ADHERENCE TO ART AND ITS DETERMINANTS AMONG HIV INFECTED PATIENTS AT DESSIE REFERRAL HOSPITAL, NORTH CENTRAL ETHIOPIA

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ABSTRACT

Background: The use of antiretrovirals in combination therapy decisively altered the course of HIV infection epidemics. Adherence to ART regimens over an extended period is a key factor in obtaining their health benefits. Adherence to ART improves clinical results, controls the progression of disease and reduces mortality rates, resulting in improved patient quality of life.

Objective: to measure the levels of adherence and assess determinant factors leading to non-adherence to antiretroviral therapy at Dessie Referral Hospital, North Central Ethiopia.

Methodology: A cross-sectional study that engaged qualitative and quantitative data collection methods was carried out from February 07 to March 31, 2011in Dessie Referral Hospital. Self report and unannounced pill count techniques were used to measure the adherence level. Bivariate logistic regression analysis was undergone to determine presence of statistically significant association between possible determinant factors and adherence rate to antiretrovirals. Qualitative data was transcribed and analyzed using themes.

Results: The majority of the participants were females, 172 (56.8%). 277 (91.4%) of the respondents were optimally adherent to ART by 3-days self-report and 142(85.0%) of the 167 participants were optimally adherent by unannounced pill count method. Binary logistic regression analysis revealed that non disclosure of HIV status (AOR=14.15, CI (3.64, 54.98), P=0.001), lack of support (AOR=3.19, CI (1.07, 33.73), P=0.042), perceived side effects due to antiretrovirals (AOR=4.93, CI (1.34, 18.19), P=0.017) and inadequate knowledge about ART (AOR=5.64, CI (1.08, 296.26), P=0.001) were associated with non-adherence to doses of ARVs.

Conclusion and Recommendations: The optimal adherence level achieved by 3-days self report and unannounced pill count were 91.4% and 85.0%, respectively. Disclosure of HIV status, social support and disclosure, knowledge about ART and reported side effects due to ARVs were found to be associated with adherence in HIV-infected patients. Optimal adherence was found to be associated with better quality of life and increased CD_4 count.

Government and stakeholders working on HIV/AIDS should include food and transport support to ARV users and healthcare providers should inform patients about possible side effects and manage these side effects as early as possible so that users can maintain good adherence rate.

Key words: *Adherence, ART, Dessie Referral Hospital, quality of life, unannounced pill count*

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LIST OF ABBREVIATIONS AND ACRONYMS

AIDS   Acquired Immunodeficiency Syndrome

ART   Antiretroviral Therapy

BP   Bodily Pain

DACA   Drug Administration and Control Authority

EDM   Electronic Drug Monitoring

FGDs   Focus Group Discussions

GH   General Health

HAART   Highly Active Antiretroviral Therapy

HAPCO   HIV/AIDS Prevention & Control office

HIV   Human Immunodeficiency Virus

MCV   Mean Corpuscular Volume

MEMS   Medication Event Monitoring System

MH   Mental Health

MHS   Mental Health Summary

MOH   Ministry of Health

OIs   Opportunistic Infections

 PF   Physical Functioning

PHS   Physical Health Summary

QoL   Quality of Life

RE   Role Emotional

RP   Role Physical

RVI   Retroviral Infection

SF   Social Functioning

SF-36   Short form-36

UNAIDS   United Nations AIDS Program

USAID   U.S. Agency for International Development

VCT   Voluntary Counseling and Testing

VL   Viral Load

VT   Vitality

WHO   World Health Organization

1. INTRODUCTION

1.1. Background

HIV/AIDS has produced an enormous threat to mankind since its detection. The number of people living with HIV worldwide continued to grow in 2009, reaching an estimated 33.3 million. People newly infected with HIV in 2009 were 2.6 million, of which 1.8 million are in sub-Saharan Africa, bringing the total number of people living with HIV to 22.5 million in this region. While the rate of new HIV infections in sub-Saharan Africa has slowly declined-with the number of new infections in 2009 approximately 25% lower than at the epidemic's peak in the region in 1995-the number of people living with HIV in sub-Saharan Africa slightly increased in 2009, in part due to increased longevity stemming from improved access to HIV treatment (1).

HIV was first detected in Ethiopia in stored sera collected in 1984 and the first two AIDS cases were reported in 1986. A National HIV/AIDS taskforce was established in 1985 (2). In 2003, the Government of Ethiopia introduced ART program with the goal of reducing HIV-related morbidity and mortality, improving the quality of life of people living with HIV and mitigating some of the impacts of its epidemics (3). In 2005, Ethiopia launched free ART; over 246,347 clients were initiated on ART by the end of February 2010 of which 179, 183 are currently on ART. Some 532 hospitals and health centers are now providing HIV care and treatment services in all regions of the country (4).

The use of antiretroviral combination therapy has decisively altered the course of the HIV/AIDS infection epidemic. The antiretrovirals control the HIV infection, interfering with viral replication and thus drastically reducing the morbidity/ mortality due to AIDS (5). Approximately 2.9 million lives have been saved because of access to antiretroviral therapy, adding 11.7 million life-years globally between 1996 and 2008 (1).

Therapeutic strategies have expanded greatly from historical treatments with a single antiretroviral drug to combination therapy that includes at least three different drugs from three different classes, HAART. When compared to monotherapy, combination therapy has shown to delay progression to AIDS, improve survival, result in a greater and more sustained virologic and immunologic response and delay development of virus mutations that confer resistance to the drugs being used (6). Widespread acceptable use of ART has thus turned HIV infection into a chronic manageable disease (7).

Adherence to complex ART medication regimens over an extended period is a key factor in obtaining their health benefit; moreover, nearly complete adherence is necessary for an optimal benefit from ART (8).

Adherence is the extent to which a person's behavior – taking medication, following a diet, and/or executing lifestyle changes – corresponds with agreed recommendations from a health care provider (8). In another way medication compliance refers to the act of conforming to the recommendations made by the provider with respect to timing, dosage, and frequency of medication taking. Adherence and compliance are measured over a period of time and reported as percentage (9).The word "adherence" is favored by many health care providers, because compliance advocates that the patient is passively following the provider's orders and that the treatment plan is not based on a therapeutic alliance or contract established between the patient and the physician (10, 11).

It is well-known that adherence to ART improves clinical results, controls the progression of disease and reduces mortality rates, which theoretically should result in improved patient QoL. QoL should be considered throughout the long therapeutic process of AIDS and is one of the most utilized subjective aspects in evaluating the impact of chronic diseases. Treatment adherence and QoL should occur simultaneously, with adherence improving treatment outcomes (12, 13).

1.2.   Statement of the Problem

To carry out effective treatment and gain the benefits of treatment, firm adherence to treatment instructions are extremely essential. Just having medicine accessible cannot solve the HIV and AIDS troubles (14).

Successful long-term treatment of HIV/ AIDS requires at least 95% adherence to ART to bring improved virological, immunological and clinical outcomes and to prevent emergence of drug resistant HIV that can lead to regimen failure and that may also limit future therapy options (14). A decrease of 10% in adherence has been associated with a doubling of the HIV RNA level, suggesting that small differences in adherence can result in major differences in virological control (15). Therefore, patients with HIV are in need to strive for "perfect" (100%) adherence. Non adherence to therapy is a significant problem, particularly since the disease process is chronic and therapeutic regimens are employed for prolonged periods (14).

Several studies in Africa have shown that adherence to ART being ranging from 58% to 98.6% (16, 17, 18, 19, 20). In Burkina Faso and Mali, 58% of patients had complete adherence to ART in 2004 (16), whereas, in Malawi mean adherence level of 98.6% was indicated based on pill count and 57.5% optimal adherence level based on medication event monitoring system (MEMS) in 2005/2006 (20). In Coˆte d'Ivoire 74.3 % of the respondents were optimally adherent to ART (17). In Senegal, on average, patients had taken 91% of each over the study period dose (18) whereas in Zambia 83.7% of the patients took more than 95% of their ARV doses (19).

Comprehensive studies were not done in Ethiopia that indicated ART adherence level. Some pocket studies indicated adherence level of 74.2% to 95.0% (21-26). A study in Yirgalem Hospital found that adherence level of 74.2% in the week before assessment in 2006 (21). Another study done in Yirgalem, Hawassa, and Shashemene Hospitals reported an adherence rate of 93.1% and 88.1% using 15-days self-report and unannounced pill count method, respectively in 2007(23). A study conducted at Jimma University Specialized Hospital, based on self-report, indicated a relatively higher level of optimal adherence (95.0%) in 2009 (26).

Studies done in Amhara Region spotted suboptimal adherence rates. Adherence rate determined by a seven-day-recall period self-report was shown to be 89.2% at Felege Hiwot Hospital in Bahir Dar (22). A study at University of Gondar Teaching Hospital and Felege Hiwot Hospital brought similar figure of adherence level of 87% with self-report (25).

Few studies have looked into the challenges to long-term adherence in a sub-Saharan setting and qualitative methods have been particularly underutilized. A study in Cot d'Ivoire identified factors that were independently related to poor adherence: younger age, lack of social support, taking at least 10 pills per day, and higher CD_4 cell count at ART initiation (17). A study in South Africa with visual analog scale indicator found greater adherence amongst those with lower levels of education and amongst single, separated, divorced or widowed groups compared to those married and cohabiting. The adherence was found to be 3.3 times greater among patients with a CD_4 count above 200 cells/μL, and 4.6 times greater among patients with the 3TC, d4T + NVP regimen and higher overall QoL (27). Perceived quality of patient-provider interaction was also shown to be significantly associated with adherence by a study conducted in Tanzania (28).

A study in Southwest Ethiopia identified that adherence to ART was better when patients are in social support than with no social support (83.3% versus 65.2%) (24). Medication adverse effects were associated with nonadherence to antiretroviral therapy by studies conducted at Bahir dar and University of Gondar Teaching Hospitals (25) and Yirgalem Hospital (21).

Few studies have considered the relation of quality of life (QoL) and adherence. A study in USA found that QoL being significantly associated with their concurrent self-reported ART adherence level for the two QoL summary scores and for each of the eight QoL dimensions (29).

A study in South and Central Ethiopia has established that adherence to dose of ARVs, except for scores of role physical (RP), bodily pain (BP) and vitality (VT) scales, those adhered to doses of ARVs had better mean scores than those who did not adhered (23).

Suboptimal adherence rapidly leads to resistance, which can then be transmitted to other people. Non adherence to ART can have important public health implications as resistance can be transmitted to other persons during high-risk activity, which can then limit therapeutic options (8).

Since ART service is few years back introduced, studies should be conducted to evaluate and assess rate of adherence among people on ART and factors affecting adherence. However, there are few studies in Ethiopia on the level and determinants of adherence to the treatment. These few researches in Ethiopia have shown that our understanding of factors associated with ART adherence is limited. Moreover, the relationship between QoL and adherence has not been well studied in our context. So, this research will contribute an input to fill the gaps in these issues.

2. LITERATURE REVIEW

2.1. Measurement of ART Adherence

Commonly used methods for measuring adherence include indirect measures, such as self-reports, electronic drug monitoring (EDM), pill counts, and pharmacy refill records; and direct measures, including detection of drugs or drug metabolites in plasma (30).

Biological parameters used for adherence detection include mean corpuscular volume (MCV) for zidovudine or stavudine, uric acid level for didanosine and hyperbilirubinemia for indinavir. These indicators were not found to be consistent for the detection of adherence level (31). Monitoring plasma concentrations (therapeutic drug monitoring) is pharmacologically possible for many drugs but not all studies have shown a benefit of measuring serum drug levels for the measurement of adherence level (10, 31). It is limited by lack of technological standardization; procedures for sample collection, cross-validation of analytic procedures, and interpretation of results vary between settings. Factors other than adherence may affect drug levels, such as drug-drug interactions and diet. Serum drug levels only reflect adherence over the past 24 hours, and patients who are aware of a planned visit may ingest medication in anticipation of the test (30).

The underlying premise of pharmacy refill records is applicable if patients do not receive timely refills from the pharmacy; they are either missing doses (as measured by prolonged periods between refills) or not taking the medication at all. However, this premise is invalid if patients are obtaining medications in alternate ways (e.g. nearby facilities, family members, or friends). This method of measuring adherence further relies on the major assumption that patients who receive timely pharmacy refills ingest their medications correctly. The validity of this assumption has been evaluated by examining the association between pharmacy refill adherence and biologic outcomes, and in several studies pharmacy refill adherence has been shown to correlate significantly with HIV viral load (30).

Self-report is the most commonly used adherence measure in both clinical and research settings because it has low staff and respondent burden, and is inexpensive, flexible, and takes very little time. In clinical settings, self-report allows for a discussion of reasons for missed doses and potential solutions (10). Self-report overestimates adherence. Substantial variation also exists in the relevant time frame, with recall periods including the past one, three, seven, or thirty days (30). Most commonly, respondents are asked to report the number of doses they missed during a specified recall period. Caregivers and patients are prone to social desirability and recall bias, and

providers often misjudge adherence. However the validity of self-reports from adult patients has been demonstrated, at least in terms of their associations with VL (31).

Two pill-counting techniques for measuring adherence have been described. Announced pill counts take place at clinical appointments or scheduled research visits to which the patient brings their medication bottles. Announced pill counts can be inaccurate if patients empty pill containers without ingesting any pills ("pill dumping"), if the accurate start date for the pill supply cannot be determined, or if patients use multiple pill containers. In contrast, unannounced pill counts minimize the risk of pill dumping (30). A potential disadvantage of unannounced pill counts is that some patients may regard them as an invasion of privacy (31).

Electronic drug monitoring (EDM) utilizes devices, such as the medication event monitoring system (MEMS) cap, which is a pill bottle cap, embedded with a microprocessor that records the time and date of each bottle opening as a presumptive dose. The cap stores the information until it is downloaded. Benefits of EDM include the ability to examine both patterns of adherence and detailed aspects of medication taking, such as dose interval adherence. EDM is often treated as the adherence gold standard, because it produces adherence rates that correlate more closely with HIV VL than other individual measures. "Pocket dosing," or the act of removing more than one dose for each bottle opening and pocketing the extra doses to ingest at a later time, can also underestimate adherence (31).

2.2. Predictors of ART Adherence

Five types of factors have generally been found to predict problems with adherence to ART (figure 1). These include 1) regimen characteristics, 2) various patient factors, 3) disease related factors, 4) the relationship between provider and patient, and 5) the system of care (8).

2.2.1. Regimen-Related Factors

There are various regimen related factors as predictors of adherence, such as regimen complexity, side effects, and other medications given.

Research has shown that adherence decreases as the complexity of the medication regimen increases (i.e. the number of pills per dose and number of doses per day; the necessity to observe strict requirements related to the intake of food, and the existence of special requirements regarding fluid intake) (8).The findings of a study in Itali confirm that simpler regimens with lower pill burden and fewer medication doses enhance adherence (32). By substituting a one-pill

once-a-day ART, a study in Itali observed an improvement of both adherence and QoL while maintaining high virologic and immunologic efficacy (33). Regimens that involve close monitoring and severe lifestyle alterations together with side-effects may lead not only to frustration and treatment fatigue, but also ultimately to non adherence. Regimens requiring fewer alterations in lifestyle patterns (e.g. fewer pills per day and fewer dietary restrictions) are likely to have a positive influence on adherence to medication (8, 34).

Side-effects have also been consistently associated with decreased adherence and patients who experience more than two adverse reactions are less likely to continue their treatment. A study in three African countries indicated the role of side effects of ARV drugs on adherence. In Tanzania and Uganda, the occurrence of side-effects was mentioned as an important reason for skipping doses. In contrast, in Botswana, where side-effects are discussed extensively in pre-treatment counseling, of the 58% of ARV users who reported that they had experienced side-effects, only 8% cited them as one of the reasons for missing their medication, suggesting that effective counseling increases tolerance (35). By a study in South and Central Ethiopia, focus group discussion (FGD) participants reported side effects as major problems at the initiation of treatment but only few of them discontinued therapy (23).

It was observed that patients stopped taking their ARV treatment and concentrated on traditional medicines or spiritual activities. Prophylaxis is probably at least as important as ART in preventing the onset of AIDS in retroviral infected (RVI) patients. It was also supported by a study which revealed daily co-trimoxazole improved ART adherence by the patient (36, 37).

2.2.2. Patient-Related Factors

All things being equal, the most important factors influencing adherence are patient-related factors (8). By a study in US socio-demographic factors were not found to predict adherence to ART, although male sex, white ethnicity, older age, higher income and higher education and literacy correlated with better adherence (38). The study in Coˆte d'Ivoire showed that younger age was associated with poor adherence (17).

Active alcohol or drug use prevents patients from adhering to treatment (8, 38). Adherence is apparently most difficult for patients with lower levels of education and literacy, and it was reported that lower adherence among blacks and women, although this finding has not been consistent (10).

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Non disclosure was one of the themes that emerged as a barrier to adherence as found by a study in Botswana. Respondents stated that failure to tell someone (e.g. a friend or family member) could be due to reasons such as fear of being discriminated against stigma, job loss or abandonment. It was not uncommon to hear of people who were rejected by their partners because they had revealed their HIV status. Pateints cited that they are not released by employers to feel their medications. They reported that they could not even freely discuss the issue of their HIV status and treatment at work, for fear of being victimized by their employers (39).

Lack of food was mentioned as a problem for most ARV users. According to FGD participants, a study in Tanzania coined that lack of food disrupted the daily schedule for taking medicines and affected adherence (40).

2.2.3. Patient-Provider Relationship

A meaningful and supportive relationship between the patient and health care provider can help to overcome significant barriers to adherence, but few providers routinely ask about adherence or offer counseling. Conversely, patients become frustrated with health care providers when misunderstandings occur, treatment becomes complex, the patient is blamed for being a "bad patient" or side-effects go unmanaged. These frustrations may lead to poor adherence (8, 40).

2.2.4. Disease Factors

Late HIV disease stage were less likely to be adherent when compared with those in the early stage of the disease. Multivariate analyses indicated that independent positive predictor of adherence during the preceding days to be high CD_4 cell count (18). Prior opportunistic infections (OIs) contribute to increased adherence. Patients who have had serious OIs may perceive their illness to be severe and adhere better to their treatment (41).

2.2.5. Clinical Setting

Studies in Botswana showed that well-trained counselors (nurses, social workers and lay counselors) are available in all health facilities providing ARVs. In the public facility in Uganda, the counseling was done by nurses, who were not well trained because the public health facility could not afford to pay for good quality training courses for counselors. In Tanzania, the quality of counseling was found to be different in Dar es Salaam and Arusha. While patients in Dar es Salaam appreciated the quality of the counseling received, several ARV users in Arusha complained about the quality of their counseling due to the lack of trained counselors. In Uganda,

the public facility lacked enough room to accommodate patients for counseling and to discuss personal issues. As a result, the nurses took them to any free space available, thereby compromising confidentiality (35).

Malfunctioning equipment and shortages of reagents were problems reported by patients in three African countries facilities, and could result in a costly referral to another facility (41).

In studies of Ethiopia and Uganda, factors that caused patients to interrupt or stop their ART were money needed for transportation and the cost of treatment fees and OI drugs while being unable to sufficiently feed themselves and their families (42).

Conceptual Framework for Adherence: It identifies service, patient, alcohol use and drug abuse, treatment regimen, psychosocial and disease factors leading directly and indirectly to suboptimal adherence to ARVs (8).
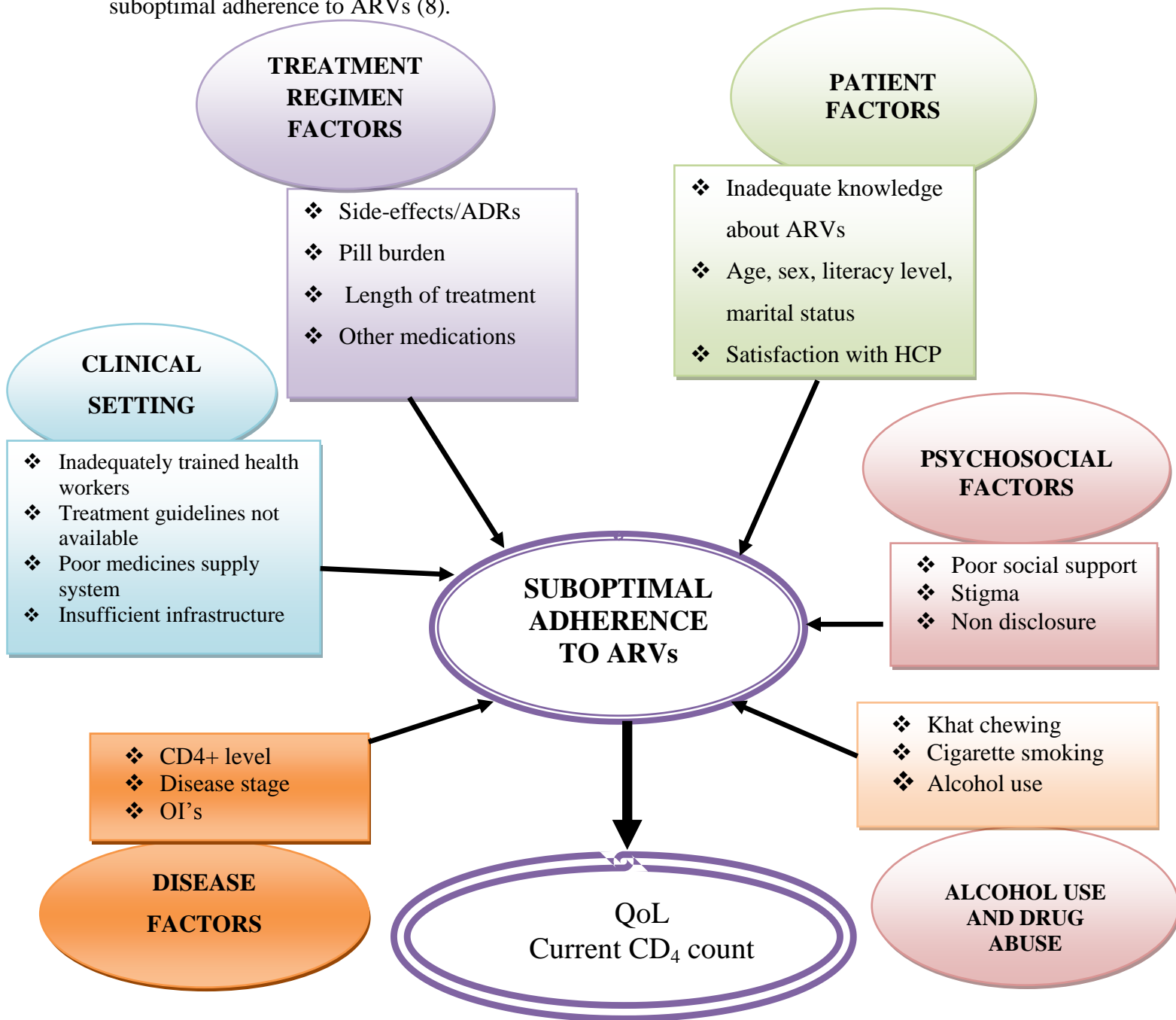
Figure 1: Factors leading directly and indirectly to suboptimal adherence to ARVs

2.3. Quality of Life and ART Adherence

Adherence is a critical component for therapeutic success in HIV infection, while improved quality of life (QoL) has been recognized as an important outcome from the treatment of HIV (43). Adherence to antiretroviral therapy (ART) has been shown to be a major determinant of biological outcome measures in HIV, including HIV ribonucleic acid (RNA) level, CD4 lymphocyte count, and genotypic resistance. Adherence has also been found to predict clinical outcome measures in HIV, including mortality, AIDS progression, and hospitalization (44).

The relationship between QoL and adherence has not been well studied. ART adherence is known to contribute to improved HIV clinical outcomes, which could result in a better QoL. Both QoL and adherence have been associated with HIV RNA levels, HIV disease stage, and symptoms. QoL and adherence both share an inverse relationship with HIV RNA: lower adherence rates predict higher HIV RNA levels and this virological failure has been associated with lower QoL scores (45). In addition, having AIDS diagnosis and disease-related symptoms has been associated with lower QoL scores and higher adherence levels (41, 46).

2.4.   Significance of the Study

As the world works towards increasing access to antiviral treatment in the developing world it is critical to understand factors that influence adherence to ART and apply the lessons learnt in improving existing and new programs.

Understanding the predictors of adherence in the local context is a forefront agenda in Ethiopia where little is known and scaling up of ART program is in progress. It is anticipated that the findings generated from this study will contribute to the knowledge and understanding of adherence to ARVs and be useful in developing evidence based interventions that are undertaken to address ARV adherence in Ethiopia. Therefore, this study aims at understanding the factors influencing adherence and developing an effective interventions for improved clinical outcomes among persons on antiretroviral therapy.

This study is vital for the pateints by identifying the key interventional ways of determinants of adherence to ART. The study is also important for the health institution, health care providers, and stakeholders by identifying determinants of adherence to ART and the interventions to tackle these determinants. This study will help to enlighten the MoH and other policy-makers in Ethiopia to differentiate ways of improving or maintaining adherence to ART that improve clinical outcome of ART. It will also put an insight for policy makers with valuable information about the clinical and qualitative outcome of ART.

It could also be useful to propose adherence intervention for people on ART. Moreover, the study will focus on evaluating the effect of ART on QoL and this will give policy makers and clinicians valuable information to improve their focus on the qualitative outcome of ART.

The study can bring a baseline data and information to initiate further research on the issues of rates of adherence to ART, determinants of adherence to ART and the clinical and qualitative outcomes of adherence to ART.

3. OBJECTIVES

3.1. General objective

The aim of this study was to assess ART adherence level, determinant factors and its association with clinical outcomes and quality of life.

3.2. Specific objectives

- ⚕ To measure the adherence level of patients on ART at Dessie Referral Hospital
- ⚕ To identify factors associated with adherence to ART at Dessie Referral Hospital
- ⚕ To evaluate ART adherence as predictor of clinical outcomes of antiretroviral therapy at Dessie Referral Hospital
- ⚕ To assess ART adherence as predictor of quality of life of patients on ART at Dessie Referral Hospital

4. METHODS

4.1. Study Area and Period

4.1.1. Study Area

Dessie is a city in Northcentral part of Ethiopia, surrounded by the continuous hills of Tossa Mountain. It is the capital of South Wollo Administrative Zone and is a center of market for East Amhara, Afar and South Tigray. The city lies on the Addis Ababa-Mekele road, 400km away from Addis Ababa, and is located with a longitude and latitude of 11°8′N 39°38′E and with an elevation between 2470 and 2550 meters above sea level. Based on figures from Central Statistical Agency, 2007, Dessie had an estimated total population of 120, 029 (47).

The study was conducted at Dessie Referral Hospital. The hospital was purposefully selected with the fact that there was higher patient flow; it serves for multiethnic groups and absence of similar studies in the region. Dessie Referral Hospital is run by Amhara National Regional State Health Bureau with catchment population of seven million. It is one of the oldest public hospitals in the country. It was established in 1962. The hospital had 200 beds with 200 clinical staffs. It started ART service in Sept, 2003. Up to the end of Oct, 2010, the hospital had a total of 13,757 patients on HIV chronic care of which 5322 were adult males and 7229 were adult females. The remaining 1206 were pediatrics. 9601 patients had ever started ART from which 8908 were adult and 693 were pediatrics. 5246 patients were on ART of which 4908 were adults in that time.

4.1.2. Study Period

The study was conducted from February 07 to March 31, 2011

4.2. Study Design

The study was based on a cross-sectional study design. Both qualitative and quantitative methods were employed in the data collection.

4.3. Population

4.3.1. Source Population

4.3.1.1. Source population for quantitative study

The source populations for face-to-face interview and unannounced pill count constituted all HIV positive adult patients who were on ART follow up at Dessie Referral Hospital ART-Unit.

4.3.1.2. Source population for qualitative study

The source population for qualitative data collection involved all adult HIV positive patients who were on ART follow up and all health care practitioners who were providing ART services at the ART clinic and ART pharmacy of the hospital.

4.3.2. Study population

4.3.2.1. Study population for quantitative studies

The study populations for the face-to-face interview and unannounced pill count constituted all adult HIV positive patients who were on ART follow up at Dessie Referral Hospital ART-Unit found during data collection period.

4.3.2.2. Study population for qualitative studies

The study population for qualitative data collection involved all adult HIV positive patients who were on ART follow up and all health care practitioners who were providing ART services at the ART clinic or pharmacy of the hospital found during data collection period.

4.4. Inclusion and Exclusion Criteria for Interviewees

4.4.1. Inclusion Criteria

Patients
- Age 18 years or above
- On ART for at least three months

Health care workers
- Staff working at the ART clinic
- Worked in ART unit at least for three months

4.4.2. Exclusion Criteria

Patients
- Patient who are seriously ill, can not respond, not willing to be interviewed, pregnant women

Health care providers
- Not willing to be interviewed, not directly interacting with ART patients

4.5. Sample Size Determination and Sampling Techniques

4.5.1. Sample Size Determination

4.5.1.1. Sample size determination for Qualitative data collection

For the qualitative data collection, the number of participants was purposively based on the redundancy or theoretical saturation of the information they delivered during data collection.

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4.5.1.2.   Sample size determination for quantitative data collection

Sample size determination for face-to-face interview of patients was by using a single proportion population formula (48):

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

Where:

n-the sample from an infinite population

P- The prevalence of ART adherence (P = 0.742) by the study of Markos *et al* at Yirgalem in 2006 (21).

d- Marginal error between the sample and the population (d = 0.05)

$Z_{\alpha/2}$- Critical value at 95% certainty (1.96).

$$n = \frac{(1.96)^2 0.742(0.258)}{0.05^2} = 294$$

Since the study population, (N=4908), was less than 10,000, we reduced the sample size by using correction factor: $n = \frac{n}{1+\frac{n}{N}} = \frac{294}{1+\frac{294}{4908}} = 277$

With the assumption of 10% non-response rate, the number of patients on ART included in the study was calculated to be 305.

For the unannounced pill count study, using the prevalence of ART adherence, P of 87% by a study at Hawassa, Yirgalem and Shashemene Hospitals in 2007 (23):

$$n = \frac{(1.96)^2 0.87(0.13)}{0.05^2} = 174$$

Again since the study population, (N=4908), was less than 10,000, we reduced the sample size by using correction factor:

$$n = \frac{n}{1+\frac{n}{N}} = \frac{174}{1+\frac{174}{4908}} = 167$$

The number of patients on ART included in the unannounced pill count study was calculated to be 167.

4.5.2. Sampling Techniques

4.5.2.1.   Sampling for face-to-face interview

The eligible study participants who were patients on ART were sampled randomly using systematic random sampling. During the data collection period 4680 patients on ART were expected to visit the ART unit based on an average patient flow of 120 patients per day. Hence the sampling interval was determined to be 4680/305=15. The first unit was selected randomly to be the 8th patient among the first fifteen patients. Each patient on the interval was told to go for the interview after he/she had the routine visit for his/her of healthcare provider

4.5.2.2.   Sampling for key-informant interview

The selection of the key informants was based purposefully to address different issues about adherence related to healthcare providers. Three nurses, one physician, one heaalth officer, one laboratory technologist, one pharmacist and one drugist were interviewed during the study.

4.5.2.3.   Sampling for focus group discussions (FGDs)

The participants were sampled purposively to address different issues related to adherence to ART. Six focus groups were established. From the six FGD's three groups were from female as the prevalence of HIV is higher in these population. The rest FGD's were two male FGD's from patients and one FGD from health care providers. Each group consisted of 6-12 patients and healthcare providers.

4.5.2.4.   Sampling for Unannounced Pill Count

Participants for the unannounced pill count were sampled conveniently from the face-to-face interviewee who were to the nearest (up to 25 km radius) of the hospital.

4.6.   Study Variables

4.6.1. Independent Variables

☞ Socio demographic characteristic, disclosure of HIV status, social support, alcohol use, drug abuse, ART regimens: number of pills, frequency, adverse effects of drugs, CD4 cell count, WHO clinical stage, duration of treatment, knowledge about ARVs, satisfaction with health care providers, presence of OIs, hospitalization due to OIs

4.6.2. Dependant Variables

☞ Adherence to dose of ARVs   ☞ Latest CD_4 count

☞ SF-36 Quality of life scales

4.7. Data Collection and Management

4.7.1. Data Collection Instruments

Pre- tested questionnaire and short form-36(SF-36) survey were run by trained data collectors for all study participants selected for face-to-face interview. For the unannounced pill count a format prepared for this purpose was used to collect information about each ARV drugs not taken or drugs not swallowed by the patient. A guide for focus group discussions was used to collect qualitative data whereas open-ended interview guides were applied for key informant interviews. Medical record review form was utilized to collect clinical aspects of the study participants. In the case of observation at clinical setting a guide for observation at the facility was used.

4.7.2. Training of Data Collectors

Two BSc nurses(for face to face interviews, FGD, indepth interviews and medical recored review) who were working at other units of the hospital and took basic ART training and three community health workers at the home of participants were employed for data collection. Prior to data collection, a two-day training workshop was conducted for the data collectors, which focused over the objectives of the study, the content of the questionnaires, formats and guides, the way how they approach, extent of explanation, about the privacy and confidentiality. This involved detailed presentation and discussion in English, followed by discussion of the translated (Amharic) version of the research questions.

4.7.3. Pre-test

The training was followed by pre-testing of the face-to-face interview questinnaire using 5% of the sample size at Woldya Hospital ART unit. Appropriateness of wording, format, length and sequencing of questions were modified after the pre-test. Both the data collectors and the investigator discussed lessons learnt from pre-testing to help further modify the tools and clarify some of the issues. The following week, the tools were finalized and brought to the study site for data collection.

4.7.4. Data Collection

Data was collected by two BSc nurses and three HIV$^+$ community health workers. The nurses conducted face to face interviews, key-informant interviews, review of medical records, FGDs and observation of health care facilities whereas; community health workers undertook unannounced pill counts under close supervision of the principal investigator. Review meetings were conducted every three days in order to share the daily experiences. In addition, the principal investigator checked the completeness of the collected data.

By the face-to-face interview information about the patient's socio-demographic characteristics (age, sex, ethnicity, religion, marital status, educational and employment statuses and occupation), disclosure and social support, alcohol use and drug abuse, antiretroviral use, knowledge about ART, clinical parameters and patient-providers relationship were gathered using questionnaires. The participants were asked to recall and report missed doses for the last three days preceding the day of the interview.

Unannounced pill counts were undertaken by community health workers trained as data collectors. The data collection process involved going to patients' home and counting each ARV drugs not taken or drugs not swallowed by the patient. Without being notified before the study time patients were asked for their written informed consent to show the type of medicine they took; and to count the number of each ARV drugs not taken or drugs not swallowed by the patient. The data collectors asked patients additional information such as: when the patient collected his/her recent regimens, what number of each regimen collected by the patient at recent visit, and what number of each drugs not taken or drugs not swallowed from each previous regimens before collecting the recent regimens. This information was used later for calculating percentage of adherence by unannounced pill count.

Six FGDs each consisting of 6-12 persons were conducted Administrative records, which included the pharmacy refill register, medical consultation appointment visit, and information from the counselors at the health facilities, were used to recruit the participants for FGDs with ARV users. The FGDs were designed to provide insight into patients' knowledge and perceptions of their illness; knowledge, perceptual understanding, expectations of treatment and social support and the comfortable status of the clinical setting. The FGDs also explored weather adherence is a problem among ARV users; and if so, what were the causes of sub-optimal adherence and the

reasons for failure to adhere. The information from FGDs was used to supplement the quantitative data collection. Data were collected with an interview guide, and information was recorded on audio-cassettes during the interviews. The two nurses conducted the FGDs one being a moderator and the other being note taker. The moderator had an FGD guide, which used to keep the research focused on the main themes of the study.

These involved the use of open-ended interview guides with flexible probing techniques for investigating personal experiences of each respondent. Health care workers involved in ART patient care were interviewed. These included nurse, doctor, health officers, laboratory and pharmacy personnel. The interview focused on the following: level of formal and non-formal training taken by health workers, availability of guidelines, and availability of medicines. The interview also solicited general assessment of adherence, reasons for low adherence, reasons for high adherence, opinions on the quality of health care provided and on ways of improving adherence.

The health facility was observed with a focus on issues such as structural outlay, privacy, conducive environment (structure, cleanliness, and workers' attitudes, availability of standard treatment guidelines (STG) and standard operating procedures), availability of ARVs and other medicines for opportunistic infections. It has also included observation on the days and hours the clinic is open and whether it is open at convenient times, such as evenings or weekends, the availability of private space for counseling and laboratory services for CD4 was noted.

Following each face to face interview, the nurses took the patient's medical records to review the level of WHO Clinical stage, CD_4 counts, types of current ART regimen, opportunistic infection and medications other than ARVs.

4.8. Data Processing and Analysis

Data entry for face-to-face interview and patient medical record review were conducted by using SPSS version 16.0. The principal investigator did data checking and cleaning. Descriptive, Chi-square test, bivariate logistic regression and independent t-test analyses were completed using SPSS version 16.0. Data regarding QoL (SF-36) and ununnounced pill count were entered and analyzed using MS Excel 2007 by following standard method of analysis for SF-36 (49).

Bivariate analysis was done to determine presence of statistically significant association between possible determinant factors and the adherence rate. Multivariate binary logistic regression model

was constructed with adherence and the independent variables to identify the predictors. Odds ratios (OR) and their 95% CI were used to look into the strength of association between the dependent and independent variables. Independent t-test was applied to examine the difference of the mean scores of the eight scales of sf-36 QoL instrument.

The qualitative data analysis involved reading through the data from the qualitative research tools, which included the key-informant interviews with health workers and the FGDs with patients on ART and healthcare providers in order to identify key themes. After the themes were identified, a general thematic analysis was conducted, focusing on similarities and differences of perspective between different groups of respondents. Information was analyzed to capture the different perspectives of both actors: ARV users and health workers.

4.9. Quality Control

To ensure the completeness, accuracy and consistency of data collection, a session held each day of the data collection period. During these sessions thorough checking was done after receiving the filled questionnaires from each data collector. The data was checked in the field to ensure that all the information has been properly collected and recorded.

4.10. Ethical Considerations

Approval and permission was sought from Ethical Review Committee of College of Public Health and Medical Sciences of Jimma University. An official letter of cooperation was written from the Department of Pharmacy to Dessie Referral Hospital and Woldiya Zonal Hospital. Due care was taken to ensure that all those who accept to participate in the study do so voluntarily, and give their informed consent. The verbal informed consent process involved the data collector gave a verbal explanation to each potential participant on the nature of the study, its purpose, the procedures involved, the expected duration, the potential risks and benefits involved, and any discomfort it might entail. Each potential participant were also informed that participation in the study is voluntary and that he/she can withdraw at any time, and that withdrawal of consent will not affect his/her subsequent treatment or relationship with the facility staff or any other person. The confidentiality of both written and verbal responses as well as recorded voices onto audio-cassette was made known to the participants. The participants were told that their name and identification will not be written to assure anonymity.

4.11. Dissemination Plan

The finding of the study and the result will be disseminated to different organizations including Jimma University, the hospital, stakeholders, woreda and zonal health departments by using different mechanisms such as seminar, workshops and meeting. In addition, the findings of the research will be presented on professional association meetings and publication will be attempted on a scientific journal.

4.12. Operational Definitions

Adherence: is the extent to which HIV infected adult patients take ART to correspond with agreed recommendations from a healthcare provider during the last three days prior of interview.

Complete adherence: patients who never had skipped a single dose of medication during a specific period of time prior of interview.

Optimal adherence: When patients took more than 95% of their prescribed medications during a specific period of time prior to interview.

Sub optimal adherence: When patients only took between 80-94% of their prescribed medications during a specific period of time prior of interview.

Poor adherence: When patients took less than 80% of their prescribed medication during a specific period of time prior of interview.

Disclosure: if a patient on ART had shared his or her HIV status and the fact of being on treatment with at least one friend and/or any other person (including family members) for the purpose of deriving support if needed.

Social support: emotional / psychological, financial or physical support for patients on ART from their family or other than their families like friends, nongovernmental organizations, faith based organizations or workplace programs.

Alcohol use: when a patient on ART takes drinks that contain alcohol during the last fifteen days.

Drug abuse: when a patient on ART has used drugs like hashish, shisha, khat or cigarette in the last 6 months

Knowledge about ART: Information, understanding gained through education or experience on how ARVs work and how they should be used; whether the ARV users know that ARVs are not a cure and that they have to be taken for life. Study participants were asked eight questions, each with two similar response categories (1 = Yes, 2 = No). If the patient answered the question correctly, he/she was given a score of one. If the patient was not able to answer the question

correctly, he/she was not be given a score of zero. Those participants that scored six and above out of eight (75%) were considered as having adequate knowledge and those that score below six were considered as having inadequate knowledge about ART.

Satisfaction to relations with healthcare providers: response of patients on their relationship with their healthcare providers regarding privacy, trust, confidentiality and schedule of appointments. All participants were asked five questions, each with four similar response categories (1 = totally disagree, 2 = disagree, 3 = agree and 4 = totally agree). The mean score of the five questions were calculated for each patient. The overall mean of the mean scores of each respondent were used to categorize the satisfaction status of each respondent. Those that scored above the mean score were regarded as satisfied and those who scored below the mean score were regarded as not satisfied, using Likert scale.

Quality of life: ART taking patient's perception of their position in life in the context they live and in relation to their goals, expectations, standards and concerns measured with SF-36 instrument as physical functioning, physical role, bodily pain, general health, vitality, social functioning, role emotional, physical health summary, mental health summary scales.

4.13. Strengths and Limitations of the Study

This study has confined upon being informative. The study used sample of respondents that were currently on ART and did not include patients who had stopped their treatment due to some severe grounds. Furthermore, almost all of the patients in this study were on first line regimens and it was not possible to see adherence to second line regimens in this study.

As this study is not longitudinal it could not identify the long-term effect of ART on QoL. The other methodological limitation was that the participants for the unannounced pill count were selected conveniently as it was not feasible to access these participants if they were selected randomly.

The other limitation of the study is the concern that self-report may overestimate adherence (30). Regardless of this concern, studies in developed countries have demonstrated a strong association between self-reported adherence and QoL in HIV-infected patients (30). Moreover we done pill count and compared it with the self report findings. In addition the assessment of ptaients'

knowledge could have limitation regarding content validity as the instrument lacks questions regarding side effects and drug interaction of ARVs.

Despite the above limitations, the present study is the first and provides useful information about ART adherence by unannounced pill count and in evaluating the effect of ART on QoL using SF-36 scores in Amhara Region. The study data was based on 3-days self-reports, and therefore was decreased reporting or recall bias. Furthermore; the use of several methodologies to complement different methods with each other can be taken as the strength of the present study.

5. RESULTS

5.1. Findings from Face-to-Face Interview and Review of Patients' Records

5.1.1. Socio-demographic Characteristics

Three hundred and five adult patients who were getting ART participated in this study. Of these, two patients were excluded from the analysis because of incomplete adherence data. Accordingly the response rate was 99.3%.

The participants' age varied from 19 to 81 years with a mean age of 32.7 years. 172(56.8%) of them were female. The majority of the participants were Muslim and Orthodox Christians, 160(52.8%) and 137(45.2%), respectively. Only 5(1.7%) of participants were Protestant and the rest participant was Catholic.

As indicated by table 1 the majority of participants were Amhara, 281(92.7%), followed by Tigre ethnic group, 10(3.3%). Oromo and Afar ethnic groups constituted 8(2.6%) and 4(1.3%) of the total respondents, respectively.

Majority of the participants had attended 7-12 grades (45.9%) and were married (66.0%). More than three-quarter of the respondents (75.9%) were employed. About half of the employed participants 119(51.7%) mentioned that they were self-employed. The socio-demographic characteristics are presented with table 1.

Table 1: Socio-demographic characteristics of respondents of face-to-face interviews in Dessie Referral Hospital, North Central Ethiopia, February 07 to March 31, 2011

	Characteristics	N (%)
Gender	Male	131(43.2)
	Female	172(56.8)
Age	Mean(SD)	32.7(8.5)
Ethnicity	Amhara	281(92.7)
	Tigre	10(3.3)
	Oromo	8(2.6)
	Afar	4(1.3)
Religion	Muslim	160(52.8)
	Orthodox	137(45.2)
	Protestant	5(1.7)
	Catholic	1(0.3)
Educational Level	Can't read and write	60(19.8)
	Adult literacy	18(5.9)
	1-6th	40(13.2)
	7-12th	139(45.9)
	Vocational	25(8.3)
	Diploma and above	21(6.9)
Marital status	Currently married	200(66.0)
	Cohabiting	2(0.7)
	Divorced/separated	41(13.5)
	Widowed	30(9.9)
	Never married	30(9.9)
Occupational status	Employed	229(75.9)
	Unemployed	74(24.4)
Occupation, n=229	Self employed	119(51.7)
	Government office	61(26.5)
	NGO	14(6.1)
	Private sector	13(5.7)

 *Joblessness, retired

5.1.2. Social Support and Disclosure

Two hundred sixty eight (88.44%) participants reported that they had disclosed their HIV status to other persons. Only 58(19.1%) had got any kind of support. Details on the psychosocial variables of the study participants on ART are presented in Table 2.

Table 2: Psychosocial variables of adults on ART at Dessie Referral Hospital, North Central Ethiopia, February 07 to March 31, 2011

Variables		N (%)
Disclosure status	Disclosed	268(88.4)
	Not disclosed	35(11.6)
Disclosed to:	Partner	184(60.73)
	Family	201(66.35)
	Relatives	49(16.17)
	Friends	34(11.22)
	Neighbors/community members	21(6.93)
	Others*	4(1.31)
Do you get support	Yes	58(19.14)
	No	245(80.86)
Support from:	Families	36(11.88)
	Friends	12(3.96)
	NGOs	26(8.58)
	Faith-based Organizations	8(2.64)
	Work place programs	2(0.66)

* NGOs

5.1.3. Alcohol Use and Drug Abuse

Twenty three (7.6%) of the study participants reported that they drank alcoholic beverages in the two weeks preceding the day of the interview. Of all participants, 18(5.9%) and 6(2.0%) were reported that they chewed khat and smoked cigarette over six months preceding the day of the interview, respectively. The detail of alcohol use and drug abuse is presented in Table 3.

Table 3: Use of khat, cigarette and alcohol by adults on ART at Dessie Referral Hospital, North Central Ethiopia, February 07 to March 31, 2011

Items	N (%)	Period
Alcohol	23(7.6)	Over fifteen days preceding the day of interview
Khat chewers	18(5.9)	Over six months preceding the day of interview
Cigarette smokers	6(2.0)	Over six months preceding the day of interview

5.1.4. Clinical Characteristics

Based on the review of patients' records, at the initiation of ART most of participants, 221(72.9%), were at Stage III of WHO clinical staging and 232(76.6%) had a CD_4 count of ≤ 200 cells/mm^3. In the case of the recent CD_4 count, 144 (50.3%) and 108(37.8%) of the participants had CD_4 count of 200-500 cells/mm^3 and >500 cells/mm^3, respectively.

Table 4: Clinical parameters of adults on ART in Dessie Referral Hospital, North Central Ethiopia, February 07 to March 31, 2011

Parameters	N (%)
WHO Clinical stage of HIV disease at the initiation of ART	
Stage I	2(0.7)
Stage II	58(19.1)
Stage III	221(72.9)
Stage IV	22(7.3)
CD4 count at the start of ART	
>500 cells/mm^3	1(0.3)
200-500 cells/mm^3	70(23.1)
<200 cells/mm^3	232(76.6)
Most recent CD_4 count	
>500 cells/mm^3	108(37.8)
200-500 cells/mm^3	144 (50.3)
<200 cells/mm^3	34 (11.9)
No recent CD_4 count	17(5.6)

From the respondents only 14(4.6%) had opportunistic infection(s) at the time of interview and 35(11.6%) of them were hospitalized at least once. Thirty eight (12.5%) of the patients perceived that they experienced side effects due to ARVs (Table 5).

Table 5: Disease characteristics of adults on ART in Dessie Referral Hospital, North Central Ethiopia, February 07 to March 31, 2011

Characteristics		N (%)
OIs (n=303)	Yes	14(4.6)
	No	289(95.4)
Perceived side effects of ARVs	Yes	38(12.5)
(n=303)	No	265(87.5)
Ever hospitalized due to	Yes	35(11.6)
HIV/AIDS (n=303)	No	266(87.8)
	Cannot remember	2(0.7)
Frequency of hospitalization over	Once	7(46.7)
the past one year (n=15)	Twice	8(53.3)

The most common side effects perceived were headache, nausea/vomiting and fatigue as described in Figure 2.
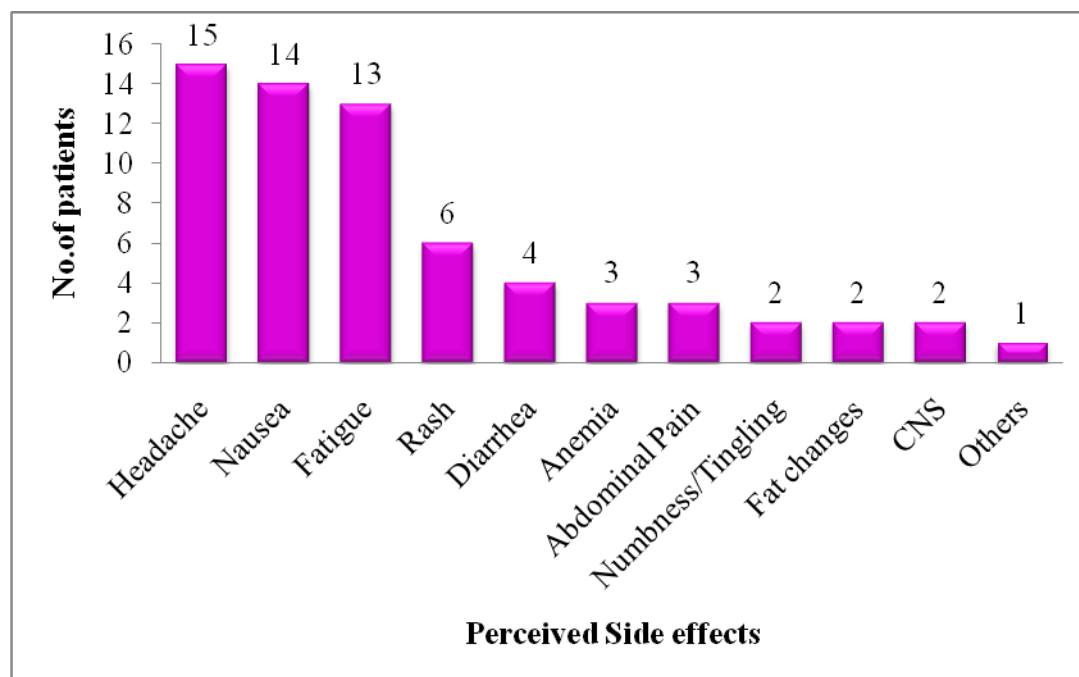
*ulcer on lips

Figure 2: Types and distribution of perceived side effects by patients on ART in Dessie Referral Hospital, North Central Ethiopia, February 07 to March 31, 2011

5.1.5. Knowledge about ART

In this study, 286 (94.4%) participants scored six and above out of eight and they were considered as having adequate knowledge about ART whereas 17(5.6%) of them had inadequate knowledge about ART.

5.1.6. Satisfaction with Healthcare Providers' Relationship

Of the total participants, 223(73.6%) scored above the mean score and were considered as satisfied on their relationship with HCPs. The rest, 80(26.4%) of the participants were not satisfied on their relationship with HCPs

5.1.7. Antiretroviral Use

Concerning duration of treatment, as shown in Table 6, majority of the participants, 183(60.4%), were on ART for more than 25 months.

Table 6: Antiretroviral use by adults in Dessie Referral Hospital, North Central Ethiopia, February 07 to March 31, 2011

Characteristics		N (%)
Months of treatment	3 - 12 months	57(18.8)
	13 - 24 months	63(20.8)
	$\geq$ 25 months	183(60.4)
Regimen	First line	300(99.0)
	Second line	3(1.0)
Frequency of ARVs	Once	13(4.3)
	Twice	290(95.7)
Number of pills per day including drugs for OIs	$\leq$ 4 pills	291(96.0)
	$\geq$ 5 pills	12(4.0)
Adherence to doses of ARVs over the last 3 days	< 95% adherence	26(8.6)
	$\geq$95% adherence	277(91.4)

With regard to the type of combination of ARVs taken by the participants, 106 (35.0%) were on ZDV+3TC+NVP followed by 75 (24.8%) on ZDV+3TC+EFV and 54 (17.8%) on $D_4T(30)$+3TC+NVP. Although, the treatment guideline recommends TDF instead of D4T as first line therapy, large number of patients is still taking D_4T in this study. Almost all, 300(99.0%), were on first line regimens.The details of the ARV regimens of the study area are indicated in Figure 3.
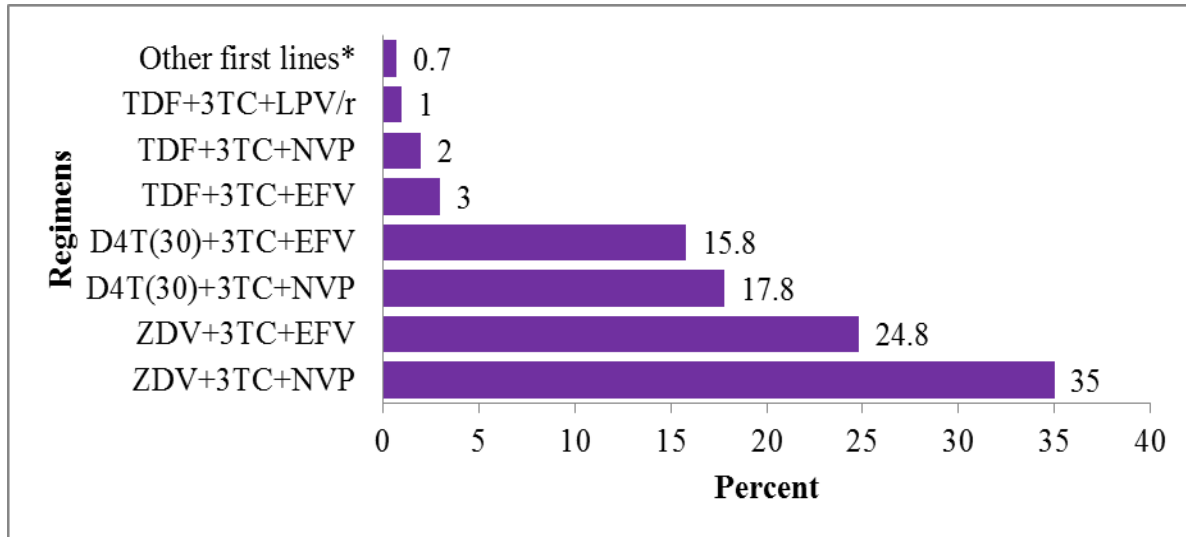
ABC + 3TC + ZDV, ABC/3TC/NVP

Figure 3: Current ART regimens taken by patients in Dessie Referral Hospital, North Central Ethiopia, February 07 to March 31, 2011

Respondents were asked the number of doses they missed over the last 3 days prior to completing the questionnaire. As shown in Table 6, out of the total respondents, 277 (91.4%) of the participants had been adherent for ART (≥ 95% adherence rate) by 3-days self-report.

5.1.8. Factors Associated with Adherence to ART

Bivariate binary logistic analysis was made to notice presence of statistically significant association between explanatory variables and the outcome variable. All explanatory variables that were associated with the outcome variable in bivariate logistic analyses were included in the final model. Multivariate logistic regression model was undergone with the independent variables and adherence to doses of ARVs to identify the determinants. The model was evaluated using backward stepwise selection method. Odds ratios (OR) and their 95% CI were used to look into the strength of association between the dependent and independent variables.

Among the socio-demographic variables, all were not found to be associated with adherence to doses of ARVs in multivariate logistic regression analysis. But marital status was found to be associated with adherence to doses of ARVs in binary logistic regression. Those who were unmarried (crude OR=2.46, CI (1.10, 5.55), P=0.029) were 2.5 times more likely to be non adherent than those who were married.

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With psychosocial factors, disclosure and support were significantly associated with reported adherence with multivariate logistic regression analysis. Those that did not disclose their HIV status to others (AOR=14.15, 95%CI (3.64, 54.98), P=0.001) and did not get support (AOR=3.19, 95%CI (1.07, 33.73), P=0.042) had greater odds of non adherence than those who disclosed their status and got support from others.

Factors of alcohol use and drug abuse were not found to be associated with adherence to doses of ARVs in multivariate logistic regression analysis. But they were found to be associated in bivariate binary logistic regression analysis. Those who reported to have alcohol drinking habit (crude OR=4.59, CI=1.63, 12.93, P=0.004) were more likely to be non adherent than those that had no drinking habit. In drug abuse factors those who chewed Khat (crude OR=4.84, CI=1.57, 14.87, P=0.006) were about 5 times more likely to be non adherent than those who did not chew. Likewise, those who smoke cigarette were more likely to be non adherent than those who did not.

Among factors related to treatment, type of regimens, frequency of taking ARVs, number of ARV pills taken at a time, total ARV pills taken daily, total number of pills taken daily including drugs taken for OIs, and duration of ART were not associated with reported adherence. But perceived side effects due to ARVs were associated with nonadherent to ARVs. Those who reported side effects due to ARVs (AOR=4.93, 95% CI (1.34, 18.19), P=0.017) were about 5 times more likely to be non adherent to doses of ARVs than those who did not report ARV side effects in multivariate logistic regression analysis.Taking medications other than ARVs was associated with adherence to ARVs in bivariate binary logistic regression but not in multivariate. Patients who took medications other than ARVs were more likely to be non adherent than patients who did not (Crude OR=5.88, CI (1.75, 20.41) P<0.01).

Knowledge about ART was also associated with adherence to doses of ARVs. The odds of non adherence in respondents having inadequate knowledge about ART was 5.64 times that of respondents with adequate knowledge about ART (AOR=5.64, 95%CI (1.08, 296.26), P=0.001).

Participants' satisfactions scores of relationships with healthcare providers were not significantly associated with reported adherence in multivariate binary logistic regression analysis but with bivariate binary logistic regression analysis. Participants who were not satisfied were more likely to be non adherent than satisfied participants (AOR=11.57, CI (3.55, 37.70), P<0.001)

Other factors that are related to clinical situations like CD_4 cell count, WHO clinical staging of disease, presence of OIs and admission to hospitals due to HIV/AIDS were not associated with reported adherence in multivariate logistic analysis.

Table 7: Factors associated with adherence to doses of ARVs among patients receiving ART in Dessie Referral Hospital, February 07 to March 31, 2011.

Variables		Adherent		Crude OR(95%CI) for non adherence	Adjusted OR(95% CI) for non adherence
		Yes, N(%)	No, N(%)		
Marital Status	Married	188(94.0)	12(6.0)	1	1
	Unmarried	89(86.4)	14(13.6)	2.46(1.10-5.55)*	3.03(0.84, 10.893)
Disclosure status	Disclosed	253(94.4)	15(5.6)	1	1
	Not disclosed	24(68.6)	11(31.4)	7.73(3.20-18.70)**	14.15(3.64, 54.98)**
Support	Yes	56(96.5)	2(3.5)	1	1
	No	221(90.2)	24(9.8)	2.98(1.28-6.97)*	3.19(1.07, 33.73)*
Alcohol intake	Yes	17(73.9)	6(26.1)	4.59(1.63-12.93)**	2.20(0.43, 11.23)
	No	260(92.9)	20(7.1)	1	1
Khat chewing	Yes	13(72.2)	5(27.8)	4.84(1.57-14.87)*	0.70(0.11, 4.45)
	No	264(92.6)	21(7.4)	1	1
Cigarette smoking	Yes	3(50.0)	3(50.0)	11.92(2.27-62.40)**	3.06(0.04, 268.8)
	No	274(92.3)	23(7.7)	1	1
Reported side effects due to ARVs	Yes	27(71.1)	11(28.9)	6.79(2.84-16.24)**	4.93(1.34, 18.19)*
	No	250(94.3)	15(5.7)	1	1
Knowledge about ART	Adequate	274(95.8)	12(4.2)	1	1
	Inadequate	3(17.6)	14(82.4)	10.66(2.76, 42.12)**	5.64(1.08, 296.26)**
Satisfaction with HCP relationship	Satisfied	213(95.5)	10(4.5)	1	1
	Not satisfied	64(80.0)	16(20.0)	11.57(3.55, 37.70)**	3.19(0.94, 10.83)
Taking medications other than ARVs	Yes	156(87.2)	23(12.8)	5.88(1.75, 20.41)**	2.10(0.46, 9.63)
	No	121(97.6)	3(2.4)	1	1

*P-value<0.05, **P-value<0.005, OR= odds ratio, AOR=adjusted odds ratio, CI=95% confidence interval, HCP=healthcare provider

5.1.9. ART Adherence and Clinical Outcomes

Using Chi-square test of association, a significant clinical benefit of ART adherence for HIV-infected patients was revealed with the case of CD_4 count. Only 26(10.0%) of patients with optimal adherence level were found to have latest CD_4 count of below 200 CD_4cells/mm^3 whereas 8(30%) of patients with suboptimal adherence level had CD_4 count below 200 CD_4cells/mm^3. In the other case, there were no suboptimally adhered patients having CD_4 count above 500cells/mm^3 whereas 108(41.5%) of optimally adhered patients had CD_4 counts of more than 500cells/mm^3 (P=0.001) (Table 8).

Table 8: Association of adherence level and clinical parameters for patients on ART in Dessie Referral Hospital, February 07 to March 31, 2011

Clinical parameters	Adherence Status			
	≥95% Adherence, N (%)	<95% Adherence, N (%)	χ^2	P-value
Recent CD4 count after ART initiation, N=286			28.64	0.001
<200 cells/mm^3	26(10.0)	8(30.8)		
200-500 cells/mm^3	126(48.5)	18(69.2)		
>500cells/mm^3	108(41.5)	0(0.0)		

5.1.10. Adherence Barriers

Figure 4 shows the patients' percieved reasons for missing ARV pills. Shortage of food (10 respondents), travelling far away from home (10 respondents), being too busy (10 respondents), and ARV side effects (7 respondents) were cited as the four major reasons for missing their medications.
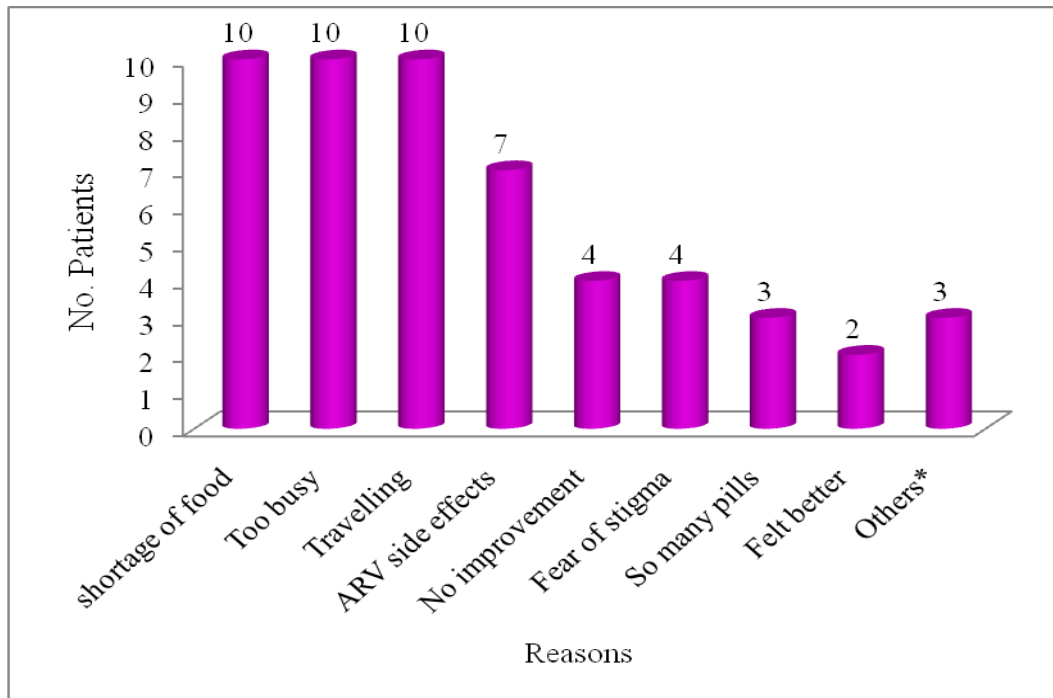
*confilict with family

Figure 4: Perceived reasons of patients for missing ARV doses in Dessie Referral Hospital, North Central Ethiopia, February 07 to March 31, 2011

5.1.11. Quality of life and Adherence to Treatment

Concerning adherence to dose of ARVs, those who were adherent to ART had better mean scores of SF-36 than those who did not adhere to ART. Adherence to doses of ARVs showed significant association in independent samples t-test analysis for all these SF-36 mean scores except VT (Table 9).

Table 9: Association between SF-36 mean scores and adherence to ART for patients on ART in Dessie Referral Hospital, North Central Ethiopia, February 07 to March 31, 2011

SF-36 Scales	Adherence to doses of ART				
	Total (n=303)	Adherent (n=277)	Non adherent (n=26)	Mean difference (95%CI)	P-value
PF	78.38	79.86	62.69	17.17(12.33, 22.00)	<0.001
RP	64.93	67.60	36.54	31.06(21.82, 40.30)	<0.001
BP	92.64	94.65	71.19	23.46(18.47, 28.45)	<0.001
GH	81.45	82.81	66.92	15.89(9.21, 22.56)	<0.001
VT	71.37	71.46	70.38	1.08(-5.10, 7.25)	0.731
SF	84.98	86.75	66.19	20.56(15.10, 26.02)	<0.001
RE	68.69	71.65	37.23	34.42(23.59, 45.24)	<0.001
MH	75.45	76.30	66.31	10.00(3.27, 16.72)	0.004
PHS	77.73	79.26	61.50	17.76(13,56, 21.95)	<0.001
MHS	76.34	77.74	61.42	16.32, 11.48, 21.16)	<0.001

5.2. Unannounced Pill Counts

A total of 167 patient homes were visited for the unannounced pill count. Patients were asked information such as: when the patient collected his/her recent regimens, what number of each regimen collected by the patient at recent visit, and what number of each drug was not taken or drugs not swallowed from each previous regimens before collecting the recent regimens. By unannounced pill count, 142(85.0%) of clients visited at their home had optimal adherence.

5.3. Qualitative Results

5.3.1. Findings of FGDs

The average age of participants was 37 years (with SD of 6.5) and it ranged from 22 to 56 years of age. Totally, 35 patients on ART participated in five FGDs. One FGD was made for healthcare providers.

Results were analyzed by thematic approach. The transcriptions of the FGDs were reviewed to classify the primary categories within the themes. Finally, three themes were selected for presentation of findings. These included attitude on treatment options for HIV/AIDS, quality of care, and barriers of adherence to ARVs.

5.3.1.1. Attitude on Treatment Options for HIV/AIDS

Majority of the FGD participants have honored ART by discouraging treatment options other than ART. Most of them reported that they had tried traditional medicines before they started ART but with great deal of loss. Many of them commented on the disadvantage of traditional medicines and healing practices. A 34-years old female ART user said:

"...At the beginning of my complaint, first what I tried was Holy water but my illness got aggravated. Then I joined the ART program at this hospital. At the beginning my CD$_4$ count was 24. But at this time it has risen to 556. My direct enrollment into the ARV treatment course has improved my distress,"

Most participants knew the harms from traditional medicines. A 45-years-old male participant discouraged traditional medicines by pointing its dangers:

"...I will never use traditional medicines because the Doctor told me that traditional medicines will destroy my liver as the dose of these drugs is not properly determined. And the holy water did not help me to be free from my HIV rather made my infections easily happen as it is not treated water."

Group members have identified several benefits of ARVs in addition to the mere improvement on their health status. A 32-years-old female ART user point out that:

"...Previously (before I started my ART), I was not able to work and I can't help myself and my family. Due to this my husband decided not to continue with me. I separated myself from my

husband and children. Then I got myself HIV positive and started ART. Later I regain my health, moreover I regain my husband and my children."

Another 28-years-old female ART user admired ART saying:

"...I am really happy and also lucky because not only I got my health but also I am able to have a child who is free from HIV. This is happened because I got the medicines (ART)."

A female adherence supporter who is on ART herself stated on the importance of the program:

"…I thank God because I got the chance to use the medications. You know most of my friends who had been HIV positive like me have passed away because they did not have the chance to get the medicines (ARVs)*."*

5.3.1.2. Quality of Care

FGD participants gave remarks on the quality of the services provided in the ART clinic in terms of: confidentiality, waiting time, respect; whether the health workers listened to them; laboratory services; and the general environment.

Most of the respondents appreciated the role of the case managers who were working in the ART care service. A 24-years-old male ART user informed that:

"...I saw many changes after these professionals (the case managers) came to help us. They are well mannered and they keep our secrets.

Another female respondent shared the same idea with the roles of the case managers.

"…I feel comfort to discuss my problems with the case managers and adherence supporters as we understand each other easily."

Most participants agree that the ART service in the hospital has some progress in quality of care. Previously they were facing different problems at each department, especially in the pharmacy. A 26-years-old female ART user rehearsed what she faced in the pharmacy before two years.

"...I was with my appointment to refill my medications. When I went to the pharmacy the pharmacist's care for me was very disgusting. I asked him to tell me about the drugs he gave me but he refused. Rather he said 'I don't know what you are taking, whether it is maize or sorghum'. I was very annoyed and I left my medications there."

But the current situation was reported to be comfortable for most of the respondents by their relation with the professionals. They admired how it was possible to handle this much clients with these few professionals. One respondent said that:

"…*I am happy with the care they are giving us these times. The professionals are really strong to accommodate this much ART users. I don't blame them if they make faults as they may get tired.*" Another added that: "*I am really shocked when the pharmacist told me that he is the only one who is working there throughout the week.*"

A healthcare provider who supported this clients' idea said:

"…*Nowadays it is difficult to hold all these clients. We are tired of it. We need time to refill and counsel our patients, but no time. We should cover all the patients that came on their appointment. The quality will be compromised as we rushed to cover all patients. The problem becomes severe on Friday and Monday as the service is closed during weekends*"

5.3.1.3. Bariers to Adherence to ART

Stigma and discrimination, non-disclosure of one's status as HIV positive, concerns about confidentiality, use of alternative treatments and lack of food were reported as barriers to adherence.

Patients and health care professionals mentioned that stigma and discrimination related to being HIV positive are still present in their communities and families, despite the positive benefits of ART. A 39-years-old woman stated that discrimination made her life difficult.

"…*One day, when I was giving my blood for CD$_4$ count I saw my neighbors around there. I was an issue for that week for my neighbors, talking too much about my status as they got together. Afterwards I used to come to hospital around closing hours so that I will not be seen by people I know. Sometimes I miss the healthcare providers as may leave the hospital earlier*".

In the contrary some mentioned that the image of HIV/AIDS had changed nowadays considering it as a simple thing.

A 32 years old adherence supporter explained this very well: "*…Some years back, HIV/AIDS's image was very horrific. The models, images and cartoons that used to explain HIV/AIDS were really very unpleasant. These images were repeatedly spoken by the media, making HIV/AIDS more terrible. But nowadays this image is changing. There are some people who think HIV/AIDS as simple cold.*"

Non disclosure was one of the arguments that emerged as an obstacle to adherence. Respondents stated that failure to tell someone could be due to reasons such as: stigma, job loss or abandonment. A 22-years old young boy who was on ART said:

"...My friends don't know my HIV status. When we are together it is difficult for me to take my medications on time."

Side-effects from medications were also cited by patients as issues contributing to non-adherence. Health care professionals also emphasized the negative impacts side-effects could have on patients' motivation for treatment, as illustrated by the statement from a 29-year-old female nurse:

"…I have a patient who was initiated last month. She stopped her drugs as a result of side-effects. She had less severe rash. She actually declared that she had to stop taking the drugs because the side-effects were just intolerable. But after so much discussion, she agreed to continue and came back and said ok, 'the side-effects are subsiding and for now I'm ok'."

Feeling improved and being in good health after a period on treatment was reported by adherence supporters as a reason for not taking medication by patients. A 31- year-old adherence supporter said:

"...I had a patient who started ART before three months. Being on ART he regained his health. He considered this as the end of his management and stopped taking his medications. After proper counseling he was made to start his medications back."

5.3.2. Findings of Key Informants' Interviews

A total of eight staffs were interviewed. They were pharmacist, drugist, medical doctor, health officer, laboratory technologist and nurse by profession. (Table 10)

Table 10: Demographics and training taken by key informants in Dessie Referral Hospital, February 07 to March 31, 2011

Respondents	Gender	Profession	Role	Experience in ART (yr)	Trained on…
R1	Male	druggist	Dispenser	3	Comprehensive HIV training for pharmacists
R2	Female	Nurse	ART nurse	3	ART for adults, ART for pediatrics, STI management
R3	male	Lab technologist	ART lab	3.5	Simple maintenance ART lab machines
R4	Male	Physician	ART Physician	0.5	Basic ART training, comprehensive ART training, STI
R5	Female	Nurse	ART Nurse	0.75	Nutrition, HANS, STI, IP
R6	Female	HO	ART case team	2	Basic ART training, comprehensive ART training,
R7	Male	Nurse	Focal person	5.5	Comprehensive HIV training , adherence Case management, mental health on ART, Nutrition for ART, PMTCT, VCT, TB/HIV
R8	Male	Pharmacist	ART pharmacy head	4	Basic ART, Comprehensive ART

HO-health officer

The main important tools for getting information to manage HIV/AIDS as listed by the respondents were guidelines of ART, nutrition, TB, STI, other OIs; standard operating procedures for ARVs, training manuals, and leaflets.

All the interviewed healthcare providers established that the prescribed ARV drugs were available at all times. During the study period, shortage of ARVs was not observed, although some medications for OIs were not available (e.g., acyclovir).

Majority of interviewed staffs mentioned that there was adequate laboratory and diagnostic equipment.

Respondents agreed that follow up visit by patients is good in the facility. All of the respondents roughly estimated that the percentage of patients who had optimal adherence to be more than 95%. All respondents agreed that females have better adherence to medication than males and they praised females as they care for their families.

All respondents described transportation problem and poverty for ARV users as main restraints to adherence.

Most of the staffs have cited different strategies to monitor adherence like promoting patients to follow their ART service at health institutions situated near to them to tackle problems associated with transportation cost, maximizing duration of refill period, proper management of side effects, proper counseling of patients on adherence and training of healthcare providers.

5.3.3. Observation of Health Facility

5.3.3.1. Structural Issues

The clinic was not separated from the rest of the units within the hospital. Patients gather at the ART clinic for their ARV consultations, adherence counseling, laboratory schedules and collection of their medications. The structures provided for good counseling, and laboratory services with adequate shade, and seats provided for the patients in the waiting area. The confidentiality and privacy during counseling patients is in question as more than two patients were counseled at the same time in one room by different professionals. The environment was found to be clean. Posters were not purposefully placed within the ART clinic to explain the importance of adherence to ARVs. The room that served for counseling of patients by case managers was too narrow.

5.3.3.2. Service Provision

The clinic opened Monday to Friday. The patient load peaked at Monday and Friday as the clinic was not functional in the weekend.

The clinic had three case managers who were completely devoted for ART adherence and support. They did pre-treatment adherence counseling and treatment adherence counseling on a one-to-one basis. Under this case managers there were eight adherence supporters who were HIV positive themselves. They were primarily important to identify those ART user lost on their appointment. They also arranged coffee ceremonies in their catchment area creating an environment to discuss several issues of clients with the community members and officials from K*ebeles*.

At the time of the study, equipments for measuring CD_4 cell counts were available in the facility.

6. DISCUSSION

In a country where the prevalence of HIV is high, and the disease presents a heavy burden on public health resources, as in Ethiopia, it is particularly important that optimal treatment outcomes are achieved in order to realize the long-term goals of public health programs. This study has been conducted to identify determinants, which constrain adherence to ART and levels of adherence to ART. The study was conducted using methods including unannounced pill count and SF-36 application for studying QoL of patients on ARVs, which were not tested in the region previously. It is the first to give some valuable information on these issues in the region's setting.

Antiretroviral therapy (ART) adherence levels of ≥ 95% optimize patient outcomes and minimize HIV drug resistance (14). Based on three-days self-report method, 277(91.4%) of the study population had optimal adherence to doses of ARVs (≥ 95%). This result is comparable with a study done in Amhara Region at Felege Hiwot Referral Hospital, with adherence level of 89.2% for seven days recall period (22). Other studies in the country have slightly greater levels of optimal adherence. A study at Jimma University Specialized Hospital illustrated 95% of the patients were adherent with ≥ 95% of prescribed doses in the last 7 days (26). Another study in Yirgalem, Shashemene and Hawassa Hospitals showed that 93.1% of the study population had optimal adherence to doses of ARVs (≥ 95%) in 15-days self-report (23). This slight variation might be due to the greater recall periods they used. Greater level of optimal adherence is observed compared to studies in other African countries like 74.3% in Coˆte d'Ivoire (17) and 62.5% in South Africa (50).

With the unannounced pill count method 85.0% of the study subjects were found to have optimal adherence, i.e., ≥95% of prescribed doses they took. The outcome is not as much as the three-days self-report. This might be due to the fact that, self report methods tend to overestimate actual adherence when compared with pill count methods (30). This finding is slightly greater than the study in Zambia which had brought optimal adherence level of 83.7% (19). This difference might be due to the greater distance of the the patient has to travel in the Zambian study (up to 68km vs 25km).

Shortage of food, travelling far away from home, being too busy, and ARV side effects were indicated as major reasons for missing the medications in this study. Similarly, the reasons cited as causes of missing doses in a study at Southwest Ethiopia were running out of drugs, being

away from home, being busy by other things and finances (26). In a study at South Africa the most common reasons were away from home, side effects, too busy or simply forgot to take the medicines (50).

The result of our study confirmed a significant clinical benefit of ART adherence for HIV-infected patients: patients with optimal adherence have shown to have significantly higher recent CD4 cells count as compared to patients with suboptimal adherence. This is similar with the findings in Yirgalem, Shashemene and Hawassa Hospitals (23) and a study in Coˆte d'Ivoire (17).

The present study recognized both equivalents and variations when determinants related to adherence compared to those identified in this country and other countries populations.

A study in Coˆte d'Ivoire reported that younger age, one of the demographic characteristics, has been found to be associated with poor adherence to ART (17). However, other studies did not find an association between such demographic factors and ART adherence (23, 38). Similarily in this study, it was not possible to find any association between adherence and demographic factors.

In the present study, social support and disclosure were shown to have positive association with adherence to doses of ARVs. This finding is similar to the findings of other studies done in Yirgalem, Shashemene and Hawassa Hospitals (23), Jimma (24, 26) and Botswana (39). Patients who got support and disclosed their HIV status were more adherent than patients who lack support and did not disclosed themselves. Social support is often cited as having a great impact on a patient's treatment adherence. Findings from FGDs of the present study also showed that openness and disclosure of HIV status is crucial to gain support from others since this lets family members provide supports that enhance adherence through encouragement and reminding of the schedule of ARVs.

Patients with alcohol use or active drug use have problems in adhering to treatment. They often forget to take medications on time or correctly. Alcohol consumption and drug of abuses were found to have significant association with non-adherence to doses of ARVs (7). In a study at Jimma University Specialized Hospital, patients who drank alcohol most of the time were found to be about four times more likely to default from ART (52). But in our study, alcohol consumption, khat chewing and cigarette smoking were not associated with adherence to doses of ARVs. This difference might be due to the higher prevalence of alcohol consumers in the study of JUSH. A study at Yirgalem was in agreement with our study (21).

Research has shown that adherence diminishes as the complexity of the medication regimen increases (i.e. the number of pills per dose and number of pills per day) (8). In contrast to this fact, antiretroviral regimen characteristics such as number of pills prescribed per day and number of doses taken at a time were not found to have significant association with skipping doses of ARVs in the present study. In terms of pill burden a study in Cot d'Ivoire identified that taking at least 10 pills per day was associated with poor adherence (17). This might be due to the simplification of regimens that were currently availabe as fixed dose combinations. Similar to the findings from South and Central Ethiopia (23), duration of ART was not associated with reported adherence in this study.

In this study, it was noted that patient's knowledge of ARVs to be significantly associated with adherence to doses of ARVs. Patients with adequate knowledge about ARVs were found to be more adherent than patients who lack adequate knowledge about ARVs. This finding is against the study at Yirgalem in which knowledge on ART benefit and adherence did not have association with adherence to doses of ARVs (21). This discordance might be due to the lesser proportion of respondents with adequate knowledge in the Yirgalem study (47.4% versus 94.4%). Comparable to our finding, a significant association was observed between knowledge of HIV and ARVs and adherence level in Botswana (39).

The patient–provider relationship is believed to be an encouraging factor for adherence to ART (8, 40). The finding of the present study could not show any association between satisfaction to health care providers' relation and ART adherence. The likely explanation for this discordance could be that although the patient appeared to be dissatisfied with the relation with the health care provider the great benefit of ART they acquired, as was stressed during the FGDs, could make patients to adhere to their treatment. Similarly, satisfaction in healthcare providers' relation was not found to be associated with adherence in a study in Northwest Ethiopia at Felege Hiwot and University of Gondar Hospitals (25).

Lack of information and continued unpleasant side effects can cause patients to discontinue treatment as supported by FGD members who are ART users. Drug side effects were cited as barriers to adherence in the present study. The multivariate logistic regression analyses showed that medication adverse effects had statistically significant association with nonadherence to antiretroviral therapy. This is in agreement with the findings of other studies conducted in

Northwest Ethiopia at Felege Hiwot and University of Gondar Hospitals (25) and Yirgalem Hospital (21). In Tanzania and Uganda, the occurrence of side-effects was mentioned as an important reason for skipping doses (35). FGD discussants also raised side effects and lack of information about side effects as the barriers of adherence to doses of ARVs. In a study in South Africa, those who admitted to being affected by the side effects were found to be associated to non-adherence (50).

ART adherence is known to contribute to improved HIV clinical outcomes, which could result in a better QoL (29). To reconize the relationship between QoL and ART adherence, this study examined QoL and self-reported adherence among patients on ART. In our study, it was observed that adherence to doses of ARVs had statistically significant positive association with all SF-36 scores, except VT. Similarly, by a study in USA it was found that self-reported ART adherence level being significantly associated with the two QoL summary scores and for each of the eight QoL dimensions (29). Comparabely, adherence to ART was significantly associated with five aspects of quality of life scores in a study done in Central China. Consistent adherers had better physical function, general health, vitality, social function, and mental health, compared with nonadherers (51). A study by A study in South and Central Ethiopia has established that adherence to dose of ARVs, except for scores of role physical (RP), bodily pain (BP) and vitality (VT) scales, those adhered to doses of ARVs had better mean scores than those who did not adhered to doses of ARVs (23). This variation in the RP and BP scales might be due to the difference in the duration of being on ART in our study (mean months on ART=33 months) and in the South and Central Ethiopia study (mean months on ART=16 months).

7. CONCLUSIONS AND RECOMMENDATIONS

7.1. Conclusions

In this study the optimal adherence level to ART achieved by 3-days self report was 91.4% whereas it was 85.0% with unannounced pill count in the study area.

This study established that multiple factors, including disclosure of HIV status, social support, knowledge about ART and reported side effects due to ARVs were found to be associated with adherence in HIV-infected participants.

Shortage of food, travelling far away from home, being too busy, and ARV side effects were the four most important reasons for missing ARVs.

The present study identified that a significant clinical benefit of ART adherence for HIV-infected patients as revealed by inceased CD_4 count. In this study optimal adherence was found to be associated with better quality of life of patients on ART.

7.2. Recommendations

Based on the findings of this study, we recommend that:

1. Government and other stakeholders working on HIV/AIDS should include food and transport support to ARV users

2. Healthcare providers should inform patients about possible side effects and manage these side effects as early as possible so that ARV users can maintain good adherence rate.

3. Patients should be educated to use reminders (alarm watches, radios programs) especially when they are busy.

4. Patients should have been encouraged to disclose their HIV status to their partner, families, relatives or any other party.

5. It is necessary to increase the number of trained healthcare providers to cope with increasing workloads in ART clinics.

6. Materials (broachers, leaflets) that support patients to achieve optimal adherence must be provided for patients and posted on ART clinics.

7. In the future longitudinal research should be done to further strengthen the use of SF-36 health survey instrument for assessing the QOL of HIV-infected patients in Ethiopian setting.

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ANNEXES

JIMMA UNIVERSITY COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCES
HEALTH RESEARCH AND POSTGRADUATE COORDINATING OFFICE

DEPARTMENT OF PHARMACY

ANNEX I: Informed Consent

Adherence to ART and its determinants among HIV infected patients at Dessie Referral Hospital, North Central Ethiopia

Good morning/afternoon! My name is _____. I am working with Assefa Mulu who is doing a research as partial fulfillment for the requirement of Masters of Science in clinical pharmacy at Jimma University, Pharmacy Department. You are selected to be one of the participants in the study. We are asking you for a little of your time, about forty five minutes, to participate in this study

In treating HIV/AIDS it is important to follow the prescribed dosage otherwise there is a risk that the medicines will be less effective. The purpose of this study is to understand how patients are adhering to the antiretroviral use and what barriers they have for their non-adherence, and also to know how adherence affects patients' quality of life. The results obtained from this study are useful in order to develop better strategies and solve the problems for the future.

Your participation in the study is voluntary and that you can chose not to be in the study or withdraw at any time. Your refusal to participate will in no way affect your service at the hospital. Reports of the data collected will be presented in the aggregate and that all personal identifiers will be removed and also no personal identifying information will be forwarded to study.

You may not personally derive any benefits from participating in the study. Study findings will be used to better meet the adherence support needs of PLWHA across the country.

Your personal information will be maintained through the use of unique identifiers, and through restricting access to the data set to the principal investigator and those working directly with him. The data collected will be entered into a computer where it will be maintained in password control. Hard copies of completed instruments will be kept in a locked file and will be available only for research study staff. The information that you provide to the interviewer will not be

shared with ART care providers at the clinic. The information you provide will be kept completely separate from your medical and other visits records.

If you have any questions please contact: Assefa Mulu Baye

Mob: +251910980410 P.O.Box: 378, Jimma University E-mail: mulubaye@gmail.com

 We would greatly appreciate your truthful and keen participation in responding to this questionnaire.

Yes I agree [____] No, I don't agree [____] Id Number [_____]

Date of Interview [___/____/_____]   Interviewer Name_____

                                                         Supervisor_____

ANNEX II: SF-36 QoL Scoring System

Adherence to ART and its determinants among HIV infected patients at Dessie Referral Hospital, North Central Ethiopia, 2011

Items	Scales	Dimensions	
3. Vigorous activities	Scale-1 Physical functioning (PF)	Dimension-A: Physical Health Summary (PHS)	
4. Moderate activities			
5. Lift, carry groceries			
6. Climb several flights			
7. Climb one flight			
8. Bend, knee			
9. Walk a mile			
10. walk several blocks			
11. walk one block			
12. bathe, dress			
13. cut down time	Scale-2 Role-physical (RP)		
14. accomplished less			
15. limited in time			
16. had difficulty			
21. pain magnitude	Scale-3 Bodily pain (BP)		
22. pain interference			
1. general health rating	Scale-4 General health (GH)		Dimension-B: Mental Health Summary (MHS)
36. excellent			
34. as healthy as anyone			
33. sick easier			
35. health worse			
23. full of life	Scale-5 Vitality (VT)		
27. energy			
29. worn out			
31. tired			
32. social extent	Scale-6 Social functioning (SF)		
20. social time			
17. cut down time	Scale-7 Role emotional (RE)		
18. accomplished less			
19. not careful			
24. nervous	Scale-8 Mental health (MH)		
25. down in dumps			
26. peaceful			
28. blue/sad			
30. happy			
2. change in reported health			

ANNEX III: Scores of SF-36 Scales and Their Specifications (Meanings)

Adherence to ART and its Determinants among HIV Infected Patients at Dessie Referral
Hospital, North Central Ethiopia, 2011

Scale	Acronym	Specifications	
		Lowest Possible Score (Floor)	Highest Possible Score (Ceiling)
Physical functioning	PF	Very limited in performing all physical activities, including bathing or dressing	Performs all types of physical activities including the most vigorous without limitations due to health
Role physical	RP	Problems with work or other daily activities as a result of physical health	No problems with work or other daily activities
Bodily pain	BP	Very severe and extremely limiting pain	No pain or limitations due to pain
General health	GH	Evaluates personal health as poor and believes it is likely to get worse	Evaluates personal health as excellent
Vitality	VT	Feels tired and worn out all of the time	Feels full of pep and energy all of the time
Social functioning	SF	Extreme and frequent interference with normal social activities due to physical and emotional problems	Performs normal social activities without interference due to physical or emotional problems
Role emotional	RE	Problems with work or other daily activities as a result of emotional problems	No problems with work or other daily activities
Mental health	MH	Feelings of nervousness and depression all of the time	Feels peaceful, happy, and calm all of the time
Physical health summary	PHS	Limitations in self-care, physical, social, and role activities, severe bodily pain, frequent tiredness, health rated "poor"	No physical limitations, disabilities, or decrements in well-being, high energy level, health rated "excellent"
Mental health summary	MHS	Frequent psychological distress, social and role disability due to emotional problems, health rated "poor"	Frequent positive affect, absence of psychological distress and limitations in usual social/role activities due to emotional problems, health rated "excellent"

ANNEX IV: Questionnaire for Face-to-Face Interview

JIMMA UNIVERSITY

COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCES

HEALTH RESEARCH AND POSTGRADUATE COORDINATING OFFICE

DEPARTMENT OF PHARMACY

Adherence to ART and its Determinants among HIV Infected Patients at Dessie Referral Hospital, North Central Ethiopia, 2011

SECTION I: SOCIO-DEMOGRAPHIC INFORMATION				
QID	Question	Response options/codes	Coded Response	Skip Pattern
101	Sex of respondent	Male 01 Female 02	[__|__] [__|__]	
102	Age	_____ Years	[__|__]	
103	Ethnic group	Amhara 01 Oromo 02 Tigray 03 Afar 04 Other, specify_____ 88	[__|__]	
104	Religion	Orthodox 01 Muslim 02 Protestant 03 Catholic 04 Other, specify _____ 88	[__|__]	
105	What is your highest educational level?	Can't read and write 01 Adult literacy 02 1-6 classes of school 03 6-12 classes of school 04 Diploma and above 05 Vocational 06	[__|__]	
106	What is your current marital status?	Single (Never married) 01 Cohabiting (Not married but Living with partner) 02 Currently married 03 Divorced/Separated 04 Widowed 05 Other 88	[__|__]	If the answer is 4/5 skip to 108
107	If divorced or separated or widowed, was the divorce /separation / death of your partner due to HIV?	Yes 01 No 02 Don't Know 99 N/A 98	[__|__]	

108	Are you employed?	Yes		01	[__|__]	If no skip to 201
		No		02		
109	Where do you work?	Government office		01	[__|__]	
		Private sector		02		
		Self employed		03		
		NGO		04		
		Other (specify)		88		
		N/A		98		

SECTION II: SOCIAL SUPPORT AND DISCLOSURE

201	Have you disclosed your HIV status to anyone?	Yes		01	[__|__]	If no skip to 204
		No		02		
202	If yes, whom have you disclosed your status to?	Mentioned		01		
		Not Mentioned		02		
		N/A		98	[__|__]	
		a) Partner /spouse …………………			[__|__]	
		b) Parent ……………………………			[__|__]	
		c) Relatives …………………………			[__|__]	
		d) Friends …………………………..			[__|__]	
		e) Neighbors / community members			[__|__]	
		f) Other, specify_____		88	[__|__]	
203	Do you get support	Yes		01	[__|__]	If no skip to 301
		No		02		
204	From where do you get support?		Mentioned	01		
			Not Mentioned	02		
			N/A	98	[__|__]	
		a)Families			[__|__]	
		b) Friends			[__|__]	
		c) NGO			[__|__]	
		d) Faith based organization			[__|__]	
		e) Workplace programs			[__|__]	
		f) Other (specify)_____				

SECTION III: ALCOHOL AND DRUG ABUSE

301	Do you drink alcohol?		No	01	[__|__]	If the answer is no skip to 401
			Yes	02		
			N/A	98		

305	DRUG ABUSE				
	A) Have you ever used (name of drug)?			B) Have you used it in the last 6 months	
		Yes 01		Yes 01	
		No 02		No 02	
		If no skip to next drug		If no skip to next drug	
	Hashish	[__|__]		[__|__]	
	Shisha	[__|__]		[__|__]	
	Khat	[__|__]		[__|__]	
	Cigarette	[__|__]		[__|__]	

SECTION IV: CURRENT USE OF ARVs

QID	Questions	Coding Categories	Coded responses	Skip pattern

401	Since how long are you taking ARV/HIV medications?	Years…….months…… I don't remember 98		[__|__|__] [__|__]	
402	# Pills each time (Pills each dose) 1 tablet = 1 2 tablets=2	# Times per day (Doses /day) Once/d =1 Twice/d =2 Thrice/d =3	Number of Pills to be taken Per day		Number of Pills to be taken Per day(including OI meds)
403	How many doses have you missed over the last 3 days?	None 01 One dose 02 Two doses 03 Three doses 04 Four or more doses 05			[__|__]
404	What were the reasons for mssing your doses? **Probe: (Multiple responses possible. After respondent answers, probe by asking for any others.)**	**Reasons for stopping treatment** Shortage of food needed for the drug 01 ARVs had too many side effect 02 No improvement with medications 03 Was worried about side effects 04 Too busy doing other things 05 Traveling so could not keep the routine 06 Did not want anyone to know 07 Felt better so did not feel the need to continue medication 08 Found it very difficult to take so many pills 09 Health worker/physician told me to stop 10 Others (specify)_____ 88 N/A 98		[__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__]	
405	Is there any side effect related to your ART?	Yes 01 No 02		[__|__]	If No skip to 501
406	Which side effects do you have related to the ART you are taking	Nausea 01 Diarrhea 02 Fatigue 03 Headache 04 Numbness/tingling 05 Rash 06 Anemia 07 Abdominal pain 08 Jaundice 09 Fat changes 10 Dizziness/anxiety/nightmare 11 Other/Specify---------------- 88		[__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__]	

SECTION V: ADDMITION DUE TO HIV/AIDS

501	Have you ever been admitted for an illness due to your HIV infection?	Yes 01 No 02 Don't know 99	[___|___]	If no or DK skip to 601
502	Please tell me how many times have you been admitted for HIV related illnesses over the past 12 months?	Total number of hospitalizations N/A 98	[___|___]	

SECTION VI: KNOWLEDGE ABOUT ART

Questions 601 - 608 are to assess the knowledge of the patients about their ART medications			
Response Options: Yes		*01*	
	No	*02*	
601	ARV medications prolong life.		[__|__]
602	Taking ARV medications as prescribed by the doctor can make a PLWHA healthier and has a positive effect on their life		[__|__]
603	ARV medications are effective in preventing HIV/AIDS		[__|__]
604	When ARV medications are not taken properly the medications do not work as well and the virus is not controlled		[__|__]
605	HIV/AIDS has become less serious because of ARV medications		[__|__]
606	With ARV medications HIV/AIDS can be managed now like any other disease		[__|__]
607	ARV medications can make the virus undetectable in the blood		[__|__]
608	If taken within short time after being infected, ARV medications can cure HIV		[__|__]

SECTION VII: QUALITY OF LIFE

SF-36 Health Survey. Instructions: This set of questions asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities.

No	Questions	Coding categories		Code
701	In general, would you say your health is	Excellent	01	[__|__]
		Very Good	02	
		Good	03	
		Fair	04	
		Poor	05	
702	Compared to one year ago, how would you rate your health in general now?	Much better than one year ago	01	[__|__]
		Somewhat better now than one year ago	02	
		About the same as one year ago	03	
		Somewhat worse now than one year ago	04	
		Much worse now than one year ago	05	
703	Questions 703i-703x are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much? (Please circle one number on each line) **Response Options: Yes, Limited A Lot 01 Yes, Limited A Little 02 Not Limited At All 03**			
703i	Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports			[__|__]
703ii	Moderate activities, such as moving a table, moving a chair, cleaning home….			[__|__]
703iii	Lifting or carrying groceries			[__|__]
703iv	Climbing several flights of stairs/hills			[__|__]
703v	Climbing one flight of stairs/hills			[__|__]
703vi	Bending, kneeling, or stooping			[__|__]
703vii	Walking more than a mile			[__|__]
703viii	Walking several blocks			[__|__]
703ix	Walking one block			[__|__]
703x	Bathing or dressing yourself			[__|__]
704	During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health? **Response Options: Yes 01 No 02**			
704i	Cut down on the amount of time you spent on work or other activities			[__|__]
704ii	Accomplished less than you would like			[__|__]
704iii	Were limited in the kind of work or other activities			[__|__]

704iv	Had difficulty performing the work or other activities (e.g., it took extra effort)	[__|__]
705	During the <u>past 4 weeks</u>, have you had any of the following problems with your work or other regular daily activities <u>as a result of any emotional problems</u> (such as feeling depressed or anxious)? (Please circle one number on each line.) **Response Options: Yes 01 No 02**	
705i	Cut down on the amount of time you spent on work or other activities	[__|__]
705ii	Accomplished less than you would like	[__|__]
705iii	Didn't do work or other activities as carefully as usual	[__|__]

706	During the <u>past 4 weeks</u>, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?	Not at all Slightly Moderately Quite a bit Extremely	01 02 03 04 05	[__|__]
707	How much <u>physical</u> pain have you had during the <u>past 4 weeks</u>?	None Very mild Mild Moderate Severe Very Severe	01 02 03 04 05 06	[__|__]
708	During the <u>past 4 weeks</u>, how much did <u>pain</u> interfere with your normal work (including both work outside the home and housework)?	Not at all A little bit Moderately Quite a bit Extremely	01 02 03 04 05	[__|__]

709	Questions 709i-709ix are about how you feel and how things have been with you <u>during the past 4 weeks</u>. Please give the one answer that is closest to the way you have been feeling for each item. **Response options: All of the Time 01 Most of the Time 02 A Good Bit of the Time 03** ** Some of the Time 04 A Little of the Time 05 None of the Time 06**	
709i	Did you feel full of life?	[__|__]
709ii	Have you been a very nervous person?	[__|__]
709iii	Have you felt so down in the dumps that nothing could cheer you up?	[__|__]
709iv	Have you felt calm and peaceful?	[__|__]
709v	Did you have a lot of energy?	[__|__]
709vi	Have you felt downhearted and blue?	[__|__]
709vii	Did you feel worn out?	[__|__]
709viii	Have you been a happy person?	[__|__]
709ix	Did you feel tired?	[__|__]

710	During the <u>past 4 weeks</u>, how much of the time has your <u>physical health or emotional problems</u> interfered with your social activities (like visiting with friends, relatives etc.)	All of the time Most of the time Some of the time A little of the time None of the time	01 02 03 04 05	[__|__]

711	For questions 711i-711iv how TRUE or FALSE is <u>each</u> of the following statements for you? **Response Options: Definitely True 01 Mostly True 02 Don't Know 03** ** Mostly False 04 Definitely False 05**	
711i	I seem to get sick a little easier than other people	[__|__]
711ii	I am as healthy as anybody I know	[__|__]
711iii	I expect my health to get worse	[__|__]
711iv	My health is excellent	[__|__]

SECTION VIII: SATISFACTION IN THE PROVIDER

Questions 801-805 are designed to learn about your relationship with your doctor. Please feel free to tell us what you think. How strongly do you agree or disagree with the following statements?

Response Options: *Totally disagree*   *01*   *Agree*   *03*
                       Disagree   *02*   *Totally agree*   *04*

No	Questions	Response categories	Response
801	If my health care provider (HCP) tells me something is so, then it must be true		[__|__]
802	I am sure that my HCP keeps the information we discuss totally private		[__|__]
803	I trust my HCP so much I always try to follow his/her advice		[__|__]
804	My HCP is well qualified to manage (diagnose, treat or make an appropriate referral) medical problems like mine		[__|__]
805	I am satisfied in the scheduling, appointments and confidentiality of the treatment unit		[__|__]

ANNEX V: Medical Record Reviews

SN	Questions and filters	Response options/codes		Coded Response
1	WHO Clinical stage of HIV disease	Stage I Stage II Stage III Stage IV		[__/__/__] [__/__/__] [__/__/__] [__/__/__]
2	CD4 counts at start of treatment/ total lymphocyte count	CD4 count		[__|__|__].[__|__]
3	CD4 count currently (latest)	CD4 count		[__|__|__].[__|__]
4	Opportunistic infection co-morbidities after ART is initiated	No TB Fungal infection PCP Depression Toxoplasmosis Herpes Other /specify	01 02 03 04 05 06 07 08	[__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__]
5	Medications (other than ARV)	Nothing Ant –TB Cotrimoxazole Fluconazole Acyclovir Other (specify)--------------	01 02 03 04 05 06	[__|__] [__|__] [__|__] [__|__] [__|__] [__|__]
6	Regimen, current	--------------------------		
7	Date ART was initiated	---------------------------		

ANNEX VI: Observation of the Clinical Setting

Adherence to ART and its Determinants among HIV Infected Patients at Dessie Referral Hospital, North Central Ethiopia

Name of observer: _____Date of observation: _____Time of observation: _____

1	Opening hours of ART clinic and pharmacy		
	Day	No. of Opening hours, Clinic	No. of Opening hours, Pharmacy
	Monday		
	Tuesday		
	Wednesday		
	Thursday		
	Friday		
	Saturday		
	Sunday		
	Total Hours		
2	Is the clinic open anytime at the weekend or in the evenings? (evening means at least a two hour session after five pm)	Yes [___] No [___]	
3	Is there a functioning clinic attendance register showing all patients who visited each day?	Present [___] Absent [___]	
4	Is there an appointment book/system showing all patients due for clinic attendance each day?	Present [___] Absent [___]	
5	Number of staffs working directly with HIV/AIDS patients in the clinic		
	Healthcare worker	# Working	
	Nurses	[___]	
	Physicians	[___]	
	Social workers	[___]	
	Counselors	[___]	
	Pharmacist	[___]	
	Other/specify	[___]	
6	Copy of the national ART treatment guidelines	Present [___] Absent [___]	
7	Copy of guidelines on ART storage?	Present [___] Absent [___]	
8	Following a clinical guideline for starting patients on ART	Yes [___] No [___]	
9	Number of days for supply of ARVs are usually given to new patients	[___]	
10	Number of days for supply of ARVs are usually given to experienced patients	[___]	
11	Frequency of order of CD_4 count		
	11.1. Pre-treatment assessment 11.2. Routine 11.3. Monitoring of patients who deteriorate clinically 11.4. Not applicable, CD_4 counts are not done	[___] [___] [___] [___]	
12	Presence of private space for adherence counseling	Present [___] absent [___]	
13	Presence of formal system for linking patients with other persons living with HIV as support partners	Yes [___]No [___] S [___]	
14	Presence of connection with the local community? *(Churches or other organizations)*	Present [___] Absent [___]	

15	Availability of functioning laboratory system for measuring CD_4 counts		Present [___] Absent [___]		
16	ARV First Line:				
	Drug	Abb	Present/Absent	# days in stock in last 90	Any stock outs in last 90 days (Y/N)
	Lamivudine 150mg tab	3TC			
	Stavudine 40 mg	D_4T			
	Stavudine 30 mg	D_4T			
	Nevirapine 200mg	NVP			
	Efavirenz 200mg	EFV			
	600mg ZDV+3TC 450mgs	ZDV,3TC			
	Tenofovir 300mg	TDF			
17	Drugs for opportunistic infections				

Drug	Present/absent		# days in stock in last 90	Any stock-outs in last90 days (Y/N)	
Cotrimoxazole tabs 480 or 960mg					
Cotrimoxazole susp 240mg/5ml					
Fluconazole tabs 150 or 200mg					
Miconazole Gel Erythromycin tabs 250 or 500mg					
Nystatin oral drops 10,000 IU/ml					
Acyclovir 200 mgs					
Acyclovir Cream					
Folic Acid 5mgs					

ANNEX VII: Guides for Focus Group Discussion (FGD) for ART Users

Adherence to ART and its Determinants among HIV Infected Patients at Dessie Referral Hospital, North Central Ethiopia

- Participants per FGD (6-12)
- Adults (≥18 years, men and women)

- One moderator, one note-taker (*and* use of tape recorder)
- Neutral venue outside the facility

Short introductory remarks
- Introduction of researchers and participants
- Thank participants for agreeing to participate, all share a common feature–they are on ARV treatment, are here to share their thoughts about ARVs and difficulties in taking ARVs: we want to learn from participants
- Explain purpose of the study, purpose of the discussion, reassurance about confidentiality, agree on rules.

Topics for discussion
1. What treatments do you know to be available for treating HIV? What is your opinion about these? (E.g. ARVs; herbs; traditional medicines; spiritual healing; prayers; and perceived benefit (s) of treatment).
2. What is your experience of ART? (Probe: about adherence, adverse effects, pill burden, lack of food, lifestyle issues).
3. How do you think you are being treated (handled) by the health care workers (probe: privacy, confidentiality, respect, being listened to, time spent with patient, waiting time, integration with other services). What is the quality of care provided by health care workers?
4. How do you think the clinical setting is comfortable for your ART experience? (Location and setting of the ARV clinic and support services (pharmacy, laboratory, counseling, etc), the sanitary condition of the environment).
5. What do you think about the counseling that you receive? (Probe especially on importance of adherence effectiveness of counseling). What support are you given by the health workers to help you adhere better to your medications? Have you disclosed?
6. What support is available for you in the community, in the family, in the workplace? (Probe about discrimination, stigma). Is there any negative social support? Any stress exacerbation?
7. What do you think could be done to help people adhere more easily to their treatment?
8. What do you think are the key reasons for non-adherence and good adherence? What are the sources of motivation for adherence?

Duration of discussion (1½ hours); provide refreshments

Conclusion, thank participants!

ANNEX VIII: Guide for Focus Group Discussion (FGD) for Healthcare Providers

Adherence to ART and its Determinants among HIV Infected Patients at Dessie Referral Hospital, North Central Ethiopia

- Participants per FGD (6-8)
- Healthcare providers

- One moderator, one assistant note-taker (*and* use of tape recorder)
- Neutral venue outside the facility

Short introductory remarks
- Introduction of researchers and participants
- Thank participants for agreeing to participate, all share a common feature–they have experienced on ARV treatment, are here to share their thoughts about ARVs and difficulties of patients taking ARVs: we want to learn from participants
- Explain purpose of the study, purpose of the discussion, agree on rules.

Topics for discussion
1. What treatments do you know to be available for treating HIV? What is your opinion about these? (E.g. ARVs; herbs; traditional medicines; spiritual healing; prayers; and perceived benefit (s) of treatment).
2. What is your experience of ART on patients? (Probe: about adherence, adverse effects, pill burden, lack of food, lifestyle issues).
3. How do you think you are handling patients taking ART (probe: privacy, confidentiality, respect, listening patients, time spent with patient, waiting time, integration with other services). What is the quality of care provided to ART taking patients?
4. How do you think the clinical setting is comfortable for your patients taking ART? (Location and setting of the ARV clinic and support services (pharmacy, laboratory, counseling, etc), the sanitary condition of the environment).
5. What do you think about the counseling that you give for patients? (Probe especially on importance of adherence effectiveness of counseling). What support are you giving to the patients taking ART to help them adhere better to the medications?
6. What support is available for patients taking ART in the community, in the family, in the workplace? (Probe about discrimination, stigma). Is there any negative social support? Any stress exacerbation?
7. What do you think could be done to help people adhere more easily to their treatment?
8. What do you think are the key reasons for non-adherence and good adherence? What are the sources of motivation for adherence?

Duration of discussion (1½ hours); provide refreshments
Conclusion, thank participants!

ANNEX IX: Guides for Key-informant Interview with Healthcare Providers

Adherence to ART and its Determinants among HIV Infected Patients at Dessie Referral

Hospital, North Central Ethiopia

Name of interviewer: _____Date: _____

(Introduction of the interviewer (s), introduction of the study)

Section one: Background information on informant (health care provider)

Sex	M [___] F [___]
Age …….Years	[_____]
Profession	[_____]
Role in ARV program	[_____]
Involved in program since...... mn……yrs	[_____/_____]

Section two: Tasks and training
1. What specific training have you received for this job in relation to ARV program? Tell me about the training (Details)
2. Do you think this training has been sufficient? (Details)

Section two: Treatment and procedures

3. Which treatment guidelines for HIV/AIDS management do you use at this facility? (Give details if necessary, e.g. national guidelines etc)

4. Are the drugs you prescribe always available? (If not, give details- how often, reason, what do you do about it)

5. Are the drugs in the guidelines you use to dispense always available? (Give details – how often, reason, what do you do about it)

6. Have you had periods where your patients have not been able to get their medications because they were not available in stock?

7. How reliable are your lab and diagnostic support services? Do results come in on time?

8. What is your procedure when a patient is put on ARV drugs for the first time?

9. What is your procedure when a patient switches regimens?

10. In what ways are ARV-users informed about and prepared for ARV treatment?

11. What kind of information do they receive? Please describe it to us:

✓ The disease process (i.e. HIV and AIDS)

✓ How the disease affects the body

✓ How ARVs work

✓ How to use them

- ✓ The need to continue treatment
- ✓ What to do if a pill is forgotten
- ✓ Possible interactions with other drugs (including traditional medicines)
- ✓ Which side effects can occur & what to do if they occur
- ✓ When and where to get re-supply

Section three: Adherence issues

12. Generally speaking, do your patients keep their appointments?

13. How do you think your patients do, generally speaking, in terms of adherence to ART?

14. Could you estimate the percentage of your patients who you think are "sufficiently adherent" to ART? (Respondent gives their definition of 'sufficiently adherent' what level is that?)

15. What do you use to determine adherence (probe: appointments, refills?)

16. We would like to get your views on the following (probe): From your experience
    - ✓ How would you compare adherence between women and men?
    - ✓ How would you compare adherence between older patients and younger patients?
    - ✓ How does a patient's educational level affect adherence?

17. How do you think the distance to the health facility affects adherence?

18. From your experience how do you think the following affect adherence?
    - ✓ Having or not having a treatment-support partner?
    - ✓ Duration of treatment, side effects, lack of food, knowledge about ART?

19. What strategies are in place to monitor adherence?

20. What strategies are in place to support adherence? (probe: family/community involvement).

21. What are the main challenges you face in supporting your patients to adhere to ARV drugs (especially for longer term users)?

Thank you very much for your participation in this interview.

ANNEX X: Unannounced Pill Count Data Collection Format

Adherence to ART and its Determinants among HIV Infected Patients at Dessie Referral

Hospital, North Central Ethiopia

Code of regimen
01 = ZDV+ 3TC 450mg
02 = Zidovudine 300mg
03 = Stavudine 30mg
04 = Stavudine 40mg
05 = Abacavir 300mg

06 = Lamivudine 150mg
07 = Nevirapine 200mg
08 = Efavirenz 600mg
09 = Didanosine 100mg
10 = Didanosine 25mg
11 = Didanosine 50mg

12 = Lopinavir/ritonavir 166.6mg
13 = Nelfinavir 250mg
14 = Tenofovir 300mg

Ser No.	Card no.	Previous date issued	Qty taken home (total)	Qty left to be untaken	Date counting is done	Day since last issue	Regimen	Qty taken extra in previous visits	Qty supposed to be taken	Pills missed
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

ANNEX XI: Informed Consent (Amharic Version)

ጥናቱ ውስጥ ለመሳተፍ የፍቃደኝነት መግለጫ ቅጽ

ጅማ ዩኒቨርሲቲ የፋርማሲ ትምህርት ቤት የክሊኒካል ፋርማሲ ድህረ ምረቃ ፕሮግራም

በደሴ ሪፈራል ሆስፒታል በኤች.አይ. ቪ/ኤድስ ህሙማን የእድሜ ማራዘሚያ መድሃኒቶች አጠቃቀም ላይ ለሚደረግ ጥናት የቀረበ መጠይቅ

ኤች. አይ. ቪ/ ኤድስ በማከም ሂደት ውስጥ በባለሙያ የታዘዘውን መድሃኒት በተገቢ መጠንና መመሪያ መሰረት መውሰድ አስፈላጊ ነው። ይህን ያለማድረግ ከሚያስከትላቸው ችግሮች አንዱ ቫይረሱ ከመድሃኒቶቹ ጋር ተላምዶ ውጤታማነታቸውን ይቀንሰዋል። ከዚህ በፊት የተሰሩ ጥናቶች አንዳንድ ህሙማን የታዘዙላቸውን መድሃኒቶች በተገቢው ሁኔታ እንደማይወስዱ አመልክተዋል። የዚህ ጥናት አላማም የዕድሜ ማራዘሚያ መድሃኒቶችን በተገቢው ላለመውሰድ ምክንያቶች ናቸው የሚባሉ ነገሮችን ለመረዳትና ለመለየት ሲሆን በተጨማሪም መድሃኒቶቹን በትክክል አለመውሰድ በህሙማን የ� ተቀን ውሎ ላይ ያለውን ጫና ለመረዳት ነው። የዚህ ጥናት ውጤትም ለወደፊቱ በዚህ ዙሪያ ያሉትን ችግሮች ለመቅረፍ ከፍተኛ አስተዋጽኦ ይኖረዋል።

የእርስዎ በጥናቱ መሳተፍ በበጎ ፈቃደኝነት ላይ የተመሰረተ ሲሆን በጥናቱም አለመሳተፍ፣ ጥናቱ ከተጀመረ በኋላም የማቋረጥ መብቶዎ የተጠበቀ ነው። የእርስዎ በጥናቱ ለመሳተፍ ፈቃደኛ አለመሆን ከዚህ በፊት ከጤና ድርጅቱ ያገኙ የነበሩትን ማንኛውም አገልግሎት ጋር ምንም አይነት ግንኙነት አይኖረውም። በጥናቱ ውስጥ መሳተፍዎ እንደ ግለሰብ የሚያስገኝልዎት ጥቅም ላይኖር ይችላል ሆኖም ግን የዚህ ጥናት ውጤት በአጠቃላይ ለኤች.አይ.ቪ/ኤድስ ህሙማን መድሃኒቱን በተሻለ ሁኔታ ለመስጠት ከፍተኛ አስተዋጽኦ ይኖረዋል። ማንኛውም የስጡት መረጃ በመለያ ቁጥር (ኮድ) የሚቀመጥ ሲሆን ማንነትዎ በምንም ሁኔታ አይገለፅም። ለሰጡት መረጃ ከጥናቱ ባለቤት ውጭ ሌሎች ሰዎች መረጃ አይኖራቸውም ለዚህም ሲባል የተሰባሰቡት መረጃዎች በሚስጥር በተቆለፈ የኮምፒውተር ፋይሎች ውስጥ ይቀመጣሉ። በወረቀት የተሰበሰቡ መረጃዎች በጥናቱ ባለቤት በሚስጥር ተቆልፈው ይቀመጣሉ። በተጨማሪም የስጡት የግል መረጃዎ በጤና ድርጅት ውስጥ ለሚገኙ ሌሎች አገልግሎት ሰጪ ባለሙያዎች ግልፅ የማይደረግ ሲሆን ከሌሎች ተቀማጭ የእርስዎ ዶክመንቶች ጋር ምንም አይነት ግንኙነት አይኖረውም።

ተጨማሪ ጥያቄ ወይም ማብራሪያ ካስፈለገዎ ከጥናቱ ባለቤት ጋር በዚህ አድራሻ መገናኘት ይችላሉ።

አሰፋ ሙሉ ባዬ
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ፖስታ ሳጥን ቁ. **378** ጅማ ዩኒቨርሲቲ
 መለያ ቁጥር _____ቀን_____ የጠያቂው ስም_____
የተቆጣጣሪ ስም _____   ፊርማ_____
      ፊርማ_____

ANNEX XII: Questinnaire (Amharic Version)

ጅማ ዩኒቨርሲቲ የፋርማሲ ትምህርት ክፍል የክሊኒካል ፋርማሲ ድህረ ምረቃ ፕሮግራም

በደሴ ሪፈራል ሆስፒታል በኤች.አይ. ቪ/ኤድስ ህሙማን የፀረ ኤች አይ ቪ ኤድስ መድሃኒቶች አጠቃቀም ላይ ለሚደረግ ጥናት የቀረበ መጠይቅ

የካርድ ቁጥር ––––––––––––––––

መለ/ቁ	ጥያቄ	መልስ	ኮድ
ክፍል አንድ፡ አጠቃላይ የግለሰቡን መረጃ ለማወቅ የቀረበ መጠይቅ			
101	ፆታ	[01] ወንድ [02] ሴት	[__|__]
102	ዕድሜ	––––––––––––––––ዓመት	
103	ብሄር	[01] አማራ [03] ትግሬ [02] ኦሮሞ [04] አፋር [88] ሌላ/ጥቀስ––––––––––––––––	[__|__]
104	ሃይማኖትዎ ምንድን ነው?	[01] ኦርቶዶክስ [03] ፕሮቴስታንት [02] ሙስሊም [04] ካቶሊክ [88] ሌላ ካለ ይጠቀስ––––––––––––––––	[__|__]
105	የትምህርት ደረጃዎን ቢነግሩኝ?	[01] ማንበብና መጻፍ የማይችሉ[04] 7-12 ክፍል [02] ማንበብና መጻፍ የሚችሉ [05]ከዲፕሎማ በላይ [03] 1-6 ክፍል [06] የሞያ ትምህርት	[__|__]
106	አሁን ያለዎት የትዳር ሁኔታ	[01] ያገባ [03] የተፋቱ/የተለያዩ [02] ህጋዊ ያልሆነ ጋብቻ [04] በሞት የተለዩ [88] ሌላ ካለ ይጠቀስ –––––––––––––––––––––	[__|__]
107	የተፋቱ፣ የተለያዩ የሞተባዎት ከሆነ ምክንያቱ ኤች አይ ቪ ኤድስ ነውን?	[01] አዎ [99] አላውቅም [02] አይደለም [98] መልስ የለም [03] እርግጠኛ አይደለሁም	[__|__]
108	በአሁኑ ሰዓት ከማን ጋር ነው የሚኖሩት?	[01] ብቻዬን [04] ከዘመዶቼ ጋር [02] ከባለቤቴ ጋር [05] ከልጆቼ ጋር [03] ከእናት እና አባቴ ጋር [06] ከጓደኞቼ ጋር [88] ሌላ ካለ ጥቀስ ––––––––––––––––––––	[__|__]
109	ሥራ አለዎት?	[01] አዎ [02] የለኝም	[__|__]
110	የት ነው የሚሰሩት?	[01] መንግስት መስሪያ ቤት [03] የግል ስራ [02] በግል መስሪያ ቤት [04] መያድ [98] መልስ የለም [88] ሌላ ካለ ይጠቀስ	[__|__]
ክፍል ሁለት፡ የማህበረሰቡ ድጋፍና ለሌሎች በሽታይረሱ እንደተያዙ ማሳወቅን በተመለከት የቀረበ መጠይቅ			
201	ከሽታይረሱ ጋር እንደሚኖሩ ለሌላ ሰው አሳውቀዋል (ለህክምና ባለሞያ ሳይጨምር)	[01] አዎ [02] አላሳወኩም	
202	መልስዎ አዎ ከሆነ ከሽታይረሱ ጋር እንደሚኖሩ ለማን ለማን አሳውቀዋል?	[01] አሳውቄአለሁ [02] አላሳወኩም [98] መልስ የለም ሀ) ለትዳር ጓደኛዬ–––––––––– ለ) ለቤተሰብ––––––––––––– ሐ) ለዘመዶቼ–––––––––––– መ) ለጓደኞቼ–––––––––––– ሠ) ለጎረቤቶቼ/ለአካባቢው ነዋሪዎች- ረ) ሌላ ካለ ጥቀስ––––––––––––88	[__|__] [__|__] [__|__] [__|__] [__|__] [__|__]

71

			[__|__]
203	ከየት ድጋፍ ያገኛሉ?	[01] አገኛለሁ [02) አላገኘም [98] መልስ የለም	[__|__]
		ሀ) ቤተሰቦቼ---------------------	[__|__]
		ለ) ከጓድኞቼ---------------------	[__|__]
		ለ) ከእርዳታ ድርጅቶች--------------	[__|__]
		ሐ) ከሀይማኖታዊ ድርጅቶች---------	[__|__]
		መ) ከመስሪያ ቤት-------------------	[__|__]
		ሠ) ሌላ ካለ ይጠቀስ------------88	[__|__]

ክፍል ሶስት: አልኮል አወሳሰድ እና የጎጅ ዕፅ አጠቃቀምን በተመለከተ የቀረበ ቅፅ

301	ባለፈት 15 ቀናት ውስጥ አልኮል ጠጥተው ያውቃሉ?	[01] አዎ [99] አላስታውስም [02] አላውቅም	[__|__]

302	የዕፅ አጠቃቀም	

	ሀ) የሚከተሉትን ዕፃች ተጠቅመው ያውቃሉ?	ለ) ባለፈው 6 ወር ጊዜ ውስጥ ተጠቅመዋል?
ዕፃች	[01] አዎ [02] አልተጠቀምኩም [98] መልስ የለም	[01] አዎ [02] አልተጠቀምኩም [98] መልስ የለም
ሀሺሽ	[__|__]	[__|__]
ሽሻ (ጋያ)	[__|__]	[__|__]
ጫት	[__|__]	[__|__]
ሲጋራ	[__|__]	[__|__]

ክፍል አራት: በአሁኑ ሰዓት ስለሚወሰዱት የፀረ ኤች አይ ቪ ኤድስ መድሃኒት አጠቃቀም በተመለከተ የቀረበ መጠይቅ

401	አሁን እየወሰዱ ያሉትን የፀረ ኤች አይ ቪ ኤድስ መድሃኒቶች መጠን እና የአወሳሰድ ሁኔታ ሊነግሩኝ ይችላሉ?		
	በአንድ ጊዜ የሚወሰድ የእንክብል ብዛት [01] 1 እንክብል [02] 2 እንክብል [03] 3 እንክብል	በቀን ምን ያህል ጊዜ ይወሰዳል? [01] በቀን 1 ጊዜ [02] በቀን 2 ጊዜ [03] በቀን 3 ጊዜ	በቀን የሚወሰዱት የእንክብል ብዛት
	[__|__]	[__|__]	[__|__]
402	የፀረ ኤች አይ ቪ ኤድስ እንክብሎችን ጨምሮ በቀን ምን ያህል ዕንክብሎችን ይወስዳሉ?	ቁጥር ------------ [99] አላውቅም	[__|__]
403	ባለፉት 3 ቀናት ውስጥ ምን ያህል የፀረ ኤች አይ ቪ ኤድስ መድሃኒት ሳይወስዱ ቀርተዋል?	[01] ምንም [04] ሃስት [02] አንድ [05] አራት ወይም ከዛ በላይ [03] ሁለት	[__|__]
404	ሀ) በማንኛውም ምክንያት ለመጀመሪያ ጊዜ የፀረ ኤች አይ ቪ ኤድስ መድሃኒት መውሰድ ከጀመሩበት ጊዜ ጀምሮ ለምን ያህል ጊዜ መድሃኒቶችን ከሳምንት በላይ አቋርጠዋል?	[01] በፍፁም [03] ከ2-3 ጊዜ [02] 1 ጊዜ [04] 4 ወይም ከዛ በላይ [98] መልስ የለም	[__|__]

	ለ) አቋርጠው ከሆነ ምክንያቱ(ቶቹ)	[01] የምግብ አለመመኘላት	[__|__]
		[02] በመድሃኒቱ ጎጅ ባህርያት የተነሳ	[__|__]
		[03] ጤናዬ ስላልተሻሻለ	[__|__]
		[04] በሌላ ስራ ተጠምጄ	[__|__]
		[05] በጉዞ ምክንያት ስላልተመቸኝ	[__|__]
		[06] ሰዎች እንዳያውቁብኝ	[__|__]
		[07] ከህመሜ ስላገገምኩ	[__|__]
		[08] የእንክብሎቹ ብዛት ለመውሰድ አስቸጋሪ ስለሆነ	[__|__]
		[09] ሐኪም እነዳቆም ስለነገረኝ	[__|__]
		[88] ሌላ ካለ ይጠቀስ ------------	[__|__]
		[98] መልስ የለም	[__|__]
405	ባለፉት አራት ሳምንታት ውስጥ ከፀረ ኤች አይ ቪ ኤድስ መድሃኒቱ ጋር የተያያዘ የጎንዮሽ ችግር በርስዎ ላይ ተከስቷል?	[01] አዎ [02] አልተከሰተም	[__|__]
406	ባለፉት አራት ሳምንታት ውስጥ ምን ዓይነት ከፀረ ኤች አይ ቪ ኤድስ መድሃኒቱ ጋር የተያያዙ የጎንዮሽ ችግሮች ተከስተዋል?	[01] ማቅለሽለሽ [02] ማስቀመጥ [03] የድካም ስሜት [04] የራስ ምታት [05] መደንዘዝ/መጠዝጠዝ [06] የቆዳ መቆጣት [07] ደም ማነስ [08] የሆድ ህመም [09] የስብ ክምችት ለውጥ [10] ድብርት፣ ጭንቀት [98] ሌላ ካለ ይጠቀስ	[__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__] [__|__]

ክፍል አምስት: ሀመምዎን በተመለከት የቀረበ መጠይቅ

501	በኤች አይ ቪ ኤድስ ምክንያት ሆስፒታል ተኝተው ያውቃሉ?	[01] አዎ [99] አላውቅም [02] አልተኘሁም	[__|__]
502	እባክዎ ባለፈው አንድ አመት ውስጥ በህመም ምክንያት ምን ያህል ጊዜ ሆስፒታል እንደገቡ ይንገሩን?	ቁጥር------------ [99] አላውቅም/አላስታውስም	[__|__]

ክፍል ስድስት: ሀሙማን የፀረ ኤች አይ ቪ ኤድስ መድሃኒቶችን በተመለከት ያላቸውን ዕውቀት ለማወቅ የቀረበ መጠይቅ

አማራጭ መልሶች: [01] ትክክል ነው [02] ትክክል አይደለም

601	የኤች አይ ቪ ኤድስ መድሃኒቶች ዕድሜ ያራዝማሉ።	[__|__]
602	ከቫይረሱ ጋር የሚኖር ሰው ሀኪሙ ባዘዘለት መሰረት የፀረ ኤች አይ ቪ ኤድስ መድሃኒት ቢወስድ ህይወቱ ወደ ጤናማነት ይለወጣል።	[__|__]
603	የፀረ ኤች አይ ቪ ኤድስ መድሃኒቶች ኤች አይ ቪ ኤድስን የመከላከል ብቃት አላቸው።	[__|__]
604	የፀረ ኤች አይ ቪ ኤድስ መድሃኒቶች በትክክል ካልተወሰዱ እንደተፈለገው ካላመስራታቸውም በላይ ቫይረሱን መቆጣጠር አይችሉም።	[__|__]
605	የኤች አይ ቪ ኤድስ አሳሳቢነት በፀረ ኤች አይ ቪ ኤድስ መድሃኒቶች ምክንያት ቀንሷል።	[__|__]
606	ኤች አይ ቪ ኤድስን በፀረ ኤች አይ ቪ ኤድስ መድሃኒቶች እነደማንኛውም በሽታ መቆጣጠር ይቻላል።	[__|__]
607	የኤች አይ ቪ ኤድስ መድሃኒቶች ቫይረሱን ከደም ውስጥ በከፍተኛ መጠን መቀነስ ይችላሉ።	[__|__]
608	በቫይረሱ በተያዘ በጥቁት ጊዜ ውስጥ የፀረ ኤች አይ ቪ ኤድስ መድሃኒቶችን ከወሰዱ ከኤች አይ ቪ ኤድስ ሙሉ በሙሉ መዳን ይቻላል።	[__|__]

ክፍል ሰባት: ህይወት ላይ ስላላ መሻሻል የቀረቡ ጥያቄዎች

መ/ቁ	ጥያቄ	ኮድ		መልስ
701	ጤንነትዎ በአጠቃላይ ሲታይ ምን ይመስላል?	[01] እጅግ በጣም ጥሩ ነው [02] በጣም ጥሩ ነው [03] ጥሩ ነው	[04] ድህና ነው [05] መጥፎ ነው	[__|__]

702	ካለፈው አመት ጋር ሲነጻጸር በአጠቃላይ ጤንነትዎ ምን ደረጃ ላይ ነው?	[01] ካለፈው አመት በጣም ይሻላል [02] ካለፈው አመት በጥቂቱ ይሻላል [03] ምንም ለውጥ የለውም [04] ካለፈው አመት እንዳውም አሁን መጥፎ ሁኔታ ላይ ነኝ [05] ካለፈው አመት እንዳውም አሁን በጣም መጥፎ ሁኔታ ላይ ነኝ	[__|__]
703	የሚከተሉት ጥያቄዎች በቀን ውሎዎ የሚሰሩዋቸውን ስራዎች የሚመለከቱ ናቸው፡፡ አሁን ያለብዎት የጤና ችግር እነዚህን ነገሮች ለማከናወን ይከለከለዎታል? አዎ ከሆነ ምን ያህል?		
	አማራጭ መልሶች: [01] ጊዶቦኛል [02] በትንሹ ጊዶቦኛል [03] ከምንም አልጊደበኝም		
	ሀ)ጠንካራ እንቅስቃሴዎችን ማድረግ:- መሮጥ፤ ከባድ ነገር ማንሳት፤ ጠንካራ እስፖርቶችን መሰራት ወዘተ		[__|__]
	ለ)ቀለል ያሉ ስራዎችን እነደ ጠረጴዛ ማንቀሳቀስ፤ ወንበር ማንቀሳቀስ፤ ቤት ማፅዳት ወዘተ		[__|__]
	ሐ)ከገብያ ዕቃ ገዝቶ መሸከም		[__|__]
	መ)ብዙ የፎቅ ደረጃዎችን (ከበድ ያለ ዳገት መውጣት)		[__|__]
	ሠ)አንድ የፎቅ ደረጃ (ቀለል ያለ ዳገት መውጣት)		[__|__]
	ረ)ጎንበስ ማለት፤ቁሊጥ ማለት፤ መቆም		[__|__]
	ሰ)ከአንድ ማይል (1.6ኪ.ሜ) በላይ መጓዝ		[__|__]
	ሸ)ከቤት ራቅ ወዳለ ሌላ ቤት መሄድ		[__|__]
	ቀ)ከቤት ወዳተገብዖ ያለ ሌላ ቤት መሄድ		[__|__]
	በ)እራስን ችሎ ሻወር መውሰድና ልብስ ማጠብ		[__|__]
704	ባለፉት አራት ሳምንታት ውስጥ በስራ ላይ ወይም በቀን ተቀን ኑሮዎ ላይ በጤንነትዎ ምክንያት የሚከተሉት ችግሮች ተከስተዋል?		
	አማራጭ መልሶች: [01] አዎ [02] አልቀነሱም		
	ሀ)በስራና በሌሎች እንቅስቃሴዎች ላይ የሚያሳልፉትን ጊዜዎች ቀንሰዋል?		[__|__]
	ለ)መስራት የሚፈልጉትን ያህል አልሰሩም?		[__|__]
	ሐ)የተወሰኑ ሥራዎች ወይም እንቅስቃሴዎችን ብቻ ነው የሚያከናውኑት?		[__|__]
	መ)ሥራም ሆነ ሌሎች እንቅስቃሴዎች ማድረግ አልቻሉም?		[__|__]
705	ባለፉት 4 ሳምንታት ጊዜ ውስጥ በሆነም ምክንያት በተፈጠረው ስሜት ለምሳሌ መጨናጨን ወይም በተዘረዘሩት ችግሮች ምክንያት በስራዎ ወይም በቀን ተቀን ውሎዎ ላይ የተፈጠረ ችግር አለ?		
	አማራጭ መልሶች: [01] አዎ [02] የለም		
	ሀ)የስራ ሰዓት ወይም ሌሎች እንቅስቃሴዎችን ለማክናወን የሚያጠፉት ጊዜ ቀንሷል?		[__|__]
	ለ)የፈለጉትን ያህል ሥራ መስራት አለመቻል?		[__|__]
	ሐ)ሥራዎንና ሌሎች እንቅስቃሴዎችን እንደ ወትሮው በጥንቃቄ መስራት አለመቻል?		[__|__]
706	ባለፉት 4 ሳምንታት ውስጥ አካላዊና አእምሮዊ ችግሮችዎ በምን ያህል ደረጃ የተለመደ የዘወትር ማህበራዊ እንቅስቃሴ ላይ ችግር ፈጥረዋል?(ለምሳሌ በቤተሰብ፤ በጎረቤት ወይም ሌላ)	[01] በፍፁም [04] ከበድ ያለ [02] በትንሹ [05] በጣም ከባድ [03] መካከለኛ	[__|__]
707	ባለፉት 4 ሳምንታት ውስጥ ምን ያህል አካላዊ ህመም ይሰማዎት ነበር?	[01] በፍፁም [04] ከበድ ያለ [02] በትንሹ [05] በጣም ከባድ [03] መካከለኛ	[__|__]
708	ባለፉት 4 ሳምንታት ውስጥ ህመምዎ ለዘወትር እንቅስቃሴዎ (በቤትና ከቤት ውጭ ባሉ ሥራዎች) ምን ያህል ጫና ፈጥሮብዎታል?	[01] በፍፁም [04] ከበድ ያለ [02] በትንሹ [05] በጣም ከባድ [03] መካከለኛ	[__|__]
709	የሚከተሉት ጥያቄዎች ባለፉት 4 ሳምንታት ውስጥ በእርስዎ ዙሪያ ስላሉ ነገሮች ምን ይሰማዎት እንደነበር ለማወቅ የቀረቡ ጥያቄዎች ናቸው፡፡		
	አማራጭ መልሶች: [01] ሁል ጊዜ [02] አብዛኛውን ጊዜ [03] የተወሰነ ጊዜ [04] አንዳንዴ [05] በጥቂቱ [06] በጭራሽ		
	ሀ)በህይወትዎ ምንም የሚደሰ ነገር እንደሌለ ይሰማዎት ነበር?		[__|__]
	ለ)ቁጡ ሰው ሆነው ነበር?		[__|__]

	ሐ)በህይወትዎ ምንም እንደማያስደስትዎትና ተስፋ የመቁረጥ ስሜት ተሰምቶት ነበር?	[__|__]
	መ)መረጋጋትና ሰላም ተሰምቶዎት ነበር?	[__|__]
	ሠ)ጥንካሬ ይሰማዎት ነበር?	[__|__]
	ረ)ትካዜና ስጋት ተሰምቶዎት ነበር?	[__|__]
	ሰ)የመኖር ተስፋዎ ያበቃት መስሎዎት ነበር?	[__|__]
	ሸ)ደስተኛ ሰው ነበሩ?	[__|__]
	ቀ)ድካም ይሰማዎት ነበር?	[__|__]
710	ባለፉት 4 ሳምንታት ውስጥ አካላዊ ወይም ስሜታዊ ችግሮችዎ ለምን ያህል ጊዜ ማህበራዊ ጉዳዮችዎ ችግር ፈጥረውበዎታል? ለምሳሌ: ከጓድኞችዎ፣ ከቤተሰብ፣ ከዘመዶ ወዘተ	[__|__]
711	የሚከተሉት ዓ/ነገሮች እያንዳንዳቸው ለእርሰዎ ምን ያህል እውነት ወይም ዉሸት ናቸው?	
	አማራጭ መልሶች: [01] *በትክክል ዕውነት ነው* [02] *ብዙውን ጊዜ ዕውነት ነው* [03] *አላውቅም* [04] *ብዙውን ጊዜ ውሸት ነው* [05] *በፍፁም ውሸት ነው*	
	ሀ)ከሌላ ሰው ይልቅ በቀላሉ ልታመም እችላለሁ::	[__|__]
	ለ)እንደማንኛውም ሰው ጤነኛ ይሰማኛል::	[__|__]
	ሐ)የጤንነቴ ችግር የሚባባስ ይመስለኛል::	[__|__]
	መ)ጤንቴ እጅግ በጣም ተሻሽሏል::	[__|__]
ክፍል ስምንት: ከጤና ባለሞያ ጋር ስላለ ግንኙነት ለማወቅ የቀረበ መጠይቅ		
አማራጭ መልሶች: [01] በጣም አልሰማማም [02] አልሰማማም [03] እስማማለሁ [04] በጣም አልሰማማም		
801	ሐኪሜ የሚነግረኝን ሁሉ እውነት ነው ብዬ አምናለሁ::	[__|__]
802	አንዳንዴ ሐኪሜ ያወያየሁትን ምስጢር አይጠብቅልኝም ብዬ እሰጋለሁ::	[__|__]
803	ሐኪሜን በጣም ስለማምነው የመከረኝን ምክር በሙሉ እቀበላለሁ::	[__|__]
804	ሐኪሜ የኔ አይነቱን የጤና ችግር ለመመርመር ለማከምና አስፈላጊውን ሪፈራል ለማድረግ በአግባቡ የሰለጠነ ነው::	[__|__]
805	ለህክምናዬ በወጣልኝ ፕሮግራምና በሚሰጠኝ ቀጠሮ ደስተኛ ነኝ::	[__|__]

Declaration

1. This thesis is my original work, and all those sources of materials used for the thesis has been duly acknowledged

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