Addis Ababa University, College of Health Sciences

School of Public Health

Adherence to Highly Active Antiretroviral Therapy and its associated factors among HIV infected adolescents in Addis Ababa, Ethiopia

By

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A thesis Submitted in Partial Fulfillment of the Requirements of the Master of Public Health Degree

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June, 2014

Addis Ababa, Ethiopia

ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

ADHERENCE TO HIGHLY ACTIVE ANTI-RETROVIRAL THERAPY AND ITS ASSOCIATED FACTORS AMONG HIV INFECTED ADOLESCENTS IN ADDIS ABABA, ETHIOPIA

BY- NAOD FIRUD (MD)

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Acknowledgments

I would like to acknowledge Addis Ababa University, College of Health Sciences, School of Public Health for providing me this opportunity of assessing the magnitude of ART adherence among adolescents in Addis Ababa, Ethiopia.

I also wish to express my special thanks to my advisors, Drs Fikre Enquoselassie and Degu Jerene, for their unlimited support, advice, careful guidance and critical reviews for which I will always be very grateful.

Funding for this thesis work was made possible in full by a CIPHER grant from the International AIDS Society, supported by ViiV Healthcare. The views expressed in this thesis do not necessarily reflect the official policies of the International AIDS Society or ViiV Healthcare.

I also appreciate the Management at the Zewditu Memorial, Tikur Anbessa and Saint Paul hospitals for their support and cooperation during the conduct this study.

List of Abbreviations and acronyms

AAU	Addis Ababa University
ABC	Abacavir
AIDS	Acquired Immune Deficiency Syndrome
ART	Anti-retroviral therapy
AZT/ZDV	Zidovudine
CPT	Cotrimoxazole Prophylactic Therapy
DALYs	Disability Adjusted Life Years Lost
DDI	Didanosine
d4t	Stavudine
EDHS	Ethiopian Demographic and Health Survey
EFV	Efavirenz
FMOH	Federal Ministry of Health
HAART	Highly active antiretroviral therapy
HIV	Human Immune deficiency Virus
IPT	Isoniazid Prophylactic Therapy
KAL	Kaletra (Lopinavir + Ritonavir)
LTFU	Lost to follow up
NVP	Nevirapine
SOP	Standard Operating Procedure
SSA	Sub- Saharan Africa
3TC	Lamivudine
TAH	Tikur Anbessa Hospital
TDF	Tenofovir
WHO	World Health Organization

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Abstract

Background: For antiretroviral therapy (ART) to work effectively, adherence is very crucial. However, most of the studies done on ART adherence are either on children or on adults. There is limited information on the level of adherence among adolescents. Since the physical, biological and behavioral changes which occur during adolescence could affect ART adherence, we endeavored to assess the level of adherence among adolescents treated at three hospitals in Addis Ababa, Ethiopia.

Study Objective: This study was carried out to assess the magnitude of ART adherence among HIV infected adolescents in Addis Ababa, Ethiopia. It also looked into the various socio-demographic, behavioral and clinical factors associated with ART adherence among adolescents.

Study Methods: Using a cross-sectional study design, 273 HIV infected adolescents receiving ART were interviewed from three hospitals in Addis Ababa. We used a structured questionnaire to measure adherence levels using patient self-reports among randomly selected adolescents aged 13-19 years. Data was entered using Epi Info version 3.5.4 and exported to SPSS version 21 for analysis. Bivariate and multivariate methods were used for analysis.

Results: We interviewed 273 adolescents aged 13 to 19 years, and 144 (52.7%) of the participants were female. Their mean age was 15.42 years (SD± 1.75). The self-reported adherence rate of the respondents was 79.1% (216/273). Most (96%) were on first line antiretroviral drugs. The median duration on ART was 7 years (IQR, 3). On Bivariate analysis; WHO stage, being on Cotrimoxazole Prophylactic Therapy (CPT), marital and living status of the parent, whether parent was on ART and having special instructions for ART medications were associated with optimum adherence. However only WHO stage IV (adjusted OR, 12.874 95% CI, 2.079-79.706), being on CPT (adjusted OR, 0.339 CI, 0.124-0.97) and adolescents with widowed parent (Adjusted OR, 0.087 with CI, 0.021-0.359) were significantly associated with optimum adolescent ART adherence.

Conclusions: The level of self-reported ART adherence among HIV infected adolescents at the three hospitals was below the recommended threshold. Being in advanced WHO clinical stage was associated with better adherence levels, but history of taking CPT was associated with poorer adherence. Earlier presentation of adolescents to care should be encouraged, but more targeted adherence support should be planned for those who present at early stage of their illness.

1. Introduction

1.1 Background

More than 1.5 billion of the world's population is between 10-24 years and 70% of those live in developing countries where, social, economic and health challenges are greater (1). Adolescence by definition is the period between 10 and 19 years (2, 3) and one-fifth of the world's population belongs to this age group. In the Sub- Saharan Africa (SSA), one third of the total population is aged between 10 to 24 years; similarly in Ethiopia 1/3 of the population is between ages 10-24 (1).

Historically, G. Stanley Hall coined the term 'Adolescence' in 1904. His two part text of 1904 entitled "Adolescence: its psychology and its relations to anthropology, sex, crime, religion and education" has been recognized as popularizing the use of the term "adolescent" and heralding the recognition of adolescence in the industrialized world as a vulnerable and malleable group deserving of special attention (2). Adolescence is a period of dynamic change representing the transition from childhood to adulthood. During this stage, rapid changes in physical, emotional, cognitive and social characteristics take place (2, 3). This period has three developmental stages; early adolescence (10-14 years) is marked by profound physical changes, whereas the second phase of middle adolescence (15-17 years) is where cognitive and emotive changes occur. The late stage of adolescence (18-19 years), is the time of social changes and moral development (3).

A study estimated the Global Burden of Disease among young people using data from WHO's Global Burden of disease study, 2004 (4). According to this study, the total number of incident Disability Adjusted Life Years Lost (DALYs) in those aged 10–24 years was about 236 million, representing 15·5% of total DALYs for all age groups. In the same study, Africa had the highest rate of DALYs for this age group, which was 2·5 times greater than in high-income countries (4). Similarly, another research which analyzed data from the 2004 Global Burden of Disease Study assessed the global patterns of mortality among young people aged 10-24 years (5). According to this study, almost two thirds of deaths in this age group were in Sub-Saharan Africa and Southeast Asia. Furthermore, infectious diseases like HIV/AIDS and tuberculosis

were among the significant causes of death (5). In 2011, youth (15-24) accounted for 40% of all new global HIV infections in people aged 15 years and older (6). In the same year, there were an estimated five million youth living with HIV and some 2400 youth newly infected with HIV every day. Among the five million youth living with HIV, 3.6 million (78%) lived in sub-Saharan Africa.

Studies in sub-Saharan Africa showed that adolescents and young women in particular, are vulnerable to HIV infection; despite reported behavioural changes, HIV incidence rates remain substantial in this age group (7). Adolescents make up a significant proportion of those on ART, as increasing number of children are growing into adolescence because of better access to ART and since the HIV incidence rates in the adolescent age group are substantial (8).

Adherence to medication has been described as the proportion of prescribed medications that is actually taken. It is measured on a scale from 0% to 100%. The recommended optimal adherence level for ART to be effective is above 95 percent (9). Any patient who misses more than 3 dosages in one month treatment course is considered to have achieved suboptimal adherence which is less than 95% (10). A level of adherence which is greater than 95% (optimal adherence) suppresses viral replication and prevents the development of resistance and treatment failure (9).

1.2 Statement of the Problem and rationale

It is known that young people are at the epicenter of the global AIDS epidemic. In sub-Saharan Africa, nearly 3.8 million youth are living with HIV/AIDS which comprise 76 percent of the world's HIV positive youth (11). In 2011, there were an estimated 1.2 million adolescents 10-19 years old living with HIV in Eastern and southern Africa, more than half of all HIV-positive adolescents globally (12). Though, less than one percent of Ethiopian youth tested positive for HIV on the 2011's Ethiopian Demographic and Health Survey (EDHS), according to the regional estimates of HIV prevalence among youth, Addis Ababa has the second highest prevalence next to Gambela (13). Similarly, another study revealed that HIV is significantly prevalent among youth in Addis Ababa, particularly among out- of school and female youth (14).

In Ethiopia ART was launched in 2003 and since 2005 it has been provided for HIV patients for free (15). For ART to work effectively, adherence is very crucial. The major factor determining the success of ART is sustainable and optimum adherence to therapy (16), as poor adherence increases the chance of virologic failure and viral resistance (17). Studies in North America showed that adolescents have worse adherence to ART and clinic appointments, than adults (18-20). Adolescents have been found to have poor adherence to antiretroviral therapy (18, 19) with one study showing a decrease in adherence as children moved into adolescence (21). Various studies also indicated that adolescents have poor treatment outcomes, compared to adults; low levels of virological suppression (18, 20, 22-24), increased risk of virological failure (22), loss to follow-up (LTFU) (20, 23) and death (22). However, there is limited information on the levels of adolescent ART adherence in resource-poor settings (25).

Adolescent ART adherence is influenced by several factors. A study showed that, poor processing of disclosure, stigma, the accessibility of health facilities, due distance and waiting time, the nature of social support, and feelings toward taking antiretroviral were factors associated with poor adherence (26). Studies done on ART adherence in Ethiopia are either on children or on adults and those showed high adherence rates (27, 28). Studies on the level & predictors of HAART adherence among adolescents in Ethiopia are lacking. Therefore, in this study we aimed to fill this information gap by assessing the magnitude and factors associated with ART adherence among adolescent HIV patients in Addis Ababa.

2. Literature Review

2.1 Magnitude (Health Burden of Adolescents)

In 2008, the worldwide population of young people aged between 10 and 24 years was more than 1·8 billion, representing 27% of the population (1). This number is projected to peak in 2032 to about 2 billion, with 90% of these people in this age group living in low-income and middle-income countries (1). Adolescents 10-19 years old make up twenty percent of the global population.

A study was done to estimate the Global Burden of Disease among young people (4). This study used systematic analysis of data from WHO's Global Burden of Disease study in 2004. In the same study, however, the total number of incident Disability Adjusted Life Years Lost(DALYs) in those aged 10–24 years was about 236 million, representing 15·5% of total DALYs for all age groups. This is a significant contribution despite the assumption that young people are healthy. In the same study, Africa had the highest rate of DALYs for this age group, which was 2·5 times greater than in high-income countries (208 *vs.* 82 DALYs per 1000 population) (4). Similarly, another study analyzed the same WHO 2004 Global burden of Disease data and assessed the global patterns of mortality among young people aged 10-24 years (5). Rates of mortality were highest in Sub-Saharan Arica and Southeast Asia; almost two thirds of the deaths were in those regions. Moreover, infectious diseases like, HIV/AIDS and tuberculosis were among the significant causes of death (5).

Globally, about 40 percent of new HIV infections are among young people (6, 11). This age group also has the highest rates (over 500,000 infections daily) of sexually transmitted infections, excluding HIV (6). Young people are particularly vulnerable to HIV infection for social, political, cultural, biological, and economic reasons. Adolescent girls in particular are disproportionately affected by HIV (12). In Africa, the burden of HIV among youth is so high that trends among young people shape the overall epidemic (12).

In Sub-Saharan African Countries, adolescents are the emerging group of HIV infected population as survival of children with perinatally acquired HIV infection into adolescence is increasingly being documented (30, 31). Furthermore, the burden of HIV in the adolescent population in the Region is also due to sexual transmission, with adolescents and young adults being particularly vulnerable to this mode of transmission (32).

The overall HIV prevalence among Ethiopian youth is low; below one percent (13). The regional estimates of HIV prevalence among youth are similar. However there are some regions with high HIV prevalence. In Gambela HIV prevalence among young women is much higher, at 9 percent, than in other regions of the country (13). The second highest is the prevalence among young women in Addis Ababa which is 1.7% (13). Similarly a study done by Negussie Taffa assessed the prevalence of HIV among youth in Addis (14). The study screened air dried saliva of participants for HIV 1 IgG antibodies using HIV 1&2 rapid ELISA kit. This study came up with a high HIV prevalence of 3% among youth in Addis (14).

2.2 Level of HAART adherence

Adolescence is a complex development phase of marked psychosocial, behavioral, physiological and cognitive changes (31, 33) that exacerbate the challenges of an HIV-positive status and the requirement to adhere to a structured treatment regimen. Adolescence, being a time of behavioral experimentation and risk-taking, has unique challenges of maintaining health especially when compounded by HIV infection (34, 35). Different factors may complicate adolescents' transition toward taking responsibility for managing their illness, ART adherence and clinic appointment attendance.

Various studies showed that adolescents have poor adherence to antiretroviral therapy (18, 19) with one study showing a decrease in adherence as children moved into adolescence (21). In addition, lower levels of virological suppression (18, 20, 22-24), increased risk of virological failure (22), loss to follow-up (LTFU) (20, 23) and death have all been described among adolescents (22). Based on an American study on HIV infected children and adolescents, rates of self-reported adherence were relatively high and were influenced by multiple child and family characteristics (36). Of the 2088 children and adolescents studied, 84% reported complete adherence to antiretroviral therapy medications over the past 3 days. The median viral load was 10 times higher among non-adherent than adherent children, and the strength of this association increased with age. This study, however, was not limited to the adolescent age group; it included those aged 3-18 years (36).

According to a study in Gaborone, Botswana; a high proportion of HIV-infected adolescents studied had excellent ART adherence (37). In this study, adherence to ART was considered excellent when greater than or equal to 95% of the prescribed doses were taken; the

study used pill count method to measure adherence. However, this study was limited to a single institution and had a small (82 subjects) sample (37). In contrast, Kambale's study showed lower adherence rate with the adherence mean for the entire adolescent studied population being 76.9%, which was lower than the required adherence rate of 95% necessary to ensure the success of the ART (26). This study was done among those between 13-20 years and it used patient self-report to measure adherence (26).

As described the major factor determining the success of HAART is sustainable and optimum adherence to therapy (16) as poor adherence increases the risk of virologic failure and viral resistance (17). Several studies documented the association between low ART adherence with poor treatment outcome. Though there are few adolescent studies, adherence studies conducted in Africa have largely been on adults.

Based on the 2011 EDHS HIV prevalence in Ethiopia, among adults aged 15-49 years was 1.5 percent (confidence interval 1.2-1.7 percent) (13). In Ethiopia, antiretroviral drugs have been in use for the past ten years. However, there was widespread national coverage only after 2006 (15). In Ethiopia, studies on levels and predictors of ART adherence have largely been of adults and also children. A study on HIV infected children (3months-14years) taking HAART in five hospitals in Addis Ababa reveled self-reported adherence levels of 93.1% in 3 days and 86.9% in a 7-days recall period and this was found to be higher than other similar setups (27). In the same study numerous variables were found to be significantly associated with adherence (27). Similarly, a study among children below the age of 15years attending pediatric ART clinic of Tikur Anbessa Hospital assessed the ART adherence using a somewhat different method; unannounced home based pill count. The level of ART adherence based on unannounced home-based pill count was found to be unacceptably low, 34.8% (29). In both studies important part of the adolescent age group (15-19) was excluded. Another Ethiopian study on HIV infected adults also came up with high self-reported ART adherence rate (28).

2.3 Factors associated with adherence

In the previously mentioned Botswana study; male sex (odds ratio [OR] 3.29, 95% confidence interval [CI] 1.13–9.54; $P = 0.03$) was the only factor which was independently

associated with suboptimal ART adherence (37). Kambale's study however described various common factors contributing to poor adherence among adolescents (26). The study found that, poor processing of disclosure, stigma, the accessibility of health facilities, due distance and waiting time, the nature of social support, and feelings toward taking antiretroviral were associated with poor adherence (26).

Based on the former American study on HIV infected children and adolescents, factors associated with at least marginally significant increases in non-adherence in a multiple logistic regression model included, increasing age in years, female gender, detectable HIV viral load, occurrence of recent stressful life events, repeating a grade in school, self-assessment of adherence by the subject, and diagnosis of depression or anxiety (36). Having an adult other than the biological parent as the primary caregiver, using a buddy system to remember to take antiretroviral therapy medications, higher caregiver education level, previous adherence assessments, and taking antipsychotic medications were each associated with improved adherence. After controlling for these characteristics, there was no significant association of adherence with race, knowledge of HIV status, medication burden, CD4 percentage, or current antiretroviral therapy (36).

Gibb's etal revealed that symptomatic HIV disease was associated with better ART adherence (38). Catz etal also found that healthy HIV-infected outpatients had lower rates of adherence to medical appointments than the symptomatic ones (39). Nabukeera etal also found that those who had been hospitalized two or more times had better adherence (40). This implies that those who are healthy be less serious about taking their medication. Those studies however, were all on HIV positive children, not on adolescents.

A study in Ethiopia among HIV infected patients below 15 years old showed that several factors were associated with ART adherence (29). In that study, those with married, widowed or divorced parent had better adherence than those with a single parent. Furthermore those who were not aware of their HIV sero-status and those who were on WHO stage III/IV at baseline were more likely to adhere (29).

2.4 Conceptual Framework

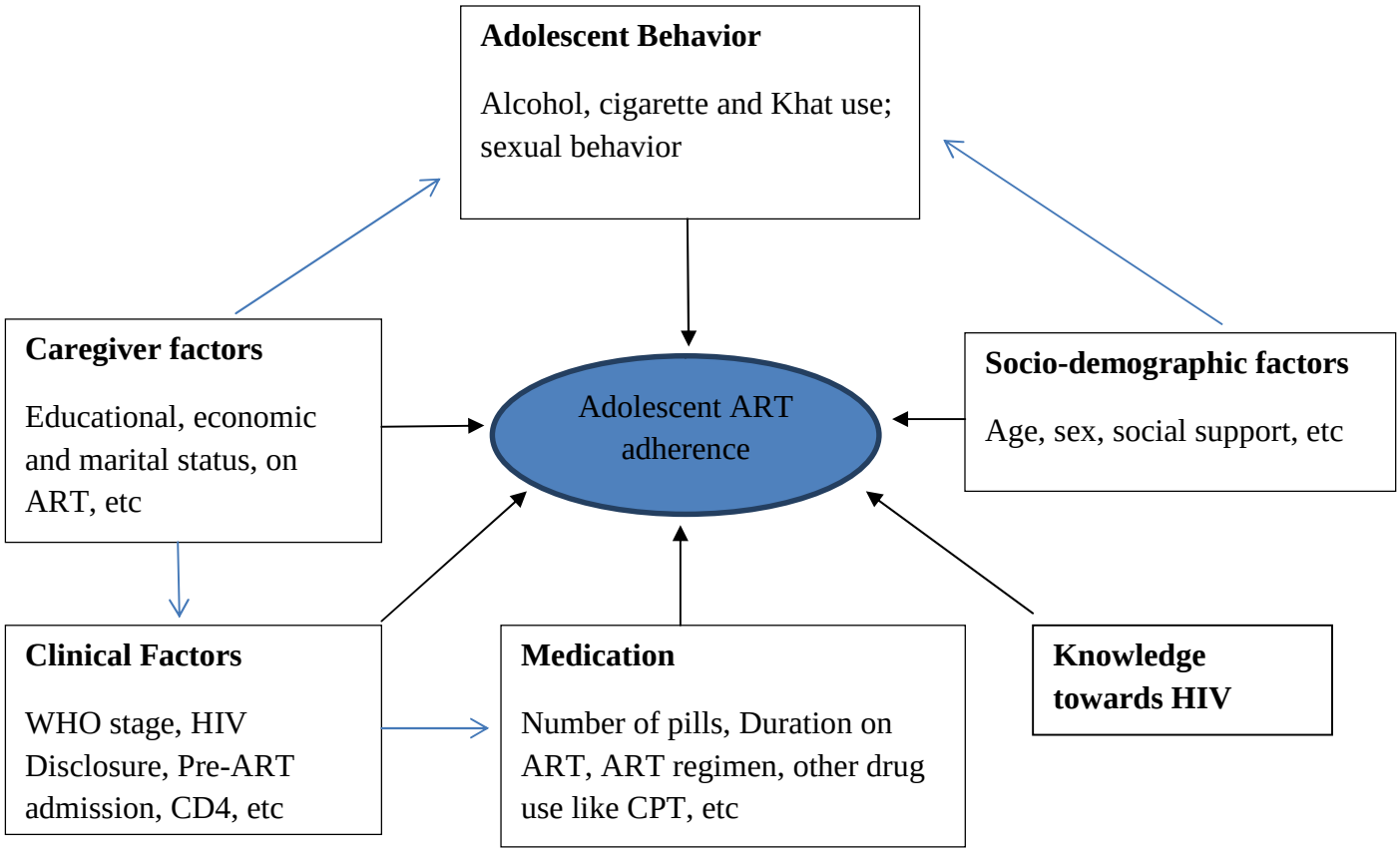

Figure 1: Conceptual frame work on adolescent ART adherence based on the reviewed literature

3. Objectives

The study was designed to achieve the following objectives:

General Objective

To assess the level of HAART adherence and factors associated with it among HIV infected adolescents in Addis Ababa, Ethiopia

Specific Objectives

- ✓ To assess the level of HAART adherence among HIV infected adolescents in Addis Ababa.
- ✓ To determine socio-demographic, behavioral and clinical factors associated with HAART adherence among HIV infected adolescents in Addis Ababa.

4. Methods

4.1 Study Area

The study took place in three hospitals in Addis Ababa City, the Capital City of the Federal Democratic Republic of Ethiopia. It was carried out in the ART units of the following three health institutions. Tikur Anbessa, Saint Paulos and Zewditu Memorial hospitals; these three hospitals were selected based on two reasons; high case load (large number of HIV infected adolescents enrolled in the facilities) and based on convenience to the principal investigator. Among those, Tikur Anbessa Hospital is the single largest referral and tertiary level teaching hospital in Ethiopia. Patients are referred to this hospital from other health institutions across the country. St. Paul Hospital is also a General Specialized Teaching Hospital under the Federal Ministry of Health; while Zewditu Referral Hospital is under the Addis Ababa Regional Health Bureau, known to serve most of the patients on ART follow-up. All the three hospitals have separate ART clinics for children and adults. Adolescents are cared for in either the child or in the adult clinics. There are no separate adolescent ART clinics.

4.2 Study Design

The study used a facility based cross-sectional study design.

4.3 Target (Source) Population

All HIV infected adolescents in Addis Ababa, Ethiopia.

4.4 Study Population

All adolescents who are taking HAART and are on follow up in the selected hospitals during the study period.

Inclusion criteria:

- Willingness to participate in the study
- Age between 13-19yrs.

4.5 Study Subjects

In each of the three health facilities, list of all adolescents aged between 13-19 years and who are on ART was prepared. The patient ART register book and electronic database maintained at each site were used to prepare this list. And the study subjects were sample of adolescents from the prepared list.

4.6 Sample size and Sampling Procedure

The sample size was calculated using StatCalc of Epi info version 3.5.4 software package by considering the following assumptions:

- Proportion of non-adherence among unexposed, 23.1% ( ).
- 80% power and non-exposed to exposed ratio of 1:1
- 95 % confidence interval
- Odds ratio of 2
- 10% Non-response rate

This gives a total sample size of 379, including the ten percent non-response rate. Since this study focused on a unique population with limited size the finite population correction was then applied.

Then finite population formula was applied to reach at the final sample size of n= 303

$$n = \frac{n0}{(1 + \frac{n0}{N})}$$

Where n0 is the sample from an infinite population, 379

The total sample size was allocated proportionally to the three facilities. This was done after determining the population size in each facility i.e. total number of adolescents on HAART at each institution.

Sampling frame was prepared using patient ART register book and the electronic database. The frame constituted all HIV infected adolescents on ART aged 13-19 years & on follow up at the

three facilities. Then simple random sampling was used to identify the predetermined number of adolescents from each facility.

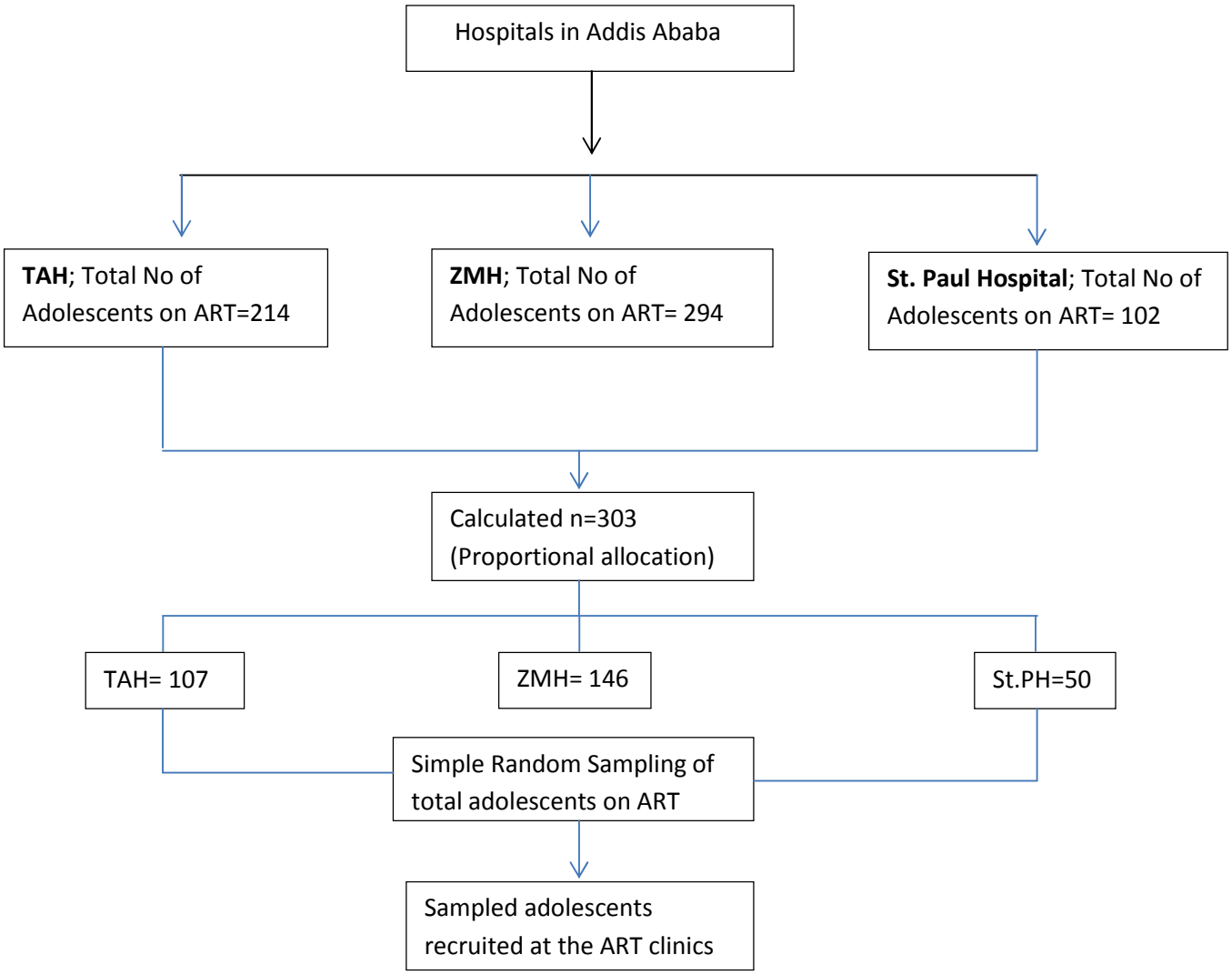

Figure 2: Schematic presentation of the sampling procedure

4.7 Study Variables

The dependent variable (main outcome variable) in this study is ‘adherence to ART, independent variables are socio-demographic, behavioral and clinical factors. And these include: -

- Sex
- Age
- HIV status disclosure
- Educational status of care givers
- Marital status of the caregiver
- Occupational status of the caregiver
- Monthly income in ETB of the caregiver
- Co-trimoxazole intake beside ARV
- WHO stage, CD4 value at ART initiation
- Who is the primary caregiver responsible for the adolescent?(Biological parents/Non-biological parents)
- Hospitalizations before ART
- Caregiver also on ART
- Smoking, alcohol, Khat use and sexual history

4.8 Operational Definitions

Adherent- Participant is said to be adherent if he/she took more than 95% of the prescribed pills correctly for the four days prior to the study.

Adolescence – The period between 13 to 19 years of age.

Youth – Those between the ages of 15 to 24 years.

Young People – those between 10-24 years

Baseline- Refers to the time at which Anti-retroviral treatment is initiated.

4.9 Data Collection Methods

4.9.1 Data collection tools: A structured questionnaire was used after pretest. It was adapted from various literatures and had different sections.

1. *Measurement of adherence*: Adherence was measured using a tool adapted from AIDS Clinical trials Group (ACTG). The ACTG patient self-reported adherence instrument was used.
2. *Behavior assessment*: This was measured by questions adopted from the Youth Risk Behavior Survey (YRBH), 2013 a standard tool.
3. *Socio-demographic conditions:* of the adolescent and parent/caregiver were assessed.
4. *Clinical factors:* some clinical variables were also included in the tool.

The data collection tool was first translated to Amharic and back translated to English by a different person to check for validity of translations.

4.9.2 Data collection procedure: Nurses working in the ART clinics of the selected facilities were recruited as data collectors and were provided with two days intensive training on the study and on the Standard Operating Procedure (SOP) of the study. The tool was pretested on non-sampled adolescents and was modified accordingly. The pretest was on 5% of the sample size.

A list of the sampled subjects was provided to the ART nurse in the follow-up clinic. The sampled adolescents were-not identified by names, rather by the medical record number. The nurses checked whether patients coming to the clinic were in the list or not. Those in the list were directed to the study after their clinical evaluation. This was carried out for one month. After one month, patients were recruited consecutively till the sample size allocated for that specific facility was reached.

Nurses collected data by face to face interview with the adolescents. This was done in a private room to create an atmosphere of empathy and confidence. For adolescents whose HIV status was not disclosed, data regarding ART medications adherence was taken from their parents/caregivers.

Patient medical charts were used to retrieve clinical information like CD4, Hgb and others.

5. Data Management and Analysis

To ensure data quality intensive training was provided to data collectors and the tool was pretested. All data collectors were BSc degree holders. The data collection process was closely monitored by the principal investigator. The completed questionnaires and signed consent forms were collected on twice weekly basis. The researcher checked for completeness and accuracy of the forms and put them in order of numbers to be entered into a data base.

Data were entered using Epi Info version 3.5.4. Then, it was exported to SPSS version 21 using Stat /Transfer. Cleaning and final analysis of the data were done by the researcher on SPSS, v21. First, descriptive statistics was carried out to explore the socio-demographic characteristics of the respondents, the adherence rate and clinical characteristics of the adolescents. Then, the various independent variables were explored for association with ART adherence on bivariate analysis. Finally those variables which were found to be associated with adherence at a level of P-value of less than 0.05 were included in the multivariable analysis.

6. Ethical Considerations

The research was reviewed and approved by the School of Public Health, Addis Ababa University and by the IRBs of the institutions. Permission to conduct the study was also sought from the Medical Directors of the three hospitals. Adolescents and caregivers received information about the study. Written informed consent was obtained from adolescents aged 18 and above. For adolescents under 18 years, consent was obtained from parents or legal guardians in addition to verbal assent by the young.

To ensure confidentiality of all study participants, no direct identifiers were used in the data collection, storage or report writing. All electronic documents were password protected and all paper documents were stored in a locked cabinet. Accidental disclosure of HIV status to those non-disclosed adolescents was prevented. This was dealt with by training the interviewer on the study protocol and by collecting data regarding adherence from parent/caregiver.

7. Dissemination

Results will be disseminated to the scientific community, practitioners, patient groups and the general public through relevant media. This will be achieved in a form of oral and written

presentations in local and international meetings, press releases of scientifically confirmed data, and publications in peer-reviewed scientific journals.

8. Study Results

8.1 Characteristics of Participants

Table 1 provides the socio-demographic characteristics of the study participants. A total of 273 adolescents aged 13 to 19 years were interviewed in the study with almost an equal proportion of both sexes; 144 (52.7%) female participants; making response rate 91%. The mean age of the sample was 15.42 years. Almost all the respondents were living in urban settings. The median age of caregivers was 42 years with the minimum age of 20 years and a maximum of 76 years. Almost three fourth of the caregivers 197 (72.2%) were orthodox by religion. Regarding the marital status of caregivers around two third 162 (60%) were either single or were widowed; 105 (38.9%) were married. Concerning the educational status of the care givers, 54(19.8%) were university graduates; 90(33%) completed or had some secondary education. Looking at occupation of the caregivers 88 (31.9%) had private jobs, 67 (24.5%) were house wives and 34 (12.5%) were government employees. 11.7% of the care givers were unemployed. About one third of the adolescents had both Parents dead and 39 (14.3%) were cared by their grandparents. The majority 165 (60.5%) of the adolescents were cared by either of their parent. Only 45 (16.5%) of the caregivers had external monetary support for the adolescent. The median number of caregivers' children was 2 children (range: 0 to 9 children).

Table 1: Socio-demographic characteristics of study participants (adolescents on ART) and their caregivers; n=273, Addis Ababa, Ethiopia, 2014

Characteristics/variable	Frequency	Percentage
Sex of adolescent		
Male	129	47.3%
Female	144	52.7%
Age of adolescent		
13-14 years	96	35.2%
15-17 years	141	51.6%
18-19 years	36	13.2%
Mean Age: 15.42 with SD: 1.745		
Residence		
Urban	267	97.8%
Rural	6	2.2%
Caregivers' age		
20-35 years	60	22%
36-50 years	144	52.7%
51-65 years	42	15.4%
>65 years	27	9.9%
Religion		
Orthodox	197	72.2%
Islam	35	12.8%
Protestant	35	12.8%
Catholic	4	1.5%
Other	2	0.7%
Caregiver marital status		
Married	105	38.9%
Single	81	30%
Widowed	81	30%
Divorced/separated	3	1.1%
Caregiver educational status		
University graduate	54	19.8%
Secondary	90	33.0%
Primary	78	28.6%
Can read & write	18	6.6%
Unable to read & write	30	11.0%

Occupation		
Private Job	88	31.9%
Government employee	34	12.5%
House wife	67	24.5%
Merchant	16	5.9%
Daily laborer	10	3.7%
Student	10	3.7%
Unemployed	32	11.7%
NGO	7	2.6%
House maid	3	1.1%
Caregivers relation with adolescent		
Mother	96	35.2%
Father	69	25.3%
Brother	6	2.1%
Sister	15	5.5%
Grand parent	39	14.3%
Other relative	48	17.6%
Parents living status		
Both parents alive	90	33%
Father is dead	51	18.7%
Mother is dead	54	19.8%
Both parents are dead	78	28.6%
External monetary support		
No support	228	83.5%
Supported	45	16.5%
Number of caregiver's children		
Median number of children = 2children (range 0-9)		

8.2 Behavioral Characteristics

Table 2 below shows some behavioral characteristics of adolescents. Nine (3.3%) of the adolescents have tried to smoke cigarette. Among those, the earliest age when a whole cigarette was smoked was 14years, 3 out of the 9 did at this age. None of the nine did smoke cigarette daily. Similarly, 9 (3.3%) of the respondents have used Khat and all of those nine were male respondents. Concerning alcohol use, 21 (8%) of the participants have used alcohol in the thirty

days prior to the survey. Of the 21, three of the respondents used alcohol on a daily basis for the thirty days prior to the study. Regarding sexual behavior, 12 (4.4%) of the study participants have had sexual intercourse. Of the 12, three used substance while having the last sexual intercourse; six did not use a condom at the last sexual act. The earliest age at first sex was 14 years.

Table 2: Behavioral characteristics of study participant adolescents on ART, Addis Ababa, Ethiopia, 2014

Variable	Frequency	Percentage
Ever used cigarette		
Yes	9	3.3%
Never	261	96.7%
Ever used Khat		
Yes	9	3.3%
Never	261	96.7%
Alcohol use*		
Yes	21	8%
No	243	92%
Ever had sex		
Yes	12	4.4%
No	258	95.6%
Substance use at last sex		
Yes	3	33.3%
No	9	66.7%
		n=12 (those who had sexual encounter)
Condom use at last sex		
Yes	6	50%
No	6	50%
		n=12 (those who had sexual encounter)

* Use of alcohol in the 30 days prior to the survey

8.3 Clinical characteristics

Close to three fourth of respondents 192 (71.2%) were either in WHO stage III or stage IV at initiation of ART. Concerning the CD4 count at the start of ART 123 (45.1%) had count less than or equal to 200 cells. Half of the participants 135 (49.5%) were on co-trimoxazole prophylactic therapy (CPT) at the time of the study. Almost all of the adolescents were having HIV care and follow up at Pediatric ART clinics, 254 (93%). Regarding disclosure of HIV status to the adolescent, 246 (90.1%) of the respondents were informed of their HIV status. The median hemoglobin level at base line was 12.3gm/dl (range: 8.5-17.9). Looking at the health facilities where the adolescents were enrolled in; 134 (49.1%) were in Zewditu Memorial Hospital, 94 (34.4%) were in Tikur Anbessa Hospital and the remaining in Saint Paul Hospital. Hundred and twenty nine (71.7%) of the parents were enrolled in HIV care and treatment and 141 (81%) of parents have disclosed their HIV status. Almost half of the participants 123(45.1%) had history of hospital admission before starting ART. Table 3 below describes the clinical characteristics of adolescents

Table 3: Clinical characteristics of participant adolescents on ART, Addis Ababa, Ethiopia, 2014

Variable	Frequency	Percentage
WHO clinical stage at baseline[#]		
Stage I	21	7.8%
Stage II	57	21%
Stage III	123	45.6%
Stage IV	69	25.6%
Baseline CD4 count		
<100	30	11.0%
100-200	93	34.1%
201-500	117	42.9%
>500	33	12%
On CPT*		
Yes	135	49.5%
No	138	50.5%
ART clinic		
Pediatric	254	93%
Adult	19	7%
Adolescent HIV status disclosure		
Disclosed		
Not-disclosed	246	90.1%
	27	9.9%
Baseline Hgb		
Median with range	12.3gm/dl (8.5-17.9)	
Hospital		
Zewditu Memorial	134	49.1%
Tikur Anbessa	94	34.4%
Saint Paul	45	16.5%
Parental HIV status disclosure		
Disclosed	141	81%
Not-disclosed	33	19%
Parent enrolled in HIV care		
Yes	129	71.7%
No	51	28.3%

Pre ART hospital admission		
Yes	123	45.1%
No	150	54.9%

* On CPT at the time of the survey, # baseline is to mean at the beginning of ART

8.4 Adolescent ART adherence

The vast majority of the adolescents 252 (92.3%) started ART in the facilities where they were enrolled at the time of this study. Almost all were on first line medications 262 (96%), furthermore 105 (38.5%) were on 4c= AZT/3TC/NVP, 69 (25.3%) were on 4d= AZT/3TC/EFV, 36 (13.2%) were on TDF/3TC/EFV and 21(7.7%) were on 4a=d4t/3TC/NVP. Hundred and forty seven (53.8%) had either of their parents on ART. The median duration on ART was 7 years (range; 0-12 years) whereas the mean age at ART initiation was 8.85 years (SD of 2.661years). The self-reported adherence rate of the respondents for the four days was 79.1% (216/273). Thirty nine (14.3%) of the respondents reported missing full day's medication within the prior four days. Six (2.2%) of the adolescents missed all ART doses of the four days i.e. zero adherence. 22% of the participants missed at least a single pill. Hundred and fourteen (41.8%) reported following specific medication schedule all of the time; seventy five (27.5%) reported following the schedule most of the time for the four days. One hundred fifty (54.5%) reported having ART medication with special instructions. In 99 (55.9%) of the cases parents were enrolled for HIV care at a different health facility than the adolescent.

Table 4: ART drugs, regimen, missed doses, duration and self-reported adherence among study participants (HIV infected adolescents) in Addis Ababa, Ethiopia 2004

Variable	Frequency	Percentage
ART regimen		
First line	262	96%
Second line	11	4%
ART drugs		
4a= d4t/3TC/NVP	21	7.7%
4b= d4t/3TC/EFV	3	1.1%
4c= AZT/3TC/NVP	105	38.5%
4d= AZT/3TC/EFV	69	25.3%
TDF/3TC/EFV	36	13.2%
AZT/3TC/KAL	16	5.9%
TDF/3TC/NVP	6	2.2%
TDF/3TC/AZT	3	1.1%
AZT/DDI/KAL	6	2.2%
Parent on ART		
Yes	147	53.8%
No	126	46.2%
Duration on ART in years		
< 6 years	75	27.5%
6 years and above	198	72.5%
Adolescent ART adherence		
Adherent (>95%)	216	79.1%
Non-adherent (< 95%)	57	20.9%
Missed full day's medication*		
Yes	39	14.3%
No	234	85.7%
Special instruction with ART		
Yes	150	54.5%
No	123	45.5%
Parent enrollment		
Same facility	48	27.1%
Different facility	99	55.9%
Not known	30	16.9%

* In one or more of the four days prior the study adolescent missed full day's medication

8.5 Factors associated with ART adherence

First several independent variables were examined on Univariate analysis to look for association with ART adherence. Table 5 below describes the factors that were associated on Univariate analysis. Factors like base line WHO clinical stage, being on CPT, caregiver's marital and living status, whether parent was on ART and special instruction with ART medications were found to be significantly associated.

Table 5: Factors associated with optimal adolescent ART adherence (> 95%) from bivariate analysis

Variable	Adherence level	P-value	Odds ratio with 95% CI
WHO clinical stage			
Stage I	13/21 (61.9%)	(reference)	
Stage II	40/57 (70.2%)	0.489	1.448 (0.508-4.128)
Stage III	96/123 (78%)	0.117	2.188 (0.822-5.823)
Stage IV	64/69 (92.75%)	0.001*	7.877 (2.220-27.950)
On CPT			
Yes	97/135 (71.85%)	0.004*	0.408 (0.221-0.752)
No	119/138 (86.2%)	(reference)	
Parent marital status			
Married	94/105 (89.5%)	(reference)	
Single	67/81 (82.7%)	0.181	0.560 (0.239-1.310)
Widowed	52/81 (64.2%)	0.000*	0.210 (0.097-0.454)
Parent living status			
Both are alive	82/90 (91.1%)	(reference)	
Father dead	34/51 (66.67%)	0.001*	0.195 (0.077-0.495)
Mother dead	34/54 (62.96%)	0.000*	0.166 (0.067-0.413)
Both are dead	66/78 (84.62%)	0.200	0.537 (0.207-1.390)
Parent on ART			
Yes	118/147 (80.2%)	0.039*	2.3 (1.042-5.078)
No	23/36 (63.89%)	(reference)	
Special medication instruction			
Yes	126/150 (84%)	0.03*	1.925 (1.066-3.477)
No	90/123 (73.2%)	(reference)	

*Statistically significant with P-value less than 0.05.

The above six variables which were found to be significantly associated with ART adherence on Univariate analysis were considered for multivariate logistic regression; to control for the possible effect of confounders. And three of the above variables were found to be independently associated with ART adherence; baseline WHO clinical stage, being on CPT and marital status of the parent/caregiver. Table six below shows factors associated with ART adherence after multivariate analysis.

Table 6: Factors associated with optimal adolescent ART adherence (>95%) from multivariate analysis

Variable	Odds ratio with 95% CI	P-value
WHO clinical stage		
Stage I	(reference)	
Stage II	2.624 (0.631-10.918)	0.185
Stage III	1.449 (0.419-5.009)	0.557
Stage IV	12.874 (2.079-79.706)*	0.006
On CPT		
Yes	0.339 (0.124-0.97)*	0.035
No	(reference)	
Parent's marital status		
Married	(reference)	
Single	0.528 (0.141-1.980)	0.344
Widowed	0.087 (0.021-0.359)*	0.001
Divorced/separated	---	---

*Statistically significant with P-value less than 0.05. --- Not included in analysis b/c very few are divorced

9. Discussion

In this study we assessed the magnitude of ART adherence among HIV infected adolescents in Addis and we also looked into the factors associated with adolescent ART adherence. The single most important factor which determines the success of ART is adherence to medications (16). This is evidenced by many studies which showed association between suboptimal ART adherence and poor treatment outcomes (18, 20, 22, and 24).

Generally adherence to medication has been described as the proportion of prescribed medications that is actually taken. It is measured on a scale from 0% to 100%. The recommended optimal adherence level for ART to be effective is above 95 percent (9). However accurate measurement of adherence to therapy is oftentimes difficult. There are around four ways of adherence assessment; patient self-reports, pill count method, biochemical assays of drug levels and electronic monitoring system. All of these techniques have their own limitations. A major limitation of self-reports is that they assess only short-term adherence and may often overestimate it. Moreover this method assumes that patients can correctly recall their behavior and are providing honest answers. Pill count method measures adherence by counting the returned excess pills which should have been taken. Here patients are expected to return the excess pills on their refill visit date. Similar to the former this method tends to overestimate adherence as patients tend to discard the package inadvertently. In addition some patients may also discard packages purposively to appear adherent. The latter two techniques, assays of drug levels and electronic monitoring system, tend to be sophisticated and costly (41).

In our study using self-reports we found the level of adolescent ART adherence to be 79.1% (216/273) for the four days before the interview. The level of non-adherence (20.9%) is quite high and puts a risk of ART resistance. Also of great concern is that 14.3 % of the respondents reported missing full day's medication of one or more days in the four days prior to the study. Furthermore six of the adolescents had zero percent adherences; did not take any ART medication in the four days. This finding of low adolescent ART adherence is in line with other study findings. A study done among American adolescents aged 12-18 years revealed low ART adherence level (18). This study, unlike ours, longitudinally followed a cohort of 231 HIV + adolescents. Though it used a similar self-report method to assess adherence it was further

validated by various additional ways. Another study done in Botswana came up with adolescent ART adherence rate of 76.9%. Despite a small sample size this study was done in similar group of patients, 13-20 years and used patient self-reports method (26). Similarly other studies as well showed low ART adherence among adolescents (19, 20, and 21). In contrast to these a study done in Gaborone, Botswana reported that high proportion of the studied adolescents had excellent ART adherence. This study considered excellent adherence using pill count method when greater than or equal to 95% of the prescribed doses for one month were taken by the end of the month. However this study was just limited to a single health institution and had a small (82 subjects) sample (37).

Most of the studies on ART adherence in Ethiopia are either on children or on adults. A study in Addis Ababa assessed the ART adherence among children and found a higher adherence level, 86.9% (27). Similarly a prospective study on adult HIV patients in Ethiopia found a higher ART adherence rate, 94.3% (28). Contrary to these findings a study which measured adherence using unannounced home based pill count revealed a very low adherence level, 34.8%. This study was done among HIV infected children below 15 years who were attending pediatric ART clinic of TAH (29).

The results also showed that baseline WHO clinical stage, being on cotrimoxazole prophylactic therapy and marital status of parent/caregiver were independently associated with adolescent ART adherence. After controlling for the effect of other variables in multiple logistic regression model, this study have shown that the odds of being adherent to ART was 12.9 times higher for adolescents in WHO stage IV at baseline compared to those in WHO stage I at baseline (AOR 12.87 with 95% CI, 2.079, 79.706). This finding is consistent with other research findings. A study in Ethiopia revealed that children & adolescents in WHO stage III/IV were more likely to adhere. This could be because those who are relatively healthy will be reluctant about taking their medications. Gibb's study revealed that symptomatic HIV disease was associated with better adherence (38). Catz et al also found that healthy HIV-infected outpatients had lower rates of adherence to medical appointments than the symptomatic ones (39). A study in Uganda also found that those who had been hospitalized two or more times had better adherence (40). On the contrary the previously mentioned American cohort study showed

that those with late HIV disease stage were less likely to be adherent compared with those in early stage of the disease (18).

Regarding marital status of the parent/caregiver; those adolescents whose parents were widowed were 91% less likely to be adherent than adolescents whose parents were married (AOR = 0.087 with 95% CI, 0.021-0.359). This could be because married parents tend to be emotionally and economically better and might also get support from their partner in giving care and support to the adolescent.

We also found that those adolescents who were taking CPT in addition to ART were 66% less likely to be adherent than adolescents who were not on CPT at the time of the survey (AOR = 0.339 with 95% CI, 0.124-0.97). Poorer adherence among those who were on CPT could be due to high bill burden but a false sense of security with CPT or even misunderstanding CPT as replacement for ART could be another factor. However a study in Addis described that those who took CPT besides ART were more than three times likely to adhere than those who didn't (OR = 3.65 with 95% CI, 1.24-10.74) (27).

10.Strengths and Limitations of the study

Strengths

- ✓ This study was carried out among adolescents; the focus of attention in contemporary public health.
- ✓ Multiple facilities are used
- ✓ Standard tools are adapted to assess adherence and other conditions.

Limitation

In this study nurses who routinely care for the adolescents in the ART clinic took the data. This may introduce some bias i.e. social desirability bias. In addition adherence was measured based on self-reports. This method tends to overestimate.

11.Conclusion and Recommendations

The findings of this study indicated that the ART adherence rate among adolescents in Addis Ababa is low, 79.1%. Late WHO stage and having a married parent were associated with better ART adherence. On the other hand being on CPT was associated negatively with ART adherence.

Based on the findings the following recommendations are forwarded;

For health science researchers:

- ➢ Further research to assess the reasons for low adherence, and to come up with interventions.
- ➢ Research to further measure adolescent ART adherence using other methods like unannounced home based pill count as this technique could avoid overestimation. Furthermore this method will help to assess the adherence over longer period; a month or two.

For health care providers:

- ➢ To strengthen adolescent ART adherence counseling services in the ART clinics

- ➢ Earlier presentation of adolescents to care should be encouraged but more targeted adherence support should be planned for those who present at early stage of their illness.

- Adolescents or their guardians should be provided with adequate counseling during medication change or when new medications with a different role are added.

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Annexes

Annex 1: Consent form in English

Verbal Assent of Adolescents age 13-17

Hospital name_____

To be read to adolescent by clinic staff:

Introduction:
You are invited to participate in a research study investigating (HAART adherence & its correlates among HIV infected adolescents by Dr. Naod Firdu a staff & graduate student at AAU-SPH under the supervision of Dr. Fikre Enquasselase, head of the Department of Preventive Medicine and Dr. Degu Jerene, Clinical Director, Technical Support for the Ethiopian HIV/AIDS, ART Initiative). You are selected for this study because your health facility is one of the 3 health facilities selected for this study. The person in charge of the project at this clinic is_____

Your [parent or guardian] has already agreed that you may take part in this project. We are also asking you to agree to take part. If you decide not to take part, you will still be able to receive care and ART drugs at this clinic. If you do agree to take part, you may leave the project at any time. I will explain the project to you now. You may ask me any questions.

If you take part in this study, you will be asked about your socio-demographic characteristics and ART medication adherence questions. By so doing, you agree that information about you and about your medical care may be shared outside this clinic. This information will not include any information that could be used to identify you, such as your name, your address, your phone number, or names, addresses, and phone numbers of your family or caregivers that you have given the clinic team. Instead, you will be identified by a code number that is used only for this project.

If you decide to take part in this study, you will be interviewed to tell us about your socio-demographic information, medication adherence, challenges for adherence etc. The interview will take about 30 minutes.

Risks associated with participating in this study: There is a minimally increased risk that someone might find out about your illness if you participate in this project. However, we will try very hard to protect against this risk.

How to ensure confidentiality: We will remove your name, address and other information that can be used to identify you from any information sent outside this clinic. When we contact others in an attempt to find you or your medical information, we will not tell anyone why we are trying to find you or that you

are HIV-infected. We will keep your information under lock and key or protected by a computer password.

All files that include both your name and medical information will stay only at this clinic. Access to these files will be limited to clinic staff and to staff from the organizations participating in this project or the National Ethics Committee.

Benefits of participating in this study

There may be no direct benefit to you of participating. The findings from this study may be used to improve the health care provided to you and other patients in Ethiopia.

Consequences of deciding not to participate

You or your [parent or guardian] may decide not to participate in this project, which will have no effect on the care and ART drugs you receive at this clinic.

Any costs or payments to the participant

You will-not be paid for participating in this study.

Your rights as a research participant

Taking part in this project is completely voluntary. You or your [parent or guardian] may choose not to take part in this project and you may choose to leave the project or your [parent or guardian] may withdraw you at any time. You will be treated the same no matter what you decide. Deciding not to participate in this project will not affect your care at this clinic. If you want to learn results from this project, you can request this from the clinic staff.

Clinic staff asks adolescent to check box with answer

Do you agree to participate in this project?

☐ **Yes** ☐ **No**

Name of Participant_____ Signature: ……

Name of Staff _____Signature_____D/M/Y_____

Conducting Consent Discussion

Verbal Consent of Adolescents age 18-19

Hospital name_____

To be read to adolescent by clinic staff:

Introduction:

You are invited to participate in a research study investigating (HAART adherence & its correlates among HIV infected adolescents by Dr. Naod Firdu a staff & graduate student at AAU-SPH under the supervision of Dr. Fikre Enquasselase, head of the Department of Preventive Medicine and Dr. Degu Jerene, Clinical Director, Technical Support for the Ethiopian HIV/AIDS, ART Initiative). You are selected for this study because your health facility is one of the 3 health facilities selected for this study. The person in charge of the project at this clinic is_____

We are asking you to agree to take part. If you decide not to take part, you will still be able to receive care and ART drugs at this clinic. If you do agree to take part, you may leave the project at any time. I will explain the project to you now. You may ask me any questions.

If you take part in this study, you will be asked about your socio-demographic characteristics and ART medication adherence. By so doing, you agree that information about you and about your medical care may be shared outside this clinic. This information will not include any information that could be used to identify you, such as your name, your address, your phone number, or names, addresses, and phone numbers of your family or caregivers that you have given the clinic team. Instead, you will be identified by a code number that is used only for this project.

If you decide to take part in this study, you will be interviewed to tell us about your socio-demographic information, medication adherence, challenges for adherence etc. The interview will take about 30 minutes.

Risks associated with participating in this study: There is a minimally increased risk that someone might find out about your illness if you participate in this project. However, we will try very hard to protect against this risk.

How to ensure confidentiality: We will remove your name, address and other information that can be used to identify you from any information sent outside this clinic. When we contact others in an attempt to find you or your medical information, we will not tell anyone why we are trying to find you or that you are sick. We will keep your information under lock and key or protected by a computer password.

All files that include both your name and medical information will stay only at this clinic. Access to these files will be limited to clinic staff and to staff from the organizations participating in this project or the National Ethics Committee.

Benefits of participating in this study
There may be no direct benefit to you of participating. The findings from this study may be used to improve the health care provided to you and other patients in Ethiopia.

Consequences of deciding not to participate
You or your [parent or guardian] may decide not to participate in this project, which will have no effect on the care and ART drugs you receive at this clinic.

Any costs or payments to the participant

You will-not be paid for participating in this study.

Your rights as a research participant

Taking part in this project is completely voluntary. You or your [parent or guardian] may choose not to take part in this project and you may choose to leave the project or your [parent or guardian] may withdraw you at any time. You will be treated the same no matter what you decide. Deciding not to participate in this project will not affect your care at this clinic. If you want to learn results from this project, you can request this from the clinic staff.

Clinic staff asks adolescent to check box with answer

Do you agree to participate in this project?

☐ **Yes** ☐ **No**

Name of Participant_____ Signature: …….

Name of Staff _____Signature_____D/M/Y_____

Conducting Consent Discussion

Verbal Consent of Parents or Guardians of Adolescents age 13-17

Hospital name_____

To be read to adolescent by clinic staff:

Introduction:

You are invited to participate in a research study investigating (HAART adherence & its correlates among HIV infected adolescents by Dr. Naod Firdu a staff & graduate student at AAU-SPH under the supervision of Dr. Fikre Enquasselase, head of the Department of Preventive Medicine and Dr. Degu Jerene, Clinical Director, Technical Support for the Ethiopian HIV/AIDS, ART Initiative). You are selected for this study because this health facility is one of the 4 health facilities selected for this study. The person in charge of the project at this clinic is_____

We are asking you to agree to take part. If you decide not to take part, your child will still be able to receive HIV care and ART drugs at this clinic. If you do agree to take part, you may leave the project at any time. I will explain the project to you now. You may ask me any questions.

If you take part in this study, you will be asked about your socio-demographic characteristics and your child will be asked about ART medication adherence. By so doing, you agree that information about your child and about his/her medical care may be shared outside this clinic. This information will not include any information that could be used to identify your child, such as name, your address, your phone number that you have given the clinic team. Instead, your child will be identified by a code number that is used only for this project.

If you decide to take part in this study, you will be interviewed to tell us about your socio-demographic information, child's medication adherence, challenges for adherence etc. The interview will take about 30 minutes.

Risks associated with participating in this study: There is a minimally increased risk that someone might find out that your child is HIV infected if you participate in this project. However, we will try very hard to protect against this risk.

How to ensure confidentiality: We will remove name, address and other information that can be used to identify your child from any information sent outside this clinic. When we contact others in an attempt to find your child or his/her medical information, we will not tell anyone why we are trying to find your child or that he/she is HIV-infected. We will keep your child's information under lock and key or protected by a computer password.

All files that include both your child's name and medical information will stay only at this clinic. Access to these files will be limited to clinic staff and to staff from the organizations participating in this project or the National Ethics Committee.

Benefits of participating in this study

There may be no direct benefit to you of participating. The findings from this study may be used to improve the health care provided to adolescent HIV patients in Ethiopia.

Consequences of deciding not to participate

You or your child may decide not to participate in this project, which will have no effect on the HIV care and ART drugs your child receive at this clinic.

Any costs or payments to the participant

You will-not be paid for participating in this study.

Your rights as a research participant

Taking part in this project is completely voluntary. You or your child may choose not to take part in this project and you may choose to leave the project at any time. Your child will be treated the same no matter what you decide. Deciding not to participate in this project will not affect your child's care at this clinic. If you want to learn results from this project, you can request this from the clinic staff.

Clinic staff asks adolescent to check box with answer

Do you agree to participate in this project?

☐ **Yes** ☐ **No**

Name of Participant_____

Name of Staff _____Signature_____D/M/Y_____

Conducting Consent Discussion

Details of the PI:

Name: Dr. Naod Firdu

Email address: naodfirdu@gmail.com

Mobile phone no: 0910-20-48-88

Annex 2: Questionnaire in English

Adherence to highly active antiretroviral therapy and its correlates among HIV-infected adolescents in Addis Ababa, Ethiopia

Structured questionnaire

Part I. Socio-demographic and economic characteristics of Parent/care giver

No	Question	Category
1	**How old are you?**	**……. Years (age in completed)**
2	**What is your religion?**	**1. Orthodox 3. Muslim 5. Other (Specify)…….** **2. Protestant 4. Catholic**
3	**What is your educational level?**	**1. College/University graduate** **2. High School (9-12grade)** **3. Grade 1-6** **4. Able to read & write** **5. Unable to read & write** **6. No response** **7. Other (Specify)…….**
4	**Marital Status**	**1. Currently Married** **2. Never married partner** **3. Widowed/widower** **4. Divorced/Separated** **5. Cohabitated/living together**
5	**Residence**	**1. Urban** **2. Rural**
6	**Care giver relationship with adolescent**	**1. Biological Mother** **2. Biological Father** **3. Brother** **4. Sister** **5. Grandmother/father** **6. Legal Guardian** **7. Other Relatives** **8. Other (specify)……**
7	**Number of children a mother/father have**	**……..(children)**
8	**Mother/father enrolled in HIV/ART care**	**1. Yes** **2. No**
9	**Mother/father currently taking ART**	**1. Yes** **2. No**
10	**HIV disclosure status of adolescent's mother/father**	**3. Disclosed** **4. Not disclosed**
11	**Where the**	**1. In the same facility**

	mother/father enrolled for care	**2. Out of the facility** **3. Unknown**
12	**Parent's Vital Status**	**1. Both father & mother are alive** **2. Father died** **3. Mother died** **4. Both died** **5. Other (Specify)……**
13	**What is your current occupation?**	**1. Unemployed** **7. Merchant** **2. Student** **8. Private employee** **3. Housewife** **9. House Servant** **4. Daily Laborer** **10. No Response** **5. Government Employee** **11. Other (Specify)…….** **6. NGO Employee**
14	**How much do you expend monthly?**	**……..ETH Birr** **1. No Income** **2. No response** **3. Other (Specify)……**
15	**Is there any external financial support for the child**	**1. No** **2. Yes ……ETH birr**
16	**If there is any external support, where you are getting from?**	**1. ……..** **2. ……..** **3. ……** **4. ……**

Part II: Socio-demographic characteristics of adolescent on ART

16	**Adolescent started ART at age of (dd/mm/yy)**	**…….**
17	**Current age of adolescent**	**……years (age in completed)**
18	**Sex of the adolescent**	**1. Male** **2. Female**
19	**HIV and treatment disclosure status of the adolescent**	**1. Adolescent HIV and treatment status disclosed** **2. Adolescent HIV and treatment status not disclosed** **3. Other (specify)……**
20	**Hospitalization of adolescent before ART?**	**1. Yes** **2. No**

Part III: Document review of the adolescent in the beginning of the ART initiation

21	**Adolescent HIV/ART enrollment**	**1. Enrolled within the facility** **2. Referred from other facility**
22	**WHO clinical stage when adolescent starts ART**	**1. WHO Stage I** **2. WHO Stage II** **3. WHO Stage III** **4. WHO Stage IV**
23	**Type of ART initiated**	**1. 1st line-regimen** **2. 2nd line-regimen**
	Lab Value	
24	**CD4 cell count/mm3 or TLC**	**…….**
25	**Hgb**	**…….**
26	**OI Prophylaxis taken**	**1. CPT** **2. IPT**

Part IV: ART Adherence questionnaire

Part V: Adolescent behaviour questionnaire

Please be honest in answering these questions, and know that all of your answers will be held as confidential. Thank you.

	Have you ever tried cigarette smoking, even one or two puffs?	**1. Yes** **2. No** **If No, go to Q. 24**
	How old were you when you smoked a whole cigarette for the first time?	**……. (years)**
	Have you ever smoked cigarettes daily, that is, at least one cigarette every day for 30 days?	**1. Yes** **2. No**
	Have you ever used Khat?	**1. Yes** **2. No**
	During your life, on how many days have you had at least one drink of alcohol?	**…….Days**
	During the past 30 days, on how many days did you have at least one drink of alcohol?	**…….Days**

	Have you ever had sexual intercourse?	**1. Yes** **2. No**
	How old were you when you had sexual intercourse for the first time?	**…….years**
	During your life, with how many people have you had sexual intercourse?	**……**
	During the past 3 months, with how many people did you have sexual intercourse?	**……..**
	Did you drink alcohol or use drugs before you had sexual intercourse the last time?	**1. Yes** **2. No**
	The last time you had sexual intercourse, did you or your partner use a condom?	**1. Yes** **2. No**
	The last time you had sexual intercourse, what one method did you or your partner use to prevent pregnancy?	**…….**

Annex 3: Amharic Questionnaire

የፀረ ኤች ኣይቪ መድሀኒቶች ትክክለኛ አወሳሰድና ተያያዥ ጉዳዮቹ የኤች ኣይቪ ህክምና እየወሰዱ ባሉ ታዳጊ ወጣት ታካሚዎች በአዲስ አበባ ኢትዮጵያ

የመጠይቁ መለያ ቁጥር:..... የጤና ተቁሙ ስም: .....

ኤአርቲ ክፍል: 1 የህጻናት 2 የአዋቂ

ክፍል 1: ጸረ ዔች ኣይቪ ህክምና እየወሰደ/ች ያለው ታዳጊ የክትትል ዶክመንት ፍተሻ

1	ታዳጊው/ዋ ስለ ራሱ/ሷ ዔች ኣይቪ ሁኔታና የጸረ ዔች ኣይቪ ህክምና ይፋ ማድረግን አስመልክቶ	1 ታዳጊው/ዋ ስለ ራሱ/ሷ ዔች ኣይቪ ሁኔታና የጸረ ዔች ኣይቪ ህክምና ይፋ ተደርጎለታል/ላታል 2 የዔች ኣይቪ ሁኔታም ይሁን የጸረ ዔች ኣይቪ ህክምና ይፋ አልተደረገም
2	ታዳጊው የጸረ ዔች ኣይቪ ህክምና የጀመረው/ችው	1 አሁን ባለበት/ችበት ጤና ድርጅት 2 ከሌላ ጤና ድርጅት ነው የተላከው/ችው
3	በአለም አቀፍ የጤና ድርጅት የዔች ኣይቪ ደረጃዎች (የጸረ ኤች ኣይቪ መድሃኒት ሲጀምር/ስትጀምር)	1 ደረጃ 1 2 ደረጃ 2 3 ደረጃ3 4 ደረጃ4
4	ታዳጊው የጀመረው የጸረ ዔች ኣይቪ ህክምና ኣይነት	1 የመጀመርያ ደረጃ ህክምና 2 ሁለተኛ ደረጃ ህክምና
	የላቦራቶሪ ውጤቶች	
5	የሲዲ ፎር ቁጥር (ቤዝ ላየን)	.....(ካውንት/ሚሊ)
6	ሊንፎሳይት ቁጥር (ቤዝ ላየን)	.....(ካውንት/ሚሊ)
7	ሂሞግሎቢን (ቤዝ ላየን)	..... (ሚሊግራም/ሚሊ)
8	በመወሰድ ላይ ያሉ የተጓዳኝ በሽታዎች መከላከያ	ሲፒቲ (CPT) 1. አዎ 2 አይ ኧይፒቲ(IPT) 1. አዎ 2 አይ

9. ታካሚው በወቅቱ የሚወስዳቸው የጸረ ዔች ኣይቪ መድህኒቶች ዝርዝርና የአወሳሰድ ሁኔታ

የመድህኒቱ ኣይነትና/ስምና መጠን	**በአንድ ግዜ የሚወሰድ የዕንክብል ብዛት**	**በቀን ውስጥ ስንት ግዜ መድሃኒት ይወስዳል**

ክፍል ሁለት: የቤተሰብ ተንከባካቢዎች ማህበራዊና ኢኮኖሚያዊ ባህሪያቶች

ተ/ቁ	**ጥያቄ**	**የመልስ ምደባ**

1	እድሜህ/ሽ ስንት ነው	……ዓመት (ሙሉ ዕድሜ)
2	ሀይማኖት	1 ኦርቶዶክስ 2 ፕሮቴስታንት 3 ሙስሊም 4 ካቶሊክ 5 ሌላ (ይገለፅ)
3	የትምህርት ደረጃ	1 ኮሌጅ/ዩኒቨርስቲ ምሩቅ 2 ሁለተኛ ደረጃ ት/ት ያጠናቀቀ (9-12) 3 1-8ኛ የጨረሰ/ሰች 4 ማንበብና መፃፍ የሚችል 5 ማንበብና መፃፍ የማይችል 6 መልስ የለውም 7 ሌላ (ይገለፅ)
4	የጋብቻ ሁኔታ	1 ያገባ/ች 2 ያላገባ/ች 3 ባል/ሚስት የሞተባት/ችበት 4 የተፋታ/ች ወይም የተለያየ/ች 5 አብሮ የሚኖሩ
5	የመኖርያ ቦታ	1 ከተማ 2 ገጠር
6	የቤተሰብ ተንከባካቢው ከታዳጊው ጋር ያለው/ላት ዝምድና	1 የታዳጊው እናት 2 የታዳጊው አባት 3 ወንድም 4 እህት 5 አያት (የእናት/አባት) 6 ህጋዊ ጠባቂ 7 ሌላ ዘመድ 8 ሌላ (ይገለፅ)
7	ተንከባካቢው ያለው/ላት ልጅ ብዛት	……(ልጆች)
8	የታዳጊው ወላጆች በህይወት አሉ?	1 አባትም እናትም በህይወት አሉ 2 አባት ሞትዋል 3 እናት ሞታለች 4 አባትም እናትም ሞተዋል 5 ሌላ (ይገለፅ)
9	እናት/አባት በጤና ድርጅት ውስጥ በሚሰጥ የጤች ኣይቪ ድጋፍና ህክምና ታቅፋለች/ፏል	1 አዎ 2 አይደለም
10	የታዳጊው እናት/አባት ጸረ የጤች ኣይቪ መድሀኒት በመውሰድ ላይ ነው/ናት?	1 አዎ 2 አይደለም
11	የታዳጊው እናት/አባት ስለ ራሱ/ሷ የጤች ኣይቪ ሁኔታ ይፋ አድርጓል/ጋለች	1 አዎ 2 አይደለም
12	የታዳጊው እናት/አባት ለራሱ/ሷ የህክምና ክትትል የሚያደርገው/ምታደርገው የት ነው?	1 ታዳጊው ክትትል በሚያደርግበት/ምታደርግበት ጤና ድርጅት 2 ሌላ ጤና ድርጅት

		3 አይታወቅም
13	ስራ	1 ስራ የሌለው/ላት 2 ተማሪ 3 የቤት እመቤት 4 የቀን/ጉልበት ስራ 5 የመንግስት ሰራተኛ 6 የ ዜንጂዎ ሰራተኛ 7 ነጋዴ 8 የግል ስራ 9 የቤት ሰራተኛ 10 መልስ አልተሰጠም 11 ሌላ (ይገለፅ)
14	የወር ወጪ	..... የኢትዮጵያ ብር 1 ምንም ገቢ የለኝም 2 መልስ አልተሰጠም 3 ሌላ (ይገለፅ)
15	ከቤተሰብ ውጪ ታዳጊውን በገንዘብ የሚረዳ አካል አለ	1 የለም 2 አለ .....የኢትዮጵያ ብር
16	እርዳታ ካለ ከየት እንደሆነ በዝርዝር ብትነግረኝ/ሪኝ	1..... 2..... 3..... 4.....

ክፍል ሶስት: ጸረ ዔች አይቪ ህክምና እየወሰደ/ች ያለው ታዳጊ ማህበራዊ ባህሪያትና የጤና ክትትል ሁኔታ

17	ታዳጊው የጸረ ዔች አይቪ ህክምና የጀመረበት እድሜ	…… (ቀናት/ወራት/ዓመታት)
18	ታዳጊው አሁን ያለበት እድሜ	..... አመት
19	የታዳጊው ጾታ	1 ወንድ 2 ሴት
20	ታዳጊው/ዋ ስለ ራሱ/ሷ ዔች አይቪ ሁኔታና የጸረ ዔች አይቪ ህክምና ይፋ ማድረግን አስመልክቶ	1 ታዳጊው/ዋ ስለ ራሱ/ሷ ዔች አይቪ ሁኔታና የጸረ ዔች አይቪ ህክምና ይፋ ተደርጎለታል/ላታል 2 የዔች አይቪ ሁኔታም ይሁን የጸረ ዔች አይቪ ህክምና ይፋ አልተደረገም 3 ሌላ (ይገለፅ)
21	ታዳጊው/ዋ የጸረ ዔች አይቪ ህክምና ከመጀመሩ/ሯ በፊት ታሞ/ማ ሆስፒታል ተኝቶ/ታ ያውቃል/ታውቃለች?	1 አዎ 2 አይደለም

ክፍል 4: የጸረ ዔች ኣይቪ መድህኒቶች ትክክለኛ አወሳሰድ መመዘኛ ጥያቄዎች

ይህ ቅጽ ከተጠያቂው ጋር አብሮ በመሆን የሚሞላ ነው

1: ታካሚው በወቅቱ የሚወስዳቸው የጸረ ዔች ኣይቪ መድህኒቶች ዝርዝርና የአወሳሰድ ሁኔታ

የመድህኒቱ ኣይነትና/ስምና መጠን	**በአንድ ግዜ የሚወሰድ የዕንክብል ብዛት**	**በቀን ውስጥ ስንት ግዜ መድሃኒት ይወስዳል**

<u>የሚከተለው የመጠይቅ ክፍል ባለፉት አራት ቀናቶች ታካሚው ስለወሰዳቸው የጸረ ዔች ኣይቪ መድህኒቶች ይመለከታል።</u>

አብዛኛዎቹ የ ዔች ዓይቪ ታካሚዎች በቀን ውስጥ ብዙ መድሃኒቶች መውሰድ ይጠበቅባቸዋል:: በመሆኑም ብዙ ታካሚዎች መድሃኒቶቻቸውን ሁሌ አስታውሰው ለመውሰድ ይቸገራሉ::

_ አንዳንዶች ከስራ/ትምህርት ብዛት የተነሳ መድሃኒቶቻቸውን ይዘው መሄድ ይረሳሉ::

_ አንዳንድ ታካሚዎች ደግሞ መድሃኒቶቻቸውን በመመርያው መሰረት መውሰድ ይቸገራሉ:: ለምሳሌ ከምግብ ጋር፣በባዶ ጎድ፣በየ 8 ሰአቱ ፣ ከብዙ ውሀ ጋር ወዘተ

_ ሌሎች ታካሚዎች የመድሃኒቶችን ሳይድ ኢፌክት (ተጓዳኝ ተጽእኖ) በመፍራት አሊያም እንዲሁ ዛሬን አልውሰድ በማለት ይተውታል::

የ ዔች ዓይቪ ታካሚዎችን የመድሃኒቶቻቸውን አወሳሰድ ማወቅ እንፈልጋለን:: እባክዎን በትክክል ስለ መድሃኒት አወሳሰዶ ይንገሩን:: መድሃኒቶቹን በሙሉ እንዳልወሰዱ በመናገሮ በፍጹም ሊጨነቁ አይገባም:: ማወቅ የምንፈልገው ኧውነተኛውን ነገር እንጂ እኛ የምንፈልገውን እንዲነግሩን አይደለም::

የሚከተለው የመጠይቅ ክፍል ባለፉት አራት ቀናት ውስጥ ስላልወሰዷቸው የጸረዔች ዓይቪ መድሃኒቶች ይመለከታል:

ባለፉት አራት ቀናት ውስጥ በአንድ ጊዜ መወሰድ ካለባቸው የጸረዔች ዓይቪ መድሃኒቶች መካከል አንዱን እንኳን ካልወሰዱ ሙሉ ዶዙን እንዳልወሰዱ ይቆጠራል::

የጸረዔች ዓይቪ መድሃኒቶቹ ስም ዝርዝር	ምን ያህል ዶዞች አልተወሰዱም?			
	ትናንትና	ከትናንት ወዲያ (ከሁለት ቀን በፊት)	ከሶስት ቀን በፊት	ከአራት ቀን በፊት
	…….. ዶዞች			
	…….ዶዞች			
	…….ዶዞች			
	…….ዶዞች			
	…….ዶዞች			

የሚከተሉት ጥያቄዎች ታካሚው ቀደም ብሎ ስለዘረዘራቸው የጸረዔች ዓይቪ መድሃኒቶች ይመለከታል::

ባለፉት አራት ቀናት ውስጥ በአንድ ጊዜ መወሰድ ካለባቸው የጸረዔች ዓይቪ መድሃኒቶች መካከል አንዱን እንኳን ካልወሰዱ ሙሉ ዶዙን እንዳልወሰዱ ይቆጠራል::

2. ባለፉት አራት ቀናት ውስጥ ለምን ያህል ቀናት ሁሉንም ዶዞች ሳይወስዱ ቀሩ?

1. ምንም ቀናት 2 አንድ ቀን 3 ሁለት ቀን 4 ሶስት ቀን 5 አራት ቀን

3. አብዛኛዎቹ የጸረዔች ዓይቪ መድሃኒቶች በታዘዘው አወሳሰድ መሰረት መወሰድ አለባቸው:: ለምሳሌ በቀን ሁለት /በቀን ሶስት/በየ 8 ሰዓት ወዘተ:: ባለፉት አራት ቀናት ውስጥ እንደዚህ ዓይነት መመርያዎችን ምን ያህል በአግባቡ ተከትለው ወስደዋል?

1 ምንም ጊዜ 2 አንድ አንድ ጊዜ 3 ግማሽ በግማሽ 4 አብዛኛውን ጊዜ 5 ሁሉም ጊዜ

4. ከሚወስዱዋቸው የጸረዔች ዓይቪ መድሃኒቶች መካከል የተለየ የአወሳሰድ መመርያ ያላቸው መድሃኒቶች አሉ? ለምሳሌ ከምግብ ጋር/ በባዶ ሆድ/ ከብዙ ውሃ ጋር ወዘተ

1 አዎ 2 አይደለም

መልስዎ አዎ ከሆነ ባለፉት አራት ቀናት ውስጥ ምን ያህል ይህን ልዩ መመርያ ተከትለዋል?

1 ምንም ጊዜ 2 አንድ አንድ ጊዜ 3 ግማሽ በግማሽ 4 አብዛኛውን ጊዜ 5 ሁሉም ጊዜ

5. አንዳንድ ሰዎች መድሃኒታቸውን በሳምንቱ እረፍት ቀናት መውሰድ ይረሳሉ:: ባለፈው የሳምንት መጨረሻ ቀናት(የባለፈው ቅዳሜ ወይም እሁድ) ያልወሰዱት መድሀኒት አለ?

1 አዎ 2 የለም

6 መድሃኒቶን ያልወሰዱበት የመጨረሻ ጊዜ መቼ ነው?

1 ባለፈው አንድ ሳምንት ውስጥ 2 ከአንድ_ ሁለት ሳምንት በፊት 3 ከሁለት_አራት ሳምንት በፊት 4 ከአንድ _ሶስት ወር በፊት 5. ከ ሶስት ወር በፊት 6. ምንም ቀን ሳልወስድ የቀረሁበት የለም

ታካሚው ምንም ቀን መድሀኒት ካልረሳ/ች ወደ ጥያቄ 8 ይሂዱ

7. ሰዎች በተለያየ ምክንያት የጸረ ኤች አይቪ መድሃኒታቸውን ላይወስዱ ይችላሉ:: ከዚህ በታች የተለያዩ ምክንያቶች ተዘርዝረዋል:: በተዘረዘሩት ምክንያቶች መሰረት ምን ያህል ጊዜ መድሃኒቶን ሳይወስዱ ቀርተዋል?

	መቼም	ከስንት አንዴ	አልፎ አልፎ	ብዙ ጊዜ
1 ቤት ባለመሆኔ				
2 በሌሎች ነገሮች ጊዜዬ ተጣቦ ስለነበር				
3 በመርሳት ምክንያት				
4 ብዙ መድሃኒቶች መውሰድ ስለነበረብኝ				
5 ተጓዳኝ ተጽኖዎቹን ለማስወገድ ፈልጌ				
6 ሌሎች መድሃኒት እየወሰድኩ መሆኔን እንዳያውቁ				

7 የቀን ውሎዬ በመለወጡ				
8 መድሃኒቱ ጎጂ ይሆናል ብዬ በማሰብ				
9 መድሃኒት በመውሰጃ ሰአት ላይ በመተኛቴ				
10 ታምሜ ስለነበር				
11 ደብሮኝ/ደብቶኝ ስለነበር				
12 መደሃኒት አልቆብኝ				
13 የተሻለኝ ስለመሰለኝ				

<u>ክፍል 5፡ የታካሚ ባህሪ መጠይቅ</u>

እባክዎ ይህን ጥያቄ በእውነተኛነት ይመልሱ:: የሚሰጡት መልስ በሙሉ ሚስጥርነቱ የተጠበቀ ነው:: እናመሰግናለን::

1 ሲጋራ ለማጨስ ሞክረህ/ሽ ታውቃለህ/ቂያለሽ(አንድ ጊዜ መሳብም ቢሆን)? 1 አዎ 2 አይ

መልሱ አይ ከሆነ ወደ ጥያቄ 4 ይሂዱ

2 አንድ ሙሉ ሲጋራ ስታጨስ/ሽ ዕድሜህ/ሽ ስንት ነበር? ..... ዓመት

3 በተከታታይ ቀኖች ሲጋራ አጭሰህ/ሽ ታውቃለህ/ቂያለሽ? 1 አዎ 2 አይ

4 ጫት ተጠቅመህ/ሽ ታውቃለህ/ቂያለሽ? 1 አዎ 2 አይ

5 በህይወትህ ስንት ቀናትን መጠጥ ተጠቅመዋል ? .....

6 ባለፉት 30 ቀናት ውስት ቢያንስ በቀን አንዴ ለስንት ቀናት አልኮል ተጠቅመዋል? .....ቀኖች

7 የግብረ ስጋ ግንኙነት አድርገህ/ሽ ታውቃለህ/ቂያለሽ? 1 አዎ 2 አይ

መልሱ አይ ከሆነ ወደ ጥያቄ መጠይቁን ያጠናቅቁ::

8 የመጀመርያ ግዜ የግብረ ስጋ ግንኙነት ስታደርግ/ጊ እድሜህ/ሽ ስንት ነበር? ..... አመት

9 በህይወት ዘመንህ/ሽ ከስንት ሰው ጋር የግብረ ስጋ ግንኙነት አርገሃል/ሻል? ..... ሰው ጋር

10 መጨረሻ ግንኙነት ስታረግ/ጊ የአልኮል መጠጥ ወይም እጽ ተጠቅመህ/ሽ ነበር? 1. አዎ 2 አይ

11. መጨረሻ ግንኙነት ስታረግ/ጊ ኮንዶም ተጠቅማችሁ ነበር? 1. አዎ 2 አይ

ቀን: / / ዓ ም

የጠያቂው ሙሉ ስም: ……..

Annex 4: Amharic Consent Form

¾Ø“~ }dታò-‹ SeTT>Á pî

Ÿ13-17 ¯Sƒ ¾°ÉT@ ¡MM KT>Ñ–< ታÇÑ> Ií“ƒ ¾}²ÒË

¾Jeúታ K< eU _____

u¡K=’>Ÿ< W^}™‹ Kታ ÇÑ> Qí’< ¾T>’uw

SÓu=Á *የፀረ ኤች ኣይቪ መድሀኒቶች ትክክለኛ አወሳሰድና ተያያዥ ጉዳዮቹን* u}SKŸ} ÁK¨<” *ሁኔታ* KS[Çƒ uT>Å[Ó Ø“ƒ ”Éƒd}õ ”ÖÃnK”:: ÃI Ø“ƒ ¾T>ŸH@Å¨< *በዋነኝነት* u›Ç=e ›uv ¿’>y‘e+ *አባል በሆኑት በ ዶ/ር ናኡድ ፍርዱ ሲሆን በዛው ዩኒቨርስቲ አባልና የዲፓርትመንት ሀላፊ የሆኑት ዶ/ር ፍቅሬ እንቁስላሴ እንዲሁም ዶ/ር ደጉ ጀረኔ ይሳተፉበታል::* ›”} ¾}S[Ø¡uƒ U¡”Áƒ ÃI ¾Ö?“ É‘Ïƒ K²=G< Ø“ƒ Ÿ›=ƒÄåÁ u}S[ጡ ¾Ö?“ É‘Ï„‹ ›”Æ J• eK}Ñ– ’¨<:: u²=I ¡K=’>¡ ÃI”” Ø“ƒ ¾T>Áe}vw\ƒ _____ “†¨<::

Á”} ¨LÏ/›dÇÑ> u²=I Ø“ƒ wƒd}õ ¾T>ÅÓñ SJ•’<” ›ekÉV ÑMïM:: ›”}U eUU’ƒI” ”ÉƒÑMîM” uƒIƒ“ ”ÖÃnK”:: u²=I Ø“ƒ KSd}õ ŸKSðKÓI ¾}’d Ÿ²=I ¡K=’>¡ ¾UÑ–¨<” ›ÑMÓKAƒ u}SKŸ} U”U ¾T>k‘wMI ’Ñ‘ ¾KU:: wƒeTTU vK–I uT“†¨U c¯ƒ KkI ¾S¨<×ƒ SwƒI ¾}Ÿu[’¨<:: ›G<” eKØ“~ ÖKp ÁK Tw^]Á McØI ’¨<:: ØÁo ŸKI MƒÖÃk˜ ƒ‹LKI::

u²=I Ø“ƒ KSd}õ wƒeTT *ማህበራዊና ኢኮኖሚያዊ እንዲሁም ስለ* ¾›?‹ ›Ãy= *መድሀኒትህ አወሳሰድ እና የመሳሰሉ ጥያቄዎችን ትጠየቃለህ::* እ”Ç=IU uTÉ[Ó Ÿ”} ¾U”cT¨<” S[Í KK?KA‹ c-‹ እ”Í= ¾›”} ¾ÓM S[Í u}SKŸ} KT”U ”T“d¨<p M“[ÒÓØ እ”¨ÇK”:: ¾›”} T”’ƒ ¾T>ÑKì¨< uUeÖ=‘ lØ‘ w‰ እ”Í= eUI ›É^hI eM¡ lØ‘I” ¾SdcK<ƒ ¾ÓM S[Í-‹I ¨ÃU ¾u?}cwI ¾ÓM S[Í KT”U c¨< ›ÃÑKîU::

u²=I Ø“ƒ KSd}õ ðnÅ˜’ƒI” ŸÑKî¡ Ó” *የጥናቱን መጠይቅ እንድትመልስ ትጠየቃለህ:: መጠይቁ* Óó u=M u *ሰላሳ ደቂቃ* Ñ>²? ¾T>Ö“kp ÃJ“M::

u²=I Ø“ƒ uSd}õI ¾T>Å‘e Ñ<Çƒ” u}SKŸ} U“Mvƒ uJ’ ›Ò×T> ¾ÓM S[ÍI ŸØ“ƒ u<É” ›vLƒ ¨<Ü Ãó ¾SJ” ›Ò×T> K=•‘ Ã‹LM:: እ— Ó” እ”Ç=I ›Ã’~ eI}ƒ እ”ÇÃðìU Ÿõ}— Ø”no እ“Å‘ÒK”::

UeÖ=^©’~” eKSÖup UeÖ=^©’~” KSÖup Ã‰M ²”Å eUI” ›É^hI”“ K?KA‹ ¾ÓM S[Í-‹I” Ÿ²=I ¡K=’>¡ ¨<ß T”U c¨ ”ÇÁ¨<p Ÿõ}— Ø”no “Å‘ÒK”:: eK›”} Q¡U“ }ÚT] S[Í TÓ–ƒ u=ÁeðMÓ K?KA‹ c-‹” eM”ÖÃn†¨< ”‹LK”:: ’Ñ‘ Ó” uU” U¡”Áƒ እ”ÅU”ÖÃp Ãó ›“Å‘ÓU:: eK›”} ¾U”cueu¨< S[Í G<K< u}qKð lØUdØ” ¨ÃU uUeÖ=‘ u}²Ò ¢Uú¨<}‘ ¨<eØ እ”Ç=kSØ እ“Å‘ÒK”:: ያ”}” ¾ÓM S[Í ¾Á²< Ê¡S”„‹ G<K< Ÿ²=I ¡K=’>¡ ¨<ß ›Ã¨Ö<U:: Á”}” ¾ÓM S[Í K=Á¿ ¾T>‹K<ƒ ¾²=I ¡K=’>¡ vKS<Á-‹“ ¾²=I Ø“ƒ u<É” ›vLƒ w‰ “†¨<::

u²=I Ø“ƒ uSd}õ eKT>Ñ˜ ØpU u²=I Ø“ƒ uSd}õI U”U ØpU Lታ Ñ˜ ƒ‹LKI:: ’Ñ‘ Ó” ŸØ“~ ¾T>Ñ–¨< S[Í K›”}U J’ KK?KA‹ ScØ ¾Ö?“ ‹Ó‘ LKv†¨< ÖkT@ K=•[¨< Ã‹LM::

uØ“~ vKSd}õI eKT>Ÿcƒ Ñ<Çƒ ›”}U J”¡ ¨LÐ‹I/›dÇÑ>-‹I u²=I Ø“ƒ LKSd}õ wƒ¨e‘< U”U ¾T>Å‘ev‹G< Ñ<Çƒ ›Ã•‘U እ”Å¨ƒa¨< G<K< ²=I ¡K=’>¡ ¨<eØ ¾T>cÖ¨<” ¾Ö?“ ›ÑMÓKAƒ }ÖnT> ƒJ“L‹G<::

uØ“~ Sd}õ ¾T>Áe¨×¨< ¨Ü u²=I Ø“ƒ uSd}õI ¾U ¨×¨< ¨Ü ›Ã•‘U:: *እዚህ ጥናት ውስጥ በመሳተፍህ የሚከፈልህ ገንዘብ አይኖርም::*

እ”ÅØ“~ }dታò ÁKI Swƒ u²=I Ø“ƒ Sd}õ uõì<U ðnÅ~’ƒ LÃ ¾}SW[} ’¨<:: ›”}U J”¡ ¨LÐ‹I ›dÇÑ>-‹ u²=I Ø“ƒ LKSd}õ ÁL†¨< Swƒ ¾}Öuk ’¨<:: እ”Ç=G<U uT“†¨<U Ñ>²? Ø“~” Kq S¨<×ƒ Ã‰LM:: ¾Uƒ¨e’¨< ¨<d’@ uሚታÑ–¨< Q¡U“ LÃ U”U ¯Ã’ƒ }î®• ›ÁdÉ‘U:: eKØ“~ ¨<Ö?ƒ S[Í u=ÁeðMÓʊ ¾¡K=’>Ÿ<” W^}™‹ uSÖ¾p }Ñu=¨<” S[Í Mታ Ñ˜ ƒ‹LKI::

¾SeTT>Á pê

¾¡K=’>Ÿ< W^}™‹ ታÇÑ> ¨×~ SeTTƒ eKSeTT~ ULi ÁÑ—K<::

u²=I Ø“ƒ KSd}õ ÃeTTK<;

☐ ›-” ☐ ›ÃÅKU

¾}dታò¨< ¾UeÖ=` lØ` _____

¾¡K=’>Ÿ< vKS<Á eU _____

ò`T _____

k” _____

ማሳሰቢያ፡- ለሌሎች የጥናቱ ተሳታፊዎች የሚዘጋጀው ቅጽም ይዘቱ ከዚህ ጋር ተመሳሳይ ሲሆን እንደዕድሜአቸው ክልል መጠነኛ ለውጥ ይደረጋል ::

CV's of Investigators

CV of the PI

General Information

Name: - Naod Firdu Gizaw

Place of birth: - Addis Ababa, Ethiopia

Date of birth: - 14 August, 1986

Sex: - Male

Marital Status: - Single

Nationality: - Ethiopian

ADDRESS

Addis Ababa University

College of Health Sciences, School of Public Health

P.O Box: 9086

Addis Ababa, Ethiopia

Tel: - +251 115157701 (Office)

+251 910204888 (Mobile)

Email: - naodfirdu@gmail.com

Educational Background

Type of Education	Educational Institution	Location	Years Attended	Certificates Awarded
Secondary Education	Lideta Catholic cathedral	Addis Ababa, Ethiopia	September 2001-July 2003 G.C	Ethiopian General Secondary Education Certificate
Preparatory Education	Lideta Catholic cathedral	Addis Ababa, Ethiopia	September 2003-July 2005 G.C	Ethiopian Higher Education Entrance Certificate
Higher Education (Undergrad)	Addis Ababa University (AAU), School of Medicine	Addis Ababa, Ethiopia	January 2006-September 2011	Medical Degree (MD)
Postgraduate	Addis Ababa University (AAU), School of Public Health	Addis Ababa, Ethiopia	September 2012-July 2014 (On Progress)	Pending (MPH)

Merits Received

- ➔ Ethiopian General Secondary Education Certificate with **4.00 GPA** (9As)
- ➔ Ethiopian Higher Education Entrance Certificate with **Very Great Distinction**
- ➔ Completion of **Internship** in four clinical departments (Internal Medicine, Surgery, Pediatrics and Obstetrics & Gynecology), **all with an 'A' level assessment**

Work Experience

Addis Ababa University, School of Public Health (SPH), Addis Ababa, Ethiopia from Sept 2011

Lecturer (**lecture undergraduate medical students** and other health science students)
Member of the managing committee of ***'Butajira rural Demographic Surveillance Site'***
Involvement as a research assistant in various projects
Member & Secretary of ***Research & Ethics Committee*** of the Department of Preventive Medicine
MPH fellow at AAU, SPH (Epidemiology & Biostatistics specialty track)
PI in a project (Adherence to HAART & its correlates among HIV infected adolescents in Addis Ababa, Ethiopia)

Co-Investigator in a study (Characteristics & Outcomes of Mechanically Ventilated Patients in Black Lion Hospital Medical ICU)

Black Lion Specialized Hospital, Addis Ababa, Ethiopia **from July 2010**

Worked as an intern
Clinical works in Pediatrics, Internal Medicine, Obstetrics and Gynecology and Surgery
Clinical works in the Private Wing of the Hospital

Anania Maternal and Child Health Specialty Clinic **from July 2010**

Worked as a clinician in the Pediatric department

Medco Bio-medical College, Addis Ababa, Ethiopia **from Sept 2011**

Lecturer (Pathology, OBGYN, Pediatrics & Internal Medicine) and clinical mentor

Lecturer (Epidemiology, Reproductive Health & other Public health Courses)

Africa Medical College, Addis Ababa, Ethiopia

Lecturer & clinical mentor

Betel Medical College, Addis Ababa, Ethiopia

Lecture health science students

Trainings taken, Conferences attended

- MDR/XDR TB management training from Ethiopian Society of General Medical Practitioners and USAID, September 2010.
- PMTCT training from AAU & John Hopkins University/TSEHAI project, March, 2011.
- ART & HIV care training from AAU School of Medicine & WHO, August 2011.
- Emergency Medicine training for interns from AAU, September, 2010.
- BPR & Government policy training from Ministry of Health, September, 2011.
- TOT on Application of Behavior Change Communication Strategies for HIV/AIDS, by AAU-MARCH Project, Johns Hopkins University Bloomberg School of Public Health & the US CDC.
- World Public Health Conference, 2012
- The international conference on AIDS and sexually transmitted diseases in Africa

(ICASA) 2011

– International Training Workshop on Grants Management & Research Administration, Nairobi, Kenya by National Institutes of Health (NIH).

– Training on "Understanding and Using the Demographic and Health Surveys", Measure DHS, August, 2012,

Language

Language	Speak	Write	Read	Understand
English	Excellent	Excellent	Excellent	Excellent
Amharic	Excellent	Excellent	Excellent	Excellent

Skills, Interests, Hobbies

- Know how on statistical software packages (SPSS, EPI INFO, WHO-Anthro, ENA-SMART, OPEN EPI, open code, STATA)
- Positive attitude
- Planning and Organizing
- Writing & reading
- Team leadership
- Good communication skills
- IT know how
- Second level Driving License

Extracurricular Activities

- I was an active member & coordinator of the activities of EMSA (Ethiopian Medical Students Association) student led and legally licensed and registered organization.

Professional Associations Membership

- Ethiopian Medical Association (EMA)
- Ethiopian Society of General Medical Practitioners (ESGMP)
- Ethiopian Public Health Association (EPHA)

Future Plan and Interests

- To upgrade my level of education to the subsequent higher levels.

- To be a distinguished health researcher and professional.
- To be a renowned publisher.

Attestation

- Dr. Degu Jerene, Assistant Professor of Public Health at AAU, School of Public Health
- Dr. Wakgari Deressa, Dean of the School of Public Health at AAU. (*deressaw@gmail.com*)

I certify that the information given above is true & correct to the best of my knowledge.

Name: - Naod Firdu, May 2014

Curriculum Vitae (January, 2013)

1. General Information

Name: Fikre Enquselassie Gashe
Place of birth: Addis Ababa, Ethiopia
Date of birth: August 19, 1962
Sex: Male
Marital status: Married and three sons

ADDRESS

Addis Ababa University
Faculty of Medicine, School of Public Health
P.O. Box 9086
Addis Ababa, Ethiopia
Tel: 251 115507945 (Office)
251 912459707 (Mobile)
Fax: 251 115517701
E-mail: "fikreens@yahoo.com"

2. Educational Background

- B.Sc, in Mathematics, Addis Ababa University (AAU)
- M.Sc., in Mathematical Statistics, AAU
- Msc, in Biostatstics University of Newcastle (Center for Clinical Epidemiology and Biostatistics), Australia
- PhD, Infectious disease Epidemiology University of Warwick (Biological Sciences Department), UK

3. Professional Training and short courses

- Certificate on Epidemiology and Field Research Methodology I, University of Umeå, Sweden, 1993
- Certificate on advanced Epidemiology and Field Research Methodology II, University of Umeå, Sweden, 1994
- Certificate on Modern Approaches to Epidemiology and Control of Infectious Disease, University of Oxford, Oxford, UK, Sept. 1995
- Certificate on Epidemiology advanced Biostatistics and AIDS Research, Johns Hopkins University, School of Hygiene and Public Health, Baltimore, Maryland, USA, 1996
- Certificate on Electronic Processing Analysis, and reporting HIV sentinel Surveillance data using Epi Info 2002, Addis Ababa, Ethiopia, 2003
- Certificate in the INCLEN Trust Leadership and Management program school, Agra, India, 2004.

- Certificate on HIV/AIDS Monitoring and Evaluation, Nairobi Kenya 2004.
- Certificate of Merit for the dedicated crevice in the board of the Ethiopian Medical Journal 1995-2007, Addis Ababa, Ethiopia
- Certificate in participating 5th TEPHINET Global Scientific Conference, Kuala Lumpur, Malaysia 2008
- Certificate Drugs for Neglected Disdeases for contribution to the Leishmaniasis East African Platform, 2008
- Certificate in Strategic Planning and Leadership, Bangkok, Thailand, 2009
- Certificate on PhD supervision, Umea, Sweden, 2009
- Certificate in participating 3rd AFINET Scientific Conference, Mombasa, Kenya, 2009
- Certificate on Epidemiology and advanced Biostatistics, Johns Hopkins University, Bloomberg School of Hygiene and Public Health, Baltimore, Maryland, USA, 2010

4. International conferences and workshops attended

- International Clinical Epidemiology Network (INCLEN) XI annual conference Jan. 23-30, 1992 in Cairo, Egypt
- Workshop on collecting and applying longitudinal demographic data October 10-21, 1993 Matlab project in Dahaka, Bangladesh
- International Clinical Epidemiology Network (INCLEN) XII annual conference Jan. 23-30, 1993 in Chang Mai, Thailand
- Workshop in Biostatistics continuing education (Trainer) Nov. 1-5, 1994 in Nairobi, Kenya
- Summer course on Research Methods (Facilitator and trainer), organized by DCH for Regional Health Managers, August 1995.
- African Clinical Epidemiology Network (AfriCLEN) IV annual conference Oct, 1996 in Kampala, Uganda
- International Clinical Epidemiology Network (INCLEN) XIV annual conference Feb. 23-30, 1997 in Penang, Malaysia
- African Clinical Epidemiology Network (AfriCLEN) IV annual conference Oct, 1998 in Harare, Zimbzbwe
- African Clinical Epidemiology Network (AfriCLEN) IV annual conference Oct, 1998 in Harare, Zimbzbwe
- The Johns Hopkins and AAU collaborative Workshop on HIV/AIDS Addis Ababa, Ethiopia Nov. 1-5, 1994
- Biological and Clinical data collection in national surveys potential and issues, Washington DC, USA, Jan. 2000
- Dissemination Seminar for the Ethiopian DHS, Addis Ababa, Ethiopia, May 2001
- INCLEN-Africa Governance and strategic plan workshop Nairobi, Kenya, June 2001
- INDEPTH Network Governance and strategic plan workshop Accra, Ghana, August 2001
- Workshop on Health Inequity, Ho. Ghana, Oct, 2001,
- INDEPTH Network, 2nd International scientific conference (as a chairman of the organizing committee) Addis Ababa, Ethiopia Jan 21-25, 2002
- Dissemination Seminar BSS Ethiopia, (as Investigator), Addis Ababa, Ethiopia, June 25-26.

- INCLEN-Africa VIII annual conference and council meeting, May 2003 in Entebbe, Uganda
- National consensus building meeting on introduction of new vaccine into Ethiopian routine EPI (presenting the epidemiological profiles of Hepatitis B virus in Ethiopia), July, 2003, Addis Ababa, Ethiopia
- INCLEN-Africa council meeting and LAMP workshop, January 2004 Ismalia, Egypt,
- INCLEN Global meeting XX February 2004. Agra, India,
- 3rd Annual conference of South African Public Health Association, May 2006, Johannesburg, South Africa,
- Gates institute 3rd Annual Partners meeting, March 2007, Baltimore USA
- 2nd AFINET (African Field Epidemiology Network) conference, November 2007, Kampala, Uganda
- Gates institute 4th Annual Partners meeting, May 2008, Abuja, Nigeria
- Workshop on Health Informatics May 2008 Cape town, South Africa
- INDEPTH Network, 10th International scientific conference (as site leader) Dar Es Salaam, Tanzania Sept 22-26, 2008
- Gates institute 5th Annual Partners meeting, October, 2008, Abuja, China
- 5th TEPHNET (Training Programs in Epidemiology and Public Health Intervention Network) Global Scientific Conference, November 2008, Kuala Lumpur, Malaysia
- Strategic Planning and Leadership Training Workshop, March 2009, Bangkok, Thailand
- International workshop on PhD supervision, May, 2009 Umea, Sweden
- 3rd AFINET (African Field Epidemiology Network) conference, September 2009, Mombasa, Kenya
- Johns Hopkins University, Bloomberg School of Hygiene and Public Health, March 28 to May 30, 2010. Baltimore, Maryland, USA.
- International workshop on *The Pregnancy Intentions of HIV-Positive Women: Forwarding the Research Agenda 17-20 May; 2010*," Harvard School of Public Health in Boston, MA, USA.
- DSMB meeting for Drugs for Neglected Diseases Initiative, (the Leishmaniasis East African Platform), Jun 2-5. Nairobi, Kenya
- DSMB meeting for Drugs for Neglected Diseases Initiative, (the Leishmaniasis East African Platform), Sept 16-17. Nairobi, Kenya
- 6th TEPHNET (Training Programs in Epidemiology and Public Health Intervention Network) Global Scientific Conference, November 2011, Cape Town, South Africa
- INDEPTH Network Mortality analysis workshop Accra, Ghana, July 2012
- INDEPTH Network Migration analysis workshop Nirobi, Kenya, Feb, 2013
-

5. Work Experience

5.1. Place of work

- 1983-1984: Assistant lecture, Department of mathematics, Asmara University
- 1985-1988 Par-time lecturer, Department of mathematics, Addis Ababa University
- 1989: Lecturer, Department of Community Health Faculty of Medicine, AAU
- 1996- Assistant Professor, Dept. Community Health, Faculty Medicine, AAU

- 2000 (on Sabbatical leave): Consultant Biostatistician, Swedish Infectious Disease Control.
- 2002- Associate Professor, Dept. Community Health, Faculty Medicine, AAU
- 2003-Coordinator of HIV/AIDS training and research program within INCLEN-Africa
- 2006- 2009 Head Dept. Community Health, Faculty Medicine, AAU
- 2006-Member of the Faculty APC since January 2006

5.2. Teaching Experience

- Mathematics and statistics for undergraduate students
- Biostatistics for both undergraduate and graduate students.
- Epidemiology and Biostatistics for Biomedical post-graduate students
- Clinical epidemiology and Biostatistics for Biomedical PhD students
- Advanced quantitative methods for Public Health PhD students
- Rural Community Health Training Program (RCHTP)
- Research Methodology undergraduate, public health and clinical residents
- Computing, data processing and statistical analysis for all undergraduate and graduate students.
- Distance Learning program in the Clinical Epidemiology Unit (CEU) of the faculty
- Research and thesis advisor for undergraduate, MPH and PhD students in public health, biomedical and clinical medicine.
- Residency Supervisor for graduate students in public health.
- Training Project Proposal Write up, grant application and evaluation and monitoring for UNHCR field Medical officers and project coordinators
- Leadership Strategic Information Training- Program (LSI) coordinator
- Field Epidemiology and Laboratory Training Program (FELTP) director
- Biostatistics and research methods for clinical epidemiologists, Nairobi, Kenya
- Mathematical Modeling on infectious diseases for public health practitioners, Swedish Infectious Disease Control, Caroliniska Institute, Sweden
- Community based survey methods, data collection and processing on vaccine preventable infectious diseases, University of Warwick, UK

5.3. Experience on consultancy services

- UNICEF: Sanitation survey in Tigray Region
- ESTC (Gondar Medical College): Constructing baseline demographic survey surveillance
- Jimma Institute of Health Sciences: Work on new medical Journal, need assessment
- AAU (Dept. of Statistics): Need assessment and profile of statisticians in Ethiopia
- INCLEN-Africa Biostatistics and research methods for clinical epidemiologists
- Swedish Infectious Disease Control: Consultant statistician and research methods
- HABCO, MOH: National Behavioral survey surveillance (BSS Round I)
- HABCO, MOH: National Behavioral survey surveillance (BSS Round II on going)
- UNHCR: Training Project Proposal writing for field Medical officers and project coordinators in the country
- Save the Children-UK: KAPB survey on SCUK operational areas Jijjiga and South Wollo
- WHO: Measles Case fatality study

- ESTC/CDC/EPHA: National Health Research Capacity Building Project Consultancy
- International Rescue Committee (IRC), Ethiopia Program: KAP survey on HIV/AIDS, reproductive health, malaria and diaharreoal disease in West Hararge.
- Regional AIDS Training Network (RATN): Situational Analysis on Monitoring and Evaluation survey.
- EPHA/CDC: Field Epidemiology Training program.
- International Rescue Committee (IRC), Ethiopia. Gender based violence in Eritrean Refuge.
- Intermon Oxfam (HALD): Evaluation
- External reviewer of Biostatistics masters program, Jimma University
- External reviewer of Biostatistics masters program, Hawassa University

5.4. Professional and Committee Membership

- Member, Ethiopian teachers association
- Member, Ethiopian mathematical association
- Member, Ethiopian statistical association
- Member, Ethiopian public health association
- Member, Editorial board Ethiopian Medical Journal since 1994
- Associate chair person, Editorial board Ethiopian Medical Journal since 2006
- Member, Editorial Consultants Ethiopian Journal of Health Development
- Member, Editorial Consultants Ethiopian Journal General Practitioners
- Member, Clinical Epidemiology Unit (CEU), since 1992
- Chairman, Teaching load committee, Faculty Medicine 1996
- Member, Staff evaluation committee, Faculty Medicine 1996-1998
- Member, Research and Publication Committee, Faculty Medicine 1996-1998
- Secretary of INCLEN-Africa constitution committee 2003-
- INCLEN-Africa Council member 2003-
- Deputy chairman and vice editor of Ethiopian Biometric Association: 2003-
- Member, Faculty appointment and promotion committee 2005-
- Chairman, the national steering committee for Field Epidemiology and Laboratory Training Program 2006-2009
- Member of quantitative and computation skills committee, AAU
- Data Safety Monitoring Board (DSMB) member in many clinical trials including Drugs for Neglected Diseases Initiative, (the Leishmaniasis East African Platform)
-

6. Research Experience

6.1. Publications

1. **Enquselassie F,** Dobson AJ, Alexander HM and Steele PL. Seasons, Temperature and Coronary Disease. *Int J Epidemiol 1993; 22:632-36.*
2. Tesfaye F, **Enquselassie F**, Kebede F, Wendimagegn G. ORS usage in acute childhood diarrhoea in Adamitulu Woreda. *Ethiop Med J 1996; 34.*

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20. **Enquselassie F** Statistical pitfalls in published articles. *Eth J Helth Dev 2000; 14(2):225-226.*
21. Abdurehman A, **Enquselassie F**. Demographic impact of HIV/AIDS in Addis Ababa. *Ethiop Med J 2001; 39:9-22.*

22. Nokes DJ**, Enquselassie F** et al. Has oral fluid the potential to replace serum for the evaluation of population immunity levels? A study of measles rubella and hepatitis B in rural Ethiopia. *Bull WHO 2001; 79(7):588-595.*
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43. **Fikre Enquselassie**. Ethiopian Medical Journal 45 years old in the new millennium. Editorial. *Ethiop Med J 2008; 45(4)*: *Editorial.*
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50. **Fikre Enquselassie.** Meeting the Millennium Development Goals in Health Sector: as Theme Issue on EMA Annual Conference. *Ethiop Med J 2009; 47* (2): *Editorial.*
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57. **Fikre Enquselassie.** The role of the health sector on Road Traffic Injuries. *Ethiop Med J 2009; 47 (4):Editorial*

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65. **Fikre Enquselassie.** Introducing vaccine against H1N1 influenza virus in schools. *Ethiop Med J 2010; 48 (3):Editorial*
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69. Assefa M,' **Enquselassie F.** Health information exchange between clinicians and people living with HIV/AIDS on Anti retroviral therapy at Public health hospitals in Addis Ababa *Ethiop Med J; 2011; 49 (2).85-95*
70. Gebremedhin S, **Enquselassie F.** Correlates of Anemia among Women of Reproductive Age in Ethiopia: Evidence from Ethiopian DHS 2005 *Ethiop. J. Health Dev* 2011;25(1).22-30.
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73. **Enquselassie F.** Ethiopian Medical Journal celebrates 50th anniversary. *Ethiop Med J 2012; 50 (1): Editorial.*
74. **Enquselassie F.** Ethiopian Medical Journal: An overview assessment of the last 50 years. *Ethiop Med J 2012; 50 (Suppl 1):1-19.*

75. James H Bower, Emanuel Mwendo, Richard Walker, Venance Maro, **Enquselassie F**, Seid Ali. Validity of a Screening Instrument for Neurologic Disability in Resource-Poor African Communities. *J Neuro Sci. 2012*
76. Berhe G, **Enquselassie F** and Asefa A. Treatment outcome of smear-positive pulmonary tuberculosis patients in Tigray Region, Northern Ethiopia. BMC Public Health 2012, 12:537.
77. Tesso D, Fantahun M and **Enquselassie F.** Parent-young people communication about sexual and reproductive health in E/Wollega zone, West Ethiopia: Implications for intervention. *BMC Reproductive Health 2012, 9 1-13.*
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79. Tarekegn M, **Enquselassie F**. A case control study on determinants of diarrheal morbidity among under-five children in Wolaita Soddo town, Southern Ethiopia. *Ethiop.J.Health Dev* 2012; 26(2):78-85.
80. Tesso D, Fantahun M and **Enquselassie F.** Does young people's living arrangement matter in their behaviors? A systematic review and meta analysis. *Ethiop.J.Health Dev* 2012; 26(3):208-215.
81. Bayray A, **Enquselassie F**, Gebreegziabher Z. Magnitude and pattern of osteoporotic fractures among adults in Tigray, Ethiopia; a retrospective hospital based study. *Ethiop Med J 2012; 50 (4):297-305.*
82. Deribe K, Brooker SJ, Pullan RL, Hailu A, **Enquselassie F**, et al. (2013). Spatial Distribution of Podoconiosis in Relation to Environmental Factors in Ethiopia: A Historical Review. PLoS ONE 8(7): e68330. doi:10.1371/journal.pone.0068330
83. **Enquselassie F**. Focusing for better accessibility of the Ethiopian Medical Journal. *Ethiop Med J, 2013; 51(2): Editorial.*
84. **Enquselassie F**. Peer-review and editorial process of the Ethiopian medical journal: ten years assessment of the status of submitted manuscripts. *Ethiop Med J, 2031; 51(.2):95-103.*
85. Taye B, Enquselassie F, Tesgaye A, Medhin M, Davey G, Venn A. Atopy and Helicobacter pylori (H, pylori) infection: a systematic review and meta-analysis. PROSPERO 2013:CRD42013005053
86. Berhe G, **Enqueselassie F**, Hailu E, Mekonnen W, et al. Population-based prevalence survey of tuberculosis in the Tigray region of Ethiopia. BMC Infect Dis. 2013 Sep 28;13(1):448.
87. Franzen SRP, Chandler C, **Enquselassie F**, et al. Understanding the investigators: a qualitative study investigating the barriers and enablers to the implementation of local investigator-initiated clinical trials in Ethiopia. BMJ Open 2013;3:e003616. doi:10.1136/bmjopen-2013-003616.
88. **Enquselassie F.** Is Polio becoming a global challenge? *Ethiop Med J, 2013; 51(3): Editorial.*
89. Bayray A, **Enquselassie F**, Gebreegziabher Z. Cost of osteoporosis related fractures inhospital admitted patients, Tigray, Northern Ethiopia: A retrospective study. *Ethiop Med J 2013; 51 (3):177-186.*
90. Bayray A, **Enquselassie F**, Gebreegziabher Z et al. Risk factors of osteoporosis among adults in Ethiopia, the case of Tigrai region: A case control study. J. Public Health

Epidemiol, 2014; 6(2):92-100.

6.2. Other Publications

1. Tigray Sanitation Survey. UNICEF 1993.
2. Behavioral Surveillance Surveys on HIV/AIDS and SITIs (BSS), Ethiopia 2002, Round One (document is also on line (http://www.fhi.org)
3. Behavioral Surveillance Surveys on HIV/AIDS and SITIs (BSS), Ethiopia 2005, Round Two (On printing)
4. Data Processing, analysis and interpretation for health Research. ESTC/CDC/EPHA, 2004
5. Health Research Methods. ESTC/CDC/EPHA, 2004
6. Proposal writing. ESTC/CDC/EPHA, 2004

6.3. Publications in press

Publications in press

1. Incidence and risk factors that can lead to the development and affect the management of osteoporosis among adults in Tigray, Ethiopia**. (*In Press*).**
2. Assessment of Risk factors for development of active pulmonary tuberculosis in Northern part of Ethiopia: a matched case control study **(*In Press*).**
3. Contact tracing for Multi Drug Resistant Tuberculosis at tertiary hospital in Addis Ababa, Ethiopia **(*In Press*).**
4. Assessing Effect of Antiretroviral Therapy (HAART) Access on Fertility Intention and Contraception Use Among HIV Positive Women in Addis Ababa, Ethiopia **(*In Press*).**
5. Childbearing Intentions of HIV-Positive Women of Reproductive age attending health institutions in Addis Ababa, Ethiopia **(*In Press*).**
6. The Epidemiological Role of Cattle in the Transmission and Maintenance of *Mycobacterium tuberculosis* to Humans in Two Zones of Amhara National Regional State, Ethiopia **(*In Press*).**

6.4. Grant Awards

- INCLEN, USA, Clinical Epidemiology and Biostatistics masters training, University of Newcastle, Australia.
- INCLEN, USA, Community-based research in connection with RCHTP in rural Ethiopia South Ethiopia.
- Sida/SAREC, Sweden, BRHP
- Sida/SAREC, Sweden, Helicobacter Pylori study
- Well Come Trust, UK, Measles, Rubella and Hepatitis B study in urban Addis Ababa and rural Butajira (PhD research University of Warwick)
- British Council, PhD training University of Warwick
- USAID, FHI, Behavioral Surveillance Surveys (BSS) Ethiopia
- Save the children UK, KAPB study on HIV/AIDS

- International Rescue Committee (IRC), Studies on HIV and domestic violence
- ESTC/CDC/EPHA, Ethiopia Module development on "data processing and statistical analysis"
- CDC/EPHA, Leadership Strategic Information Training- Program-
- CDC/EPHA, Field Epidemiology Training Program-
- NIH/Welcome trust, GoLBet: Randomized controlled Podoconosis treatment trial in Northern Ethiopia

7. Awards

- Certificate of Merit Ethiopian Medical Association, 2007
- Certificate of Merit Ethiopian Public Health Association, 2006
- Gold medalist for senior researcher, 2008, EPHA 19th Annual conference
- Certificate of Merit Ethiopian Medical Association, 2012

Date revised 17 July 2013

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DARE, DEGU JERENE

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EDUCATION AND TRAINING

***2002-2007**: **PhD in International Health (HIV/AIDS)**, University of Bergen, Norway.*

***1992-1999**: **Doctor of Medicine (MD),** Addis Ababa University, Ethiopia*

2011-2014 MBA in non-profit management *(on progress)*

PROFESSIONAL EXPERIENCE

***05/2010-present: Clinical Director**, Johns Hopkins University, Technical Support for the Ethiopian HIV/AIDS ART Initiative (**TSEHAI**) project, Addis Ababa, Ethiopia*

*(**Since June 2011-Honorary Assistant Professor**, Department of Preventive Medicine, SPH, AAU)*

***11/2008-4/2010: National Professional Officer-HIV/AIDS,** World Health Organization, Ethiopia*

***08/2007-11/2008: National consultant** to the Federal HIV/AIDS Prevention and Control Office, Ethiopia*

***01/2007-12/2007: Director, Health and HIV/AIDS Program**, Ethiopian Kale Heywet Church, Ethiopia*

***01/2002-01/2007: HIV Project Coordinator,** Arba Minch Hospital, Ethiopia*

***08/1999-01/2002, General Practitioner and Vice Medical Director,** Arba Minch Hospital, Ethiopia*

PROFESSIONAL ACTIVITIES

Professional membership and leadership

2000- Member, Ethiopian Public Health Association

2000- Member, Ethiopian Medical Association

2006- Member, International AIDS Society

2009- Member, International Union Against Tuberculosis and Lung Disease

Participation on Advisory Panels

2007-8 Chair, TB/HIV Technical Working Group, Ethiopia

2008-10 Secretary, National HIV Treatment Working Group, Ethiopia

2008-9 Board chair, Community Vision Ethiopia (local NGO)

2011 Clinical Track Chair, International Conference on AIDS and STIs in Africa (ICASA 2011)

2012- *Member, National HIV Technical Advisory Group, Ethiopia*

Consultations

March 2010: Home Based HIV Care in Ethiopia (for Cordaid Netherlands, on behalf of ETC Crystal)
2009: The role of private health facilities in malaria prevention and control in selected zones of Oromia (for USAID/C-Change, on behalf of ABCON PLC)
2002: Baseline HIV KAP Survey for World Vision Ethiopia, Western Abaya Area Development Program
2001: A series of micronutrient deficiency surveys for World Vision Ethiopia, Western Abaya ADP

EDITORIAL ACTIVITIES

Peer Review Activities

JAMA
AIDS
Journal of AIDS Care and STDs
BMC Public Health
AIDS Research and Therapy
Ethiopian Journal of Health Development

Editorial Board Membership

2012- *Member of Editorial Board, Bulletin of Health Sciences, College of Medicine and Health Sciences, Hawassa University, Ethiopia*

HONORS AND AWARDS

Honors

1995-97: Fellow, Getachew Bolodia Foundation

Awards

1996: Dean's Letter of Academic Excellence, Addis Ababa University
1999: Outstanding Medical Graduate Award, Faculty of Medicine, Addis Ababa University
2012: Silver Medal and Certificate of Appreciation for outstanding contribution at ICASA 2011
2013: CIPHER Fellowship Award for pediatric HIV Research (IAS2013, Kuala Lumpur)

Named Lectureships*:*

Successful Scale up of a decentralized and Family-focused chronic HIV care in a setting with limited resources: a decade-long experience from Ethiopia*. Oct 5, 2012. Lund University, Sweden*

PUBLICATIONS

Journal Articles

1. *Kassa A*, Teka A , *Shoaamare A, **Jerene D***. Incidence of tuberculosis and early mortality in a large cohort of HIV infected patients receiving antiretroviral therapy in a tertiary hospital in Addis Ababa, Ethiopia. **Trans R Soc Trop Med Hyg** 2012 Jun;106(6):363-70. Epub 2012 Apr 20.

2. ***Jerene D,*** *Fentie G, Teka M, Girma S, Chibsa S, Teka H, Reithinger R.* The role of private health facilities in the provision of malaria case management and prevention services in four zones of Oromia Regional State, Ethiopia. **International Health** 4 (2012), 70-73
3. *Kassa A, **Jerene D**, Assefa Y, Teka A, Assefa A, and Deribew A*. Evaluation of collaborative TB/HIV activities in a general hospital in Addis Ababa, Ethiopia. *BMC Research Notes* 2012, **5**:67
4. Mulissa Z, **Jerene D**, Lindtjorn B: Patients present earlier and survival has improved, but pre-ART attrition is high in a six-year HIV cohort data from Ethiopia. *PLoS One 2010*, 5(10):e13268.
5. Assefa Y, **Jerene D**, Lulseged S, Ooms G, Van Damme W . Rapid scale-up of antiretroviral treatment in Ethiopia: Successes and System-wide effects. PLoS Med 2009; 6(4) : e10000056.
6. Johansson KA, **Jerene D**, Norheim OF. National HIV Treatment Guidelines in Tanzania and Ethiopia – Are they legitimate rationing tools? J. Med. Ethics 2008;34;478-483
7. Haddis M, **Jerene D**. Awareness of antenatal care clients on Mother-to-child transmission (MTCT) of HIV infection and its prevention in Arba Minch. Ethiop J Health Dev. 2006 ; 20 (1):55-57.
8. **Jerene D,** Endale A, Hailu Y, Lindtjørn B. Predictors of early death in a cohort of Ethiopian patients treated with HAART. BMC Infect Dis. 2006 ; 6 (1): 136.
9. **Jerene D,** Næss A, Lindtjørn B. Antiretroviral therapy at a district hospital in Ethiopia prevents death and tuberculosis in a cohort of HIV patients. AIDS Re**s Ther .** 2006 Apr 7; 3(1):10.
10. Bikilla A, **Jerene D**, Robberstad B, Lindtjørn B. Cost estimates of HIV care and treatment with and without anti-retroviral therapy at Arba Minch Hospital in southern Ethiopia. Cost Effectiveness and Resource Allocation, 2009 April 13; 7:6
11. Bikilla AD**, Jerene D**, Robberstad B, Lindtjørn B. Cost-effectiveness of antiretroviral therapy at a district hospital in southern Ethiopia. Cost Eff Resour Alloc. 2009 Jul 17;7:13.
12. **Jerene D,** Endale A, Lindtjørn B. Acceptability of HIV counseling and testing among tuberculosis patients in south Ethiopia. BMC Int Health and Hum Rights. 20**07 May 3**0;7:4.
13. **Jerene D,** Lindtjørn B. Disease progression among untreated HIV infected patients in south Ethiopia: implications for patient care. MedGenMed. 2005; 7(3).
14. **Jerene D**, Hailu Y, Sarato S. Sources of HIV related information among the youth in Gamo Goffa, South Ethiopia. J Ethiop Med Pract. 2002; 4 (2).
15. **Jerene D**. Malaria and absenteeism from work among workers of Arba Minch Hospital. J Ethiop Med Pract. 2000

Abstracts

16. *Legesse H, Tegegn T, McNabb M, **Jerene D**, Zewdu S, and Wissow L*. **Pilot integration of mental health services into HIV treatment in Ethiopia.** Oral presentation. Abstract no: TUAB064. ICASA 2011,6 Dec 2011. Addis Ababa, Ethiopia
17. *Tekle B, **Jerene D**, Kinde D, Ahmed S , and Zewdu S*. **Engaging the private health sector in comprehensive HIV and TB services delivery in Addis Ababa, Ethiopia.** Abstract no: TUPE213. ICASA 2011, 6 Dec 2011. Addis Ababa, Ethiopia
18. *Ahmed S, Zewde A, Gadisa T, Seid K, Tafesse Y, **Jerene D**, Ambaw Y, Williams S, Bedri A, Gichangi P, Konings E*. **Programmatic Implications of Revising the CD4 Threshold to Start ART in Asymptomatic HIV Patients in Ethiopia.** Abstract no: MOPE265, ICASA 2011, 5 Dec 2011. Addis Ababa, Ethiopia
19. *Assefa A, Mebratu A, **Jerene D**, Doherty M , McNabb M, Atnafu D, Zewdu S, Alebachew A, Negassa H, Kebede D, Mekonnen A, Wolf B, Takele F, Ruff A.* **Confidential Clinics for Female Sex**

Workers: Lessons from a Pilot Project in Addis Ababa, Ethiopia. Abstract no: WEPE175. ICASA 2011, 7 Dec 2011. Addis Ababa, Ethiopia

20. Ashenafi A, Zewdu S, Sheferedin B, Tesfaye A, Mekonnen T, Tibeso G, **Jerene D**, Ruff. **Impact of mentoring, coaching and supervision towards laboratory quality management systems development: the case of Addis Ababa Health Research and Laboratory, Ethiopia**. Abstract no: MOPE 718. AIDS 2012, Washington, D.C., 22-27 July 2012

21. Yimam Z, Weiss B, **Jerene D,** Shoamare A, Nega A, Adamu R, Zewdu S**. Use of the Plan-Do-Study-Act (PDSA) strategy to improve performance of pre-ART retention in care rate at a tertiary hospital in Ethiopia.** Abstract no: MOPE498. AIDS 2012, Washington, D.C., 22-27 July 2012.

Books or Monographs

1. WHO 2010.Will we achieve universal access to HIV/AIDS services with the health workforce we have? A snapshot from five countries. **WHO/HSS/HWA/UA/Report2010**
2. FHAPCO/MOH 2009. Linkage to Chronic HIV Care in Ethiopia: Assessment of factors contributing to poor linkage at facility level.

Other: Many national guidelines

TEACHING

Advisees

2008-9 Endegena Ashenaif, Masters of Arts in HIV/AIDS
Thesis: Youth Sexuality and HIV/AIDS: Worldview as a Precursor of Expressions of Human Sexuality and a Biblical Imperative
2009-10 Dr Eyesusawit Shewangizaw
Thesis: Assessment of Efficacy of Isoniazid preventive Therapy in Preventing Tuberculosis in HIV infected Adults in Addis Ababa
2012- In-country mentor for PhD Candidate Mulatu Biru
Research title: Children with HIV on antiretroviral therapy through home-based care: possibilities and challenges in Ethiopia
In-country mentor for Dr Keseteberhan Delele, Operational Research Fellow
Research title: Incidence of Tuberculosis among HIV Infected Individuals who are in Pre-ART/ART Care and Received Isoniazid Preventive Therapy (IPT) in Selected Hospitals of Ethiopia
Co-advisor for Addisalem Titiyos, MPH student
Thesis topic: Assessment of extent of contact tracing for multi drug resistant tuberculosis in St. Peter tuberculosis specialized hospital, Addis Ababa, Ethiopia

Final Oral Participation

3 PhD and 10 MPH/MSc candidates

Classroom Instruction

2006: Biostatistics for nursing students, Arba Minch College of Health Sciences
2007/8: Epidemiology and Impact of HIV and AIDS in Ethiopia, the Ethiopian Graduate School of Theology, MA in HIV/AIDS.

2012- Case-control and cohort studies, Experimental study designs, HIV/STI prevention and control, Addis Ababa University, School of Public Health.

Other Significant Teaching

2006: Co-facilitator in the Global Health Course (Clinical Management of HIV infection, Survival analysis using SPSS), University of Bergen, Norway,

PRESENTATIONS

Scientific Meetings

Oral Presentation at the XVIII International AIDS Conference in Vienna, Austria, July 2010. Abstract # TUAB203

XVI International AIDS Conference, 13-19 August 2006; Toronto, Canada

- Presented two posters

Oral presentation at HIVNet Seminar, October 2004; Bergen, Norway