Graduate School of Indira Gandhi National Open University

Factors Influencing

Anti-retro Viral Therapy Adherence: The Case of Fital

Health Center in Yaya Gulale Woreda, North Shoa Zone,

oromiya Regional State of Ethiopia

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Addis Ababa, Ethiopia

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DECLARATION

I hereby declare that the thesis entitled **FACTORS INFLUENCING ANTI-RETRO VIRAL THERAPY ADHERENCE: THE CASE OF FITAL HEALTH CENTER IN YAYA GULALE WOREDA, NORTH SHOA ZONE, OROMIYA REGIONAL STATE OF ETHIOPIA** submitted by me for the partial fulfillment of the MSW to Indira Gandhi National Open University,(IGNOU) New Delhi is my original work and has not been submitted earlier ,either to IGNOU or to any other institution for the fulfillment of the requirement for any other programme of study. I also declare that no chapter of this manuscript in whole or in part is lifted and incorporated in the report from any earlier work done by me or others.

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CERTIFICATE

This is to certify that Miss Sirgut Demissie Tulu student of MSW from Indira Gandhi National Open University, New Delhi was working under my supervision and guidance for her Project Work for the Course **MSWP-001**.

Her Project Work entitled **FACTORS INFLUENCING ANTI-RETRO VIRAL THERAPY ADHERENCE: THE CASE OF FITAL HEALTH CENTER IN YAYA GULALE WOREDA, NORTH SHOA ZONE, OROMIYA REGIONAL STATE OF ETHIOPIA** which she is submitting, is her genuine and original work.

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ABSTRACT

The study was conducted to assess factors influencing ART adherence among patients who take ARV drugs in the Fital Health Center. A qualitative and quantitative study was conducted on a randomly selected 25 HIV/AIDS patients on a pre-ART and ART regimen. Data collection was done by consideration that patients visit the Health Center by appointment and time that takes for in-depth interview particularly for ART drug users.
Simple descriptive statistics were used in the study to describe the adherent level of the respondents on different indicators. The findings highlight the need for attention to implement the theoretical background to practice this needs on-going educational, informational and other interventions to address the knowledge, motivation and adherence behavioural skills of patients in order to improve the current levels of ART adherence behaviour. The study also suggested the need for research into strict adherence to treatment is a long-term process and not a one-time activity. The study also recommend the concerned body and the stakeholders to give due attention on awareness creation and to fulfill the material in addition to the drug to help the people who live with HIV/AIDS to live long.

ACKNOWLEDGEMENT

ACRONYMS

AAU   - Addis Ababa University

AIDS   -Acquired Immune Deficiency Syndrome

ART   - Anti Retro Viral Therapy

ARV   - Anti Retro Viral

CDC   - Centers for Disease Control and Prevention

DACA   - Drug Administration & Control Authority

EFMOHHAPCO – Ethiopia Federal Minister Of HIV/AIDS Prevention and Control Office

FEDO   - Finance and Economic Development Office

HIV   - Human Immune Virus

HAART   - Highly Active Anti Retroviral Treatment

HAPCO   -HIV/AIDS Prevention and Control Office

PEPFAR   - President's Emergency Plan for AIDS Relief

PLWHA   - People Living with HIV-AIDS

WHO   -World Health Organization

MOH   -Minister of Health

MSH   -Management Science for Health

UNAIDS   - United Nations Programme on HIV/AIDS

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Adherence can be described as taking pharmaceuticals according to the medical standards after a voluntary agreement has been made between the patient and the health care provider. However, adherence beyond this definition also encompasses other health-related behaviours. "It is the extent to which a person's behaviour in taking medications, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider" (WHO 2003). An adherence rate of at least 95.0% is necessary to maximize the benefits of antiretroviral therapy (ART). These benefits include improved clinical, immunological and virological parameters (WHO 2006). Adherence below 95.0% is associated with a high level of viral drug resistance which has public health implications, and poor personal health outcomes (WHO 2003).

The guideline antiretroviral therapy for HIV infection in adults and adolescents, developed by World Health Organization (WHO), was first published in 2002, simplified in 2003 and was updated in 2006. The guideline continues to follow the principles of a public health approach, aiming to optimize outcomes, including the quality of life and survival, of people living with HIV (PLHIV), and to act as a reference tool for countries to adopt and adapt according to their national circumstances. During 2009, WHO has worked to update the guideline through a series of coordinated efforts to review and synthesize emerging evidence on when to initiate antiretroviral therapy (ART), what drug regimens to use, and the management of co-infections and treatment failure? This evidence has been assembled following systematic reviews, grade profile preparation and analysis, consultations with PLHIV, cost and economic impact studies, country-level feasibility assessment, and comparisons of current country guidelines.(WHO,ART rapid advice,2009).

HIV care and treatment programs in Africa and globally are quickly evolving from an emergency response with a focus on initiating the sickest HIV-infected individuals on

antiretroviral therapy (ART) to building sustainable programs which provide lifelong treatment for a large number of patients across the HIV disease spectrum. One of the pillars of sustainable HIV treatment programs is the ability of patients to achieve and maintain high levels of adherence to ART. Limited data, however, are available on levels and predicators of adherence, as well as related-behaviors, in Rwanda and other resource-limited settings.

The Government of Ethiopia elected to introduce the ART program with the goal to prolong the lives, to restore the mental and physical functions and to improve the quality of life of PLWHA.

This program will impact mortality, reduce fatalistic attitudes, promote increased voluntary HIV testing, and provide a rationale for making healthy living choices. The declaration of ART as a human rights issue and support for universal access to ART from world leaders will benefit the national ART program through several donor-led initiatives. The implementation of safe and effective ART is a serious challenge in such a resource constrained country, where there is little experience in managing this type of complex treatment program (MOH,2005).

The Ethiopian national antiretroviral drugs policy was developed in 2002 following intensive advocacy campaign from associations of PLWHA and other organizations. The government adopted the policy of antiretroviral drug supply and use in July 2003 (HAPCO, 2006). The first treatment guideline for adults and adolescents was issued in 2003 and revised in 2007 (MOH, 2007b). A fee-based ART program was officially started in 2003 in the large urban centers. However, ART drugs were so expensive and non affordable by most of the HIV infected patients in Ethiopia. This resulted in a number of initiatives that aimed at starting and expanding the availability of ART free of charge. The MOH in partnership with the Global Fund, President's Emergency Plan for AIDS Relief (PEPFAR), the Clinton Foundation, the Ethiopian North American Health Professionals Association, the Ethiopian Red Cross Society and others, launched the free ART roll out program in January 2005 (PEPFAR, 2007). As a result, ART services have been decentralized and have been made available free of charge in both health centers and hospitals since August 2006 (MOH, 2008; MOH, 2007).

After August 2005 i.e. after decentralized and free ART roll-out program was initiated, rapid expansion of ART and other HIV/AIDS services has been achieved. The number of patients ever started on ART increased from 900 at the beginning of 2005 to more than 150,000 by June 2008; and the number of patients enrolled for ART (i.e. Pre-ART patients) has also increased from 2700 to 5000 per month. (MOH, 2008).

This research was conducted in Fital Health Center. It is located in Fital Town, Yaya Gulele Woreda in North Shoa Zone of the Oromia Regional State. The town is 114 kms far from the national capital Addis Ababa, and 46 kms from the Zonal City - Fitche. The total area of the woreda is 369km^2 with 17 rural Kebeles and one rural town, Fital. The woreda is found at an altitude that ranges from 700 to 2700 meters above sea level. There are three main agro-ecologies in the woreda these are 44% of Dega (highland), 40% Weinadega (midland) and 16% Kolla (the lowlands). The majority, which constituted 90%, is living in rural area, with main source of livelihood to be mixed farming (crop farm & livestock rearing) and the rest 10% lives in urban areas. Population settlement pattern in the area has mostly featured of nucleated with sedentary life style. (Yaya Gulale Agricultural Office, 2012).

The population projection for the year 2012 indicates that the total population of the woreda is estimated to be 64,720. The total number of household heads in the woreda is about 13,483 with 59% economically active people out of the total population of the woreda. (FEDO, 2012).

In the Yaya Gulele Woreda, there are 4 health centers, 2 private clinics, and 17 health posts that provide service to the population who live in the Woreda. According to MOH implementation program, ART service is provided at Hospital and Health Center level. However, in the Woreda four Health Centers are available, due to patient flow and accessibility of infrastructure the ART service is given only in Fital Health Center. The Fital Health Center started to provide this service since 2008 with the help of Zonal Health Office HIV/AIDS Department by involving partnership like Management Science for Health (MSH), (Yaya Gulale Health Office, 2012).

Adherence to ART is the most powerful predictor of survival for PLWHA; several factors have been associated with ART adherence such as patient characteristics,

socioeconomic factors, treatment regimen, disease characteristics, patient-care provider relationship, and clinical settings. Successfully implementing an ART program requires an appropriate standardized structure and logistic capacity for monitoring treatment success or failure including that includes patient care and outcomes documentation and regular monitoring of patients' immune status to assure that treatment failure is picked in time to avoid drug resistance development. Given this complexity, factors related to ART adherence need to be explored from a health system level perspective, focusing on both individual patient factors and the health care infrastructure across multiple delivery models in resource poor settings (Gusdal, et. al., 2008).

The purpose of this study was focused, to identify and to assess factors influencing ART adherence in the different dimension like Socio-economic effects, adherence information and level of adherence behaviour among patients who take ARV drugs in the Study area.

1.2 Statement of the Problem

According to the WHO (2006), ART adherence rate of at least 95.0% is necessary to maximize the benefits of the patients who take ARV drugs. These benefits include improved clinical, immunological and virological parameters but adherence rate below 95.0% is associated with a high level of viral drug resistance which has public health implications and poor personal health outcomes.

The study undertaken by Mills, et.al., (2010) Sub-Saharan African countries found that a pooled estimate of 77 percent of patients achieved adequate adherence. However, the analysis suggested that approximately 40 percent of all ART clients may have died or discontinued treatment within two years of initiation.

An Ethiopian study determined that 10 percent of a study population was lost to follow-up and presumably alive (dropped or lost) from study facilities in an 18-month period (Mekonnen et al, 2010). These drop-out levels need to be examined for a better understanding of patient experiences with ART.

The HIV/AIDS-related morbidity and mortality has decreased significantly in Ethiopia (Jerene et al. 2006) because of the wide availability and use of a free ART service that began to operate in 2005. The statistics have given hope to people who live with HIV

because ART has enabled them to improve the quality of their lives to a degree that was previously thought to be impossible. The problem, however, is that if a patient requires the optimum benefits that a long-term exposure to ART confers in terms of suppression of the HIV, then that patient needs to comply with a near-perfect adherence to the clinical requirements of the ART regimen (Chesney, 2003). Statistics from Ethiopia shows that the rate of adherence to ART ranges from between 74.2% (Markos, et.al, 2008) and 80.2% (Wondale.Y, 2009).

The study undertaken by Markos, et.al., (2008) shows that 74.2% of the patients on ART took more than 95% of their prescribed ARV medications in the week prior to assessment. The other study that was conducted by Wondale.Y, (2008) the adherence level 80.2% of patients being treated by means of ART, the adherence level was >95% of the months preceding of the study.

These studies reveal that there are many people who are not optimally adherent to the requirements of ART (>95% adherence rate). This problem requires deep understanding because the failure to adhere to the ART regimen of regular daily dosages results in the development of drug resistance and in the ultimate failure of the ARV drugs that have given to infected people. High adherence level to antiretroviral therapy (ART) is necessary to achieve the best viro-logical response and lower the risk of drug resistance development in PLWHA. Identifying challenges to adherence is therefore essential. In order to take successful measures it is necessary to identify factors that influence ART adherence.

To understand the problem there are some studies that have been conducted on factors influencing ART adherence, mainly on information, behavior and motivation (WondaleY.2009; Markos et al,2006;Gusdal et al.(2008); Maqutu et al.2006, and Agegnehu ,2010). However, this study was exploring factors influencing ART adherence in general and the awareness level of the community in particular in the study area. Due to the special feature of the study area the study has identified unique/various area specific factors influencing ART adherence.

1.3 Research Objectives

1.3.1 General Objective
The general objective of this research was to assess factors influencing ART adherence among patients who take ARV drugs in the Fital Health Center.

1.3.2 Specific Objectives

The specific objectives of the study would be:-

- To explore the levels of ART adherence behaviour among patients who take ARV drugs in Fital Health Center.
- To assess the socio-economic impact on ART adherence in Fital Health Center.
- To evaluate the impact of information/awareness about ART on the adherence behavior skill of patient to adhere to ART in Fital Health Center.

1.3.3 Research Questions
In order to answer the above specific objectives, the following research questions were formulated:

- ✓ What were the levels of ART adherence behavior among patients who take ARV drug at Fital Health Center?
- ✓ What were the socio-economic effects on ART adherence in Fital Health Center?
- ✓ What impact has having information about ART have on the adherence behaviour skill of patients to adhere to ART?

1.4 Significance of the study

Optimal adherence is critical for the long-term benefit and success of ART. The failure to adhere to the dosage requirements of ART causes the emergence of resistance to ART in patients. The ultimate failure of the treatment in a patient can result on drug resistance, which is dangerous both for individuals and for the community as a whole.

Even though a number of research studies have been undertaken in Ethiopia that address the problem of ART adherence but the research studies was undertaken in Fital Health Center can add values on the ART adherence. Moreover, no study was conducted previously on ART adherence in Yaya Gulale Woreda. Therefore, the study was filling

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the knowledge gap in the area and provides information for health care providers on the specific locality. It will also be an input for policymakers. Since the issue was too much sensitive and local, the result of the study will help the care providers of Fital Health Center to act accordingly.

1.5 Scope of the study

The study will be conducted at Fital Health Center in Yaya Gulale Woreda, North Shoa Zone of Oromia Regional State, and Ethiopia. The focus will be on the factors that influence ART adherence in Fital Health Center.

1.6 Operational definition of terms

Antiretroviral drug (ARVs):- Substance used to kill or inhibit the multiplication of retroviruses such as HIV.

Antiretroviral therapy (ART):- Treatment regimens recommended by leading HIV experts to aggressively suppress viral replication and progress of HIV disease. The usual ART regimen combines three or more different drugs.

Adherence:- is patient ability to take ARV drugs as prescribed at specific time. This means taking the ARV medications prescribed at the "right time", in the "right doses" and in the "right way".

CD4 counts:- serves as the major laboratory indicator of immune function in patients who have HIV infection.

Highly Active Antiretroviral therapy Adherence:-means the maximum possible rate of viral suppression for as long as the regimen is being taken perfect adherence to the people who are living with HIV.

CHAPTER TWO

LITERATURE REVIEW

The literature review covers reports within the context of overview of HIV, Epidemiology of HIV, ARV drugs, ART and HIV, adherence information, level of adherence behavoiur and socio-economic factors that influence adherence to ART based on the framework of the study area. Reviewed documents were obtained from websites, journals articles, WHO publications and EMOH publications.

2. 1 Overview of HIV, Epidemiology of HIV, ARV drugs, ART and HIV

2.1.1 Overview of HIV

The human immunodeficiency virus (HIV) virus is a ribonucleic acid (RNA) virus that belongs to the family of human retroviruses (the Retroviridae) and the subfamily of lentiviruses (Fauci & Lane 2005). HIV is a viral infective agent that is normally transmitted through unprotected sexual contact in which the male does not use a condom, through HIV-infected blood that somehow or other enters the bloodstream of the non-infected person, by means of an HIV-infected mother who gives birth to a baby, and through the sharing of non-sterile needles among people who are infected with HIV and those who are not. It is not transmitted by forms of casual contact such as hugging, shaking hands, kissing or by insects bite such as mosquitoes (Fauci & Lane 2005). Fortunately for the human race, it does not spread like the influenza virus which is present in the fine mist that is disbursed in a room when an influenza-infected person coughs or sneezes.

2.1.2 Epidemiology of HIV

According to the Global AIDS Response Progress Report in 2012, 186 countries submitted comprehensive reports on progress in their national AIDS response. With 96% of the 193 United Nations Member States reporting in 2012, the Global AIDS Response Progress Reporting system has among the highest response rates of any international health and development monitoring mechanism – a vivid reflection of the breadth and

depth of global commitment to the response to AIDS. Drawing on information provided by countries, this report summarizes the current situation in the effort to reach the 2015 targets set forth in the 2011 Political Declaration. In addition to providing a snapshot of the current situation for each target, it identifies key trends. Using a scorecard approach on key indicators, the report allows individual countries to compare their own achievements with those of others. Regional breakdowns enable comparison of progress between different parts of the world. This report highlights instances where recommended policies and programmes have yet to be implemented.

Globally, 34.0 million [31.4 million–35.9 million] people were living with HIV at the end of 2011. An estimated 0.8% of adults aged 15-49 years worldwide are living with HIV, although the burden of the epidemic continues to vary considerably between countries and regions. Worldwide, the number of people newly infected continues to fall: the number of people (adults and children) acquiring HIV infection in 2011 (2.5 million [2.2 million–2.8 million]) was 20% lower than in 2001. Here, too, variation is apparent. The sharpest declines in the numbers of people acquiring HIV infection since 2001 have occurred in the Caribbean (42%) and sub-Saharan Africa (25%).(Global HIV/AIDS Epidemic,2012)

Global HIV trends. 1990–2011

NUMBER OF PEOPLE LIVING WITH HIV GLOBAL 1990-2011
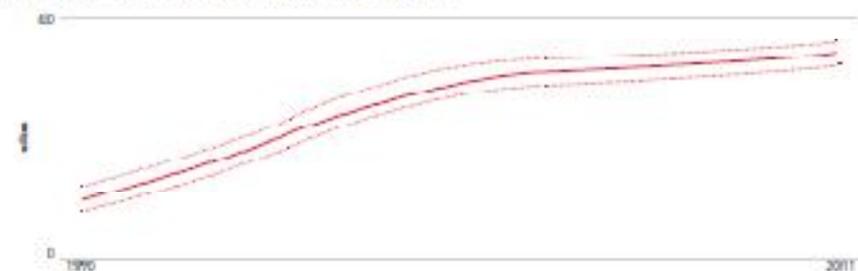
NUMBER OF PEOPLE NEWLY INFECTED WITH HIV, GLOBAL, 1990-2011
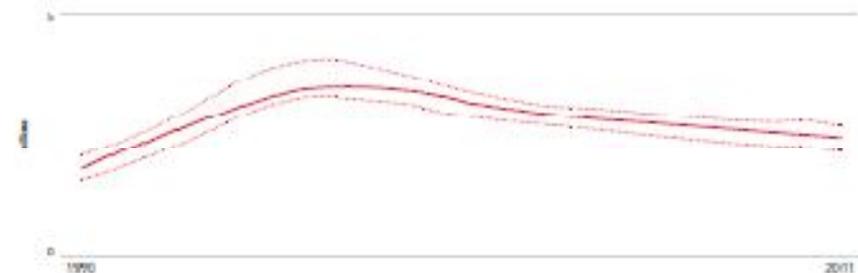
Fig.1.Source:- Adopted from: Global AIDS Epidemic Report, 2012

According to UNAIDS (2008), the Sub-Saharan countries of Africa (which includes Ethiopia) are among those that are most affected by HIV/AIDS. The infection rate in Sub-Saharan countries accounts for 67% of the total number of people throughout the world who have been infected by HIV. In some African countries such as Swaziland, a record of 26% of the population was reported to be infected by HIV in 2006 (UNAIDS 2008). This pandemic creates enormous stresses and strains in the economies of countries that are most seriously affected because the virus attacks and kills the demographic of the population that is most economically active. Sub-Saharan Africa remains most severely affected, with nearly 1 in every 20 adults (4.9%) living with HIV and accounting for 69% of the people living with HIV worldwide. Although the regional prevalence of HIV infection is nearly 25 times higher in sub-Saharan Africa than in Asia, almost 5 million people are living with HIV in South, South-East and East Asia combined. After Sub-Saharan Africa, the region's most heavily affected are the Caribbean and Eastern Europe and Central Asia, where 1.0% of adults were living with HIV in 2011.(Global AIDS Epidemic Report,2012)
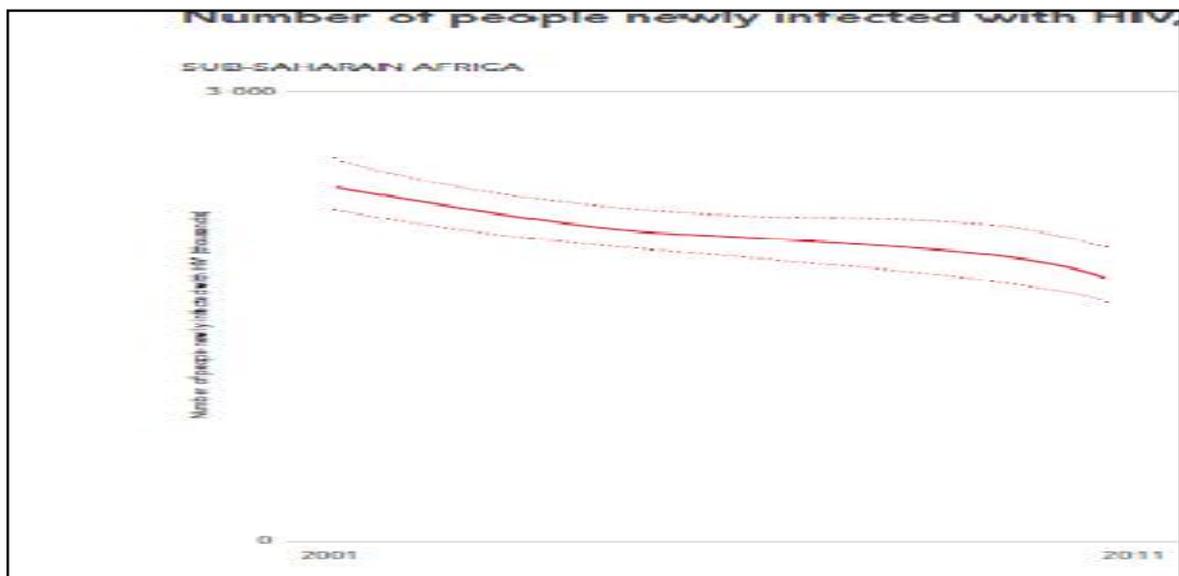
Fig.2. Source:- Adopted from Global AIDS Epidemic Report, 2012

The adjusted figure for the prevalence of HIV among Ethiopians in 2005 was 3.5% of the total population (10.5% in urban areas and 1.9% in rural areas). The unadjusted ANC (Antenatal Care) HIV prevalence was reported as being 5.3% (EFMOHHAPCO 2007).

According to the report of Ethiopian Federal Ministry of Health HIV/AIDS Control Office (EFMOHHAPCO) (2007), the four major regions (Amhara, Oromia, Addis Ababa and Southern regions) together accounted for 86.6% of all people living with HIV, 86.7% of estimated pregnancies, 85.3% of new infections, 87.9% of new AIDS cases, and 88.2% of deaths that occurred in Ethiopia in 2005.

According to a single point estimate that was made in 2007 in Ethiopia, out of a total population of more than seventy seven million people, approximately 977,394 people were living with HIV, with a point prevalence of 2.1%. Of the total number of people living with HIV in Ethiopia, 258,266 people were in need of ART (EFMOHHAPCO 2007). The estimated mortality rates from HIV/AIDS in Ethiopia was an estimated 88,997 people who died from AIDS-related conditions in 2006, and 71,902 people who died in similar causes in 2007.

In 2007, Oromia regional state HIV prevalence was 1.5% with 6.1% in urban and 0.7% in rural areas. The overall incidence rate in 2007 in Oromia region was 0.18% with 1.63% in urban areas and 0.13% in rural areas. There were an estimated 20,798 pregnancies with 3992 HIV positive live births in the same year. A total of 236808 people (138286 in urban and 98521 in rural) were living with HIV in Oromia region of which 61795 people were in need of ART in 2007. The death report due to AIDS related illnesses in the same year was 17570 (10830 from urban and 6741 from rural areas),(EFMOHHAPCO ,2007).

2.1.3 ARV drugs
When ART was first introduced to HIV-infected people in the United States in 1996, the prognosis for HIV/AIDS sufferers improved for the first time since the identification of the virus. ART also changed what was previously a fatal illness into a chronic although serious illness that could be controlled and ameliorated by means of carefully applied interventions (Fauci & Lane 2005). There are three classes of ARV drugs that are currently in use. They are: (1)Reverse transcriptase inhibitors which are in turn subdivided into nucleoside analogues and non-nucleoside analogues (e.g. Zidovudine, Stavudine, Lamuvidine, Tenofovir from nucleoside analogues, and Nevirapine, Efavirenz from non-nucleoside analogues of reverse transcriptase inhibitors); (2) Protease inhibitors (e.g. Ritonavir, Lopinavir/Ritonavir), and (3) Entry inhibitors (e.g. Enfuvirtide) (Fauci & Lane 2005; Hardon et al. 2006).

2.1.4 ART and HIV

Since the introduction of anti-retroviral therapy (ART), the clinical prognosis for HIV/AIDS patients who use this form of therapy has changed dramatically. This has resulted in a significant decrease in the morbidity and mortality rates of HIV/AIDS patients (Jerene et al. 2006). In fact, HIV/AIDS is now considered to be a chronic (rather than a fatal) illness, although patients who had been infected require life-long treatment and monitoring (Chesney 2003). A Zambian study undertaken by Chi.et al ,2009 monitor the condition and behaviour of 27,115 patients who had been taking ART for more than 12 months. This study found that a higher median CD4+count were reported in those who were optimally adherent when compared to those patients who were poorly adherent. The risk of death was also observed to be higher in those patients who were poorly adherent compared to those who were optimally adherent to the ART regimen. The study conducted by Gifford et al. (2000) state that antiretroviral adherence was significantly associated with plasma viral suppression both in univariate and multivariate statistical analysis. These studies clearly show that in order to obtain the long-term benefits of HAART, patients must adhere rigidly to the antiretroviral (ARV) drugs – with as near perfect adherence (Chesney 2003: Glass et al. 2006).

While the introduction of highly active antiretroviral treatment (HAART) became available in 2003 in Ethiopia for those who could afford it, free ART was first made available to HIV-infected patients in 2005 with the financial support of the Global Fund, the World Bank and the United States President's Emergency Plan for AIDS Relief (PEPFAR) (Assefa et al. 2009). By March 2009, 189,267 patients had started to use the recommended ART dosages while only 139,494 were alive and at that time on ART (EFMOHHAPCO ,2009).

2.2 Socio-economic factors

Tadious and Davey (2006) also demonstrated that social support and access to treatment were critical factors in determining adherence to HAART. Social support was also identified as an independent predictor of adherence in the study conducted by Amberbir et al. (2008). In Sub-Saharan African countries, economic obstacles such as a lack of the necessary funds needed to journey to the health care facility in those cases where patients

had to travel long distances to get to the clinic, also constituted important reasons for sub-optimal adherence. These difficulties should obviously be urgently addressed if we want to improve adherence rates among this group of the population (Ware et.al 2009). Chesney (2003) concluded that adherence to HAART can be improved by addressing whatever social, economic and psychosocial issues there might be before a course of treatment commences. It is obviously pointless to begin a course of ART treatment in those cases where a patient does not have the capacity, motivation or resources to practice optimal adherence.

2.3 Adherence Information to ART

According to Hardon et al. (2006), adherence can be defined as "the extent to which patients follow the instructions they are given for prescribed treatments". Adherence to ART means taking the ARV medications prescribed at the "right time", in the "right doses" and in the "right way". Adherence is "not a single event". It is rather a "dynamic process" that needs to be addressed during every follow-up meeting with patients who are on an ART schedule (Amberbir et al. 2008). Adherence to ART can be calculated by dividing the number of doses taken by the number of prescribed doses that should be taken during a specific period (Bell et al. 2007).

According to Fisher et al.(2006) the information that patients need for HAART adherence includes when and how to take the ARV medications, what level of adherence is required, the consequence of the failure to adhere to the dosage regimen, the side effects of ARVs, and any beliefs and misconceptions that patients may entertain with regard to ARVs. This model assumes that correct information will help patients to conscientiously adhere to HAART and that, conversely, inaccurate information may be an impediment to the necessary levels of HAART adherence. Some misconceptions (such as the belief embodied in the words: "Skipping my medication from time to time will eventually teach my immune system to fight the virus by itself") may have a decisively detrimental effect on the level of adherence to HAART (Amico et al. 2005; Starace et al. 2006; Amico et al. 2009).

Even if HAART has given hope to people who are living with HIV and although it plays a significant role in improving their quality of life, it requires near-perfect adherence if

the patient is to obtain the benefits of the long-term effect. Such benefits include the maintenance of the maximum possible rate of viral suppression for as long as the regimen is being taken as prescribed (Chesney 2000, Gulick 2006, Oyugi et.al 2007, Bangsberg 2008).

A number of studies have shown that a more than 95% adherence rate is required if a patient is to receive all the benefits of ART and minimize the possibility of treatment failure (Chesney 2003,Gulick 2006, Hardon et al. 2006, Oyugi et al. 2007). A Mozambican study carried out by San Lio, Carbini et. al, 2008) established that the relationship between a >95% adherence rate and a final viral load of <1000 copies/ml was closer than the relationship between a >90% adherence rate and a final viral load of <1000 copies/ml.

2.4 Factors affecting level of Adherence to ART

Chesney (2000) states that factors that affect adherence to ART can be classified into the following four categories: (1) patient factors such as age, gender and substance abuse; (2) treatment factors such as, for example, complexities surrounding the act of drug dosing, pill burdens, side effects and special food requirements; (3) the provider-patient relationship; (4) attitudes towards the prevailing system of care such as, for example, any dissatisfaction with the health care system of the facility. According to Chesney (2003), adherence to ART can be affected by ARV regimen characteristics, patient-specific factors, provider-patient relationships, and various characteristics of the health care system itself. Chesney (2006) suggests that adherence to ART must take into consideration a variety of social, cultural, economic and personal factors – an observation that suggests just how complex this problem is. Although numerous studies have shown that adherence to HAART is not optimal in many patients, the social, psychological, clinical and behavioural factors that are associated with it have not yet been fully explored or explained (Gifford et al. 2000). In a study that Deribe et.al (2008) undertook in Jimma University Specialized Hospital in Southwest Ethiopia, 28% of the total number of patients who commenced ART missed two or more visits to the ART clinic on their appointed dates. The reasons that the participants in this study gave for missing their appointments included a loss of hope in the efficacy of the medication, a lack of food, the

debilitating effects of bouts of mental illness, a belief in the power of holy water to achieve what ART could not, the fact that they did not have the money required for transport and the effect of various other illnesses that made their attendance impossible.

Other reasons that were mentioned for non-adherence in a study by Markos et al. (2008) included being too busy to attend or simply forgetting to attend, changes in the daily routines of the participants, their periodic absences from home, the effect of patients who had reported disagreeable side effects in the month prior to the study, the fact that they lived too far from the ART clinic, and the necessity to attend to the needs of their dependents.

According to study conducted by Gulick (2006) if an HIV patient on ART is not taking the ARV drugs conscientiously, i.e. if the patient is not optimally adherent to ART, the possibility of having the treatment fail along with a deterioration in the health status of the patient and the development of a multidrug resistance to ARV drugs that can be transmitted to others, is high indeed.

The study conducted in the USA, which assessed ≥95% adherence levels among 244 HIV patients aged 50-plus, the rate was found to be 80.0% (Johnson et.al, 2009). There were also other studies in the USA reporting lower adherence levels; one showed that only 71% of ART patients took their prescribed doses and another reported 96.0% of ART patients being adherent less than 95.0% (Golin et.al, 2002:761). Another USA study showed that overall adherence to ART among HIV-infected veterans, starting combination ART, was 63.0%: adherence to efavirenz-based ART being 67.0%; nevirapine-based ART 65%; and boosted Protease Inhibitor 59% (Braithwaite et.al, 2007).

ART adherence may also change over time. Different studied shows in China the mean level of adherence was 91.0% at baseline, 89.0% at month three, and 88.0% at month six, showing slight decreases over time, these due to the four most common reasons for missing doses or discontinuing treatment were forgetfulness (45%), being away from home (44.0%), being too busy (33.0%), and having side effects (30.0%) (Wang et.al, 2009).

A Senegalese study determined the viral load of a sub-sample of naïve ART patients after they had been taking ART for six months. What they found was that those patients

who had maintained more than 90% adherence rate in the previous six months showed no detectable viral load while in those who maintained an adherence rate of less than 90% showed a detectable viral load (Etar et.al, 2007). In a study undertaken in Malawi by Ferradini et.al, 2006 study, the adherence rate of patients who self-reported an adherence rate of less than 80% was regarded as the best predictor of detectable viral load during follow-up visits.

Goldman et.al, 2008 state that the risk of virological failure was highly likely in those who were sub-optimal and poorly adherent patients in comparison to those who were optimally adherent to the HAART regimen of dosages.

A Ugandan study that evaluated the association between different adherence measures and their respective viral load after 12 weeks in ART in ARV naive patients, showed that after twelve weeks the viral load was significantly associated with all adherence measures such as electronic medication monitoring, pill counting and three-day self-reporting (Oyugi et.al, 2004). In another Ugandan study, none of the patients who maintained a record of no interruptions in the HAART regimen for more than 48 hours developed drug resistance while 13% of those patients who interrupted their treatment for longer periods did develop drug resistance (Oyugi et.al. 2007).

According to the Kip et.al (2009) study done in Botswana, different factors were identified that affected adherence to ARVs both positively and negatively. The negative ART adherence factors were travel expenses, ARVs' side effects and lack of social support, use of traditional medicines, alcohol abuse, and long waiting times at ART clinics. The positive ART adherence factors were health workers ensuring that ART doses fit into the daily routine of ART patients and explaining to patients how to take ART and what side effects to expect from ARVs.

In a study undertaken by Weidle et .al ,2006 also found that in patients who took HAART for one year, a viral load of at least 1000 copies/ml was associated with a pill count adherence of less than 95%. In the Swiss HIV Cohort Study, there was a strongly significant relationship between the number of missed doses and optimal viral suppression with the rate of optimal viral suppression decreasing as the adherence rate decreased (Glass et al. 2006). That means that ARV drugs are far less tolerant of non-

adherence, and that the consequences of certain levels of non-adherence (for brief or intermittent periods) can be severe.

In a study by Tadious and Davey (2006), 81.2% of patients on ART achieved an adherence rate of more than 95%. In another study conducted by Amberbir et al. (2008) in the same year, 94.3% of patients maintained adherence rates of 95% in the week prior to the study. In another study with HIV-infected children, the adherence rate as reported by care givers was that 86.9% of children achieved a more than 95% adherence rate to ARV drugs (Biadgilign et al. 2008). This shows that even if the adherence rate that is reported in Ethiopia is better, there are still many people who are not optimally adherent to ART (i.e. who have demonstrated a >95% adherence rate). This state of affairs requires the implementation of urgent measures if treatment failures and the development of drug resistance are to be avoided.

Another study conducted in the southern part of Ethiopia at Yirgalem Hospital found that out of two hundred and ninety one AIDS patients were involved in the survey, 74.2% of patients being treated by means of ART, the adherence level was >95% a week before the assessment took places. (Markos et.al, 2008). Another study conducted by Wondale.Y(2009) in the Adama district of Ethiopia, out of 349 respondents, the adherence level 80.2% of patients being treated by means of ART, the adherence level was >95% of the months preceding the study.

In Ethiopia, the adherence rate to ART ranges from between the 74.2% reported by Markos et al. (2008) and the 80.2% reported by Wondale Y. (2009). These figures demonstrate that there are still many patients who are unable to maintain high rates of adherence to ART. Such patients may need personal assistance if they are to achieve more satisfactory adherence rates. Such rates of adherence can only be achieved after all health care personnel and physicians have understood the obstacles that undermine and prevent adherence and after they have designed an intervention that is based on the results of a careful study of all the relevant factors in the affected population. However, there was no any previous study that is conducted in Yaya Gulale Woreda in the Fital Health Center on the factors that influencing on ART adherence..

CHAPTER THREE

METHODOLOGY

3.1 Design of the research

A research design can be described, metaphorically speaking, as the "architecture" of the study or the structured approach that the researcher follows in order to answer the questions that have been raised by the research objective (Morroni & Myer 2007). Therefore, the design of this research will be descriptive type that is qualitative approach is the best which uses to explore the adherence level, the socio-economic effect and the patient's information/awareness about adherence to ART.

3.2 Source of Data

For the study, data will be collected from both primary and secondary sources. Source for primary data will be HIV patients who start Pre-ART, ART drug and health care providers. Source for the secondary data will be medical records document of patient, published and unpublished documents, Census data and Demographic Health Survey (DHS).

3.3 Sampling

According to Yaya Gulale Health Office (2012) the total number of patients who enrolled for HIV care or for pre-ART and ART service provided are 76 and 35 respectively. From these to be representative the researcher will select 15 patients from pre-ART and 10 patients from ART for in-depth interview for this study. The sample selection will be done by taking into consideration that patients visit the Health Center by appointment and time that takes for in-depth interview particularly for ART drug users. The representative sample population will be selected randomly.

3.4 Data collection

The researcher will collect data by means of in-depth interview and observation by means of physical examination to assess WHO stages guided by checklist. Moreover, patients'

history will be collected from their medical records. In this research, the selected participants will be interviewed in the ART clinic after the patients finish their scheduled appointments with the clinical staff.

In this study, the data was collected from both primary and secondary sources. Source for primary data would be HIV patients who start Pre-ART, ART drug and health care providers. Source for the secondary data medical records document of patient, published and unpublished documents, Census data and Demographic Health Survey (DHS) by means of in-depth interview and observation by means of physical examination to assess WHO stages guided by checklist. Moreover, patients' history was collected from their medical records, which consisted of the following three sections:

1. Socio-economic effects
2. Adherence information
3. Level of adherence behaviour

The population consisted of HIV/AIDS patients on Pre-ART and ART who had been taking ARV medications and others for at least two months and who were enrolled in all years old at the commencement of the study. A sample of 25 respondents was selected randomly from total eligible number of Pre-ART and ART patients.

3.5 Ethical consideration

Confidentiality will be taken into consideration for all patients and health facilities involved in the study. Data security was ensured through using coded information, which was available only to the investigators. All the data was collected in a private room. During the data collection process, the privacy of the participants was maintained.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

A raw data analyzed the data that was collected from all 25 respondents by using a Microsoft software package called the Statistical Package for the Social Science (SPSS) (version 17). The researcher used simple descriptive statistics such as frequency table to display percentages and graphs to describe the cross tabulated data. The data was analyzed in terms of the various sections and items on the questionnaire and were accordingly based on the objective of the study.

4.1 Socio-Economic status of the respondents

This section assessed information about sex, age, marital status, religion, level of education, occupation, monthly income, and distance from the health center.

Table 1 .Sex of the respondents

Number	Sex	Frequency	Percent
1	Male	8	32.0
2	Female	17	68.0
	Total	25	100.0

As Table 1 reveals 68% of the respondents are female and 32% of the respondents are male. This implies for the study more female HIV infected people take more part than male counterpart.

Table 2. Age distribution of the respondents

Number	Age Classification	Frequency	Percent
1	Age less than 18	2	8.0
2	Age between 18 and 24	1	4.0
3	Age between 25 and 40	13	52.0
4	Age between 40 and 59	9	36.0
	Total	25	100.0

The researcher categorize the age of the respondents based on the category the health office of the Woreda used to report the HIV cases. So, Table 2 shows of the total number of respondents, 8% were less than18; 4% were between 18 and 24 years old; 52% were between 25 and 40 years old and 36% were between 40 and 59 years of age. From this more than half of the respondents who are infected by HIV are the age categories between 25 and 40. This age group is economical productive part of the communities. The studies conducted in Ethiopia by Wondale Y. (2009) out of 349 respondents 75% of the affected respondents by HIV were aged between 18 and 40 years old, those who are usually economically active in jobs and vocations.

Table 3. Marital status of the respondents

Number	Categories of marital status	Frequency	Percent
1	Single	6	24.0
2	Married	7	28.0
3	Divorce	7	28.0
4	Widowed	5	20.0
	Total	25	100.0

Table 3 shows the marital status of the respondents. In the table out of the total number, 24% were single, 28% were married, 28% were Divorce, and 20% were widowed. This indicates that in the Woreda almost in every category of marital status HIV can happen.

Table 4. Religions distribution

Number	Classification of the religions	Frequency	Percent
1	Orthodox	24	96.0
2	Protestant	1	4.0
	Total	25	100.0

Table 4 reveals, 96% of the respondents were Orthodox and the rest are Protestant. This shows that the majority of the population in this study claimed to be Orthodox.

Table 5. Educational status

Number	Status of the education	Frequency	Percent

1	Illiterate	10	40.0
2	Read and write	3	12.0
3	Elementary	9	36.0
4	High school	3	12.0
	Total	25	100.0

Table 5 indicates that 40% of the respondents are illiterate; 12% of the respondents can read and write; 36% attended elementary education and 12% had some attended high school. This result shows that 60% of the respondents are literate.

Table 6. Job of the respondents

Number	Job	Frequency	Percent
1	Job less	1	4.0
2	Student	3	12.0
3	Farmer	7	28.0
4	Merchant	5	20.0
5	Daily worker	9	36.0
	Total	25	100.0

Out of the total number of respondents, 4% were unemployed (Jobless), 12% of the respondents were students, 28% were farmer, 20% were self-employed workers or merchants, and 36% were daily worker (see Table 6). This table shows daily workers followed by farmers and merchants are more exposed to HIV than students and jobless part of the community.

Table 7. Monthly Income of the respondents in Ethiopian Birr

Number	Amount of Monthly Income	Frequency	Percent
1	Between zero and 149	10	40.0
2	Between 150 and 299	8	32.0
3	Between 300 and 499	3	12.0
4	Between 500 and 999	4	16.0

Number	Amount of Monthly Income	Frequency	Percent
1	Between zero and 149	10	40.0
2	Between 150 and 299	8	32.0
3	Between 300 and 499	3	12.0
4	Between 500 and 999	4	16.0
	Total	25	100.0

Out of the total number of respondents, 40% earned a monthly income between zero and 149 Ethiopian birr monthly, 32% received a monthly income of between 150 and 299 Ethiopian birr, 12% received a monthly income of between 300 and 499 Ethiopian birr, and 16% of respondents received a monthly income between 500 and 999 Ethiopian birr (see Table 7). This implies that most of the respondents who are infected by HIV earn less than 300 birr per months.

Table 8 .Distance from Health Facilities

Number	Distance in Km	Frequency	Percent
1	0-4	14	56.0
2	5-10	6	24.0
3	11-15	2	8.0
4	>16	3	12.0
	Total	25	100.0

Respondents were asked how far they had to travel to attend the health facility for their scheduled treatments, Table 8 shows as more than half of the respondents had to travel from zero to 4 kilometers to take their medication from the health facility, 24% had to travel between 5 and 10 kilometers, 8% had to travel between 11 and 15 kilometers, and 12% had to travel more than >16 kilometers in order to attend the health facility for their scheduled appointments. These results show that half of the respondents lived within 4 km from the health facility that may be an opportunity for them to have continuous follow up for their medication.

Table 9. The place where the respondents live

Number	Place	Frequency	Percent
1	Urban	11	44.0
2	Rural	14	56.0
	Total	25	100.0

Table 9 reveals that 44% of the respondents live in urban and 56% of the respondents live in rural area. This shows that most of the respondents affected by HIV lived in rural area.

Table 10. The respondents live with

Number	The respondents live with	Frequency	Percent
1	Mother	2	8.0
2	Father and mother	1	4.0
3	Wife and children	4	16.0
4	Husband and children	3	12.0
5	Alone	4	16.0
6	Brother or sister	2	8.0
7	Children only	9	36.0
	Total	25	100.0

Table 10 indicates out of the total number of respondents, 8% of the respondents live with their mothers,4% of the respondent live with their father and mother,16% of the respondents live with their wife and children, 12% of the respondents live with their husband and children, 16% of the respondents live with alone, 8% of the respondents live with their brothers or sisters and 36% of the respondents live with children. This shows that most of the population affected by HIV lived with their children.

Generally, from the above tables we can conclude that most of the respondents who are HIV positive are female and age of the respondents also lies with in 25 and 40 years which is categorized as a productive age in Ethiopian context. The education status of the respondents also reveals that most of them are categorized under the literate. Moreover, most of the respondents who are HIV positive do have experience of marriage in their life time and there are also married at the time of the study. Regarding the income of the respondents, more than 70% of the respondents earn less than 300 birr per month and most of them live in the rural area. From this we can conclude that HIV is not a concern

of certain part of the population rather it is the concern of all the people who live in this world. Because it can affect people in different age, sex, religion and education status.

4.2 Adherence Information of the Respondents

The respondents were asked about the information they have regarding ARV drug. The following Figures and Tables show the extent of the information that the respondents have.
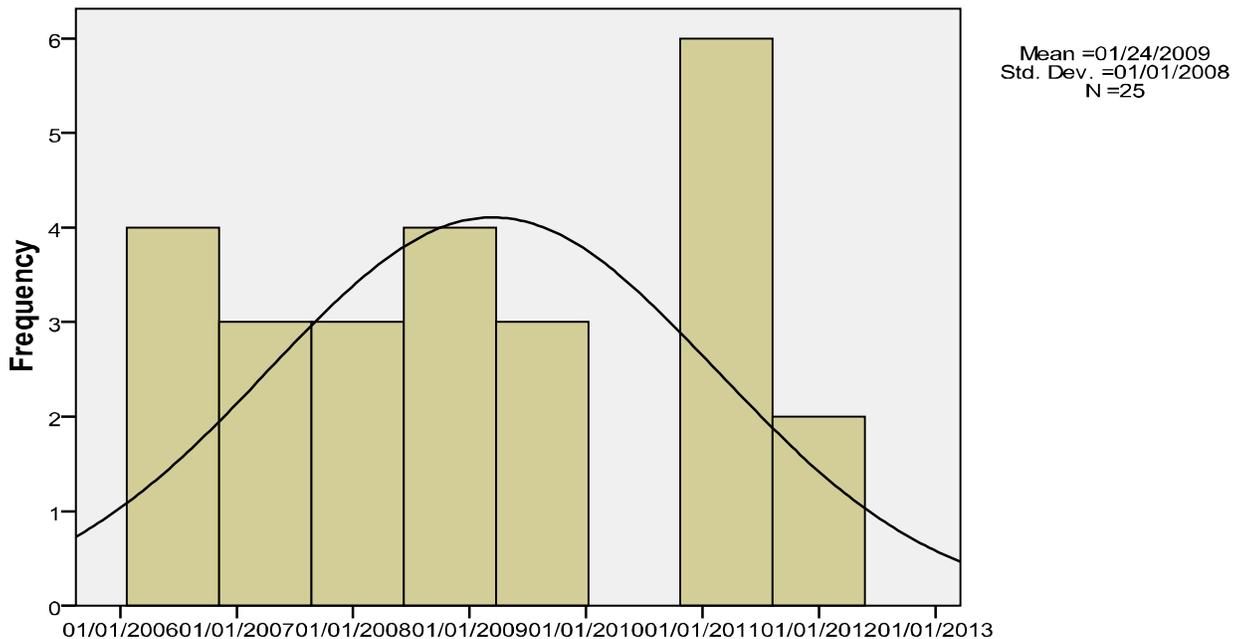

Figure 1.The respondents informed HIV status (the number of respondents known HIV positive verses year). December,2012

The above Figure 1 shows the respondents informed as they have been infected by HIV from the year 2006 up to 2013. In 2011 the incidence of HIV was high when compared to the other year. This shows that the incidence rate of HIV fluctuates from time to time.

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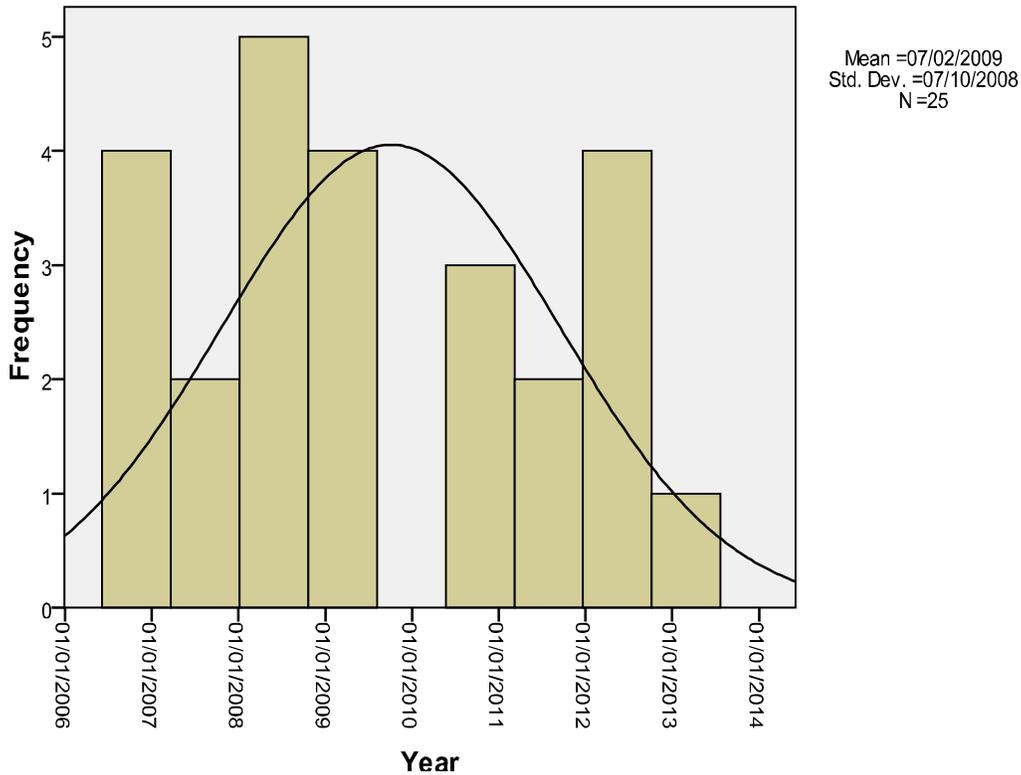
Figure 2 .The number of respondents verses the year start ART drugs (December,2012)

The above figure 2 indicates that in 2008 five of the respondents started ARV drugs and it the maximum number of respondents who are enrolled to ART compared to the other years. This implies that even though there are respondents who were informed as they are HIV positive before some years; the patients didn't start the medication immediately. This is because the patients are forced to say by taking prophylaxis (treatment to prevent opportunistic diseases for HIV/AIDS) until they know their CD4 counts.

Table 11. Respondents Information about ARV drug (Antiretroviral)

Number	Information obtained from	Frequency	Percent
1	Health care providers	21	84.0
2	Relatives	4	16.0
	Total	25	100.0

Out of the total number of respondents, 84% of the respondents obtained information about ARV drug from health care providers and 16% of the respondents obtained from relatives. This shows that most of the population obtained information from health facilities health professionals.

Table 12. Knowledge about the benefits of the ARV drugs

Number	Benefit of ARV drug	Frequency	Percent
1	Yes	5	20.0
2	No	20	80.0
	Total	25	100.0

The above Table 12 shows that out of the total number of respondents, 20% claim that they know about the benefit of ARV drugs whereas 80% of the respondents did not know the benefit of the drug.

Table 13.The Side Effect of the drug

Number	Side effects of HIV drug	Frequency	Percent
1	Yes	21	84.0
2	No	4	16.0
	Total	25	100.0

84% of the respondents are aware of the side effects of the drugs whereas 16% of the respondents didn't know the side effect of the drugs. This implies that the healthcare provides give information about the side effect of the drug before the medication started

but 16% of the respondents did not understand or listen carefully. This may have an impact when they face the side effects due to medication (see Table 13).

In conclusion, from the respondents' answers the incidence of the HIV can vary from time to time in some year it shows a decline whereas in other year it becomes higher. On the other hand after the respondents become aware that they are HIV positive but due to the delay of CD4 count results they did not start the medication on time. This may bring some effect on the health status of the respondents. Information about the ARV drug have been provided by health worker for the most of the respondents whereas the respondents did not aware of the benefit of the ARV drug before they start the drug even if the health care provides did their best. Furthermore, after the respondents start their medication they have information about the side effect even though there is few numbers of the respondents who did not know the side effect of the drug.

4.3 Level of Adherence behavior of the Respondents

This sub section of the chapter deals with the level of the adherence of the respondents using the information that is collected from the respondents.

Table 14. CD4 count of the respondents when ART Started

Number	CD4 count cells/mm^3	Frequency	Percent
1	Between 0 and 50	1	4.0
2	Between 51 and 200	9	36.0
3	Between 201 and 450	8	32.0
4	Between 451 and 600	5	20.0
5	Greater than 601	2	8.0
	Total	25	100.0

The above Table 14 shows that 40% of the respondents'CD4 count was <200cells/mm^3 and 60% of the respondents CD count was >201cells/mm^3 .This suggests that the majority of the respondents have enrolled on Pre-ART. This means that they are in a good condition. Supporting this idea, World Health Organization 2011, AIDS

Information Guideline white blood cells are produced by the body to fight off infection as a part of the immune system. CD4 cells are a type of white blood cell called **lymphocytes** which have a marker on the outside of the cell called a CD4 marker. These are also called "T cells" and occasionally "T helper cells." These are the cells that HIV infects and destroys. Usual CD4 counts for a newborn baby are around 3000-5000 and for an adolescent or adult about 700-1200 cells/ml. If your count goes below 200cells/ml, you are diagnosed with AIDS. AIDS is not a different disease than HIV infection, instead it means you can get unusual infections that other people do not get, called "opportunistic infections."

Usually your medical provider may start medicines to treat your HIV if your CD4 cells go below 350cells/ml. You want to start medications before your CD4 cells get below 200 because your body responds better to medicines when they are started at above 200 cells/ml. HIV medicines beat down the amount of HIV virus in your body, allowing your body to produce more CD4 cells. The amount of CD4 cells varies and may go up and down like a roller coaster; to determine if a change in CD4 cells is important, your medical provider may refer to the "**CD4 percentage,**" the percentage of lymphocytes with CD4 markers on the surface. For example, if your CD4 count was 400 (18%) and then was 325 (19%) at the next check, the HIV is not getting worse and hurting your immune system more because the CD4 percentage is stable or better. When your CD4 percentage is less than 15%, you can still get opportunistic infections and need to take medications to prevent sickness.

Table 15. The Current CD4 count of respondents

Number	CD4 count (cells/mm^3)	Frequency	Percent
1	Between 201and 450	12	48.0
2	Between 451 and 600	5	20.0
3	Greater than 601	8	32.0
	Total	25	100.0

Table 15 above reveals that 68% of the respondents had the CD4 count was between 201 and 600 cells/mm^3 and 32% of the respondents had the CD4 count >601cells/mm^3. The respondents whose CD4 counts greater that 600 cells/mm^3 imply that the HIV positive

patients gradually decreases the severity of the illness and the health status of the patent is improved. On the other hand, when the CD4 counts of HIV patients decrease, their immunity becomes less.

Table 16. Respondents ART starting time in line with WHO stage

Number	WHO stages	Frequency	Percent
1	First stage	6	24.0
2	Second stage	2	8.0
3	Third stage	17	68.0
	Total	25	100.0

Table 16 shows that out of the total number of respondents, 24% of the respondents have first stages which is asymptomatic, 8% of the respondents have second stage which is the patients have skin infection such as fungal infection, heper zostes etc and 68% of the respondents have the third stage the patients came with a complain of diarrheal disease, fever, pulmonary Tuberculosis etc. These figures shows that the health care providers estimate the stages of the HIV positive patients when primarily enrolled before the results of their CD4 counts known. The main reason for the estimation before the actual results is known, Fetal Health center does not have CD4 count material. Therefore, the patients' blood sample send to Fiche Health center, the result take at least 15 days.

Table 17. Current Stage of Respondents ART in line with WHO

Number	WHO stages	Frequency	Percent
1	First stage	5	20.0
2	Second stage	6	24.0
3	Third stage	14	56.0
	Total	25	100.0

As the above Table 17, 20% of the respondents categorized under first stages, 24% of the respondents under second stage and 56% of the respondents have in the third stage. This Table suggests the majority of the patients almost >50% are included under third stages this implies either the health professionals didn't provide attention to the stages or the patients didn't take or adhere on the prescribed medication.

Table 18. Respondents' adherence level on ARV drugs

Number	Adherence level of ARV	Frequency	Percent
1	>95%	17	68.0
2	<95%	8	32.0
	Total	25	100.0

The respondents were asked about the dose they take in the previous month (December 2012), and they responded as 32% of the respondents miss the dose prescribe at least three dozes, this means the respondents adherence level become less than 95% while 68% of the respondents said that they attend their HIV medications regularly therefore, this patents adherence level becomes more than 95% thinking of the past one month (see Table 18).

Table 19. Influencing Factors for adherence of respondent

Number	Factors	Frequency	Percent
1	Forgetting	5	20.0
2	Travel	1	4.0
3	Too busy	10	40.0
4	Duration of the treatment	5	20.0
5	Lack of awareness	2	8.0
6	School time	2	8.0
	Total	25	100.0

The above table 19 shows that 40% of them were not adhere on ARV drugs due to they became too busy, 20% of the respondents were not adherent because they forget the drug and 20% of the respondents were not adhere because duration of the treatment that is taking medication for long time. On the other hand, 8% of the respondents were students due to overlap with the class time they are not successfully adhering to the drug and the same percentages of the respondents were not adhering because of lack of awareness. The

rest 4% of the respondents miss the dosage prescribed due to the health center was far from their own home and they are required to travel.

4.4 The socio-economic factors that affect the adherence level of the respondents

This sub section deals with factors affecting the adherent level of the respondents with the socio economic back ground of the respondents shows that on the following bar charts.
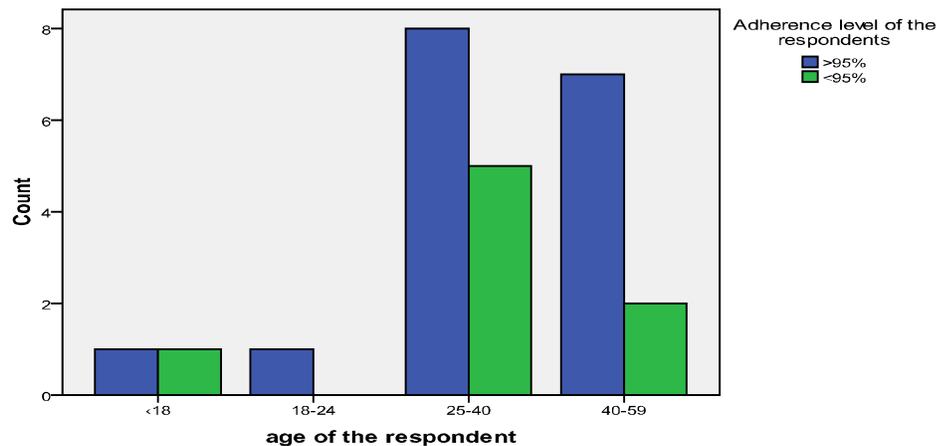

Figure 3. The Age of the respondents and adherence level (December, 2012)

The above figure 3 indicates that the age below 18 years old was adhere >95% and <95% on the prescribed medication. The age between 25 and 40 years, and age between 40 and 59 years adhere at different level but most of them have > 95% adhere. On the other hand, all of the respondents who are between 18 and 24 years are 95% adherence level. For this we can infer that nonetheless, there are respondents whose adherence level is less that 95%, most of the respondents adherence level is >95% but the health center has to work hard to reduce the number of patients who have less adherence level.
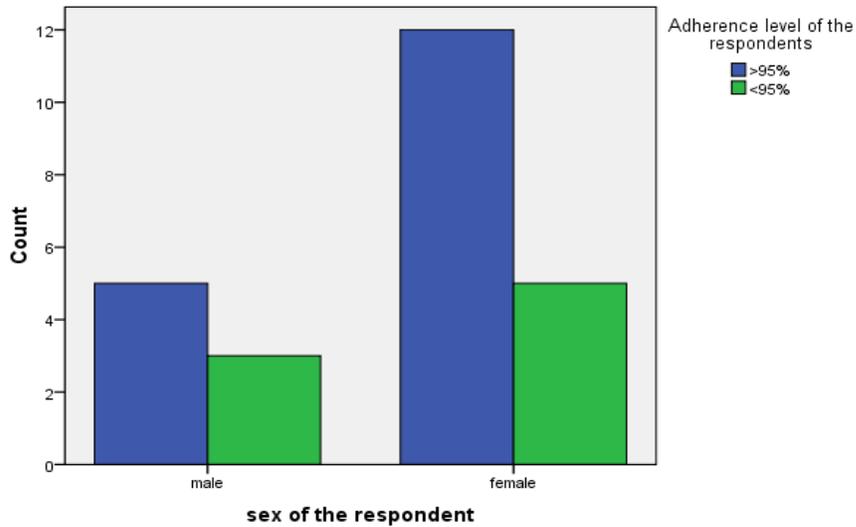
Figure 4. Sex of the respondents and adherence level (December, 2012)

Figure 4 depicts the number of females and males who said that they adhered to the ART schedule for less than 95% of the time and those who adhered to the actively on ART schedule for more than 95% of the time in the month prior to the study. Out of total respondents, 3 male respondents are adhered to ART schedule for less than 95% of the time, while 5 of them said that they adhered to the schedule for more than 95% of the time. From the female counterpart side 5 respondents adhered on ART schedule for less than 95% of the time while 12 of them said that they adhered to the schedule for more than 95% of the time in the month prior to data collection (December, 2012).
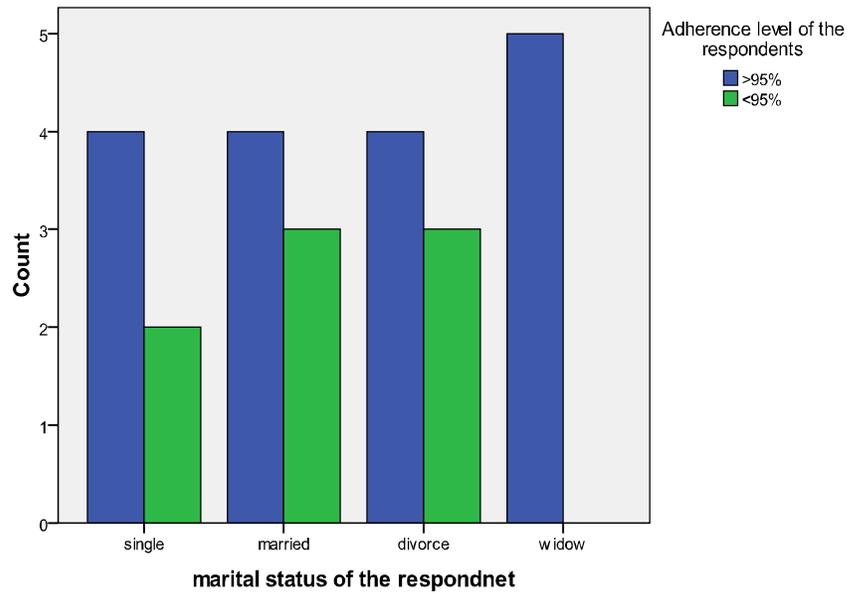
Figure 5. Marital status of the respondents and adherence level (December,2012)

As figure 5 shows, except widows who are adherent to ART >95%, the rest respondents relationship between marital status and adherence level implies that almost all respondent had the same level of ART adherent and non-adherent level month prior to data collection.
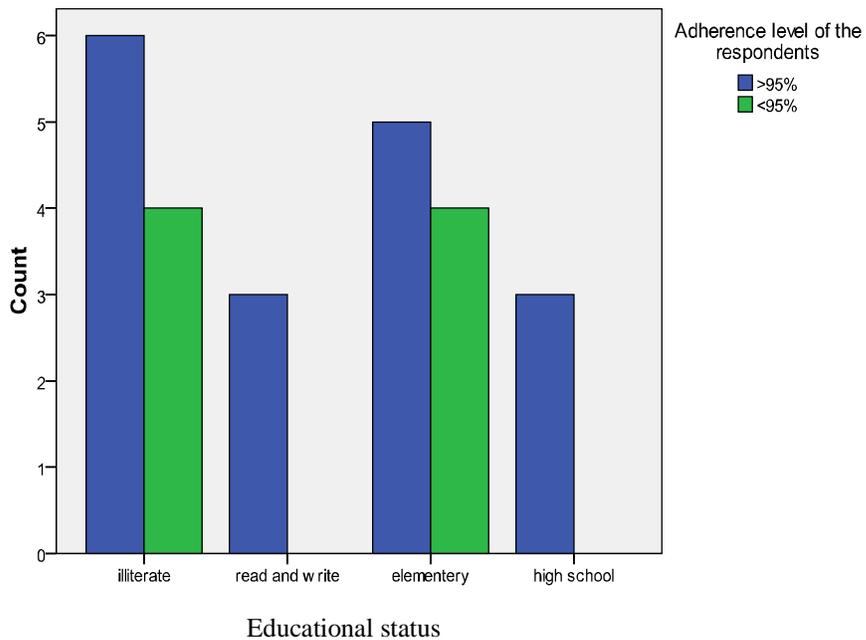
Figure 6. Educational Status of the Respondents and the adherence level.(December,2012)

The above figure 6 indicated that the respondents who can read and write and high school level have adherent level of >95% whereas illiterate and elementary educated level of the respondents do have high level of adherent and there are respondents who are not adherent that is < 95%.
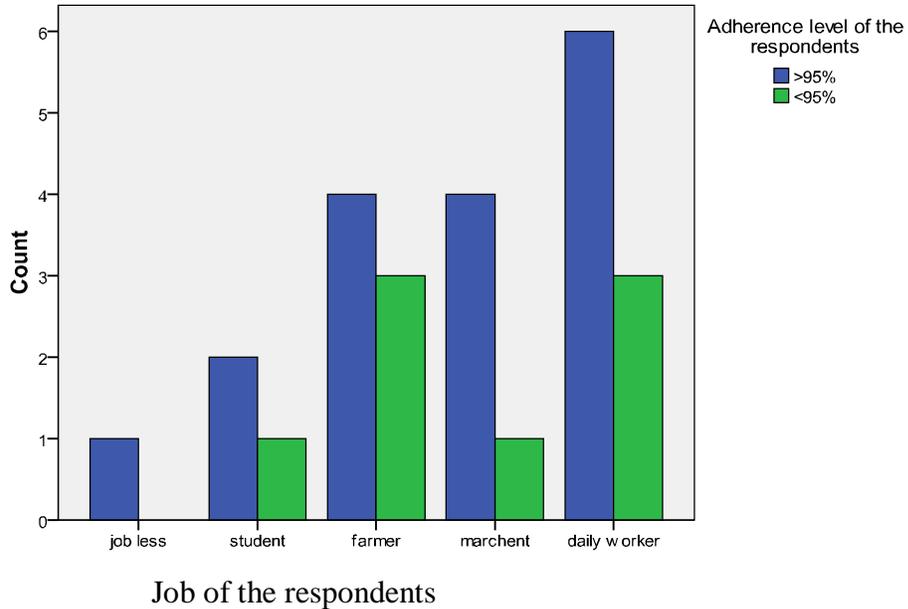

Job of the respondents

Figure 7. Job of the Respondents and the adherent level.(December,2012)

Figure 7 shows that the respondents who are jobless has adhere on ART highly whereas most of the respondents other than jobless have >95% of adherence and few of the respondents have <95% of the rest of respondents. This shows that most of the respondents are having their job not perfectly used the prescribed regimen dose of medication by health professionals.
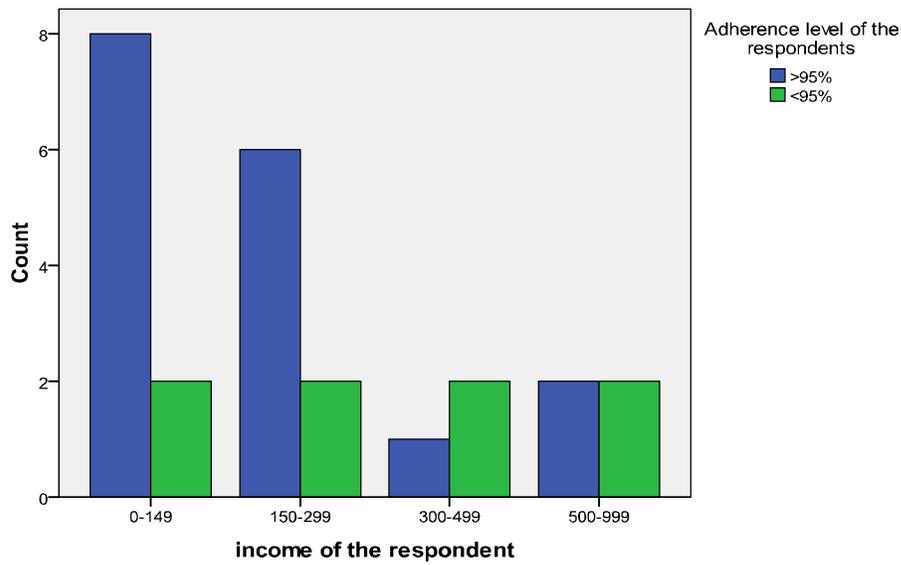
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Figure 8. Monthly income of the Respondents and adherence level.(December,2012)

The above figure 8 indicates that most respondents whose earn monthly income of <299 Ethiopia birr adherent level > 95% and few of the respondents adherence level is <95%. The respondents who earn monthly income between 500 and 999 have both less and high adherence level equally. Nonetheless, the respondents who earn monthly income between 300 and 499 have < 95% of adherence level and few of the respondents have >95% adherence level. From this we can conclude that the respondents who earn less money do follow the medication properly than who earn more this may be the support they get from different NGOs.
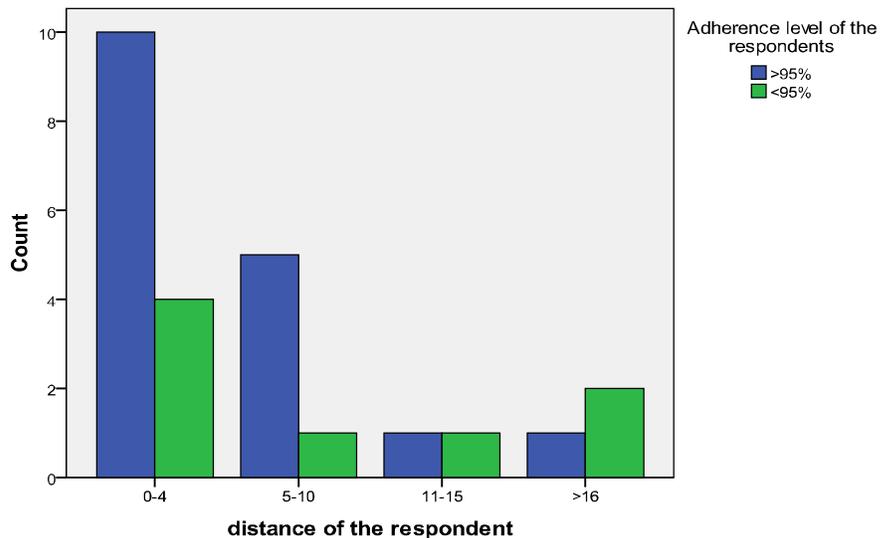
Figure 9 .Distance of the Respondents and adherence level (December,2012)

Figure 9 reveals that the respondents who live near to the health center adherence level is >95% but some of the respondents still have <95% of adherence. On the other hand the respondents who come from the far area have <95% adherence but few of them have >95% adherence. From this we can conclude that the people who are far from the health center do not follow their medication regularly compared to the people who live near. This does not mean that the respondents who live near are fully adhering.
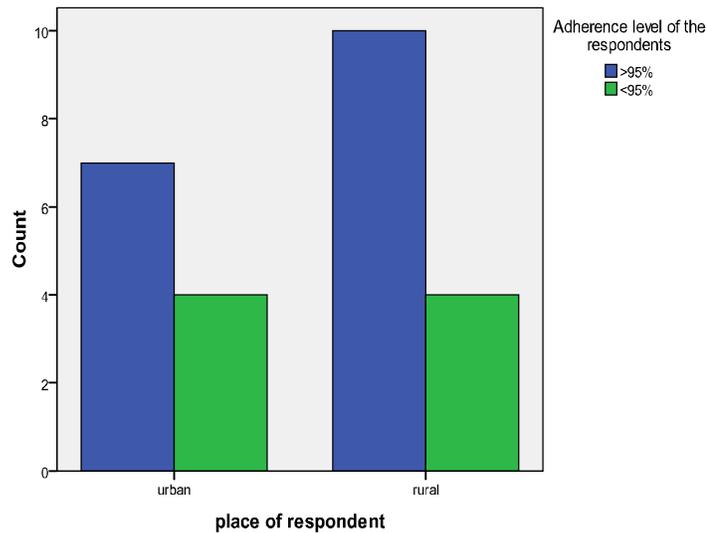
Figure 10. The place where the respondents live and adherence level.(December,2012)

The place where respondent came from did not have a factor for adherence and non adherence. This means as the figure 10 indicates more people from both the rural and urban area have >95% adherence on the other hand there are also people from both their adherence is <95%. From this we can understand that it is not the place where they live that can affect the adherence level of the people rather other factors have cause for a patient being adherent to the ARV or not.

4.5 Adherence Information/Awareness / the Respondents on ARV drugs.

In this section deal with the awareness or the information that the respondents have about the benefit and the side effects of the ARV drugs that on the adherence level of the respondents.
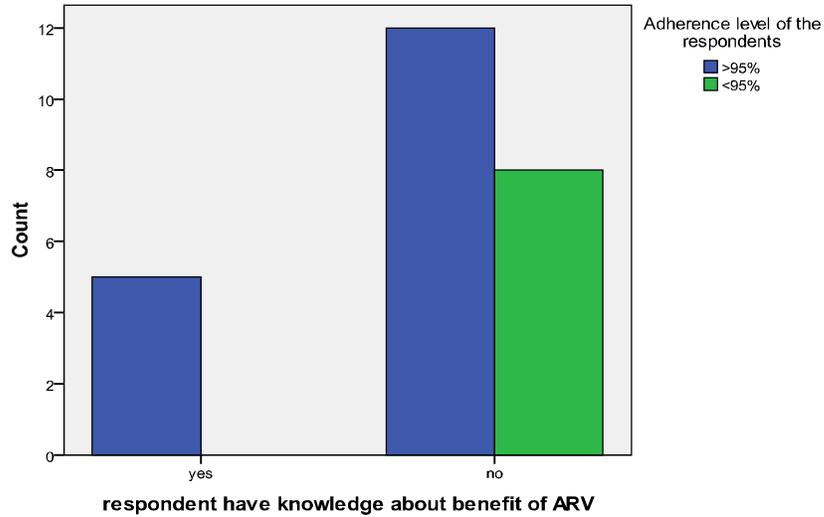
Figure 11. Knowledge of the Respondents about the Benefit of ARV and Adherence level. (December,2012)

Figure 11 shows that all respondents who have knowledge about the benefit of the ARV is >95% adherent to the drug than respondents who did not know the benefit of the ARV because there are respondents who are not adherent to the ARV drug because they lack the knowledge. The adherence for the respondents who did know the benefit of ARV drug is good but there are people who do not adhere to the drug. This implies that as the health care provider did not communicate the patient well or the patient did not give attention for the education they have been given.
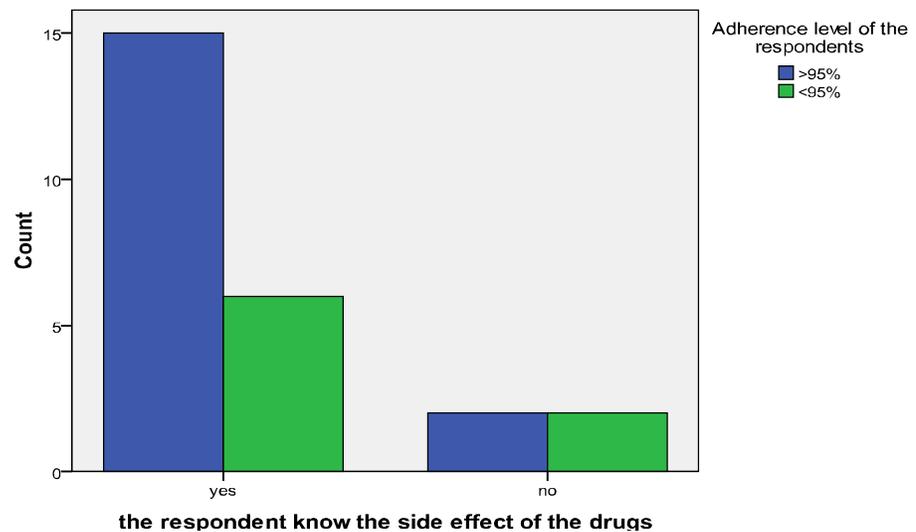
Figure 12. The respondents information about the side effect of the drugs and the adherence level.(December,2012)

Out of the total respondents 15 respondents are aware of the side effects of the drugs and their adherence level is >95%. However, there are respondents who know the side effect but they are not adherent due to that their adherent level is <95%. There are respondents who did not know the side effects of the ARV drugs but some of them are adherent to the drug and their level is >95% and there are respondents who are not adherent to the drug because they do not know the side effect their adherence level become <95%.as a result the adherence level of 15 patients are >95%. From this we can conclude that for the HIV patient knowing the side effect can have its own contribution for adherence of the patient to the ARV drug otherwise due to the side effect people may stop/interrupt the drug for some times.

4.6 Factors Influencing Level of Adherence Behavior of the Respondents

This section deals with factors that influence the level of adherence behavior of the respondents according to the categorization made by World Health Organization (WHO)
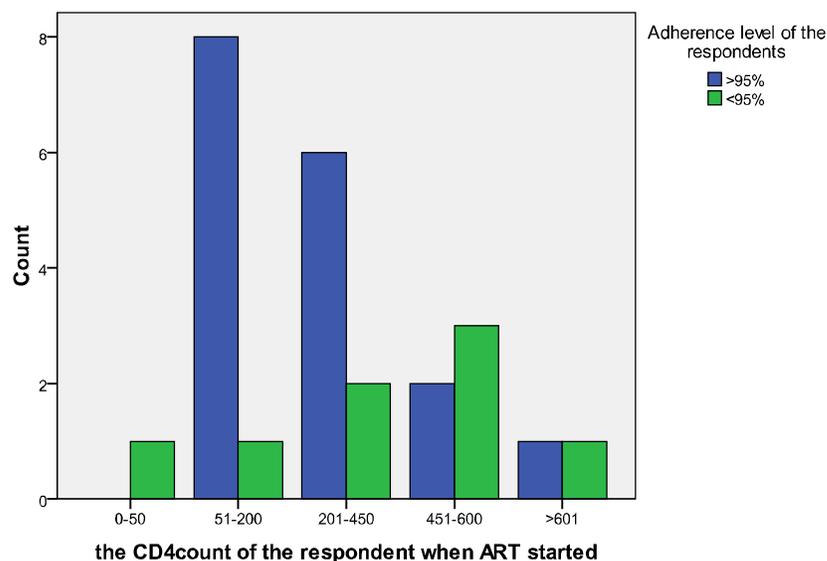
Figure 13.The CD4 count and level of adherence of the respondents when they started ART. (December,2012)

The above figure 13 indicates the relationship between the number of CD4 counts and patients adherence on ART drug regimen. The figure reveals that the CD4 counts of the patients less than 50cells/mm^3 were not adherent to the ART, the CD4 counts between 51 and 200 cells/mm^3 were actively adhere on ART but few of them are not adherent. The patients whose CD4 counts were greater than 201cells/mm^3 fluctuate the adherence level on ART.
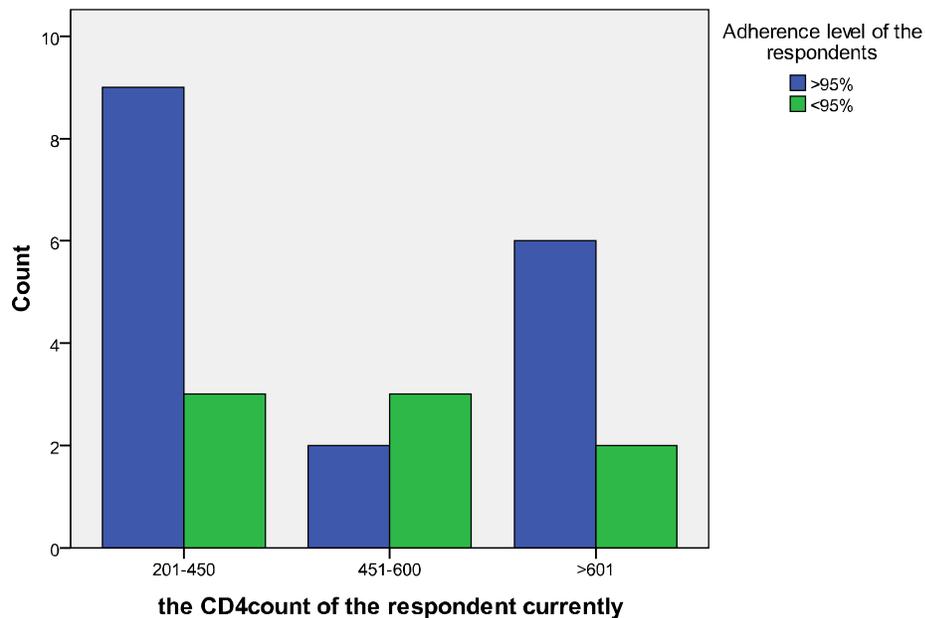
Figure 14. Current CD4 count and adherence level of the respondents.(December,2012)

Figure 14 indicates the relationship between the number of CD4 counts and patients adherence on ART drug regimen. As the medical record of the patient shows, the current CD4 counts of the patients are greater than $200cells/mm^3$ because 10 respondents are enrolled on ART whereas the rest of the respondents 15 are enrolled on pre-ART. The CD4 counts of patients are usually done every six months in order to know the patients progress with respect to their adherence level. However, Fital health does not have a material for CD4 counts due to this it may be delayed to know the patients progress. The above figure implies that out of the total respondents 17 of them are >95% are adhere on ART drugs while the rest of the respondents 8 of them are <95% of the adherent levels.
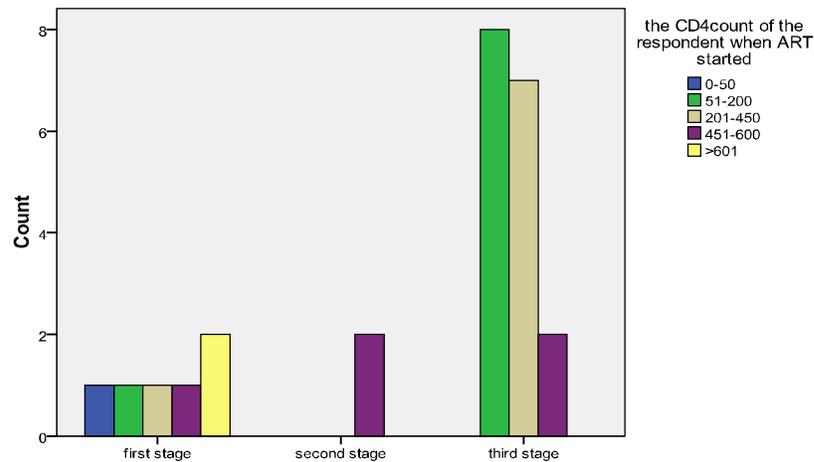
Figure 15. WHO stages of the respondents when started ARV drugs.(December,2012)

World Health Organization (WHO) classifies HIV/AIDS infection at different stages that helps to decide ART initiation. The stages are stage I (asymptomatic), stage II (mild symptoms), stage III (advanced symptoms) and stage IV (severe symptoms) (WHO 2007). Figure 15 shows that of the total respondents only 6 respondents were classified as being in WHO's HIV/AIDS stage I; 2 of them are classified in WHO's stage II; 17 of respondents were classified in stage III. This implies that most of the patients are severely ill.
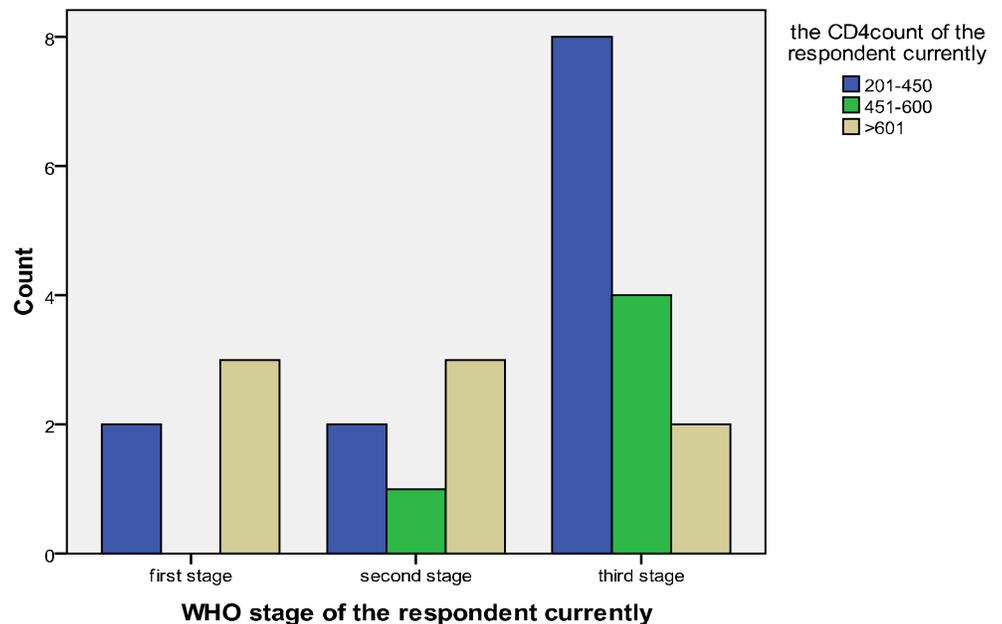
Figure 16. Respondents Current CD4 counts and WHO stages.(December,2012)

Figure 16 shows that the respondents CD4 counts and WHO stages. The figure shows that the 5 respondents those who are taking ARV drugs currently are first stages, 6 respondents are second stages and 14 respondents are engaged on third stages. A higher number of patients who were ART-adherent were found in the III stage of WHO. This implies that the health care provider estimate the stages without giving attention because the CD4 count of the respondents increased as a result the patients who adhered to treatment increased (Adherence level of the respondents>95%) as the WHO clinical stage decreased but on contrast on this study the CD4 counts increase as WHO stages increases. From this figure it is possible to conclude that the stage that health care provider put the patient is in reverse compared to WHO standard. Because the CD4 counts of most patient is higher but they are categorized under third stage. This implies as most of the respondents are severely ill with contrary to the CD4 count result the patient have. Therefore, the health care providers have to give attention when they classify their patents on the basis of WHO since this will have a negative impact for the health of patient.
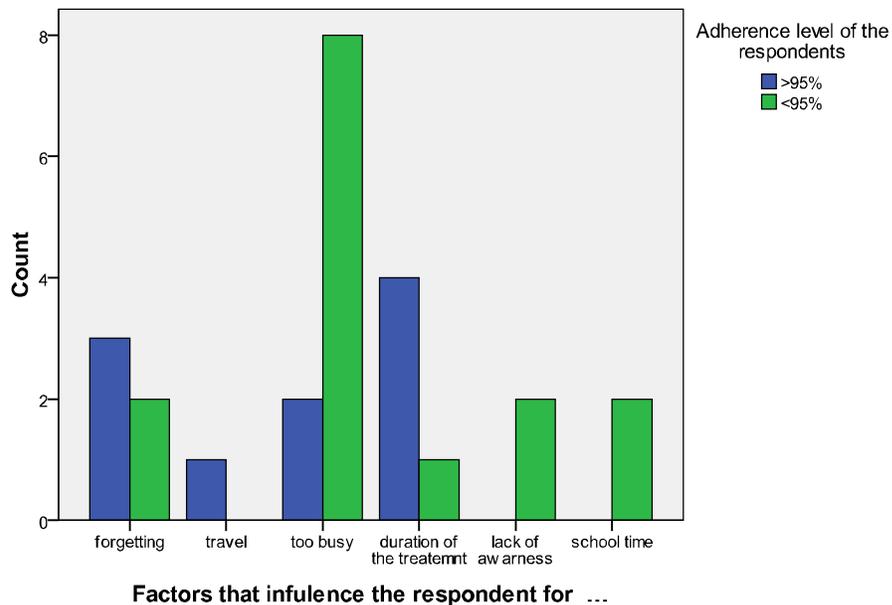
Figure 17. Adherece level and its Influencing factors (December,2012)

The above figure 17 shows that the majority of the respondents' adherence level was affected by work over load, followed by lack of awareness and schooling time for the students. Moreover, forgetting and boring to take the treatment for long period of time (that is lifelong usage of medications) were factors that influence the adherent level of the treatment. Therefore, factors that influence the adherent level of the respondents mostly was too busy, lack of awareness on the benefit of adherence on medication that prescribed by health care providers and for the students time of schooling overlap with medication time.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATION

In this chapter, the researcher summaries the study and draws conclusions on the basis of findings before making various recommendations for practice and further research in the field.

5.1 Summary and Conclusion

The study was conducted to assess the level of adherence to ART in the Oromia Regional state, in North Shoa Zone, in Yaya Gulale Woreda in Fital Health Center of Ethiopia. Since the long term success to adhere actively on ART is totally dependent on strict long-term adherence to the dosage schedules, the researcher used to identify and assess factors affecting drug adherence among HIV-positive   The result of the study could be used to address the challenges that patients experience and to encourage them to adhere actively and strictly to ART so that it can be optimally efficacious.

For the study 25 respondents were selected randomly. On the basis of the findings 68% of the respondents are female who have HIV positive and the rest are male. Regarding the age 52% of lies with in 25 and 40 years which is categorized as a productive age in Ethiopian context. Furthermore, the education status of 60% of respondents was categorized under the literate and the rest cannot read and write on the other hand the 56% of the respondents have experience of marriage in their life time. The respondents were also asked about their income and 72% of the respondents earn less than 300 birr per month and most of them live in the rural area. From this it is possible to conclude that the more disadvantageous part of the population that is female and youth are exposed to HIV.

Optimal adherence level was set at 95% which is necessary for desired clinical outcomes, adequate immunological response and suppressed viral replication. Most of the respondents adherence level were >95% found among age, sex, educational status, marital status of the respondents on contrary adherence level less than 95%, lies due to the factors of the income and the distance of the respondents.

In this study the respondents were asked about the benefit of ARV drug before they start the medication, 20% of the respondents are having knowledge about the benefit of the ARV as a result their adherent level was >95% whereas 80% of the respondents adherent respondents who did not know the benefit of the ARV the adherent level becomes <95%. 84% of the respondents have know the side effect of the drugs but not completely adhere to ART and 16% of the respondents didn't know the side effect but some of them are adherent and some of them were non adherent. From this we can generalize that the information or the awareness gap of the respondents before starting medication can have its own contribution for adherence level of the patient to the ARV drugs. Therefore, awareness creation program is very essential for the people about the benefit of ARV drug and the benefit of the adherence to the drug for life long time to live long with HIV. Among 25 respondents based on their base line of the CD4 counts which is <50 cell/mm^3 the adherent level was <95% because this respondents have no resistance (immunity) to the probability to recover from his/her illness disease were very low, whereas nine of the respondents their CD4 counts 50-200 cell/mm^3 they are actively adhere on ARV drugs due to the respondents have the chance to recover from their illness were high. In addition to this five of the respondents the current CD4 counts between 451 to 600 cell/mm^3 they adhere <95% because these respondents thinking felt better due to this reasons they may be missed a dose prescribed medication. As a result of the above CD4 counts of the respondents fluctuates with their adherent level of ARV drugs. In this health center the respondents to know their health status the current CD4 counts it usually done every six months and the result of their blood sample provided within two weeks interval this may be affect the adherence level of the respondents. In addition to this the base line of WHO stage indicates 68% of respondents were classified in stage III and the current WHO stage shows that 56% of the respondents were classified under III stage. This implies higher number of patients who were ART-adherent was found in the III stage. From this one can conclude that most of the patients are severely ill however, this is not true because the CD4 count value that the patents shows as most of the patients are in a good condition. The stage is given for the patient by mere estimation of the health care provider without giving attention due attention. On the side of the health care provider

the main reason they state for mere estimation they made was due to the delay of the CD4 count result of patients.

From this we can infer that efforts are made to treat people who live with HIV in the nearby health center by giving medication to adhere for their life long, following up for the health progress and frequent advice but lack of CD 4 count material and delay of the CD4 count result make the treatment handicapped. Due to the delay of the result of CD4 count of patents, the health care providers forced to put the patient on one of the stage to continue the medication. This results error and the patients are categorized on the stage they did not deserve. Therefore, since this is the issue related to life threatening (survival) it must have to be seen seriously and the health care providers has to use alternative to get the result by compromising the delay they have faced from Fiche Hospital and they government has also to think about the fulfillment of the material like the medication.

Finally, factors like too busy, lack of awareness on the benefit of adherence on medication that prescribed by health care providers that influence the adherent level of most respondents. So, patients have to give due attention for the medication because this is the way they sustain their life. The health care providers have to support the patient by creating awareness and advice frequently without boring to help the patients to completely adhere to their medication and live long.

5.2 Recommendations

On the basis of the conclusions, the researcher makes the following recommendations that might be useful for addressing the factors that affect adherence level and a variety of other factors that might be useful in actual practice and for further research.
Adherence level might be improved if the following recommendations are implemented by the Oromia Health Bureau and the stakeholders:-

✓ Assessment of adherence level is feasible and can be done by the healthcare providers using the patients' self report. This can be done routinely when the patient comes for medication refills.

- ✓ Patients can be supported and counseled to about the benefits and the side effects of the ARV medications before, during and after adherence to ART.
- ✓ It is important to consider the implementation of WHO standards when classifying the patients according to their chief complain.
- ✓ Factors related to the patients in problem that needs to be screened and treated accordingly to reduce the impact on adherence to ART.
- ✓ To reduce estimation of the healthcare provides to categorize patients by the stage of WHO either Fiche Hospital has to give fast response for the CD4 count of the patients or the Oromia Health office and the stakeholders has to put the material to the institution that give ARV drug.

REFERENCES

Amberbir, A., Woldemichael, K., Getachew,S., Girma, B., Deribe,K.(2008) Predictors of adherence to antiretroviral therapy among HIV infected persons: a prospective study in Southwest Ethiopia. Retrieved from:

 http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2518153&tool=pmcentrez

Amico, KR., Barta, W., Konkle-Parker, DJ., Fisher, JD., Cornman, DH., Shuper, PA., Fisher, WA. (2009). AIDS and Behaviour. The information-motivation-behavioural skills model of ART adherence in a Deep South HIV positive clinic sample.

Amico, KR., Toro-Alfonso, J., Fisher, JD. (2005). An empirical test of the information, motivation and behavioural skills model of antiretroviral therapy adherence.

Assefa,Y., Jerene, D., Lulseged, S., Ooms, G., Damme, W. (2009) Rapid scale-up of antiretroviral treatment in Ethiopia: successes and system-wide effects. Retrieved from:

http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.1000072

AVERTS. AIDS Charity AVERTS. (2009). AIDS & HIV information from AVERT.org. The
origin of AIDS and HIV and the first cases of AIDS. Retrieved from
http://www.avert.org/history-science.htm
AVERTS. AIDS Charity AVERTS. (2009). AIDS & HIV information from AVERT.org. Worldwide HIV & AIDS Statistics. Global HIV/AIDS estimates, end of 2008. Retrieved from http://www.avert.org/worldstats.htm

Bangsberg, D., Perry,S. (2001). Non- adherence to highly active antiretroviral therapy predicts progression to AIDS.

Bangsberg, D. (2008). Preventing HIV antiretroviral resistance through better monitoring.

Bell, DJ., Kapitao, Y., Sikwese, R., Vanosterhout, J., Lalloo, DG.(2007). Journal of Acquired Immune Deficiency Syndromes. Adherence to antiretroviral therapy in patients receiving free treatment from a government hospital in Blantyre, Malawi.

Biadgiligh, S., Deribew, A., Amberbir, A., Deribe, K. 2008. Adherence to highly active antiretroviral therapy and its correlates among HIV infected pediatric patients in Ethiopia. Retrieved from: http://www.biomedcentral.com/1471-2431/8/53

Braithwaite,R., Kozal, M., Chang,C., Roberts, M., Fultz, S., Goetz, M., Gibert, C., Rodriguez, M., Mole, L., Justice, C., (2007) Adherence, virological and immunological outcomes for HIV-infected veterans starting combination antiretroviral therapies.

Carlucci, J., Kamanga, A., Sheneberger, R., Shephered, B., Jenkins, C., Spurrier, J., Vermund, S. (2008). Journal of Acquired Immune Deficiency Syndrome. Predictors of adherence to antiretroviral therapy in rural Zambia.

Chesney,MA (2000). Factors affecting adherence to antiretroviral therapy. Clinical Infectious Diseases 30(2): 171-176.

Chesney, M., (2003). Adherence to HAART regimens. AIDS Patient Care and STDs.

Chesney,MA.(2006). Journal of Acquired Immune Deficiency Syndromes. The elusive gold standard Future perspectives for HIV adherence assessment and intervention..

Chi,B., Cantrell, R., Zulu, I., Mulenga, L., Levy, J., Tambatamba, B., Reid, S., Mwanago, A., Mwinga, A., Bulterys, M., Sage, M., Stringer, J. (2009). International Journal of Epidemiology. Adherence to first-line antiretroviral therapy affects non-virologic outcomes among patients on treatment for more than 12 months in Lusaka, Zambia.

Department of Disease Prevention and Control Team,*(2005)* Guidelines for use of antiretroviral drugs in Ethiopia.

Elizabeth,H.(2006) Factors Associated with Adherence To Antiretroviral Therapy For The Treatment Of HIV Infected Women Attending An Urban Private Health Care Facility.

Etard, JF., Laniece, I., Fall, MB., Cilote, V., Blazejewski, L., Diop, K., Desclaux, A., Ecochard, R., Ndoye, I ., Delaporte, E. (2007). Tropical Medicine & International Health. A 84-month follow up of adherence to HAART in a cohort of adult Senegalese patients.

Ethiopian Federal Ministry of health HIV/AIDS prevention and control office.(2007a). Single point HIV prevalence estimate. [Online] Retrieved from:
http://www.etharc.org/aidsineth/publications/singlepointprev_2007.pdf

Ethiopian Federal Ministry of Health HIV/AIDS Prevention and Control Office.(2007b). Accelerated access to HIV/AIDS prevention, care and treatment in Ethiopia: road map 2007-2008/10. [Online]Retrieved from: http://www.etharc.org.

Ethiopian Federal Ministry of health HIV/AIDS Prevention and Control Office.(2007c) Guidelines for HIV counseling and testing in Ethiopia.[Online]Retrieved from: http://www.etharc.org.

Ethiopian Federal Ministry of Health HIV/AIDS Prevention and Control Office. (2009). Monthly care and ART update March 9 2009. Retrieved from:

http://www.etharc.org/arvinfo/artupdate/ARTYek2001Mar2009.pdf

Fauci, A., Lane, H. (2005). Harrison's principles of internal medicine, edited by Kasper, DL, Faucy, AS, Longo, DL, Braunwald, E, Hausler, SL & Jameson, SL. 16th edition. New York: McGraw-Hill.

Ferradini, L., Jeannin, A., Pinoges, L., Izopet, J., Odhiambo, D., Mankhambo, L., Karungi, G., Szumilin, E,. Balandine, S., Fedida, G., Carrieri, MP., Spire, B., Ford, N., Tassie, JM., Guerin, PJ., Brasher, C. (2006). Scaling up of highly active antiretroviral therapy in a rural district of Malawi.

Fisher, JD., Amico, KR., Cornman, DH., Fisher, WA. (2006a). The LifeWindows information motivation behavioural skills ART adherence questionnaire (LW-IMB-AAQ). Retrieved from:

http://www.chip.uconn.edu/Documents/Research/F_LWIMBARTQuestionnaire.pdf

Fisher, JD., Fisher, WA., Amico, KR.,Harman, JJ.(2006b). An information-motivation-behavioural skills model of adherence to antiretroviral therapy. Health Psychology.

Gifford, AL., Bormann, JE., Shively, MJ., Wright, BC., Richman, DD., Bozzette, SA. (2000). Journal of Acquired Immune Deficiency Syndromes. Predictors of self-reported adherence and plasma HIV concentrations in patients on multidrug antiretroviral regimens.

Glass, TR., Geest, SD., Weber, R., Vernazza, PL., Rickenbach, M., Furrer, H., Bernasconi, E., Cavassini, M., Hirschel, B., Battegay, M., Bucher, HC.(2006).Journal of Acquired Immune Deficiency Syndromes. Correlates of self-reported non adherence to antiretroviral therapy in HIV infected patients: The Swiss HIV cohort study.

Golin, C., Liu, H., Hays, R., Miller, L., Beck, C., Ickovics, J., Kaplan, A., Wenger, N. (2002)
A prospective study of predictors of adherence to combination antiretroviral medication. Journal of General Internal Medicine.

Gulick, RM.(2006). Adherence to antiretroviral therapy: How much is enough? Clinical Infectious Diseases.

Gusdal,A., Andulem,J., Obus,C., Wahlstrom,R. (2008) Determinants of Adherence to Antiretroviral Treatment An Explorative Study at Health Facilities in Ethiopia and Uganda.

HAPCO. (2006). Report on progress towards implementation of the declaration of commitment on HIV/AIDS; Reporting period: January 2003-December 2005. Addis Ababa.

Hardon, A., Davey, S., Gerrits, T., Hodgkin, C., Irunde, H., Kgatlwane, J., Kinsman, J., Nakiyemba, A.,Laing, R.(2006). World Health Organization. From access to adherence: The challenges of antiretroviral treatment: Studies from Botswana, Tanzania and Uganda. Geneva.

Hill, Z., Kendall, C., Fernandez, M.(2003) Patterns of Adherence to Antiretrovirals. Why Adherence Has No Simple Measure.

Hogg,R., Vhealth,K.(1998). Improved survival among HIV- infected individuals following initiation of antiretroviral therapy.

Hus, J. (2005) Adherence. Johns Hopkins HIV Guide, Point of Care Information Technology (poc-it) .

Jerene, D., Næss, A., Lindtjørn, B.(2006) Antiretroviral therapy at a district hospital in Ethiopia prevents death and tuberculosis in a cohort of HIV patients. Retrieved from:

http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1475602&tool=pmcentrez

Johnson, CJ., Heckman, TG., Hanson, NB., Kochman, A., Sikkema, KJ. (2009) Adherence to antiretroviral medication in older adults living with HIV/AIDS: a comparison of alternative model.

Joubert, G., Ehrlich, R. 2nd edition. Cape Town: Oxford University Press.

Kip, E., Ehlers, V., Vanderwal, D. (2009) Patients' adherence to antiretroviral therapy in Botswana.

Knobel, H., Guelar,A. (2001). Response to highly active antiretroviral therapy in HIV-infected patients aged 60 years or older after 24 months follow-up.

Maqutu,D., Zewotir,T., North,D. (2006) Determinants of Adherence to Antiroviral Therapy Amongst HIV positive Adults in South Africa.

Markos,E., Worku,A., Davey,G. (2008). Ethiopian Journal of Health Development. Adherence to ART in PLWHA at Yirgalem Hospital, South Ethiopia,

Mekonnen, Yared, Mela Research PLC, Rachel Sanders, Tibebu, S. Priya Emmart. (2010). Futures Group, Health Policy Initiative. Equity and Access to ART in Ethiopia. Washington, DC:

Mills, Edward, Jean Nachega (2006). A Meta-analysis. Journal of the American Medical Association .Adherence to Antiretroviral Therapy in sub-Saharan Africa and North America:

Miller, L., Hays, R. (2000) Adherence to Combination Antiretroviral Therapy Synthesis of the Literature and Clinical Implication.

Ministry of Health January, (2005) Guideline For Implementation Of Anti-retroviral Therapy In Ethiopia.

MOH, (2007a). Annual HIV/AIDS monitoring and evaluation report: 2005/06. Addis Ababa.

MOH, (2007b). Antiretroviral treatment program implementation guideline in Ethiopia. Addis
Ababa.

MOH, (2007c).The single point HIV prevalence estimate. Addis Ababa.

MOH, (2008). Ethiopian monthly antiretroviral treatment report. June 2008. Addis Ababa.

Mocroft, A., Ledergerber,B.(2003).Decline in the AIDS and death rates in the EuroSIDA study: an observational study.

Morroni, C., & Myer, L.(2007) Epidemiology: A research manual for South Africa.

Mugusi, F., Mugusi, S., Bakari, M., Hedgemann, B., Josiah, R., Janabi, M., Aboud, S., Aris, E., Swai, H., Mhalu, F., Biberfeld, G., Rollangro, K., Sandstrom, E.(2009) Enhancing adherence to antiretroviral therapy at the HIV clinic in resource constrained countries; the Tanzanian experience.

Negash, T. (2011) personal factors influencing patients' Anti-retroviral treatment Adherence in Addis Ababa Ethiopia.

Oyugi, JH., Byakika-Tusiime, J., Charlebois, ED., Kityo, C., Mugerwa, R., Mugyenyi, P., Bangsberg, DR.(2004). Multiple validated measures of adherence indicate high levels of adherence to generic HIV antiretroviral therapy in a resource-limited setting. Journal of Acquired Immune Deficiency Syndromes.

Oyugi, JH., Byakika-Tusiime, J., Ragland, K., Laeyendecker, O., Mugerwa, R., Kityo, C., Mugyenyi, P., Quinn, TC., Bangsberg, DR.(2007). Treatment interruptions predict resistance in HIV-positive individuals purchasing fixed-dose combination antiretroviral therapy in Kampala, Uganda.

Paterson, DL,,Swindells,S.(2000).Adherence to protease inhibitor therapy and outcomes in patients with HIV infection.

PEPFAR. (2007). Retrieved from: http://www.pepfar.gov/

Polit, DF., Beck, CT. (2008) Nursing research: generating and assessing evidence for nursing practice; eighth edition.

Stommel, M., Wills,CE., Lippincott,P.,Wilkins,W.(2004) Clinical research: Concepts and principles for advanced practice nurses.

Tadious, Y., Davey, G.(2006). Ethiopian Medical Journal .Antiretroviral treatment adherence and its correlates in Addis Ababa, Ethiopia.

UNAIDS-(2008) See Joint United Nations Programme on HIV/AIDs.

UNAIDS and WHO (2009) AIDS Epidemic. Retrieved from: http://www.unaids.org/en/.

UNAIDS report,(2012) on the global AIDS epidemic.

Wang, H., Zhou, J., He, G., Luo, Y., Li, X., Yang, A., Fennie, K., Williams, AB. (2009) Consistent ART adherence is associated with improved quality of life, CD4 counts and reduced hospital costs in central China.

Ware, NC., Idoko, J., Kaaya, S., Biraro, IA., Wyatt, MA., Agbaji, O., Chalamilla, G., Bangsberg, Dr. (2009). *PLOS* Medicine. Explaining adherence success in Sub Saharan Africa: an ethno-graphic study.

Weidle, PJ., Wamai, N., Solberg, P., Liechty, C., Sendagala, S., Were, W., Mermin, J., Buchacz, K., Behumbiize, P., Ransom, RL., Bunnell, R.(2006). Adherence to antiretroviral therapy in a home-based AIDS care programme in rural Uganda.

WHO/UNAIDS/UNICEF.(2009). Towards universal access: scaling up priority HIV/AIDS
Interventions in the health sector; Progress report Malta. Retrieved from:
http://www.who.int/hiv/pub/2009progressreport/en/index.html

WHO,(2009).Rapid Advice of Antiretroviral Therapy for HIV Infection In Adult and Adolescent.

WHO, (2009) ART guideline review meeting Hotel Ramada Encore, Geneva.

Yaya Gulale Woreda (2012), Woreda profile Report. Agricultural Office.

Yaya Gulale Woreda (2012). Report on population density. Finance and Economic Development Office.

Yaya Gulale Woreda(2012). Assessment on the Health Facilities that provided in Health service. Health office.

Wondale,Y.(2009) Factors Influencing Antiretroviral Therapy Adherence in Adama District Ethiopia.

ANNEX

Questionnaire for In-Depth Interview Guide Adherence to ART

Introduction: Welcome to the interview

My Name is --------------and I am working ------------------and I come from---------.

We are here to discuss the factors that influencing antiretroviral therapy adherence. There is no right or wrong answers; all comments: both positive and negative, are most important. We would like to have many opinions and views. I would like this to be open interview, so feel free to express your opinion honestly & openly. I would like to confirm that all your comments are confidential and used for research purpose only. Your name will not be recorded to protect your confidentiality. Are you willing to participate in the interview? Y/N

Thank you for your willingness.

Section I

1. Socio-economic effects

Number	Questions	Categories
1	Sex of respondent	1. Male 2. Female
2	Age in Years	1.<18 years age 2.18-24 years age 3.25-40 years age 4. 40-59 years age 5. >60 years age
3	Ethnic groups	1. Amhara 2. Oromo 3. Tigry 4. other specify_____
4	Marital status	1. Single 2. Married 3. Divorced 4. Widowed
5	Religions	1. Orthodox 2. Catholic 3. Protestant 4. Muslim 5. Other specify_____ 6.
6	Literacy	1. Illiterate 2. Read and write 3. Elementary 4. High school 5. Diploma and above
7	Working situation	1. Employment 2. Jobless 3. Pensioner

		4. Student
		5. Farmer
		6. Merchant
		7. Daily worker
		8. Other specify_____
8	What is your monthly income in Ethiopian birr?	1. 0-149 birr 2. 150-299 birr 3. 300-499 birr 4. 500-999 birr 5. >1000 birr
9	How far do you live from the health center?	1. 0-4 km 2. 5-10 km 3. 11-15km 4. >16km
10	Where do you live	1. Urban 2. Rural
11	With whom do you live	1. With father 2. With mother 3. With father and mother 4. With father, mother and siblings 5. With wife 6. With husband 7. With wife and children 8. With husband and children 9. Alone 10. With brothers 11. With sisters 12. Children Other specify_____

Section II
2. Adherence Information

Number	Questions	Categories
1	When were you informed that you are HIV positive?	dd/mm/yyyy
2	From whom /where you did heard/obtain the information about ARV.	1. From health care providers 2. From relatives 3. From media 4. From neighbors Other specify_____
3	Do you have knowledge about the benefits of the ARV drugs you are taking?	1. Yes 2. No
4	After how long of diagnosis you decide to start ARV.	dd/mm/yyyy
5	What were the factors which influence your decision making?	1. Yes 2. No
6	What could happen if you do not take the ARV drugs as prescribed by health professions?	

| 7 | Do you know the side effect ARV drugs? | 1. Yes
2. No |

Section III
3. Level of adherence behaviour

Number	Questions	Categories
1	CD4 count (when ART started)	
2	CD4 count (Currently)	
5	WHO stage when ART started	
6	WHO stage currently	
7	When did you first start taking ART to manage your HIV?	___dd___ mm____yyyy
8	ART regimen and other drugs (prescribed doses)	

S/no.	Name of medication	Morning dose # of pills	Midday dose # of pills	Evening dose # of pills	Daily total # of pills
1					
2					
3					

9	Some people find it difficult to take their antiretroviral therapy medications on the monthly. Thinking about the past one month, how many doses did you miss? The patient adherent level by %	1. Never and 1-3 doses (>95%) 2. >3 doses (<95%)
10	Factors of poor adherence	1.For getting 3. Travel 4. Too busy 5. Side effect 6. Other disease 7. Fasting prayer 8. Duration of treatment 9. Stock – out 10. Felt better 11. Too ill 12. Stigma, disclosure 13. Alcohol 14. Lack of awareness 15. School time Specify other _____