4. ከምስት/ባል 5. ከዘመድ 6. ሌላ ከሆነ ይግ□ጹ_____
502	ከ ኤች አይ ቪ ጋር እንደሚኖሩ ለሌላ ሰዉ ተናግረዉ ያዉቃሉ ?	1.አዎ 2.አይደለም
503	502 አዎ ከሆነ፣ ለማን ?	1. ለ ፍቅር አጋር 2. ለአባት/ እናት 3. ለሊጆች 4. ለወንድም/እህት 5. ለዘመድ 6. ለጉዋደኛ 7. ሌላ ከሆነ ይግ□ጹ_____
504	ሲጋራ አጭሰዉ ያዉቃሉ ?	1. አዎ

		2. አላጨስኩም 98. አላዉቅም
505	504 አዎ ከሆነ፣ ባለፉት 30 ቀን ዉስጥ ሲጋራ አጭሰዉ ያዉቃሉ ?	1. አዎ 2. አላጨስኩም 98. አላዉቅም
506	505 አዎ ከሆነ፣ ባለፉት 30 ቀን ዉስጥ በአማካኝ በሳምንት ምን ያህል ሲጋራ ያጭሳሉ ?	_____-
507	የ ጸረ-ኤች አይ ቪ መድሃኒት መዉሰድ ከጀመሩ ሲጋራ አጭሰዉ ያዉቃሉ ?	1. አዎ 2. አላጨስኩም 98. አላዉቅም
508	507 አዎ ከሆነ፣የ ጸረ-ኤች አይ ቪ መድሃኒት መዉሰድ ከጀመሩ በአማካኝ በሳምንት ምን ያህል ሲጋራ ያጭሳሉ ?	_____
509	ጫት ቅመዉ ያዉቃሉ ?	1. አዎ 2. አላጨስኩም 98. አላዉቅም
510	509 አዎ ከሆነ፣ ባለፉት 30 ቀን ዉስጥ ብያንስ ኣንድ ፈስታል ጫት ቅመዉ ያዉቃሉ ?	1. አዎ 2. አላጨስኩም 98. አላዉቅም
511	510 አዎ ከሆነ፣ በአማካኝ በምን ያህል ግዜ ዉስጥ ብያንስ ኣንድ ፈስታል ጫት ይቅማሉ ?	1. በየ ቀን 2. በሳምንት ከ 3-6 ግዜ 3. በሳምንት ከ 1-2 ግዜ 4. በሳምንት ከኣንድ ግዜ በታች
512	የ ጸረ-ኤች አይ ቪ መድሃኒት መዉሰድ ከጀመሩ ብያንስ ኣንድ ፈስታል ጫት ቅመዉ ያዉቃሉ ?	1. አዎ 2. አላጨስኩም 98. አላዉቅም
513	512 አዎ ከሆነ፣ የ ጸረ-ኤች አይ ቪ መድሃኒት መዉሰድ ከጀመሩ በአማካኝ በምን ያህል ግዜ ዉስጥ ብያንስ ኣንድ ፈስታል ጫት ይቅማሉ ?	1. በየ ቀን 2. በሳምንት ከ 5-6 ቀን 3. በሳምንት ከ 3-4 ቀን 4. በሳምንት ከ 1-2 ቀን 5. በወር ከ 1-3 ቀን 6. በወር ከ 1 ግዜ ነታች
514	አልኮል ያለዉ መጠት ጠጥተዉ ያውቃሉ ?	1. አዎ 2. አላጨስኩም 98. አላዉቅም
515	514 አዎ ከሆነ ፣ ምን ኣይነት አልኮል ያለዉ መጠት ጠጥተዉ ያውቃሉ ?	1. ቢራ 2. ዌይን 3. አረቄ 4. ጠላ 5. ጠጅ 6. ሌላ ከሆነ ይግ□ጹ_____

516	ባለፉት 30 ቀን ዉስጥ ፣ አልኮል ያለዉ መጠት ጠጥተዉ ያውቃሉ ?	1. አዎ 2. አላጨስኩም 98. አላዉቅም
517	516 አዎ ከሆነ ፣ ባለፉት 30 ቀን ዉስጥ ፣ በምን ያህል ግዜ ዉስጥ ብያንስ ኣንድ አልኮል ያለዉ መጠት ጠጥተዉ ያውቃሉ?	1. በየ ቀን 2. በሳምንት ከ 5-6 ቀን 3. በሳምንት ከ 3-4 ቀን 4. በሳምንት ከ 1-2 ቀን 5. በወር ከ 1 ግዜ ነታች
518	ባለፉት 30 ቀን ዉስጥ ፣አልኮል ያለዉ መጠት ስጠጡ በአማካኝ በኣንድ ግዜ ስንት መጠጥ ይጠጣሉ ?	_____ መጠጥ
519	ባለፉት 12 ወራት ዉስጥ ፣ አልኮል ያለዉ መጠት ጠጥተዉ ያውቃሉ ?	1. አዎ 2. አላጨስኩም 98. አላዉቅም
520	519 አዎ ከሆነ ፣ ባለፉት 12 ወራት ዉስጥ ፣ በምን ያህል ግዜ ዉስጥ ብያንስ ኣንድ አልኮል ያለዉ መጠት ጠጥተዉ ያውቃሉ?	1. በየ ቀን 2. በሳምንት ከ 5-6 ቀን 3. በሳምንት ከ 3-4 ቀን 4. በሳምንት ከ 1-2 ቀን 5. በወር ከ 1-3 ቀን 6. በወር ከ 1 ግዜ ነታች
521	ባለፉት 12 ወራት ዉስጥ ፣ ፣አልኮል ያለዉ መጠት ስጠጡ በአማካኝ በኣንድ ግዜ ስንት መጠጥ ይጠጣሉ ?	_____መጠጥ
ክፍል ስድስት ፡ ከጤና ጋር የተያያዙ መረጃዎች የተመለከቱ ሁኔታዎች፡		
601	የአለም ጤና ድርጅት የኤድስ ደረጃ	1. ደረጃ 1 2. ደረጃ 2 3. ደረጃ 3 4. ደረጃ 4
602	በቅርብ የተሰራዉ የ CD4 ሴሌ ቁጥር	_____cells/mm^3
603	ስንት ወር ሆነዎት ፀረ ኤች አይ ቪ መድሃኒት ከጀመሩ	_____ወር
604	ባለፉት ስድስት ወር ለኤች አይ ቪ/ኤዴስ ተጓዳኝ በሽታዎችን በተመለከተ	1. Tuberculosis 1. Yes 2. No 2. Chronic diarrhea 1. Yes 2. No 3. Oral candidiasis 1. Yes 2. No 4. Oral thrush 1. Yes 2. No 5. Oral ulcer 1. Yes 2. No 6. Esophageal candidiasis 1. Yes 2. No 7. Pneumocystis carini pneumonia 1. Yes 2. No 8. Other (specify)_____

605	በቅርብ የተሰራዉ የ ሄሞግሎቢን መጠን	_____ g/dl
606	ላለፉት ወራት ያልተዋጠ የ ጸረ-ኤች አይ ቪ መድሃኒት ፒል	_____ ፒል/ 30 doses
607	የ ፀረ ኤች አይ ቪ መድሃኒት ላይነት	1. AZT + 3TC + EFV 2. AZT + 3TC + NVP 3. TDF + 3TC + NVP 4. TDF + 3TC + EFV 5. Second Line

ክፍል ሰባት ፡ በቤተሰብ ውስጥ የምግብ ዋስትናን የተመለከቱ ጥያቄዎች

ተ.ቁ	ጥያቄ	ምርጫ	ወደ
1	ባለፈው አራት ሳምንት ውስጥ በቂ ምግብ ቤትውስጥ አይኖርም ብለው ተጨንቀዉ የዉቃሉ?	0 = አልሰጋሁም ⟶ 1=አዎ	ወደ ጥይቄ 2 ይሀዱ
1.ሀ	አዎ ከሆነ በወር ውስጥ ምን ያህል ጊዜ?	1=በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2=አንዳንዴ (3-10 ጊዜ) 3=ሁል ጊዜ (ከ አስር ጊዜ በላይ)	
2	ባለፈው አራት ሳምንት ውስጥ በምግብ ወይም በገንዘብ እጥረት ምክንያት በቤተሰብ ውስጥ የመረጣቹትን ምግብ መመገብ ያልቻላቹበት ጊዜ ነበር	0 = የለም ⟶ 1 = አዎ	ወደ ጥይቄ 03 ይሀዱ
2.ሀ	አዎ ከሆነ ለምን ያህል ጊዜ	1=በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2=አንዳንዴ (3-10 ጊዜ) 3=ሁል ጊዜ (ከ አስር ጊዜ በላይ)	
3	ባለፈው አራት ሳምንት ውስጥ የመግዛት አቅም ስላልነበራችሁ ከቤተሰብ አባል ትንሽ የምግብ ላይነት የበላ ሰው ነበር?	0 = የለም ⟶ 1 = አዎ	ወደ ጥይቄ 04 ይሀዱ
3.ሀ	አዎ ከሆነ ለምን ያህል ጊዜ	1=በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2=አንዳንዴ (3-10 ጊዜ) 3=ሁል ጊዜ (ከ አስር ጊዜ በላይ)	
4	ባለፈው አራት ሳምንታት ውስጥ ምግብ ስላነሰ ወይም ገንዘብ ስለሌለ የማትፈልጉትን ምግብ ተመግባቹህ ነበር?	0 = የለም ⟶ 1 = አዎ	ወደ ጥይቄ 05 ይሀዱ

4.ሀ	አዎ ከሆነ ለምን ያህል ጊዜ	1=በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2=አንዳንዴ (3-10 ጊዜ) 3=ሁል ጊዜ (ከ አስር ጊዜ በላይ)	
5	ባለፈው ወር ቤት ውስጥ በቂ ምግብ ስለሌለ ከሌላው ጊዜ ያነሰ ምግብ የተመገበ ሰው አለ?	0 = የለም ⟶ 1 = አዎ	ወደ ጥይቄ 06 ይሀዱ
5.ሀ	አዎ ከሆነ ለምን ያህል ጊዜ	1=በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2=አንዳንዴ (3-10 ጊዜ) 3=ሁል ጊዜ (ከ አስር ጊዜ በላይ)	
6	ባለፈው ወር ውስጥ በቂ ምግብ ስለሌለ በቀን ውስጥ በጣም ትንሽ ምግብ የተመገባቹህበት ቀን ነበረ?	0 = የለም ⟶ 1 = አዎ	ወደ ጥይቄ 07 ይሀዱ
6.ሀ	አዎ ከሆነ ለምን ያህል ጊዜ	1=በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2=አንዳንዴ (3-10 ጊዜ) 3=ሁል ጊዜ (ከ አስር ጊዜ በላይ)	
7	ባለፈው ወር ውስጥ ምንም አይነት ምግብ ቤት ውስጥ ሳይኖር ቀርቶ ያውቃል (ገንዘብ ስለሌለ)?	0 = የለም ⟶ 1 = አዎ	ወደ ጥይቄ 08 ይሀዱ
7.ሀ	አዎ ከሆነ ለምን ያህል ጊዜ	1=በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2=አንዳንዴ (3-10 ጊዜ) 3=ሁል ጊዜ (ከ አስር ጊዜ በላይ)	
8	ባለፈው ወር ውስጥ ምግብ ስለሌለ ከቤተሰብ አባል ምግን ሣይበላ ለሊቲን በረሀብ ያደረ አለ?	0 = የለም ⟶ 1 = አዎ	ወደ ጥይቄ 09 ይሀዱ
8.ሀ	አዎ ከሆነ ለምን ያህል ጊዜ	1=በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2=አንዳንዴ (3-10 ጊዜ) 3=ሁል ጊዜ (ከ አስር ጊዜ በላይ)	
9	ባለፈው ወር በቤተሰብ ውስጥ በምግብ እጥረት ምክንያት ከቤተሰብ አባል ቀንና ማታ ምንም ምግብ ሳይበላ ያሳለፈ ሰው ነበር ?	0 = የለም ⟶ 1 = አዎ	**አለቀ**
9.ሀ	አዎ ከሆነ ለምን ያህል ጊዜ	1=በጣም ትንሽ ጊዜ (አንዴ ወይ ሁለቴ) 2=አንዳንዴ (3-10 ጊዜ) 3=ሁል ጊዜ (ከ አስር ጊዜ በላይ)	

ክፍል ስምንት ፡ በ 24 ሰዐት ዉስጥ የተለያዩ ምግቦች የመመገብ ሁኔታን የተመለከቱ ጥያቄዎች

- **በ 24 ሰዐት ዉስጥ የተመገቡትን የምግብ አይነቶች ሁሉ ይንገሩኝ (ሌላ ካለ ለማስታወስ ይሞክሩ) ምግቡ ከተለያየ አይነት የተዘጋጀ ከሆነ ከምን እንደተሰራ ይጠይቁ**

ቁርስ	በቁርስ እና በምሳ መሀል	ምሳ	በምሳ እና እራት መሀል	እራት	ከእራት በኃላ

ክፍል ዘጠኝ፡ ድብርትን የተመለከቱ ጥያቄዎች

ባለፈዉ ሁላት ሳምንታት ዉስጥ ከታች የተዘረዘሩትን ችግሮች እንዳላቸዉ ይጠይቁ።

- ከሌላቸዉ: 0 ላይ ያክብቡ
- ካላቸዉ : ባለፈዉ ሁላት ሳምንታት ዉስጥ ለምን ያህል ጊዜ?

ተ.ቁ	ጥያቄ	በፍጹም	አንዳንዴ (1-7)	ከሳምንት ነላይ (8-12)	ሁል ጊዜ (በየቀኑ)
1	የስራ ፍላጎት መቀነስ	0	1	2	3
2	ተስፋ ማጣት ወየም የድብርት ስሜት	0	1	2	3
3	ለረጅም ግዜ እንቅልፍ መተኛት	0	1	2	3
4	የድካም ስሜት ወየም ጉልበት/ተነሳሽነት ማጣት	0	1	2	3
5	የምግብ ፍላጎት መቀነሰ ወየም መጨመር	0	1	2	3
6	ለ ረስ/ ለቤተሰብ ቦታ ኣለመስጠት ወየም የበታችኝነት ስሜት መሰማት / ራስን መጣል	0	1	2	3

7	የትኩረት ማነስ (ለምሳሌ ሲያነቡ፤ተቪ ሲያዩ)	0	1	2	3
8	የ አካሄድ/ንግግር ፍጥነት መቀነስ ወየም መጨመር ፤ እረፍት ማጣት	0	1	2	3
9	ብሞት ይሻለኛል ብለዉ ያሰቡት ወየም ራስን ለመጉዳት ያሰቡበት ግዜ ኣለ?	0	1	2	3
	ድምር				
	ጥቅል				

እናመሰግናልን