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Determinants of Loss To Follow up from Antiretroviral Therapy Among Adult Patients Attending at High Load Health Centers in East Gojjam Zone, Northwest Ethiopia

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DETERMINANTS OF LOSS TO FOLLOW UP FROM ANTIRETROVIRAL THERAPY AMONG ADULT PATIENTS ATTENDING AT HIGH LOAD HEALTH CENTERS IN EAST GOJJAM ZONE, NORTHWEST ETHIOPIA: A CASE CONTROL STUDY

BY

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A THESIS SUBMITTED TO DEPARTMENT OF EPIDEMIOLOGY AND BIOSTATISTICS, COLLEGE OF MEDICINE AND HEALTH SCIENCES, BAHIR DAR UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS THE DEGREE OF MASTER OF PUBLIC HEALTH IN FIELD EPIDEMIOLOGY

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Declaration

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ABBREVIATIONS/ ACRONYMS

3TC- Lamivudine

AIDS - Acquired Immune Deficiency Syndrome

AOR – Adjusted Odds Ratio

ART - Antiretroviral Therapy

AZT - Zidovudine

CD4- Cluster of Differentiation 4

COR – Crude Odds Ratio

d4t – Stavudine

EFV -Efavirenz

HIV - Human Immune Deficiency Virus

IQR – Interquartile Range

K.g- Kilogram

LTFU - Lost to follow up

NVP - Nevirapine

PLHIV – People living with Human immune deficiency virus

TB -Tuberculosis

TDF - Tenofovir

WHO- World Health Organization

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

Background: Lost to follow up (LTFU) from antiretroviral therapy (ART) is a global challenge with prevalence of 24.5% which exceeds the target of World health organization. In Ethiopia, its prevalence ranges from 18.0 to 31.4%. Now the magnitude of LTFU is increased as compared to previous years in East Gojjame zone. It causes drug resistance, immunological failure, illness and death.

Objective: To identify determinants of LTFU from ART among adult patients who have been ever attending at high load antiretroviral therapy health centers in East Gojjam Zone, North-West Ethiopia.

Methods: Unmatched case control study was conducted with sample size of 1275 (425 cases and 850 controls) from March 25 to May 15/2019 at high load ART health centers in East Gojjam Zone. All cases were included whereas controls were selected by simple random sampling. Structured questionnaire and data extraction tool were used for data collection. Data were coded and entered using Epi-data version 3.1, then exported to Statistical Package for Social Science version 23 for analysis. After Bi-variable binary logistic regression analysis, all variables with a p-value < 0.2 were entered into Multivariable logistic regression and p-value < 0.05 was considered as significantly associated with the outcome variable.

Results: Starting with Stavudine+Lamivudine+Efaverinez (d4t+3TC+EFV) [AOR=5.21, 95%CI; 1.73−15.69] as compared to starting with Tenofovir+Lamivudine+Efavinez, being married and lived separately [Adjusted Odds Ratio (AOR) =3.10, 95%CI; 2.06-4.65] as compared to married and lived together, daily laborer [AOR=2.81, 95%CI; 1.52-5.20] as compared to governmental employee, <12months on ART [AOR= 2.91, 95%CI; 2.41-6.36] as compared to ≥ 24 months on ART were major factors that increased the odds of LTFU. Being college and above [AOR=0.41, 95%CI; 0.16-0.68 were protective for LTFU as compared to have no formal education.

Conclusion: Married and lived separately, daily laborer, college and above education, <12 months on ART, baseline drug regimen and having tuberculosis were major determinants of LTFU from ART. Therefore, patients' education and counseling should be strengthened.

Keywords: Adult patients, Antiretroviral therapy, Associated factors, Loss to follow up, East Gojjam Zone

1. INTRODUCTION

1.1. Background

The loss to follow- up from ART clinic is unavailable information to classify patients as dead, alive and in care or having disengaged from care three months after their last scheduled appointment[1]. Patients LTFU may be dead or alive. Those patients who are alive may have self-transferred themselves to another ART clinic; or may not be on any ART treatment anywhere[2].

Human immunodeficiency virus (HIV) is one of the leading cause of illness and death in the world[3]. Since 1981, seventy eight million people have become infected and 39 million people have died from acquired immunodeficiency syndrome (AIDS) related illnesses[4].

Globally, 36.9 million people were living with human HIV, 1.8 million new infection[5-8], and 940 000 died HIV-related causes in 2017 [5, 6]. Sub-Saharan Africa contributed 73% of all living with HIV, 76% of the total new HIV infections, and 75% of the total HIV/AIDS deaths[9]. In Ethiopia, 718,550people were living with this virus, 30,000 new infection[10], and 19,743 deaths every year[11].

Antiretroviral therapy (ART) was introduced in 1996[12]. In Ethiopia, a fee-based ART program in 2003, and a free ART program in 2005 was started[13].

Antiretroviral therapy reduces risk of HIV transmission to others by up to 96%[4]. Before initiating people on ART, detailed discussions with all clients about their willingness and readiness to initiate ART, ART regimen, dosage and scheduling, the likely benefits and possible adverse effects, and the required follow-up and monitoring visits [14].

Globally, 21.7 million people were receiving ART in 2017[5-7]. In Ethiopia, 426,000 people are currently taking ART[14].Between 2000 and 2017, new HIV infections decreased by 36%, and HIV-related deaths decreased by 38% due to ART in the world [5]. Even though, the accelerated scale up of access to ART has led to a decline in HIV related illness, death and new HIV infections globally[15], the trend of ART discontinuation increased due to loss to follow up in Ethiopia[16].

. Retention of patients in long term treatment programs of ART has importance of preventing deaths and minimizing unknown treatment outcomes[17]. World health organization's (WHO's) suggested target for retention at 12 months is above 85% [18]. Minimizing LTFU will maximize population-level retention on ART, thereby maximizing long-term reductions in AIDS-related illness and death[19] . Generally, identifying determinants of LTFU at every level is a key to design appropriate intervention and improve HIV care after ART initiation[20].

1.2. Statement of the problem

Globally, loss to follow-up is 24.5% which exceeds the WHO-recommended target of 15% [18]. In sub-Saharan Africa, it ranges from 30% to 60% [21, 22]. Studies conducted in different regions of Ethiopia showed that prevalence of LTFU ranges 18.0% to 31.4% [23-28]. The trend of LTFU is increased in East Gojjame Zone [29].

ART discontinuation due to loss to follow up causes drug resistance[30, 31], reduces the immunological benefit of treatment[32],increases AIDS-related hospitalizations, illness and death[2, 19, 30, 33]. The result of Systematic Review and Meta-Analysis studies in Africa showed that death due to loss to follow- up was from 12% to 87% [34, 35].

LTFU is a global challenge that increases cost of care, shift from first line to second line treatment and increase preventable HIV transmission[18, 36]. About 40% of HIV transmission is contributed by LTFU patients[19].

In Sub Saharan African countries, HIV positive patients who were loss of follow up visits increase the risk of opportunistic infections due to high viral load and low CD4 count [35]. In the absence of tracing, LTFU more than doubled group viral load over that of a group fully retained in care[19].

Loss to follow up has been recognized as an obstacle for achievement of sustainable provision of treatment for 90% of the Joint United Nations Program on HIV and AIDS (UNAIDS) 90-90-90 treatment targets[15]. Furthermore, LTFU affects the performance of the third 90 of the UNAIDS 90-90-90 that aimed at achieving 90% of the virological success of patients on ART[30].

Although clinical and public health achievements of ART require consistent long-term follow up[37], retention of patients in long term treatment programs has given less attention since most treatment providers have limited resources to trace LTFU patients[17].

Even though several studies were conducted regarding LTFU which were limited on health facilities. However, this study revealed that factors for LTFU at health centers and community level which were not studied in the study area.

1.3. Literature review

1.3.1. Factors of lost to follow up

1.3.1.1. Socio demographic factors

The study conducted in 9 countries of Africa the result showed that co-enrollment of family/household member and living in household with ≥ 4 people had a lower risk of LTFU[38]. The study conducted in South Africa showed that having children and number of children were significantly associated with LTFU[39].

Studies done in South Africa, Nigeria, Tanzania, Guinea-Bissau and Ethiopia the result showed that age is significantly associated with LTFU [1, 39-44]. Patients who are younger age have higher risk of LTFU [38, 41, 42]. In Guinea-Bissau, the result of the study showed that age of the patient <30 year is risk factor for LTFU[1].A facility base case–control in Oromia Ethiopia showed those patients who have age 15–24 years at ART entry almost 20 times, being day laborers 5 times and being rural residence 2 times more risk of LTFU [43]. The result of the study conducted in Nigeria showed that type of occupation, education level and marital status were significantly associated with LTFU[41].

The studies conducted in Tigray Ethiopia, South Africa, Tanzania, Guinea-Bissau and Rwanda showed that being male was the predictor of LTFU [1, 23, 40, 42, 45].

1.3.1.2. Clinical factors

In Tanzania, the study showed that Baseline weight is the predictor of LTFU[42], the result of retrospective cohort study in Tigray region Ethiopia showed that patients who have $\geq$ 60 kilo gram (kg) at ART entry are almost 3.5 times more risk of LTFU [23]. The study done in guinea Bissau the result showed that baseline body mass index <18.5kg/m^2 was significantly associated with LTFU[1].

The result of the studies in South Africa, Nigeria, Tanzania, Guinea-Bissau and Ethiopia showed that Patents baseline Cluster of differentiation 4 (CD4) cell count is significantly associated with LTFU [1, 27, 28, 40-43, 46-48]. Patients who have baseline CD4 count < 200cells/mm^3 at ART entry have higher risk of LTFU[46, 48]. The study in Oromia Ethiopia showed that the patients who have a baseline CD 4 cell count < 350 cell/mm^3 at ART entry are 3.8 times more risk of LTFU[43].

The studies conducted in Nigeria, South Africa, Rwanda, Guinea-Bissau, Oromia, Mizan-Tepi and Pawi Ethiopia the result showed that clinical stage of the patient at ART entry is significantly associated with LTFU [1, 41, 43-46, 48]. The studies in South Africa and Oromia Ethiopia showed that patient classified as WHO stage IV at ART entry have higher risk of LTFU [43, 46] where as another studies in Rwanda and Mizan-Tepi Ethiopia results showed that being WHO clinical stage III and IV patients at entry were less likely to be LTFU than clinical stage I [45, 48]. Detectable last known viral load is significantly associated with LTFU[41, 46].

The studies conducted in Mizan-Tepi, Tigray and Pawi Ethiopia the result showed that not being provided isoniazid (INH) prophylaxis(IPT) is significantly associated with LTFU[24, 44, 48]. Patients who are not provided with isoniazid are at higher risk of LTFU[48]. Another study conducted in Southern Ethiopia showed that not providing co-trimoxazole prophylaxis(CPT) was predictor of LTFU[27].

Facility based retrospective cohort studies conducted in South Africa the result showed that being on ART for < 6 month[40] and most recent partner HIV status were significantly associated with lost to follow up[39]. In Tanzania, the result of a prospective cohort study showed that being on ART for 12 month or more was protective against LTFU[42].

Adherence pattern for ART is associated with risk of LTFU[41, 43]. Patents who have 100% adherence are at 64% lower risk than patients with <50% adherence [41]. Another study conducted in a rural South-Eastern Nigeria the result showed that types of Drug combination is significantly associated with LTFU[49]. A hospital based retrospective cohort studies conducted in Ethiopia, the result showed that patients with drug regimen substitution and taking regimen Zidovudine + Lamivudine + Nevirapine (AZT-3TC-NVP) were at higher risk of LTFU[23, 48].

A prospective cohort study conducted in Tanzania showed that baseline hemoglobin level of the patient is significantly associated with LTFU[42].

A facility based retrospective cohort studies done in Tigray region the result showed that smear positive pulmonary Tuberculosis (PTB)[23], and side effect were predictors of LTFU[24, 46, 49].

The study conducted in North-West Ethiopia showed that functional status of the patient was significantly associated with LTFU[28].

1.3.1.3. Psycho- social factors

The result of the study conducted in South Africa showed that openness to family/friends was significantly associated with LTFU[39]. Compared to those who had disclosed their status to anyone (family/friends), those who had never disclosed had a 43% higher risk of becoming LTFU[50]. Study conducted in southern Ethiopia patient who have not disclosed their HIV status to their family member was nearly 3 times more likely to LTFU than those who disclosed to their family[27].

In South Africa, a facility based study result showed that having partner support was significantly associated with LTFU[46].

In Cote d'Ivoire, study showed that patients who were not members of People Living with HIV/AIDS (PLWHA) associations were almost 3 times as likely to be LTFU compared to those who were member of association[51].

The study conducted in Rural Ethiopia the result showed that stigma and lack of social support were reasons for LTFU[52].A facility based retrospective cohort studies done in Tigray region the result showed that the presence of bereavement was significantly associated with LTFU[24].

1.3.1.4. Health system factors

Study in Cote d'Ivoire showed that waiting time during ART clinic visit , Availability of health Workers at ART clinic during recent visit and Overall satisfaction with services received are significantly associated with LTFU[51].

The result of studies conducted in Kenya, Cote d'Ivoire and South Africa showed that convenience of appointment was significantly associated with LTFU [49, 51, 53]. Patients who found inconvenient appointment times were almost 3 times more likely to be LTFU compared to those who found appointment times to be convenient[51].

1.3.1.5. Others factors

The result of studies conducted in Kenya and South Africa showed that distance from health facility which provides ART service significantly associated with LTFU[49, 53]. Transportation cost is the reason for LTFU [24, 49, 53].

Study in Cote d'Ivoire showed that using traditional medicine were significantly associated with LTFU. Patients who reported using traditional medicine were about 17 times as likely to discontinue treatment as those who did not[51].

In general, many studies conducted at health facility levels showed that socio demographic, clinical characteristics of study participants and heath facility related factors were the predictors of lost to follow up among adults who are on ART but personal (knowledge and attitude) characteristics of study participants was not addressed in the previous studies whereas this study addressed it.

1.3.2. Conceptual framework

The conceptual framework for this study which has been developed based on the literatures reviewed [1, 23, 24, 27, 28, 38-43, 45-53]. These groups of variables were used to identify factors associated with LTFU.

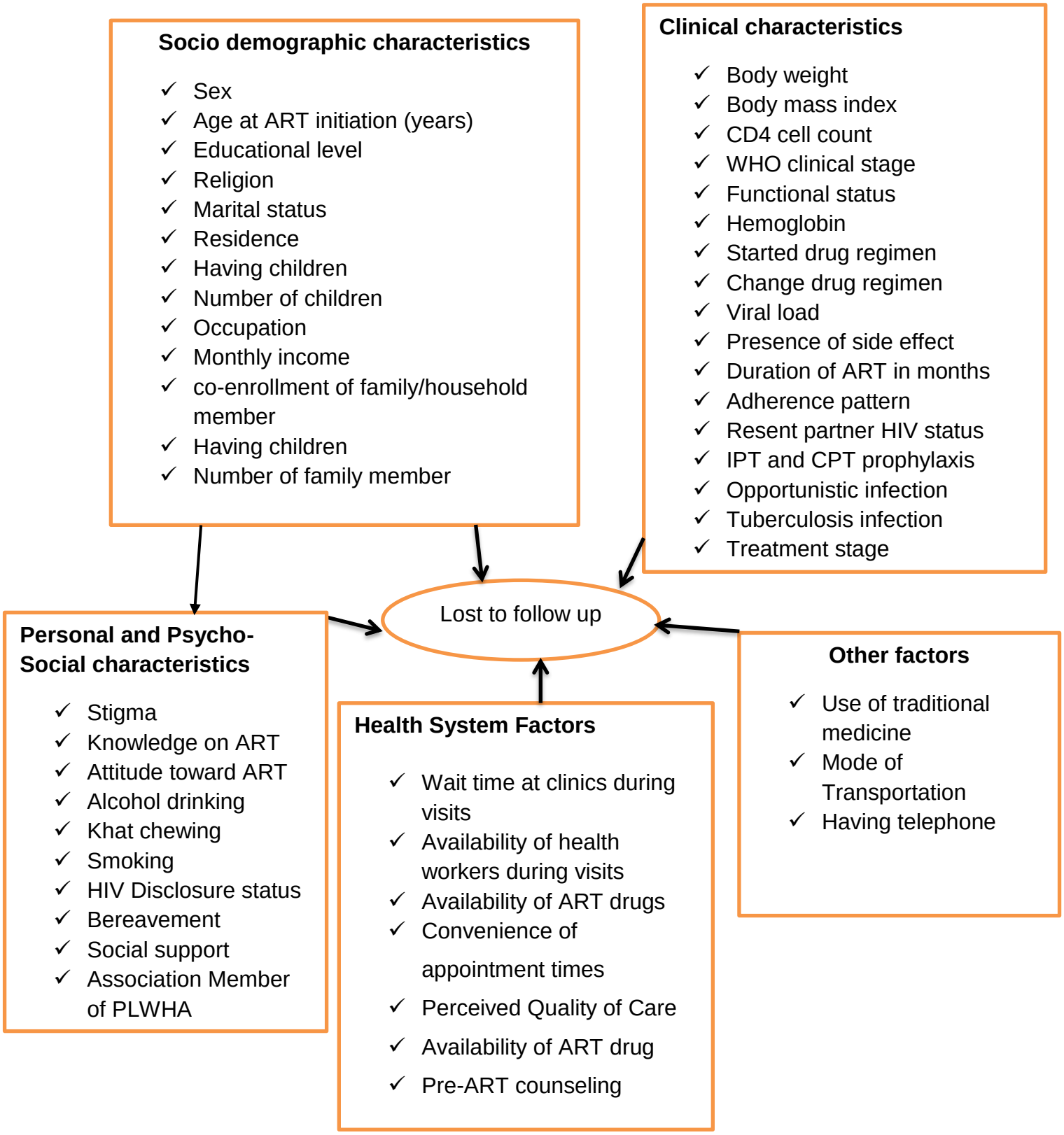

Figure 1: Conceptual framework for LTFU among adult ART patients attending at high load ART health centers in East Gojjam zone, North-West Ethiopia, 2019

1.4. Justification of the study/ Significance of the study

In Ethiopia, a lot of emphasis has been given to testing and linkage of HIV/AIDS patient to ART clinic but little is done on factors of LTFU even if factors of lost to follow up is a key to design appropriate intervention and improve HIV care. Several studies were conducted on LTFU that have mainly focused on secondary data of LTFU patients. There was limited information about determinant factors of LTFU in the study area looking at factors associated with LTFU. Therefore, this study focused on both secondary and primary data of factors associated with LTFU among adults who are on ART.

The result of this study might generate information about factors associated with LTFU among adults on ART. It might have a vital importance for initiating, planning and implementation of intervention programs. The findings might helpful to local district health offices and Non-Governmental Organizations (NGOs) to identify new approaches to prevent new infections and improve ART care for patients who are infected with HIV, specifically on treatment retention as one of the preventive approaches of new infections and loss to follow-up visits. It might also serve as an input for further research in this area in the future.

Final, identifying factors associated with LTFU in ART might also be helpful for ART patients to improve retention and ART care which reduce transmission of HIV virus to the communities.

2. OBJECTIVE

To identify determinants of lost to follow up from antiretroviral therapy among adult patients who have been ever attending at high load ART health centers in East Gojjam Zone, North-West Ethiopia, 2019

3. METHODS AND MATERIALS

3.1. Study design and study period

Unmatched case control study design was conducted from March 25 to May 15 /2019

3.2. Study Area

The study was conducted in eight high load ART governmental health centers of East Gojjam. These eight health centers are found in the centers of 8 woredas. These woredas are Debre Markos, Basoliben, Awabel, Dejen, Enemay, Enargeenawuga, Enebsiesarmeder and Debay tilategen. The name of high load health centers that found in these woredas were Debre Markos, Yejubie, Lumamie, Dejen, Bichena, Debre work, Merto Lemariam and Kuy health centers respectively.

Debre Markos and Dejen health centers have been providing ART service since 2005 and 2006 respectively whereas all other health centers have started ART service since 2007.

The Zone has 1 referral hospital, 8 primary hospitals, and 102 health centers, of which 23 have ART clinic. The capital city of the Zone is called Debre Markos which is 299 and 265 kilo meter far from Addis Abeba and Bahir Dar respectively[29].

East Gojjam is bordered on the South by the Oromia Region, on the West by West Gojjam, on the North by South Gondar, and on the East by South Wollo; the bend of the Abay River defines the Zone's Northern, Eastern and Southern boundaries. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), this Zone has a total population of 2,632,632of whom 1,318,949(50.1%) are women[29].

3.3. Source and study population

3.3.1. Source population

All HIV-positive adults who have been ever history of taking ART at high load ART health centers in East Gojjam Zone.

3.3.2. Study population

Cases: All HIV-positive adults who had ever history of on ART for greater than 6 uninterrupted months and discontinued from ART for ≥ 3 months during data collection period at high load ART health centers in East Gojjam zone

Controls: All HIV-positive adults who had ever history of on ART for greater than 6 uninterrupted months and currently on ART during data collection period at high loads ART health centers in East Gojjam Zone.

3.4. Inclusion and exclusion criteria

3.4.1. Inclusion

Cases All ≥ 15 years of age who had used ART for greater than 6 uninterrupted months and discontinued from ART for ≥ 3 months at high load ART health centers and residents of districts in which these health centers found were included.

Controls All ≥15 years of age who had used ART for greater than 6 uninterrupted months and those who were currently on ART at high load ART health centers and residents of the districts where these health centers found were included.

3.4.2. Exclusion

Both cases and controls who were pregnant, laboring, lactating women, self-transferred out, and dead or having unknown addresses were excluded. Controls that had also history of discontinuation were also excluded.

3.5. Sample size determination and sampling procedure

3.5.1. Sample size determination

The sample size was determined by using double population proportion formula. It was calculated by Epi Info version 7 with consideration of the following assumptions listed in the table below.

Table 1: Sample size calculation for determinant of LTFU in antiretroviral treatment for adult patients attending at high load ART health centers in East Gojjam Zone, North-West Ethiopia, 2019

Factors	Confidence level	Power	% of control exposed	Odds ratio	Ratio control to case	Cases	Controls	Sample size	Reference
Treatment stage (IV)	95%	80%	0.2	11.15	2	379	758	1137	[43]
Last regimen (TDF+3TC +EFV			51.7	1.58	2	246	491	737	
WHO clinical stage (IV)			1.4	6.25	2	126	252	378	

After computing the sample size calculation by Epi Info, considering 10% non-response rate, the following formula is used to increase the sample size. Total sample size = sample size/1-non-response rate [54]= 1137×/1-0.1 = 1137/0.9= , Cases=421.1 ≈422 and control=844

The minimum total of sample size was 1266 **(**422 cases and 844 controls). There was no need of sampling from 425 cases. Therefore, the total sample size was 1275 (425 cases and 850 controls)

3.5.2. Sampling procedure

The study was conducted in 8 high load ART governmental health centers in East Gojjam Zone. The total sample size was proportionally allocated for 8 health centers based on the number of lost follows up and current on ART. All eligible cases (HIV-positive adults who had been history of taking ART for greater than 6 uninterrupted months and discontinuation from ART for ≥ 3 consecutive months as well as fulfill inclusion criteria) were included in the study whereas eligible controls (HIV-positive adults who have been history of taking ART for greater than 6 uninterrupted months and currently on ART as well as fulfill inclusion criteria) were selected from each health centers by Computer generated simple random sampling. Unique ART number was used as a sampling frame.

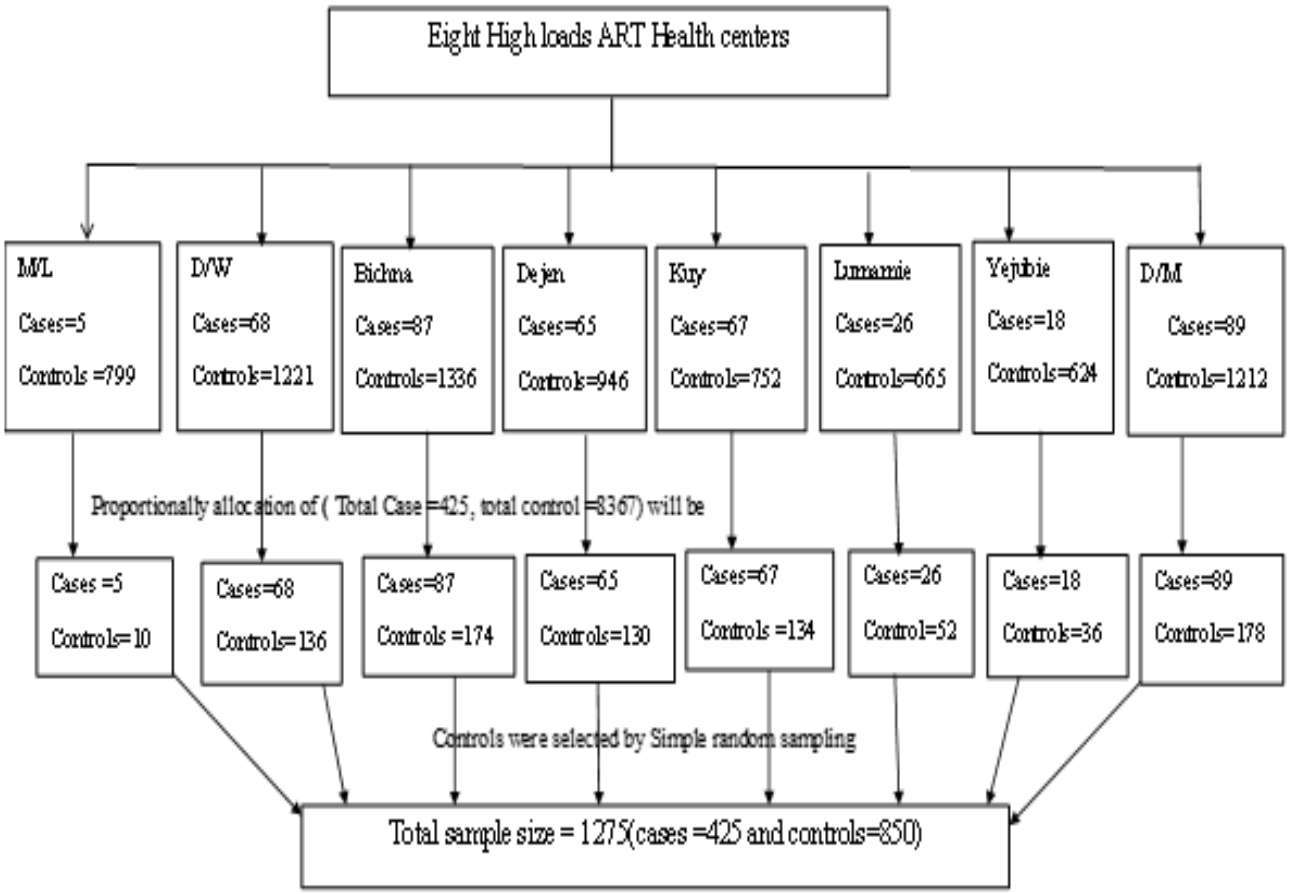

Figure 2: Sampling procedure at high load ART health center in East Gojjam Zone, North-west Ethiopia, 2019

3.6. Variables

Dependent variables

Loss to follow up (case, control)

Independent variable

Socio demographic factors (sex, age, Residence, level of education, religion, marital status, occupation, number of children, family size, monthly income and a family member co enrollment in ART)

Clinical factor (Length in month on ART, Body weight in kg, Body mass index in kg/m^2, CD4 cell count, WHO clinical stage, treatment stage, Hemoglobin, viral load, Drug regimen, change

regimen, Adherence, history of taking IPT, history of taking CPT, history of Opportunistic infection, TB infection, Resent partner HIV status, Presence of side effect and functional status)

Personal and Psycho-social factor (drinking alcohol, Khat chewing, smoking, Knowledge on ART drug, Attitude toward ART drug, stigma, member of the Association of PLWHA, social support, Bereavement and discloser status)

Health System Factors (waiting time at clinics during visits, availability of health workers during visits, convenience of appointment times and satisfied with services received)
Other Factors (Use of traditional medicine, time taken to reach health facility, having telephone and mode of transportation)

3.7. Data collection procedure

3.7.1. Data collection instruments

Structured questionnaire and checklist were prepared in English language. The questionnaire was translated into Amharic language for data collection and translated back into English to check its consistency.

3.7.2. Data collection Method

Data extraction tools (checklist) were used to extract secondary data from the medical records of selected ART patients by 8 trained clinical nurses. The patient and their medical records were linked by using unique ART number that identifies the patient. After secondary data have been collected, LTFU ART patients were traced in house to house by HIV positive voluntary Community health workers. Primary data were collected by using face to face interview technique by 8 trained grades ten completed HIV positive voluntary Community health workers.

3.8. Operational definition

LTFU(case) is defined as not taking ART refills for a period of three consecutive months or longer from the last refill and being not yet classified as ‘dead’ or ‘transferred-out’ [1].

Controls: HIV positive adults who were taking ART drug for 6 uninterrupted months and currently on ART during data collection period.

High load ART health center is defined as health facility with at least 500 ART patients.

Working functional status: A patient is able to perform usual work in or out of the house **Ambulatory functional status:** A patient is able to walk but not able to perform usual work.

Baseline clinical characteristics: clinical characteristics that were available during ART started date

Recent clinical characteristics: clinical characteristics that were recorded nearest to data collection period

Good adherence: The patient has < 3 missing doses of 30 or <4 missing doses of 60 [14].

Sufficient Knowledge: Participants who response median or above median of five yes-no and three multiple choice of ART related knowledge questions.

Favorable attitude: participants who have positive attitude toward ART above median of seven attitude related questions.

Long waiting time: participants who have waiting times of score above the median whereas **short waiting time:** participants who have waiting times of score below the median

Lowest monthly income: the income scale is broken down into five segments. Lower than the first segment (first Quintile) is called lowest monthly income whereas **highest monthly income** greater than the fifth segment (5Th quintile) is called highest monthly income.

Adults: in ART department adults are defined as HIV-positive patients whose age is 15 years or above

Ever drinking Alcohol: drinking of substance which contain alcohol (tela, tegi, areke, beer, wine etc.) by study participant either daily or occasionally after they are on ART[55].

Ever Khat chewing: is chewing of Khat by study participants either occasionally or daily after they are on ART [55].

Ever Smoking is the act of inhaling smoke produced by the combustion of an element through the mouth usually tobacco products including manufactured cigarettes and hand-rolled cigarette,

cigar, or pipe, shisha by study participants, either occasionally or daily after they are on ART[55]**.**

Ever faced Stigma: Isolation of HIV-positive due to HIV by individually or community from social, economic and political activities at least once after the initiation of ART.

Appointment time's convenience: The arrangement of appointment time is decided by both health provider and HIV-positive adults.,

Traditional medicines: locally available substances that were given by non-health professional, and taken by HIV-positive adults through oral, inhaled or applied any body parts for the purpose of medication.

Social support: is integral components of the holistic approach that is provided by individual or the communities to caring for HIV-positive adults[14].

Occasionally: is less than daily[55]

3.9. Data quality assurance

Two days training was provided for data collectors and supervisors about the objective and process of data collection. Pre-test was done. Collected data were checked for consistency and completeness on a daily base by trained supervisors. Data were also checked for completeness before data entry. Data were double-entered into Epidata version 3.1 to ensure data quality.

3.10. Data entry and analysis

Collected data were coded and entered into Epi data version 3.1, and then it was exported to SPSS version 23 for analysis. Descriptive, Bi-variable and Multi-variable binary logistic regression analysis was done. Tables, charts and text were used to present the result of the analyzed data. Independent variables with P-value of <0.2 in Bi-variable binary logistic regression analysis was considered for Multi-variable binary logistic regressions analysis. P-value < 0.05 was used as cut off point for presence of statistical significance. The final Multi-variable model was tested for goodness of fit with the HosmerLemeshow test.

3.11. Ethical consideration

Ethical clearance was obtained from Institutional Review Board (IRB) of Bahir Dar University. Permission letter was sought from East Gojjame Zone health department. Informed verbal consent was obtained from patients or from the parents or caregivers for participants who were under 18 years of age. The study participants were informed that they have right to refuse in the study or withdraw at any time during the interview. The information obtained from the study participant was maintained its confidentiality by not writing name of the study participants on the questionnaire paper

4. Results

4.1. Socio-demographic Characteristics of study participants

A total of 1260 (420 cases and 840 control) of study participants with 98.8% response rate were included in the study. The median age at ART initiation for cases was 34 years [interquartile range (IQR): 31-42 Years] and for that of the controls was 35 years [IQR: 31-45 years]. The median current age of cases and controls were also 43 years [IQR: 37-51 years] and 41 years [IQR: 35-49 years] respectively.

Nearly half, 220 (52.4%) of cases and 445(53.0%) of controls were female. About 177(42.1%) of cases and 257(30.6%) of controls were married and lived separately. Regarding to educational level, 218(51.9%) of cases and 324(38.6%) of controls had no formal education. One hundred thirty-six (32.4%) of cases were farmer and 251(29.9%) of controls were merchant. More than half, 229 (54.5%) of cases and 487(58.0%) of controls were urban dwellers (Table 2). The mean number of children for cases was 3.2 [Standard deviation (SD) = 1.4] and for that of controls was 2.8 [SD =1.1]. Regarding to family size, 5.2 [SD =2.0] and 4.9[SD=1.8] were the mean numbers of family size for cases and controls respectively.

Three hundred ten (73.8%) of cases and 598(71.2%) of controls had not co-enrolment family members in ART (Table 2).

The median monthly income of cases was 2162.00 Ethiopian birr [IQR: 1420.00-4251.00 Ethiopian birr] and for that of the controls was 2316.00 Ethiopian birr. One hundred one (24.0%) of cases had lowest monthly income (< 1400.00 Ethiopian birr) and 182(21.7%) of controls had 4^{th} quintile monthly income (between 3143.00 and 4261.00 Ethiopian birr) (Table 2).

Table 2: Socio-demographic characteristics of HIV-positive adults on ART at High load ART health centers, East Gojjam Zone, Nort-West Ethiopia, 2019

Variables		Respondents status			
		Cases(n=420)		Controls(n=840)	
		Frequency	%	Frequency	%
Sex	Female	220	52.4%	445	53.0%
	Male	200	47.6%	395	47.0%
Residence	Urban	229	54.5%	487	58.0%
	Rural	191	45.5%	353	42.0%
Marital status	Married& live together	52	12.4%	209	24.9%
	Married & live in separate	177	42.1%	257	30.6%
	Never married	67	16.0%	161	19.2%
	Divorced	75	17.9%	132	15.7%
	Widowed	49	11.7%	81	9.6%
Educational level	no formal education	218	51.9%	324	38.6%
	Primary	144	34.3%	291	34.6%
	Secondary	51	12.1%	192	22.9%
	college and above	7	1.7%	33	3.9%
Occupation	Governmental employee	38	9.0%	77	9.2%
	Farmer	136	32.4%	243	28.9%
	Merchant	102	24.3%	251	29.9%
	Housewife	65	15.5%	139	16.5%
	Day laborer	67	16.0%	82	9.8%
	Others	12	2.8%	48	5.7%
Monthly income in Ethiopian birr	Lowest income	101	24.0%	148	17.6%
	2nd quintile	87	20.7%	172	20.5%
	3rd quintile	70	16.7%	181	21.5%
	4th quintile	69	16.4%	182	21.7%
	Highest income	93	22.1%	157	18.7%
Co- enrolment of family member	No	310	73.8%	598	71.2%
	Yes	110	26.2%	242	28.8%

4.2. Baseline clinical characteristics

The median time of cases on ART before loss to follow up was 53 months [IQR: 13-84 months]. Forty-eight months [IQR: 18-84 months] was the median time of controls on ART. About 269(64.0%) of cases and 621(73.9%) of control had ≥24 months on ART. The median baseline body mass index of cases was 19.4 kilo gram per meter square (kg/m^2) [IQR: 18.29-21.31 kg/m^2) and for that of the control was 19.5 K. g/m^2[IQR: 18.5-21.0 K.g/m^2]. Two hundred eighty-four (67.6%) cases and 636(75.7%) controls had ≥18.5 kg/$m^2$of baseline body mass index. One hundred thirty-two (31.4%) of case and 297(35.4%) of controls were WHO clinical stage III at the initiation of ART. At the initiation of ART, the median CD4 count of cases was 212 cells /mm^3 [IQR: 134-434 cells/mm^3] and for that of the control was 235 cells/mm^3 [IQR: 143-430 cells/mm^3]. One hundred seventy-four (41.4%) of cases and 332(39.5%) of controls had CD4 count of < 200 cell/ml at the initiation of ART (Table 3).

Regarding to the regimen of drug, 265(63.1%) of cases and 436(51.9%) of controls started ART treatment with AZT+3TC+NVP (Table 3).

The Majority of cases, 390(92.9%0, and controls, 772(91.9%, did not get viral load measurement at the initiation of ART. During ART initiation, 361(86.0%) of cases and 708(84.3%) of controls were at working functional status (Table 3).

Table 3: Baseline clinical characteristics of HIV-positive adults on ART at High load ART health centers, East Gojjam Zone, North-West Ethiopia,2019

Variables		Last follow up status			
		Cases(n=420)		Controls(n=840)	
		Frequency	%	Frequency	%
Months on ART	< 12	83	19.8%	59	7.0%
	12-23	68	16.2%	160	19.1%
	≥ 24	269	64.0%	621	73.9%
Body mass index (K.g/m^2)	≥ 18.5	284	67.6%	636	75.7%
	< 18.5	136	32.4%	204	24.3%
WHO clinical stage	I	120	28.6%	195	23.2%
	II	101	24.0%	249	29.6%
	III	132	31.4%	297	35.4%
	IV	67	16.0%	99	11.8%
CD4 cell count (cells/mm^3)	<200	174	41.4%	332	39.5%
	200-350	116	27.6%	247	29.4%
	>350	130	31.0%	261	31.1%
Hemoglobin test	Not Done	366	87.1%	738	87.9%
	Done	54	12.9%	102	12.1%
Status of anemia	No anemic	43	79.6%	78	76.5%
	Anemic	11	20.4%	24	23.5%
Viral load	Not measured	390	92.9%	772	91.9%
	Measured	30	7.1%	68	8.1%
Value of viral load (copies/ml)	0-999	3	10.0%	36	52.9%
	1000-9999	11	36.7%	24	35.3%
	≥ 10,000	16	53.3%	8	11.8%
Drug regimen	TDF+3TC+EFV	103	24.5%	295	35.1%
	AZT+3TC+NVP	265	63.1%	436	51.9%
	TDF+3TC+NVP	17	4.0%	75	8.9%
	AZT+3TC+EFV	24	5.7%	27	3.2%
	d4t+3TC+EFV	11	2.6%	7	0.8%
Functional status	Working	361	86.0%	708	84.3%
	Ambulatory	38	9.0%	75	8.9%
	Bedridden	21	5.0%	57	6.8%

4.3. Recent clinical characteristics of study participants

The median resent CD4 cell count of cases was 530 cells/mm^3 [IQR: 284-530 cells/mm^3] and that of controls was 430 cells/mm^3 [IQR: 281-560 cells/mm^3]. Over one-thirds, 279(35.9%) of cases, and 499(64.1%) of controls had >350 cells/mm^3 of resent CD4 cells counts (Table 4).

Two hundred six (49.5%) of cases' and 458(54.5%) of controls' recent adherence status was good. Regarding to viral load measurement, 389(92.6%) of cases and 772(91.9%) of controls measured. Among these 348(82.9%) of cases and 714(85.0%) controls had < 1000 copies/ml. One hundred ninety-nine (47.4%) of cases were treatment stage I before the loss to follow up whereas 327(38.9%) of controls were treatment stage II (Table 4).

The majority 346(82.4%) of cases and 642(76.4%) of control had no history of drug regimen substitution. Three-fifths, 252(60%), of cases and nearly two-thirds 449 (53.5%) of controls had history of receiving INH prophylaxis. Two hundred thirty-nine (56.9%) of cases and 548(65.2%) of controls had history of receiving Cotrimoxazole. Nearly two-thirds, 277(66.0%), of cases and, 530(63.1%), of controls had history of opportunistic infection (Table 4).

Three hundred twenty (76.2%) of cases and seven hundred seven (84.2%) of controls had not ever history of TB after initiation of ART. More than three-fourth, 331(78.8%), of cases and, 784(93.3%), of controls had no history of side effect. The majority, 394(93.8%) of cases and 777(92.5%) of controls appointment was recorded (Table 4).

The median resent body mass index of the cases was 20 K.g/m^2 [IQR: 18.9-21.7 K.g/m^2] and that of the control was 20 K.g/m^2 [IQR: 18.96-21.0]. Three hundred thirty-seven (80.2%) of cases and 696 (82.9%) of controls had body mass index of $\geq$ 18.5 K. g/m^2. Half, 214(51.0%) of cases and 682(81.2%) of controls functional status was working (Table 4).

Table 4: Recent Clinical Characteristics of HIV-positive adults on ART at High load ART health centers, East Gojjam, North-West Ethiopia, 2019

Variables		Last follow up status			
		Cases(n=420)		Controls(n=840)	
		Frequency	%	Frequency	%
CD4 cell count (cells/mm^3)	<200	65	15.5%	118	14.0%
	200-350	76	18.1%	223	26.5%
	>350	279	66.4%	499	59.4%
Adherence	Good	206	49.5%	458	54.5%
	Fair	139	33.1%	310	36.9%
	Poor	75	17.4%	72	8.6%
Treatment stage	I	199	47.4%	307	36.5%
	II	137	32.6%	327	38.9%
	III	73	17.4%	176	21.0%
	IV	11	2.6%	30	3.6%
Drug regimen substitution	Yes	74	17.6%	198	23.6%
	No	346	82.4%	642	76.4%
INH prophylaxis	Received	252	60.0%	449	53..5%
	Not received	168	40.0%	391	46.5%
Cotrimoxazole prophylaxis	Received	239	56.9%	548	65.2%
	Not received	181	43.1%	292	34.8%
Opportunistic infection	No	143	34.0%	310	36.9%
	Yes	277	66.0%	530	63.1%
TB Infection after initiation of ART	Yes	99	23.6%	134	16.0%
	No	321	76.4%	706	84.0%
Side effect	No	331	78.8%	784	93.3%
	Yes	89	21.2%	56	6.7%
Functional status	Working	214	51.0%	682	81.2%
	Ambulatory	117	27.9%	98	11.7%
	Bedridden	89	21.2%	60	7.1%
Body mass index (K.g/m^2)	<18.5	83	19.8%	144	17.1%
	≥ 18.5	337	80.2%	696	82.9%
Appointment date	Recorded	394	93.8%	777	92.5%
	Not recorded	26	6.2%	63	7.5%
viral load	Not measured	31	7.4%	68	8.1%
	Measured	389	92.6	772	91.9

4.4. Personal and Psycho- social characteristics

Half, 212(50.5%), of cases and 542(64.5%) of controls had sufficient knowledge on ART. Regarding to attitude, 254(60.5%) of cases unfavorable attitude whereas 481(57.3%) of controls had favorable attitude (Table 5).

Nearly three-fourth, 303(72.1%), of cases and 619(73.7%) of controls had no ever-drinking alcohol after initiating of ART. Three hundred eighty-four (91.4%) of cases and 761(90.6%) of controls had no ever history of smoking after initiating ART. The majority, 395(94.0%), of cases and 790(94.0%) of controls had no ever history of chewing Khat (Table 5).

Two hundred thirty-three (55.5%) of cases and 510(60.7%) of controls were members of PLWA. Nearly two-third, 282(67.1%) of cases and 549(65.4%) of controls had no social support. More than half, 256(61.7%) of cases and 478(56.9%) of controls had no faced bereavement. More than three-fourth, 329(78.3%), of cases and, 652(77.6%) of controls had no disclosed their HIV status. Fifty-five (13.1%) of cases and 69(8.2%) of controls disclosed their HIV status to their partners (Table 5).

Table 5: personal and Psycho- social characteristics of HIV-positive adults on ART at High load ART health centers, East Gojjam, North-West Ethiopia, 2019

Variables	Respondents status			
	Cases (n=420)		Controls (n=840)	
	Frequency	Percentage	Frequency	Percentage
Knowledge				
Not sufficient	208	49.5%	298	35.5%
Sufficient	212	50.5%	542	64.5%
Attitude				
Unfavorable	254	60.5%	359	42.7%
Favorable	166	39.5%	481	57.3%
Drinking alcohol				
Yes	117	27.9%	221	26.3%
No	303	72.1%	619	73.7%
Smoking				
Yes	36	8.6%	79	9.4%
No	384	91.4%	761	90.6%
Chewing chat				
Yes	25	6.0%	50	6.0%
No	395	94.0%	790	94.0%
Member of PLHIV				
No	187	44.5%	330	39.3%
Yes	233	55.5%	510	60.7%
Social support				
No	282	67.1%	549	65.4%
Yes	138	32.9%	291	34.6%
Faced bereavement				
No	256	61%	478	56.9%
Member of family death	82	19.5%	147	17.5%
Due to friend death	73	17.4%	188	22.4%
Others	9	2.1%	27	3.2%
Disclosed				
No	329	78.3%	652	77.6%
Yes	91	21.7	188	22.4%
Partner	70	76.9%	115	61.2%
Mother	8	8.8%	33	17.6%
Father	6	6.6%	21	11.2%
Children	5	5.5%	19	10.0%
Friend	2	2.2%	0	0.0%

4.5. Health care system characteristics

The median waiting time of cases was 55 minutes [IQR: 40-70 minute] and that of control was 50 minutes [IQR: 40-60 minute]. Half, 212(50.5%), of cases and 346(41.2%) of controls had long waiting time of resent Clinic attendance. The majority, 343(81.7%), of cases and 796(94.8%) of controls had got pre-ART counseling. One hundred twenty-eight (37.3%) of cases were satisfied in pre-ART counseling whereas 326(41.0%) of controls were more satisfied. Nearly three-fourth, 312(74.3), of cases and 635(75.6%) of controls had no ever-faced unavailability health workers during clinic visit. The majority, 391(93.1%) of cases had no ever history of unavailability of ART drug during clinic visits. Two hundred fifty-eight (61.4%) of cases and 481(57.3%) of controls had no ever-convenient time during appointments. More than one-thirds, 149(35.5%) of cases satisfied whereas 381(45.4%) of controls were moderately satisfied in overall service of health center (Table 6).

Table 6: Health care system characteristics of HIV-positive adults on ART at High load ART health centers, East Gojjam, North-West Ethiopia, 2019

Variables	Respondents status			
	Cases (n=420)		Controls (n=840)	
Pre-ART counseling	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Had not get	77	18.3%	44	5.2%
Had got	343	81.7%	796	94.8%
More satisfied	51	14.9%	326	41.0%
Moderately satisfied	63	18.4%	190	23.9%
Satisfied	128	37.3%	280	35.2%
Not satisfied	101	29.4%	49	6.2%
Waiting time				
Short	131	31.2%	356	42.4%
Average	77	18.3%	138	16.4%
Long	212	50.5%	346	41.2%
Unavailability of health providers				
Yes	108	25.7%	205	24.4%
No	312	74.3%	635	75.6%
Unavailability of drug at health centers				
Yes	29	6.9%	0	0.0%
No	391	93.1%	840	100.0%
Appointment time				
Inconvenient	258	61.2%	481	57.3%
Convenient	162	38.8%	359	42.7%
Satisfied Service provided				
More satisfied	47	11·2%	310	36.9%
Moderately satisfied	85	20·2%	381	45.4%
Satisfied	149	35·5%	123	14.6%
Not satisfied	139	33·1%	26	3.1%

4.6. Others characteristics

Three hundred sixty-five (86.9%) of cases and 825(57.3%) of controls had no ever-used traditional medicine. Regarding to mode of travel to the health centers, 291(69.3%) of cases and

547(65.1%) of controls used car. The majority, 362(86.2%), of cases and 707(84.2%) of controls had telephone. (Table 7).

Table 7: Other characteristics of HIV-positive adults on ART at High load ART health centers, East Gojjam, North-West Ethiopia, 2019

Variables	Respondents status			
	Cases (n=420)		Controls (n=840)	
Used traditional medicine	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Yes	55	13.1%	15	1.8%
No	365	86.9%	825	98.2%
Mode of travel to ART health center				
by car	291	69.3%	547	65.1%
on foot	126	30.0%	268	31.9%
Other	3	0.7%	25	3.0%
Time taken to reach health center on foot				
< 1 hour	45	37.3%	103	38.4%
1 hour	6	4.8%	33	12.3%
>1 hour	73	57.9%	132	49.3%
Telephone				
No	58	13.8%	133	15.8%
Yes	362	86.2%	707	84.2%

About 124(29.5%), 102(24.3%) and 96(22.9%) of the respondents had side effect, lack of money for transportation, traditional healer preferring and bedridden respectively for the reason of loss to follow up (Figure 3).

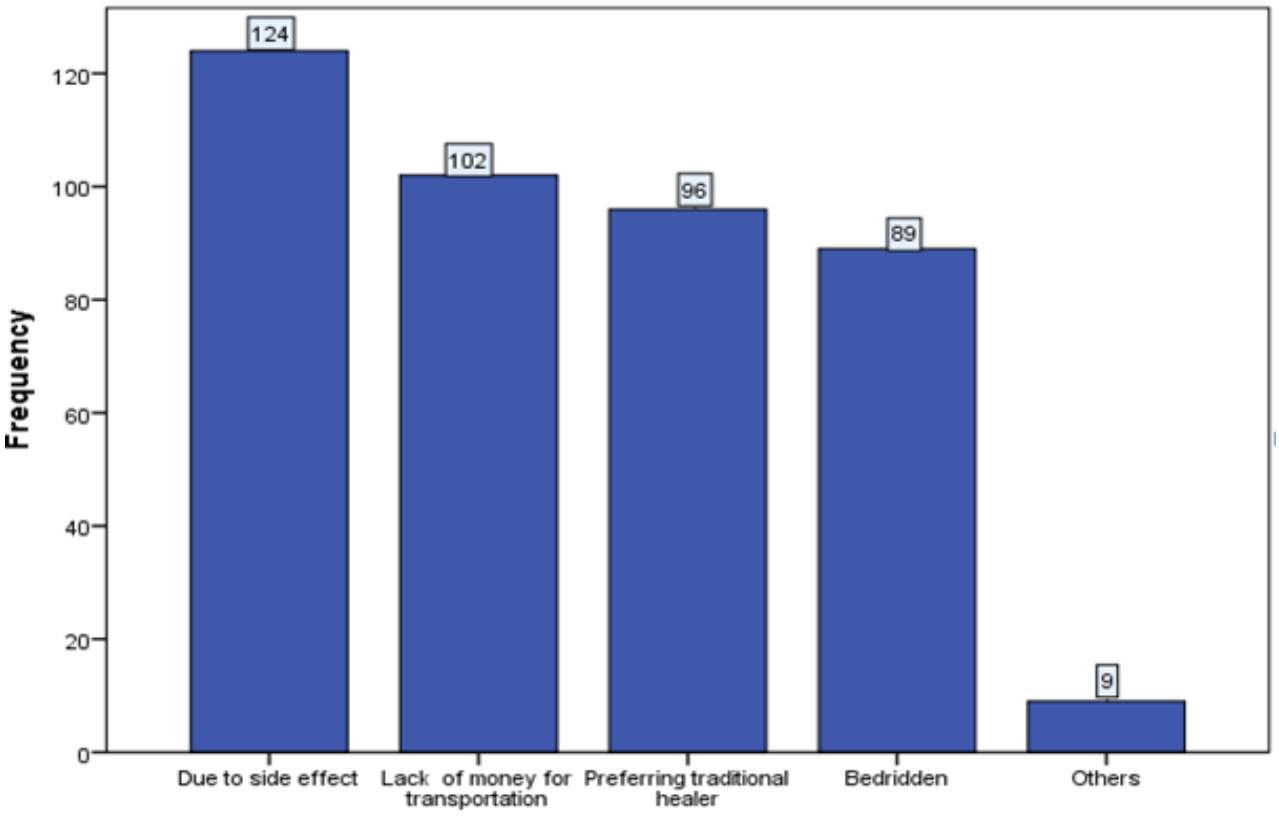

Figure 3: Reason for LTFU at High load ART health centers, East Gojjam, North-West Ethiopia, 2019

4.1. Factors associated with loss to follow up

Multivariable analysis showed that marital status was significantly associated with LTFU. Patients who were being married and live in separate were 3.10 times (AOR = 3.10, 95%CI; 2.06-4.65), widowed were 2.51 times (AOR=2.51, 95%CI; 1.47-4.29), divorced were 2.33 times (AOR=2.33, 95%CI; 1.46-3.72) and never married were1.6 times (AOR=1.61, 95%CI; 1.01-2.57) more likely to be loss to follow up compared with those married and live together. Patients who attended secondary education were 51 % (AOR = 0.49, 95%CI; 0.33-0.74) and college and above 59 % (AOR=0.41, 95CI; 0.16-0.68) times less likely to LTFU when compared to those who did not attend formal education. Those patients who were daily laborer were about 2.81 times more likely to LTFU as compared to those who were government employee (AOR= 2.81,95%CI; 1.52-5.20), those who had lowest monthly income were 1.54 times more likely to LTFU as compared to those who had highest monthly income (AOR= 1.54, 95%CI; 1.01-2.35) (Table 8).

Table 8: Multivariable analysis of factors associated with LTFU among HIV-positive adults on ART at High load ART health centers, East Gojjam, North-West Ethiopia, 2019

Variables	Last follow up status		COR (95% CI)	AOR (95% CI)	p-value
Marital status	**Cases (n=420)**	**Controls (n=840)**			
Married and live together	52	209	1		0.000
Married live in separate	177	257	2.77(2.02-4.16)	**3.10(2.06-4.65)**	
Never married	67	161	1.67(1.07-2.48)	**1.61(1.01-2.57)**	
Divorced	75	132	2.28(1.55-3.55)	**2.33(1.46-3.72)**	
Widowed	49	81	2.43(1.50-3.86)	**2.51(1.47-4.29)**	
Educational level					
No formal education	218	324	1		0.004
Primary	144	291	0.75(0.57-0.97)	0.79(0.58-1.08)	
Secondary	51	192	0.40(0.28-0.57)	**0.49(0.33-0.74)**	
college and above	7	33	0.38(0.16-0.88)	**0.41(0.16-0.68)**	
Occupation					
Governmental employee	38	77	1		0.000
Farmer	136	243	1.13(0.73-1.76)	0.98(0.57-1.67)	
Merchant	102	251	0.82(0.52-1.29)	0.83(0.48-1.44)	
Housewife	65	139	0.95(0.58-1.54)	0.98(0.55-1.77)	
Day laborer	67	82	1.66(0.99-2.74)	**2.81(1.52-5.20)**	
Others	12	48	0.51(0.24-1.06)	0.63(0.27-1.51)	
Monthly income					
Lowest income	101	148	1.15(0.80-1.05)	**1.54(1.01-2.35)**	
2nd quintile	87	172	0.85(0.59-1.23)	1.02(0.67-1.55)	
3rd quintile	70	181	0.65(0.45-0.95)	0.85(0.56-1.31)	
4th quintile	69	182	0.64(0.44-0.93)	0.71(0.47-1.07)	
Highest income	93	157	1	1	0.049
Co-enrollment of family member					
No	310	598	1.20(0.92-1.56)		
Yes	110	242	1		

Those patients who were < 12 months on ART were about 2.92 times more likely to undergone LTFU than when we compared to those who were≥24 months on ART (AOR= 2.92,95%CI; 1.87-4.54). Patients who did not received Cotrimoxazole prophylaxis were 1.74 times (AOR= 1.74, 95%CI; 1.30-2.34) were more likely to be LTFU compared to those who received Cotrimoxazole prophylaxis. Those patients who had history TB infection were 1.85 times (AOR= 1.85, 95%CI; 1.30-2.62) more likely to LTFU as compared with those patients who had no history of TB. Drug regimen at initiation of ART was also found to be significantly associated with LTFU. As patients started stavudine+ Lamivudine+Efavirenz (d4t+3TC+EFV) (AOR=5.21, 95%CI; 1.73-15.69), AZT+3TC+EFV (AOR=3.38, 95%CI; 1.71-6.67) and AZT+3TC+NVP (AOR=1.94, 95%CI; 1.42-2.65) were more likely to LTFU as compared to those who were taking TDF+3TC+EFV Patients who had baseline body mass index < 18.5 K. g/m^2 were (AOR= 1.56, 95%CI; 1.16-2.11) 1.56 times more likely to LTFU as compared to its complement (Table 8).

Patients who had long waiting time during resent clinic visit were 1.52 times (AOR= 1.52, 95%CI; 1.12-2.07) more likely to LTFU than those who had short waiting time (Table 8).

Table 8 (continued)

Variables	Last follow up status		COR (95% CI)	AOR (95% CI)	P-value
	Cases (n=420)	Controls (n=840)			
Months on ART					
<12	83	59	3.25(2.26-4.67)	**2.92(1.87-4.54)**	
12-23	68	160	0.98(0.71-1.35)	0.99(0.71-1.35)	
≥ 24	269	621	1	1	0.000
Baseline WHO stage			0.66(0.47-0.91)		
I	120	195	0.72(0.53-0.98)		
II	101	249	1.10(0.75-1.62)		
III	132	297	0.66(0.75-1.62)		
IV	67	99	1		
Recent adherence					
Good	206	458	1		
Fair	139	310	0.78(0.59-1.01)		
Poor	75	72	0.76(0.55-1.04)		
CPT					
Not received	181	292	1.42(1.12-1.80)	**1.74(1.30-2.34)**	
Received	239	548	1	1	0.000
INH					
Not received	168	391	0.77(0.60-0.97)		
Received	252	449	1		
TB					
Yes	99	134	1.62(1.21-2.17)	**1.85(1.30-2.62)**	
No	321	706	1	1	0.001
Treatment stage					
I	199	307	1		
II	137	327	0.64(0.49-0.83)		
III	73	176	0.64(0.46-0.89)		
IV	11	30	0.77(0.41-1.48)		
Resent CD4 cells count/mm^3					
<200	65	118	0.99(0.70-1.38)		
200-350	76	223	0.61(0.45-0.82)		
>350	279	499	1		
Baseline drug					

regimen					
TDF+3TC+EFV	103	295	1	1	0.000
AZT+3TC+NVP	265	436	1.74(1.33-2.28)	**1.94(1.42-2.65)**	
TDF+3TC+NVP	17	75	0.65(0.37-1.15)	0.84(0.44-1.60)	
AZT+3TC+EFV	24	27	2.55(1.41-4.61)	**3.38(1.71-6.67)**	
d4t+3TC+EFV	11	7	4.50(1.70-11.92)	**5.21(1.73-15.69)**	
ART regimen substitution					
Yes	74	198	0.69(0.52-0.93)		
No	346	642	1		
Baseline body mass index in K.g/m^2					
<18.5	136	204	1.49(1.15-1.93)	**1.56(1.16-2.11)**	
≥ 18.5	284	636	1	1	0.004

Table 8 (Continued)

Variables		**Last follow up status**		**COR (95% CI)**	**AOR (95% CI)**	**P-value**
		Cases	**Controls**			
Association of PLHIV	No	187	330	1.24(0.98-1.57)		
	Yes	233	510	1		
Bereavement	Yes	164	362	0.85(0.67-1.07)		
	No	256	478	1		
Appointment time	Inconvenient	258	481	1.19(0.94-1.51)		
	Convenient	162	359	1		
Mode of travel	By car	291	547	1		
	On foot	126	268	0.88(0.66-1.14)		
	Other	3	25	0.23(0.07-0.75)		
Waiting time	Short	131	356	1	1	0.025
	Average	77	138	1.52(1.08-2.14)	1.29(0.87-1.93)	
	Long	212	346	1.66(1.28-2.17)	**1.52(1.12-2.07)**	

5. Discussion

The main objective of this study was to identify factors associated with lost to follow up and we found significant associations with a number of study variables. To begin with, patients who were reported as married and live in separate were found to be more than three-fold increase in the odds of LTFU with an estimated odds ratio of (AOR=3.10; 95% CI: 2.06-4.65) when comparing with patients who reported as married and live together.

This is congruent with the studies conducted in Nigeria [40], India[56] and Oromia (Ethiopia) [43]. This might be due to those patients who were married and lived in separate could not get treatment support from their partners which might force LTFU [46].

However, this finding is different from the study conducted in guinea Bissau [1]. The possible reason for this variation might be due to the fact that the types of data used in the analysis. The previous study used secondary data whereas this study used primary data. Because of this, there might be a change of marital status during the follow up period.

Concerning educational status, patients whose educational level was college and above were more than 59% decrease the odds of LTFU with an estimated odds ratio of (AOR=0.41; 95% CI: 0.16-0.68) as compared to those patients who had no formal education. This evidence is supported by the study conducted in Nigeria [41], guinea Bissau [1] and Southern Ethiopia[57]. This might be due to the fact that those patients who were college and above educational level might have higher knowledge about ART. This because the result of this study showed that 82.5%of patients whose education level college and above have sufficient knowledge so that they might know the negative impact of interrupting drugs for them as well as their family where as 51.6% of patients who had no education have insufficient knowledge. Other reason might be, about 60.0% of patients whose education level was college and above have positive attitude toward ART so that they might not miss the appointment where as 55.9% of patients who had no formal education have unfavorable attitude: Another reason also might be patients who were college and above education might have higher health seeking behavior which might prevent LTFU.

Regarding to occupational status, patients who were daily laborers were found to be nearly more than three-fold increase in the odds of LTFU with an estimated odds ratio of (AOR= 2.81; 95%

CI: 1.52-5.20) as compared to government employee. This is in line with the studies conducted in Nigeria [41], Oromia (Ethiopia) [43]. This might to be those HIV-positive adults who were daily laborers had life style of hand to mouth, and they may prefer to go work place rather than visiting health centers which might impose LTFU. Another reason might be, those patients who were daily laborers had low economic status and they might experience food insecurity which might force to interrupt drugs. This is because the result of this study showed that 31.4% of daily laborer had lowest monthly income where as 8.7% of governmental employee had lowest monthly income.

Furthermore, patients who were on ART for less than 12 months were more than three-fold increase in the odds of LTFU with an estimated odds ratio of (AOR=2.92; 95% CI: 1.87-4.54) as compared to patients who were on ART≥ 24 months. This is consistent with the study done in Tanzania [42]. This might be due to those patients who were < 12 months on ART may be clinically unstable due to side effects. Other reason might be those patients who might not get clinical improvement which might impose LTFU.

However, the finding of this study is different from the study conducted in Wukro (Tigray), Ethiopia [24] and South Africa[40]. This variation might be due to difference in the study participants and variable (months on ART) categorization. In the previous studies, there might be relatively higher number of LTFU were reported among those patients who were on ART for less than 12 months.

Another independent factor for LTFU was baseline ART drug regimen. HIV-positive adults who were starting with d4t+3TC+EFV were more than fifth-fold increase in the odds of LTF with an estimated odds ratio of (AOR=5.21; 95% CI: 1.73-15.69) as compare to patients who were starting with TDF+3TC+EFV. This was supported by the study conducted in Tigray region (Ethiopia) [24]. Current WHO guidelines recommend that ART drugs regimens do not contain stavudine (d4T), which have some of the most frequent and troubling side effects [58]. The result of these study showed that 78.9% of patients who had started with d4t+3TC+EFV had history of side effects whereas 19.9% of patients who had started with TDF+3TC+EFV. Therefore, this LTFU might be due to these side effects.

Similarly, HIV-positive clients who had ever TB illness after initiation of ART were more than 1.85-fold increase in the odds of LTFU as compared to those patients who had not ever TB (AOR=1.85; 95% CI: 1.30-2.62). Regarding to any types of TB, there are no other studies that support it but the study done in Tigray region support that smear positive Pulmonary TB were more likely to LTFU [23]. This is because TB increases HIV replication through the process of immune activation leading to increased viral load. This results in more rapid progression of HIV disease which might cause bedridden. This is because the result of this study showed that 34.9% of patients who had ever TB infection after initiation of ART had bedridden functional status where as 1.5% of patients who had not ever TB infection after initiation of ART had bedridden functional status during data collection. Another reason might be drug toxicity of anti-TB and ART drug. This is because the result of this study showed that 83.2% of patients who had TB infection after initiation of ART had history of side effects therefore, the side effects might impose LTFU.

Moreover, patients who did not receive Cotrimoxazole prophylaxis were more than 1.74-fold increase the odds of LTFU as compared to those patients who received Cotrimoxazole prophylaxis (AOR=1.74; 95% CI: 1.30-2.34). This is in line with the study conducted in Southern Ethiopia [27]. This is because HIV-positive patients who did not receive Cotrimoxazole prophylaxis were prone to opportunistic infections which might prevent to visit health centers. This is because the result of the study showed that 71.2% of patients who did not received Cotrimoxazole had history of opportunistic infection whereas 35.2% of patients who had history of received Cotrimoxazole had history of opportunistic infection. However, this finding is different from the study conducted in Pawi General Hospital (Ethiopia) [44]. This difference might be due to variation in the study participants. In the previous study, dead with higher number of non-receiving Cotrimoxazole prophylaxis was reported.

The finding of this study was interpreted with a number of limitations. To start with, history of Cotrimoxazole prophylaxis was ascertained by patient record review. Thus, there was not any mechanism to proof whether the patients were properly taking prophylaxis or not.

To avoid the disclosure issues, data collectors were selected from the same district where the study participants were living. This could create information bias. Despite this limitation, we

believe that our study findings provide an important insight into the factors related to LTFU among patients on ART.

Finally, the results of this study might work for all HIV- positive adults who have ART follow up at High load health centers.

6. Conclusion and Recommendation

6.1. Conclusion

In this study, being married and lived separately, being college and above, having lowest monthly income, being daily laborer, starting with d4t+3TC+EFV, not receiving Cotrimoxazole prophylaxis, being TB illness and taking ART less than 12 months were the main determinants of LTFU among HIV-positive adults.

6.2. Recommendation

- **To Zonal health department**

✓ More work is need in supporting for income generating activities

- **To Woreda Health Offices**

✓ More work is needed on the strengthening of social support especially for married and lived separately, single, divorced and widowed patients.

✓ Patient education and counseling should be strengthened.

- **To Health centers**

✓ Strong effort should be made in closely follow up for HIV- positive adults who were on ART for less than 12 months

✓ Should strengthen TB prevention with earlier initiation of ART.

✓ More work is needed on Providing Cotrimoxazole prophylaxis to decrease LTFU.

✓ Strong effort should be made in closely follow up of HIV-positive adults who were starting with d4T+3TC+EFV to reduce LTFU.

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APPENDICES

Appendix 1: Information and Consent form

Bahir Dar university medicine and health science college department of Epidemiology and biostatistics

Questionnaire to identify factors associated with lost to follow up in antiretroviral treatment for adult patients attending at high load ART health centers in East Gojjam Zone, North-West Ethiopia

Good morning/after noon

My name is---------- I am working as data collector in this study that identify factors associated with lost to follow up in antiretroviral treatment for adult patients attending at high load ART health centers in East Gojjam Zone, North-West Ethiopia for an investigator doing his thesis for the partial fulfillment of Master's degree in Field Epidemiology at Bahir Dar University, Ethiopia. You are selected by chance. Participation in this survey is voluntary and you can choose not to take part. However, your willingness to answer all of the questions is very important to you and other HIV/ADIS patients. Your name will not be written in this form and the information you will give to us is kept confidential. There will be no injection, drawing of blood or any blood fluid involved. You will be interviewed. It will not take more than 20 minutes. Generally, all information you will give will be used for only research purpose.

Are you voluntary to participate in this study?

A / yes B/ no

If the answer is yes, Thanks! Conduct

If the answer is no, Thanks! Transfer to the next respondent

Date of interview_____

Appendix 2: Checklist

Unique ART number----------

Sex ----------

How long have he/she been on treatment for HIV/AIDS (ART) in month ----------?

S. N	Questions	Baseline	Most resent
1	Body weight in kg	----------	----------
2	Body mass index in kg/m^2	----------	----------
3	CD4 cell count	----------	----------
4	WHO clinical stage/Treatment stage	----------	----------
5	Is Hemoglobin measured?	1. Yes 2. No	1. Yes 2. No
6	If Q5 is yes, what was the Status of anemia?	1. Anemic 2. Non-anemic	1. Anemic 2. Non-anemic
7	Has ever Viral load measured?	1. Yes 2. no	1. Yes 2. No
8	If Q7 is yes, how much copies/m?	----------	----------
9	What was the baseline drug regimen?		
10	Is the baseline drug regimen changed? 1. Yes 2. No		
11	If Q9 is yes, to what regimen?		
12	Resent Adherence 1. Good 2. Fair 3. Poor		
13	Had ever history of taking IPT? 1. Yes 2. No		
14	Had history of taking Cotrimoxazole Preventive Therapy? 1. Yes 2. No		
15	Had history of Opportunistic infection? 1. Yes 2. No		
16	Had history of Tuberculosis? 1. Yes 2. No		
17	If Q11 is yes what type of TB? 1. Extra PTB 2. PTB positive 3. PTB negative		
18	Resent partner HIV status 1. Known 2. Unknown		
19	If q15 is 1 what is the result 1. Negative 2. Positive		
20	Is there a reported side effect? 1. Yes 2. No		
21	Baseline Functional status1. Working 2. Ambulatory 3. Bedridden		
22	Is appointment date registered? 1. Yes 2. No		

Appendix 3: Questionnaires

Unique ART number----------

Instruction- circle the response for question with alternative and write for open ended question on the space provide

Part I: Socio demographic characteristics of study participants			
S. No.	Question	Answer and Code	Skip
101	Age in year	----------	
102	Residence	1. Urban 2. Rural	
103	Level of education	1. No formal education 2. Primary 3. Secondary 4. College and above	
104	Occupation	1. Daily laborer 2. Farmer 3. merchant 4. governmental Employee 5. Housewife 6. Others	
105	Current Marital status	1. Never Married 2. Married and live together 3. Married and live in Separated 4. Divorced 5. Widowed	
106	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Others	
107	Do you have a child?	1. Yes 2. No	If the answer is no, skip to Q109
108	If Q105 is yes, how many?	----------	
109	Number of family member in the household	----------	
110	Monthly income in Ethiopian birr	--------	
111	Is there a family member co enrollment in ART	1. Yes 2. No	

Part II: Knowledge on ART			
S. No.	**Question**	**Answer and Code**	**Skip**
201	ART consists of drugs to cure HIV/AIDS	1. Yes 2. No	
202	ART consists of drugs to suppress the activity of HIV	1. Yes 2. No	
203	ART reduce the viral load	1. Yes 2. No	
204	ART increases the CD4 count	1. Yes 2. No	
205	What is duration of ART treatment?	1. The treatment lasts until normal test results are obtained 2. The treatment lasts forever 3. Did not know 4. Others	
206	What are the precautions with the use of other drugs by people on ART?	1. It is possible to make use of any other medicine without prescribed by health professional 2. It is possibly make use of another medicine but under medical supervision 3. Don't know 4. Others	
207	Have you been told about the side effects (unwanted effects) of ARVs?	1. Yes 2. No	
208	What will happen if you stop taking your medication?	1. Nothing will happen 2. Your medication may become less effective and HIV will increase in you 3. You will be cured of HIV 4. Do not know	

		5. Others	

Part III: Attitude toward ART drugs						
S. No.	**Question**	**Alternatives**				
		Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
301	I do not need ART drugs because I am not convinced that I have HIV/AIDS					
302	Because there is no cure for HIV, taking the drugs is a waste of time					
303	Taking ART drugs for one's life time is tiring					
304	ART drugs help to prolong lives					
305	ART Reduces frequent sickness					
306	It is shameful to be on ARV therapy					
307	ART Side effects can lead to organ damage					

Part IV: Psycho-social characteristics			
S. No.	**Question**	**Answer and Code**	**Skip**
401	Have you ever faced stigma and discrimination while you have been taking ART drugs?	1. Yes 2. No	
402	Are you member of the Association of PLWHA?	1. Yes 2. No	
403	Have you ever gote social support?	1. Yes 2. No	
404	Have you faced Bereavement due to HIV?	1. Yes 2. No	If the answer is 2, skip to Q406
405	If Q404 is Yes, what is the reason?	1. Due to member of family death 2. Due to friend death 3. Others	

406	Have ever you disclosed your status?	1. Yes 2. No	If the answer is no, skip to Q501
407	If Q406 is yes, to whom?	1. To my partner 2. My father 3. My mother 4. My children 5. Friends 6. Others	

Part V: Health System Factors			
S. No.	**Question**	**Answer and Code**	**Skip**
501	Have you ever got pre- ART counseling?	1. Yes 2. No	If the answer is no, skip to Q503
502	If Q501 is yes, what is your satisfaction?	1. More satisfied 2. Moderately satisfied 3. Satisfied 4. Not satisfied	
503	Waiting time (in munities) of the recent visit at clinics	----------	
504	Have you ever faced unavailability of health providers during visits?	1. Yes 2. No	
505	Have you ever faced unavailability of drug at health center during visits?	1. Yes 2. No	
506	Is the appointment time's convenience?	1. Yes 2. No	
507	Have you been satisfied with services received at health center?	1. More satisfied 2. Moderately satisfied 3. Satisfied 4. Not satisfied	

Part VI: Other Factors			
S. No.	**Question**	**Answer and Code**	**Skip**
601	Have you ever used traditional medicine?	1. Yes 2. No	
602	What is your mode of travel to ART	1. By car	If the answer

	health center?	2. On foot 3. Others	is 1 and 3 skips to 605
603	If Q603 is on foot, average time taken to reach health center	1. Less than one hour 2. One hour 3. Greater than one hours	
604	Do you have telephone?	1. Yes 2. No	
605	Functional status	1. Working 2. Ambulatory 3. Bedridden	
606	Respondents status	1. Case 2. Control	If the answer is 2 skips to 608
607	What is the reason for loss to follow up?	1. Bedridden 2. Traditional healer /holy water better 3. Lack of transport money 4. Others (specify)	
608	After you have been on ART, have you ever smoking?	1. Yes 2. No	If the answer is 2 skips to 610
609	If Q608 is yes How often	1. Daily 2. Occasionally	
610	After you have been on ART, have you ever drinking alcohol	1. Yes 2. No	If the answer is 2 skips to 612
611	If Q610 is yes, How often	1. Daily 2. Occasionally	
612	After you have been on ART, have you ever chewing Khat?	1. Yes 2. No	If the answer is 2 say thank and stop

613	If Q612 is yes, How often	1. Daily 2. Occasionally	

Appendix 4: Amharic Version Questionnaires

የኮድ ቁጥር----------

የመረጃ እና የስምምነት ቅጽ

በባህርዳር ዩኒቨርስቲ ህክምና እና ጤና ሳይንስ ኮሌጅ በኢፒዲሞሎጅ እና በባዮስታትስቲክስ ትምህርት ክፍል

በምስራቅ ጎጃም ዞን አምስት መቶ ወይም ከዚያ በላይ የሚሆኑ የኤች አይቪ ህሙማን የፀረ ኤች አይቪ ኤዲስ መድሃኒት ህክምና ክትትል በሚያደርጉበት ጤና ጣቢያዎች ውስጥ ክትትል ከሚያቋርጡበት ጋር ግንኙነት ያላቸውን ነገሮች ለማጥናት የተአጋጀ ጥናታዊ ጽሁፍ መጠይቅ ነው።

ጤና ይስጥልኝ እኔ----------እባላለሁ ለዚህ ጥናታዊ ጽሁፍ የሚሆን መረጃ በመሰብሰብ ከሚሳተፍ ሰዎች ውስጥ አንዱ ነኝ። ይህንን ጥናታዊ ጽሁፍ የሚያጠናው በባህርዳር ዩንቨርስቲ ህክምና እና ጤና ሳይንስ ኮሌጅ በኢፒዲሞሎጅ እና በባዮስታትስቲክስ ትምህርት ክፍል የፊልድ ኢፒዲሞሎጅ ድህረ-ምረቃ ተመራቂ ተማሪ ነው። እርሰዎ የተመረጡት በአጋጣሚ ነው። በዚህ ጥናታዊ ጽሁፍ ላይ መሳተፍም አለመሳተፍም መብት ነው። ነገር ግን ቢሳተፉ የፀረ- ኤች አይቪ መድሃነት ህክምና ክትትል ለሚያደርጉ ህሙማን ትልቅ ጥቅም አለው። በመጠየቁ ላይ የእርሰዎ ስም አይፃፍም። የሚሰጡት መረጃ ሚስጥሩ የተጠበቀ ነው። የሚሰጡን መረጃ ከጥናታዊ ጽሁፍ ውጭ ለሌላ አይውልም። ይህንን ጥያቄ ለመጠየቅ እስከ 20 ደቂቃ ሊወስድ ይችላል። ለመሳተፍ ፍቃደኛ ነዎ?

1. አዎ----መልሱ አዎ ከሆነ ወደ ሚቀጥለው ጥያቄ እለፍ/ፊ
2. የለም----መለሱ የለም ከሆነ አመሰግናለሁ ብለህ/ሽ ጥያቄውን አቋርጥ/ጭ

መረጃ ሰብሳቢ

ስም----------ፊርማ----------ቀን----------

ተቆጣጣሪ ስም----------ፊርማ----------ቀን------

ክፍል 1፡ የማህበራዊ እና የስነ-ህዝብ ጥያቄዎች

ተ. ቁ	ጥያቄ	ምላሽ	የታለፍ
101	ዕድሜ	---------- አመት	
102	የመኖሪያ ቦታ	1. ከተማ 2. ገጠር	
103	የትምህርት ደረጃ	1. መደበኛ ትምህረት የአልተማሩ 2. አንደኛ ደረጃ 3. ሁለተኛ ደረጃ 4. ኮሌጅ እና ከዚያ በላይ	
104	ስራ	1. የቀን ሰራተኛ 2. ተቀጣሪ ሰራተኛ 3. ግብርና 4. የቤት እመቤት 5. ሌላ(ይገለጽ)	
105	የጋብቻ ሁኔታ	1. ባለትዳር እና አብረው የሚኖሩ 2. ባለትዳር እና በተለያየ ቦታ የሚኖሩ 3. ያላገባ/ች 4. የፈታ/ች 5. የሞተበት/ች	
106	ሃይማኖት	1. ኦርቶዶክስ 2. እስልምና 3. ፕሮቴስታንት 4. ካቶሊክ	

		5. ሌላ(ይገለጽ)	
107	ልጅ አለህ/ሽ?	1. አዎ 2. የለም	መልሱ የለም ከሆነ ወደ ጥያቄ ቁጥር 107 ይለፉ
108	ጥያቄ ቁጥር105 መልስ አዎ ከሆነ ስንት?	-----	
109	የቤተሰብ አባላት ብዛት	--------	
110	የቤተሰቡ የወር ገቢ በብር ስንት ነው?	---	
111	ሌላ የቤተሰብ አባል የፀረ-ኤች አይቪ መድሃኒት የሚከታተል አለ/ች?	1. አዎ 2. የለም	

ክፍል 2፡ ስለፀረ-ኤች አይቪ ቫይረስ መድሃኒት ያለዎትን እውቀት የሚዳስሱ ጥያቄዎች

ተ. ቁ	ጥያቄ	ምላሽ	ይታለፍ
201	የፀረ ኤች አይቪ መድሃኒት የኤዲስ በሽታን ያድናል?	1. አዎ 2. የለም	
202	የፀረ ኤች አይቪ መድሃኒቶች የኤች አይቪ ቫይርስ ተግባራትን ያዳክማሉ?	1. አዎ 2. የለም	
203	የፀረ ኤች አይቪ መድሃኒት የኤች አይቪ ቫይረስ መጠንን ይቀንሳል?	1. አዎ 2. የለም	
204	የፀረ ኤች አይቪ መድሃኒት ሰውነት በሽታን የመከላከል አቅም ይጨምራል?	1. አዎ 2. የለም	
205	የፀረ ኤች አይቪ መድሃኒት የሚወሰደው ለምን ያህል ጊዜ ነው?	1. የኤች አይቪ ቫይረስ ምርመራ ውጤት ነጋቲቭ እከሚሆን 2. ለእድሜ ልክ 3. አለውቀውም 4. ሌላ(ይገለጽ)	

206	የፀረ ኤች አይቪ መድሃኒት የሚወስዱ ሰዎች ምን አይነት ጥንቃቄ ሌያደርጉ ይችላሉ?	1. ያለጤና ባለሙያ ትዛዝ ሌላ መድሃነት አብሮ መወሰድ ይቻላል። 2. በባለሙያ ድጋፍ እና ክትትል ሌላ መድሃኒት መውሰድ ይቻላል። 3. አለውቀውም 4. ሌላ(ይገለጽ)	
207	የፀረ ኤች አይቪ መድሃኒት የጎንዮሽ ጉዳት በባለሙያ ተነግሮዎታል?	1. አዎ 2. የለም	
208	መድሃኒቱን መዉሰድ ቢቆም ምን የሚከሰት ይመስለዎታል?	1. ምንም አይከሰትም 2. የኤች አይቪ ቫይረስ መጠን በሰውነት ውስጥ ሊጨምር ይችላል 3. ከኤች አይቪ ኤዲስ በሽታ እፈወሳለሁ 4. ምን እንደሚከሰት አላዉቅም 5. ሌላ(ይገለፅ)	

ክፍል 3፡ ከአመለካከት ጋር የተየያዙ ጥያቄዎች

ተ. ቁ	ጥያቄ	አማረጭ				
		በጣም አልስማማም	አልስማማም	እርግጠኛ አይደለሁም	እስማማለሁ	በጣም እስማማለሁ
301	የፀረ ኤች አይቪ መድሃኒት መውሰድ አልፈልግም ምክንያቱም ኤች አይቪ ቫይረስ በደሜ ውስጥ መኖሩን አላመንኩበትም ::					

302	የፀረ ኤች አይቪ መድሃኒት መውሰድ ጊዜ ማባከን ነው ምክንያቱም ከቫይረሱ መዳን ስለማይቻል ።					
303	እድሜ ልክ መድሃኒት መውሰድ አሰልች ነው ።					
304	የፀረ ኤች አይቪ መድሃኒቶች እድሜን ያራዝማሉ ።					
305	የፀረ ኤች አይቪ መድሃኒቶች በየጊዜው መታመምን ይቀንሳሉ ።					
306	የፀረ ኤች አይቪ መድሃኒት መውሰድ ያሳፍራል ።					
307	የፀረ ኤች አይቪ በአካል ክፍሎች ላይ የጎንዮሽ ጉዳት ሊያስከትሉ ይችላሉ ።					

ክፍል 4፡ የስነ-አዕምሮ እና የማህበራዊ ጥያቄዎች

ተ.ቁ	ጥያቄ	ምላሽ	የታለፍ
401	የፀረ ኤች አይቪ መድሃኒት በመውሰደዎ ምክንያት መገለል እና መድሎ አግጥሞዎ ያውቃል?	1. አዎ 2. የለም	
402	ኤች አይቪ ቫይረስ በደማቸው ውስጥ የአለባቸው ህብረተሰብ ማህበር አባል ነዎ?	1. አዎ 2. የለም	
403	ማህበራዊ ድጋፍ አግኝተዋል?	1. አዎ 2. የለም	
404	በኤዲስ በሽታ ምክንያት ሃዘን ገጠመዎ ያውቃል?	1. አዎ 2. የለም	መልሱ 2 ከሆነ ወደ ጥያቄ ቁ406 ይለፉ
405	የተ.ቁ. 404 መልስ 1 ከሆነ፣ ምክንያቱ ምንድን ነበር?	1. የቤተሰብ አባል ሞት 2. የጓደኛ ሞት	

		3. ሌላ(ይገለጽ)	
406	የኤች አይቪ ቫይረስ በደምዎ ውስጥ እንዳለ ከጤና ባለሙያ ውጭ ለሌላ ሰው ተናግረዋል?	1. አዎ 2. የለም	መልሱ የለም ከሆነ ወደ ጥያቄ ቁጥር 501ይለፉ
407	የጥያቄ ቁጥር 406 መልስ አዎ ከሆነ ለማን?	1. ለትዳር አጋር 2. ለአባቴ 3. ለእናቴ 4. ለልጄ 5. ለጓደኞቼ 6. ለሌላ(ይገለጽ)	

ክፍል 5፡ ከጤና ስርዓት ጋር የተየያዙ ጥያቄዎች

ተ. ቁ	ጥያቄ	ምላሽ	የታለፍ
501	የቅድመ ፀረ ኤች አይቪ መድሃኒት የምክር አገልግሎት አግኝተው ያውቃሉ?	1. አዎ 2. የለም	መልሱ የለም ከሆነ ወደ ጥያቄ ቁጥር 503 ይለፉ
502	የጥያቄ ቁጥር 501 መልስ አዎ ከሆነ የእርካታ ሁኔታ	1. በጣም እረክቻለሁ 2. በመጠኑ እረክቻለሁ 3. እረክቻለሁ 4. አረካሁም	
503	በጤና ጣቢያ ክትትል ሲያደርጉ ወረፋ ለመጠበቅ በአማካኝ ስንት ደቂቃ ይጠብቃሉ?	--------	
504	ለክትትል ጤና ጣቢያ በሄዱበት ወቅት አገልግሎት የሚሰጥ ባለሙያ የለም ተብለው ያውቃሉ?	1. አዎ 2. የለም	
505	ለክትትል ጤና ጣቢያ በሄዱበት ወቅት የፀረ ኤች አይቪ መድሃኒት የለም ተብለው ያውቃሉ?	1. አዎ 2. የለም	
506	ከጤና ጣቢያ የሚሰጠው የቀጠሮ ቀን(ጊዜ) የተስማሙበት ነው?	1. አዎ 2. የለም	

507	በጤና ጣቢያ የሚሰጠው አገልግሎት	1. በጣም ያረካል 2. በመጠኑ ያረካል 3. ያረካል 4. አያረካም	

ክፍል 6፡ ሌሎች ጥያቄዎች

ተ. ቁ	ጥያቄ	ምላሽ	የታለፍ
601	የባህል መድሃኒት ተጠቅመው ያውቃሉ?	1. አዎ 2. የለም	
602	ወደ ጤና ጣቢያ የሚሄዱት በምን ነው?	1. በመኪና 2. በእግር 3. በሌላ(ይገለጽ)	መልሱ 1 ወይም 3 ከሆነ ወደ ጥያቄ ቁጥር 605 ይለፉ
603	የጥያቄ ቁጥር 602 መልስ በእግር ከሆነ ስንት ስዓት ይስዳል?	1. ከአንድ ስዓት የአነሰ 2. አንድ ስዓት 3. ከአንድ ስዓት በላይ	
604	ስልክ አለዎ?	1. አዎ 2. የለም	
605	ከመደበኛ ተግባራት ጋር በተየያዘ የህሙማኑ ሁኔታ	1. መደበኛ ስራ የሚየከናውኑ 2. እነቅስቃሴ የሚያደርጉ ነገር ግን መደበኛ ስራ ማከናወን የማይችሉ 3. የአልጋ ቁራኛ	
606	ከፀረ- ኤች አይቪ መድሃኒት ክትትል ጋር በተየያዘ የህሙማኑ ሁኔታ	1. ክትተል የአቋረጠ/ች 2. ክትትል የሚያደርግ/የምታደርግ	መልሱ 2 ከሆነ ወደ ጥያቄ ቁ 608 ይለፉ
607	የፀረ ኤች አይቪ መድሃኒት የአቋረጡበት ምክንያት ምንድን ነው?	1. የአልጋ ቁራኛ 2. በባህል ህክምና 3. የመጓጓዣ ገንዘብ አለመኖር 4. ሌላ(ይገለፅ)	
የፀረ ኤች አይቪ መድሃኒት መውሰድ ከጀመሩ ወዲህ			
608	አልኮል ጠጥተው ያውቃሉ?	1. አዎ 2. የለም	የለም ከሆነ ወደ ጥያቄ ቁጥር 610 ይለፉ

609	የጥያቄ ቁ 608 መልስ አዎ ከሆነ ምን ያህል ጊዜ	1. በየቀኑ 2. አለፎ አልፎ	
610	ሲጋራ ወይም ሽሻ አጭሰው ያውቃሉ?	1. አዎ 2. የለም	የለም ከሆነ ወደ ጥያቄ ቁጥር 612 ይለፉ
611	የጥያቄ ቁ 610 መልስ አዎ ከሆነ ምን ያህል ጊዜ	1. በየቀኑ 2. አለፎ አልፎ	
612	ጫት ቅመውያውቃሉ?	1. አዎ 2. የለም	የለም ከሆነ አመስግነው ጥያቄውን ያቋርጡ
613	የጥያቄ ቁ 612 መልስ አዎ ከሆነ ምን ያህል ጊዜ	1. በየቀኑ 2. አለፎ አልፎ	

አመሰግናለሁ