ANTIRETROVIRAL THERAPY ADHERENCE AMONG PATIENTS ATTENDING HARGEISA GROUP HOSPITAL HIV CLINIC, HARGEISA, SOMALILAND

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF PUBLIC HEALTH OF KAMPALA INTERNATIONAL UNIVERSITY

NOVEMBER, 2013

DECLARATION

I declare that this research report is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

Signature: _____ Date: 15 / 11 / 2013

Adam Haibeh Farah

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APPROVAL

This dissertation entitled *"**Antiretroviral Therapy Adherence among Patients attending Hargeisa Group Hospital HIV Clinic**"* was conducted under my supervision and it has been submitted to Kampala International University-Western Campus for examination.

Signature: _____ Date: 15 / 11 / 2013

Dr. Kasule Aaron

DEDICATION

I dedicate this work to my brothers and sisters, whose esteem for the value of education and whose willingness to sacrifice for me always remains fresh in my memory. To my beloved wife, Amran, for her encouragement, support and forbearance by the time I was away from home.

ACKNOWLEDGEMENT

First of all, the researcher would like to thank Almighty Allah for giving him the patience, wisdom, knowledge and strength he needed to complete this study and for always supporting him in every phase of the work.

This study could not have been completed without the superb guidance, uninterrupted support and helpful feedback from– his supervisor, Dr. Kasule Aaron. The researcher would like to extend to Dr. Kasule his most heartfelt gratitude and appreciation.

He would also like to thank and express his deep gratitude to all of the following people for their support and unending encouragement:

i. The Hargeisa Group Hospital HIV Clinic Staff and Management for their support in data collection process of this study and for their invaluable assistance in helping him to access the relevant literature sources.
ii. The respondents who have agreed to share with him their personal delicate matters
iii. The two research assistants who have helped collect this data, Khadar and Samsam, the researcher owes you a lot.
iv. Mohamed Hamud who has helped in formatting and organizing the work.

Last but not least, his special thanks go to his beloved family (brothers and sisters) and his beloved wife, Amran, who were always supporting and encouraging him to complete his study.

LIST OF ABBREVIATIONS

AIDS	:	Acquired Immunodeficiency Syndrome
ART	:	Antiretroviral Therapy
AZT	:	Zidovudine
HGH	:	Hargeisa Group Hospital
HIV	:	Human Immunodeficiency Virus
OPD	:	Outpatient Department
PMTCT	:	Prevention of Mother-To-Child Transmission
SOLNAC	:	Somaliland National AIDS Commission
SPSS	:	Statistical Package for Social Science
UNAIDS	:	Joint United Nations Program on HIV/AIDS
UNICEF	:	United Nations Children's Fund
WHO	:	World Health Organization

DEFINITIONS OF TERMS

1. **Adherence (WHO)** = The extent to which a person's behavior – taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider.
2. **ART Adherence (Operational):** in this study adherent is defined as when a person on ART takes more than 95% of prescribed drug (dose-adherence) and follows time restriction (time-adherence) for one week prior to the study otherwise non-adherent.

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ABSTRACT

BACKGROUND:ART adherence varies in different regions of the world. Garcia et al (2006) had examined the relationship between self-reported adherence and viral load suppression. The study showed that 76% of those reported adherence had a viral suppression versus only 25% of subjects reported non-adherence (Rosa, 2006). No previous similar studies were done in Somaliland.

OBJECTIVES: This study assessed antiretroviral therapy adherence among patients attending Hargeisa Group Hospital (HGH) in Hargeisa, Somaliland.

METHODS: A facility-based cross-sectional study design was employed. A sample of 271 of patients on ART at the HIV Clinic was interviewed and their CD4 documents reviewed. Key informant interviews were held for 4 people from the clinic staff and management. A chi square test was used to ascertain the relationship of independent variables with the dependent variable.

RESULTS: The study has shown that 80.8% of respondents adhered to ART at 95% or more of the time. The study also has found that coming on foot to the clinic, living far from the clinic and being newly diagnosed with HIV were factors that led to ART non-adherence behavior. The study also assessed other factors that were found to be not related to ART adherence in this clinic. These factors include age, gender, education, marital status, patient's knowledge of HIV and ARTs, family size and previous hospitalizations among other factors.

CONCLUSION AND RECOMMENDATIONS: The study found that the respondents who come on foot to the clinic, those lived far from the clinic and those diagnosed with HIV less than 3 years ago were less likely to adhere to ART. The researcher is recommending, making the services closer to the community by opening more clinics or by outreach programs.

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CHAPTER ONE
INTRODUCTION

1.0 Introduction

In this chapter, the researcher gave a background description of this study and what is already known about antiretroviral therapy globally, in the region and at national level. This chapter also covers the problem statement of this study, its objectives, research questions, scope, justification and conceptual framework of the study.

1.1 Background of the Study

1.1.1 Historical background

Over the last 5 years, there has been a rapid change in treatment strategies for HIV infection. With the advent of newer antiretroviral drugs, treatment has moved from mono-therapy and bi-therapy to triple drug therapy or Highly Active Antiretroviral Therapy (HAART). Treatment with a cocktail of three or more antiretroviral medications is now standard treatment protocol.

According to UNAIDS (2011) an estimated 34 million people were living with HIV worldwide, up 17% from 2001. This increase in prevalence could be either due to new infections or fewer people are dying of AIDS-related causes resulting in increase of those who are living with HIV longer. Around 2.7 million people were newly infected with HIV in the year 2010 worldwide, down 21% from the peak of the global epidemic in 1997 (UNAIDS, 2011). Declines in new HIV infections across the world have been spurred in particular by, among others, greatly increased access to HIV prevention services. Increased access to antiretroviral therapy (ART) has been the cornerstone of these prevention services. When prevention and treatment are in synergy, ARTs have crucial role in prevention of mother -to -child transmission, in post-exposure prophylaxis and in reduction of viral load which lowers onward transmission of HIV (UNAIDS, 2010).In addition to that, studies conducted in Kenya, Uganda and Botswana revealed that a daily antiretroviral tablet taken by people who do not have HIV infection can reduce their risk of acquiring HIV by up to 73% (UNAIDS and WHO, 2011).

Approximately 6.6 million people in low- and middle-income countries were receiving HIV treatment at the end of 2010 – an increase of more than 1.35 million over 2009 and nearly half of those eligible (UNAIDS, 2011). The number of people dying from AIDS-related causes have decreased from 2.2 million in mid-2000 to 1.8 million at the end of 2010 (UNAIDS, 2011). A

total of 2.5 million AIDS-related deaths have been averted since 1995 due to antiretroviral therapy being introduced, according to new calculations by UNAIDS (2011).

For the ARTs to continue being effective, the patients should exercise high level of adherence (≥ 95%) (Bangsberg et al, 2000, Montaner, 1998), Paterson, 2000). Suboptimal adherence may rapidly lead to resistance, which can then be transmitted to other people (Boden,1999; Hecht,1998; Little, 1999). Virologic failure may result from low adherence, lack of antiretroviral potency, drug resistance, or a combination (Montaner et al., 1998; Descamps et al.,2000; Bangsberg et al.,2000; and Paterson et al., 1999)

ART adherence varies in different regions of the world. Garcia et al. (2003) had examined the relationship between self-reported adherence and viral load suppression. The study showed that 76% of those reported adherence had a viral suppression versus only 25% of subjects reported non-adherence. In another research done in India showed that 84% had good adherence (Ajithkumar, 2011). Also in United States of America, Arnsten et al.(2001) found out that Mean self-reported 1-day adherence was 79%, and mean self-reported 1-week adherence was 78%.

When it comes to Africa, ART adherence is better than elsewhere in the world. In a study conducted in Rwanda, 94 % of respondents reported 100% adherence in a 3-days recall (MoH, 2011). In this very study, for those subjects selected for virological assessment, 83% had undetectable viral load. Tiyou et al.(2010) found that in Ethiopia 95 % of the study subjects were adherent to medications based on self-report adherence in a one-week recall. The finding that Africans were having higher adherence was consolidated by review of 31 studies from North America and 27 from sub-Saharan Africa examining adherence to ART. The researchers identified that 82% of Africans succeeded at the goal of 95% or more adherence, compared with only 55% of North Americans (Mills et al,2006).

1.1.2 Theoretical background

The study employed information-Motivation-Behavior (IBM) theory which conceptualizes adherence to ART as a health-related behavior that is determined mainly by the extent of an individual's knowledge of ART, the serious consequences of non-adherence, by personal attitudes toward the taking of ARV medications (personal motivation), and by the ability to perform whatever adherence-related tasks are necessary, together with a strong sense of self-efficacy (behavioural skills) (Ware, Wyatt & Bangsberg, 2006). The IMB model assumes that adherence-related information, motivation, and behavioural skills are fundamental determinants

of adherence to ART as well as a wide range of useful health-related behaviours. The model asserts that people who are well-informed and motivated to act and those who possess the behavioural skills to do so, are far more likely to adhere to the HAART regimen than those who lack these qualities and skills. This IBM model theory was initially used by Fisher et al (1996).

There are a good number of factors that are associated with ART adherence either negatively or positively. Most of the patients reason out their missing of doses as running out of medications, being away from home, being busy, simply forgetting, having no food to take with the medication, fear of side effects and feeling sick or ill at that time (Tiyou et al.,2010).

Somaliland, a country of about 3.5-4.0 million population, is considered as a country of low prevalence of HIV compared to neighboring countries including Ethiopia and Djibouti. In 1999, and later in 2004, community-based surveys on Knowledge, Attitudes, Beliefs and Practices (KABP) were carried out in Somaliland revealing that HIV prevalence in the general population is 0.9 percent (MoH et al.,1999) and 1.4 (UNICEF, 2004). According to Somaliland National AIDS Commission (SOLNAC, 2007), the incidence rate of HIV has been increasing in the years 2005 and 2006. Limited segments of the general population including people with sexually transmitted infections, internally displaced people, tuberculosis patients, are carrying proportionately more HIV than the average population (SOLNAC, 2007).

Antiretroviral therapy has been introduced in Somaliland around 2005 in a free of charge basis in Hargeisa Group Hospital (HGH) HIV Clinic. The project started with few patients and the number has been increasing afterwards. In the following years, some other clinics were established in the other regions of the country. Currently, around 2000 people are enrolled in HGH HIV Clinic of which more than 700 are on ART.

1.1.3 Conceptual background

Adherence has been defined in varying terms but as WHO(2006) defined, it is "the extent to which a person's behavior – taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider. Strong emphasis was placed on the need to differentiate adherence from compliance. The main difference is that adherence requires the patient's agreement to the recommendations while compliance is just the patient is following the orders given by healthcare provider. In this new definition, patients should be active partners with health professionals in their own care and good communication between patient and health professional is a must for an effective clinical

practice.

The definition of adherence in this study is adapted from WHO definition of adherence. In this study, a person will be considered adherent if he/she self-reportedly following the recommendations agreed upon by the patient and health professional on basis of dosage and timing. Self-reported time adherent will be labeled when the patient complies with agreed scheduling instructions, otherwise non-adherent. A person will be said dose-adherent when he/she takes >95% the recommended doses and if not we consider as non-adherent. So in this study adherent is defined as when a person on ART takes 95% or more of prescribed drug (dose-adherence) and follows time restriction (time-adherence) for one day and one week prior to the study otherwise non-adherent.

1.1.4 Contextual background

This study has looked in to ART adherence and the factors that could lead to non-adherence. The factors assessed in the study were patient factors, service factors and patient-provider relationship. In Somaliland, there are many patients who receive services from HIV clinics in different regions of the country. The largest numbers of patients who receive ARTs are attending Hargeisa Group Hospital in Hargeisa. These patients have varying backgrounds and different socioeconomic statuses, and they live under varying circumstances which could affect their ART adherence.

In this study patient factors are age of the patient, his/her educational level, knowledge and beliefs about disease and medications, psychosocial issues and availability of social support. According to Jones et al. (1999), sub-optimal adherence showed a positive correlation with being young. A lower level of general education and poorer literacy may impact negatively on some patients' ability to adhere, while a higher level of education has a positive impact (Catz et al., 2000).A good level of understanding about HIV by the patient, a belief that ART is effective and prolongs life, and recognition that poor adherence may result in viral resistance and treatment failure (Wegner et al., 1999) all impact favorably upon a patient's ability to adhere.

The service factors that were explored included proximity to the patient's home or place of work, the expense of getting there, lengthy delays between appointments, clinic opening and closing times, long waiting times, lack of services such as child care, privacy, confidentiality, and unsympathetic or inconsiderate staff.

The patient-provider relationship factors assessed by the study included perceptions of provider

competence, quality and clarity of communication, compassion, involving the patient as an active participant in treatment decisions and convenience of the regimen. According to Chesney (2000), these patient-provider relationship factors influence ART adherence.

To my knowledge, no study on ART adherence was ever done in Somaliland and little is known about ART adherence. In this study, the researcher will investigate the level of ART adherence, factors associated with non-adherence and what the stakeholders are trying to do to improve the level of ART adherence among patients attending at this clinic.

1.2 Problem Statement

The use of potent antiretroviral combinations has provided unprecedented opportunities for effectively treating HIV disease and led to a dramatic decline in HIV mortality (Palela et al, 1998). Optimal adherence of antiretroviral therapy (ART) can profoundly inhibit viral replication, delay disease progression and improve survival (Shelton et al., 1998; Haubrich et al., 1999; Bangsberg et al., 2000; Orrell et al., 2003; Glass et al. 2006; Abaasa et al., 2008 Nachega et al., 2009). Sticking to the treatment instructions for a long-term illness poses a great challenge to the patients (WHO, 2003).

In Somaliland, ART services were introduced on free-of charge basis in 2005 with a small number of patients. Ever since, the number of patients enrolled for ART was increasing. With the importance of near-optimal adherence, little is known about the level of adherence and the factors that influence the non- adherence behavior of these patients. So, this study was aimed to determine the level of ART adherence among patients attending at Hargeisa Group Hospital HIV Clinic. Similarly, the study l looked at the factors that either improve or discourage optimal ART adherence among these patients.

1.3 Objectives

1.3.1 General Objective of the Study

The general objective of this study was to assess antiretroviral therapy adherence among patients attending at Hargeisa Group Hospital (HGH) in Hargeisa, Somaliland.

1.3.2 Specific Objectives

i. To assess the level of ART adherence among patients attending at HGH HIV Clinic

ii. To identify the factors leading to ART non- adherence among patients attending HGH HIV Clinic

iii. To establish whether there are interventions being put forward to improve ART Adherence among patients attending at HGH HIV Clinic

1.4 Research Questions

i. What is the level of ART adherence among patients attending the HIV Clinic?

ii. Which factors are leading to ART non-adherence among patients attending the HIV Clinic?

iii. What interventions are being put forward to improve ART Adherence among patients attending the HIV Clinic?

1.5 Scope of the Study

This study was conducted in Hargeisa Group Hospital HIV Clinic in Hargeisa, the capital of Somaliland. The study was done between February and August from approval of the topic to the submission of the report. The target populations of this study were patients getting ART services from this clinic for at least 6 months prior to the commencement of the study. The study looked the level of ART adherence and factors that lead to non-adherence among patients on ART and attending this clinic.

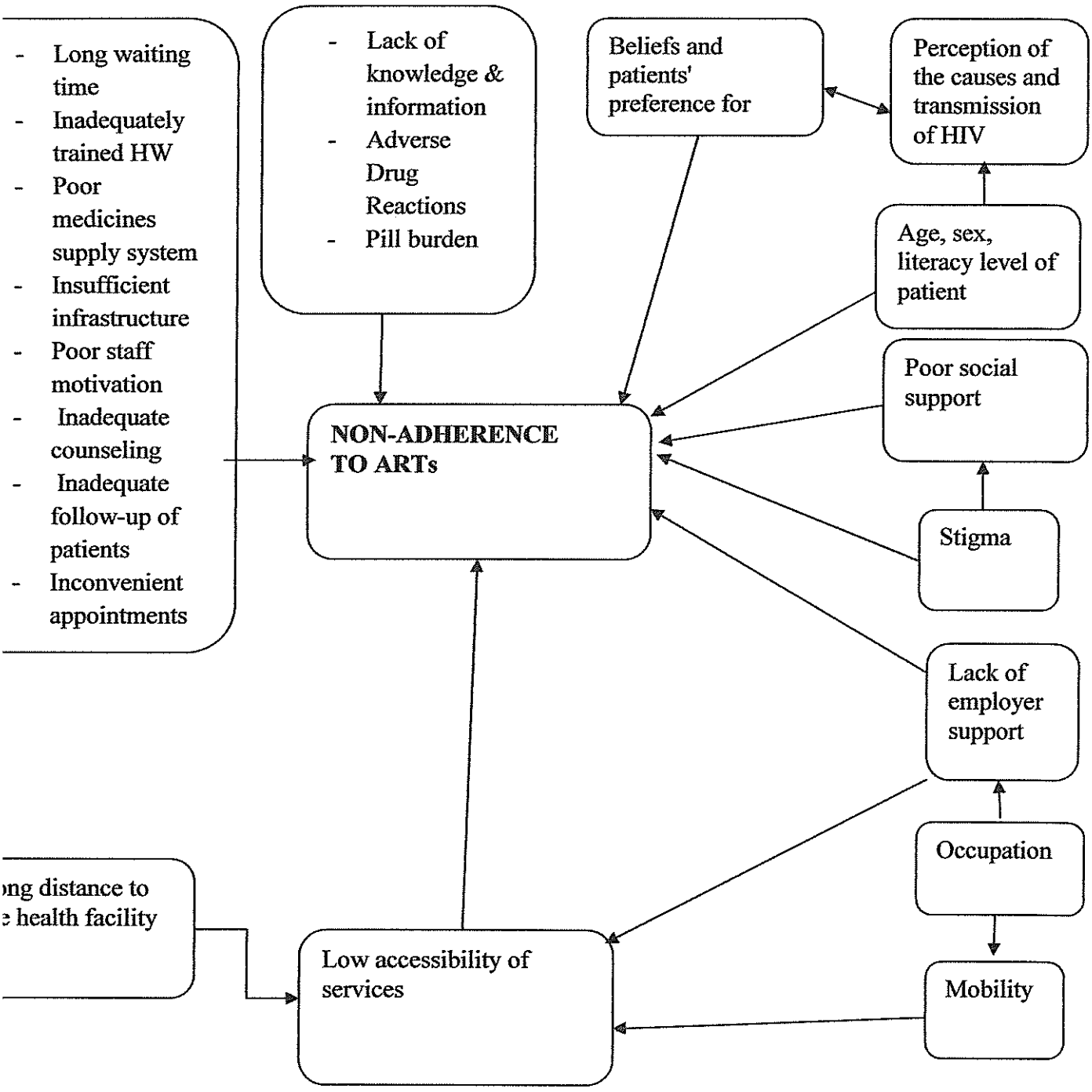
1.6 Justification of the Study

To my knowledge, studies on ART adherence were never done in Somaliland and this is the first of its kind. I hope, the results of this study will make a vital contribution to research body in this field and will result in considerable advantages for both the patients themselves and the community as a whole. The result of this study will be made available to guide the interventions that health care providers and policymakers apply to the HIV-infected population.

The findings and the recommendations of the study is also useful to the administrators of Ministry of Health of Somaliland. Henceforth, they will not rely on haphazard and unplanned personal experience or subjective expert judgments but they will base their decisions and actions on concrete knowledge of issues of the ART adherence and how to deal with adherence irregularities focusing on the research-based options of management.

1.7 Conceptual Framework

Factors leading to ARTs Non-Adherence



Source: NakiyembaA et al (2008)

1.8 Explanation of the Conceptual Frame Work

Factors that lead to ART non-adherence can be classified as service factors, patient factors and socioeconomic and cultural factors. Service factors are included support services and quality of services. When support services are inadequate or below standard, they lead to patients not to adhere their medications properly and increases defaulter rate. If patients spend long hours waiting to be served, or they cannot get people who have specialized or at least have acceptable experience of what they are doing, patients who are seeking services to that particular health center will be greatly reduced and those who still come will have strong heart to adhere their medications. If the center is characterized by long waiting time, inadequately trained health workers, treatment guidelines not available, poor medicines supply system and insufficient infrastructure, then the quality of services offered will be compromised because poor staff motivation, inadequate counseling and inadequate follow-up of patients. At the end, this will lead to non-adherence.

Similarly, patient factors like cost of care, patient income, lack of knowledge & information, adverse drug effects and pill burden will lead non-adherence. Beliefs and patients' preference for traditional medicines and alternative therapy, perception of the causes and transmission of HIV being young, being male, poor social support and stigma also lead non-adherence.

These factors were associated with ART adherence, either negatively or positively. In this study, the researcher is looking for which of the above mentioned factors have a role in ART adherence in Somaliland so that it will be easier for the programmers and planners to focus on them.

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CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

In this chapter, the researcher reviewed the literature related to ARV adherence and the factors that affect ART adherence. In the following paragraphs, the researcher has given relatively detailed information about ART adherence and the factors that may influence positively or negatively on ART adherence. These include personal factors such as age, gender and substance abuse, treatment factors such as, for example, complexities surrounding the act of drug dosing, pill burdens, side effects and special food requirements; the provider-patient relationship; attitudes towards the prevailing system of care such as, for example, any dissatisfaction with the health care system of the facility.

2.1 Level of ART Adherence

As ARTs are to be taken for long period of one's life time, it was shown it should be taken properly following the recommended dosage and time. If these evidence-based procedures are used it was shown that ARTs will decrease significantly the morbidity and mortality rates of patients living with HIV/AIDS(Jerene et al, 2006; Orrell et al., 2003; Glass et al. 2006; Abaasa et al., 2008; Nachega et al., 2009). If the adherence level is not kept at an optimum level, this will cause in these patients rapid disease progression, poor immunological response, increased drug resistance and increased risk of mortality (Sethi et al., 1999; Paterson et al., 2000; Hogg et al., 2002; Hugen et al., 2002; ; WHO, 2006).

ART adherence level varies in different parts of the world. It was generally shown that patients living in Sub-Saharan Africa have better ART adherence behavior than those living in other parts of the world. In a study conducted in United States of America, Arnsten et al.(2001) found out that Mean self-reported 1-week adherence was 78%. In another research done in India showed that 84% had good adherence (Ajithkumar, 2011).

In Africa, it has been shown that adherence is better in other places of the world. This is supported by studies conducted in many countries in Africa. In a study conducted in Rwanda, 94 % of respondents reported 100% adherence in a 3-days recall (MoH et al, 2011). Similarly, Tiyou et al.(2010) found that in Ethiopia 95 % of the study subjects were adherent to medications based on self-report adherence in a one-week recall. The finding that Africans were

having higher adherence was consolidated by review of 31 studies from North America and 27 from sub-Saharan Africa examining adherence to ART. The researchers identified that 82% of Africans succeeded at the goal of 95% or more adherence, compared with only 55% of North Americans (Mills et al,2006).

2.2 Factors That Lead To ART Non-Adherence

There are a number of key issues in the study of adherence to antiretroviral therapy, including accurate measurement of adherence, assessment of the impact of adherence on viral load and clinical outcome, determination of the factors that affect adherence, and the development of interventions. Addressing these issues may provide valuable information about which patients are most at risk for non-adherence and about how adherence might be improved.

According to Chesney (2000), the critical factors that influence adherence fall into 4 main groups: (1) patient factors, such as drug use, alcohol use, age, sex, or ethnicity; (2) medication regimen, such as dosing complexity, number of pills, or food requirements; (3) the patient–health-care provider relationship; and (4) the system of care.

2.2.1 Patient Factors

A patient's behaviour is the critical link between a prescribed regimen and treatment outcome (WHO, 2003). The most effective regimen will fail if the patient does not take the medication as prescribed or refuses to take it. Consequently, all things being equal, the most important factors influencing adherence are patient-related (Chesney, 2000). Patient's factors include age of the patient, knowledge and beliefs of the patient, substance abuse, psychosocial issues and others.

2.2.1.1 Age

Age plays a significant role in medications adherence. Studies have found that, with the exception of the most elderly, adherence increases with age. According to Jones et al. (1999), sub-optimal adherence showed a positive correlation with being younger. In another study done in Rwanda found that older age had associated with decreased odds of detectable viral load (MoH et al, 2011).

2.2.1.2 Education

A lower level of general education and poorer literacy may impact negatively on some patients' ability to adhere, while a higher level of education has a positive impact (Catz et al., 2000).

2.2.1.3 Knowledge and Belief

A patient's knowledge and beliefs about disease and medication can influence adherence. Understanding the relationship between adherence and viral load and between viral load and disease progression is integral to good adherence behaviour (Chesney, 2000). A good level of understanding about HIV by the patient, a belief that ART is effective and prolongs life, and recognition that poor adherence may result in viral resistance and treatment failure (Wenger et al., 1999) all impact favorably upon a patient's ability to adhere. Conversely, a lack of interest in becoming knowledgeable about HIV and a belief that ART may in fact cause harm adversely affect adherence.

2.2.1.4 Psychosocial Issues

Perhaps more than anything else, life stress can interfere with proper dosing of protease medication regimens (Chesney, 1997), and such stress is experienced more often and to a greater degree by individuals of low socioeconomic status. Depression and severe anxiety are both predictors of sub-optimal adherence (Hirschorn et al., 1998). At some time in the course of their illness, most people with HIV, experience a psychiatric disorder (Buhrich and Judd, 1997). Depression and/or anxiety are reported in up to 70% of AIDS patients with symptomatic disease. Adherent patients demonstrate significantly less depression or other psychiatric disturbance (Catz et al., 2000). A study conducted in Ethiopia has also shown that Patients who were not depressed were two times more likely to be adherent than those who were depressed (Amberbir, 2008).

2.2.1.5 Social Support

Availability of social support for patients taking ART has been shown to improve adherence. Social support was a constant predictor of adherence identified in many studies. Patients who reported social support were more likely to be adherent than those who did not (Amberbir, 2008). Similarly, Tiyou and colleagues (2010) found that Patients who got family support were 2 times more likely to adhere than those who didn't get family support.

2.2.2 Patient–Provider Relationship

A meaningful and supportive relationship between the patient and health care provider can help to overcome significant barriers to adherence (Stone et al. 1998;), but few providers routinely ask

about adherence or offer counseling (Hedge,1998). Factors that strengthen the relationship between patient and provider include perceptions of provider competence, quality and clarity of communication, compassion, involving the patient as an active participant in treatment decisions and convenience of the regimen (Chesney, 2000). Conversely, patients become frustrated with health care providers when misunderstandings occur, treatment becomes complex, the patient is blamed for being a "bad patient" or side-effects go unmanaged.

2.2.3 Service Factors

The organization of system of care for HIV positive patients and those on ART has a major role in patient adherence. Clinic characteristics that impact on adherence include: proximity to the patient's home or place of work, the expense of getting there, lengthy delays between appointments, clinic opening and closing times, long waiting times, lack of services such as child care, privacy, confidentiality, and unsympathetic or inconsiderate staff (Nemecheck and Tritle, 1998).

For many chronic diseases, research has shown that adherence decreases as the complexity of the medication regimen increases (i.e. the number of pills per dose and number of doses per day; the necessity to observe strict requirements related to the intake of food, and the existence of special requirements regarding fluid intake (WHO, 2003). Adherence to HIV medications is an extremely complicated process that includes both the drugs themselves and the adjustments to daily life necessary to provide the prerequisite conditions for effective drug therapy (Chesney, 2000). Some regimens require several doses of medication per day together with various requirements or restrictions on food intake and other activities. Some examples of medications that can interact with food include Zidovudine (AZT), Efavirenz, didanosine and tenofovir. Zidovudine is better taken with empty stomach but if it causes some gastrointestinal disturbances, it should be taken with low fat meal. Similarly, it is advised that Efavirenz be taken with low fat meal since high fat meal increases absorption of the drug (Castleman et al, 2004).

2.3 Interventions to Improve ARTs Adherence in Different Parts of the World

Given the long duration of ART medications and possible arise of side effects, proper adherence of ARTs is difficult to many patients. As WHO (2003) have shown, sticking to the treatment instructions for long-term illness is challenging.

To keep the patients on medications with an optimum level (≥95% adherence), there are many

interventions employed by healthcare providers and health program managers in different settings and environments. These interventions vary between counseling and giving incentives to the patients. According to Malta et al. (2005), patients who receive comprehensive information about their ART regimens, who have access to culturally sensitive health services and who have open dialogue with their health care providers are more likely to be adherent to both ART regimens and clinical follow-up visits. Giving detailed information about HIV and ARTs were used by health providers in Botswana. According to Kip et al (2009), ART information was mostly supplied to the patients by doctors during consultations, nurses during adherence counseling and pharmacists when dispensing the ARVs. Phone calling and text messaging was used in other studies. According to WHO (2013), a weekly phone text message of any length put patients on ARTs at a lower risk of non-adherence compared with those randomized to a control group.

In some clinics, the healthcare staff usually follow-up the defaulting staff especially those living in the vicinity of the clinic and sometimes they call them. Fong et al. (2003) reported that patients with irregular follow-up visits and histories of missing clinic appointments were less likely to adhere to their ART regimens than those who attended clinics regularly. As another study conducted by Malta et al (2005) have shown, follow-up visits could improve patients' clinic attendances and thus their virological, immunological and clinical ART outcomes.

CHAPTER THREE
RESEARCH METHODOLOGY

3.0 Introduction

In this chapter, it will be described in detail all the methods that was used in this study to achieve the research objectives. These include a description of the research design, sampling techniques, target population, study site, instrumentation as well as data analysis techniques. This chapter will also cover quality control techniques, ethical considerations and limitations of the study.

3.1 Study Design

This study was conducted through a facility-based descriptive cross-sectional study design. The study employed both quantitative and qualitative approaches. This design was chosen as it can give a good picture of ART adherence behavior among patients at a particular time.

3.2 Study Population

The target populations of this study were patients on ART attending at Hargeisa Group Hospital HIV Clinic. The number of patients getting ART from this clinic is 746 patients as of November 2011. The patients come to the hospital by public or private transport, although some come on foot.

3.3 Study Area

This study was carried out at Hargeisa Group Hospital (HGH) HIV Clinic. This hospital was purposively selected as it is the largest and only national referral hospital in the country that provides ART services. The hospital was selected as it has the largest ART providing clinic and the other hospitals have very much fewer patients on ARTs. It was built around 1950s by the British Colonial government. It provides services to around 1.5 million living in Maroodi-Jeex region and some referrals from other regions and neighboring countries like Ethiopia. The HIV Clinic of this hospital was established in 2004 and ART services were introduced in 2005. The clinic is part of Outpatient Department (OPD) of the hospital with no symbols different from the other OPD clinics to reduce stigmatization. It works from Saturday to Thursday of each week and 8 hours a day. On average around 50 patients attend the clinic each working day. These fifty patients comprise new patients, those who are yet to start ART, those started ART in the last 6

months and those who were on ART more than 6 months.

3.4 Sampling Methods

In this study, the researcher made use of simple random sampling technique using lottery method. This sampling technique was chosen as all patients who were eligible for the study could equally be selected and their list (sampling frame) was obtained. Each clinic day, around fifty patients were attending the clinic for consultations and for their routine follow-up visits. Of those, around 30 were eligible to the study. The research assistants were recording each patient's ID number on a separate small paper. These small papers were put in a box and 50% (around fifteen patients) were selected randomly for participation of the study. For the key informant interviews, the researcher interviewed a medical doctor in the clinic, two nurses and the clinic medical advisor to gather the needed information. The staff members were chosen using purposive non-probability sampling technique.

3.5 Sample Size

Sample size was calculated by using the following formula.

$n=Z^2pq/d^2$

Where:

n= sample size

Z= standard normal deviation at required confidence level (95% in this case)

p= the proportion in the target population estimated to have good ART adherence (50% will be used in this case as recommended by Fisher et al. since we do not have any previous estimate)

q= 1-p

d= the level of statistical significance set (in this case 5%)

$n= (1.96)^2 (0.5)(0.5)/(0.05)^2$

=385

In this study, the numbers of patients on ART attending at Hargeisa Group Hospital HIV Clinic were 746 patients. Since my target population is less than 10,000, I used the following formula to calculate final sample size (Mugenda and Mugenda, 2003):

nf: n/(1+n)/N

Where,

nf: final sample size

n: the desired sample size (when the population is more than 10,000)

N: The population size.

nf: 385/1+385/746

= 254 patients.

I added 10% (26 patients) for non-response and spoilt questionnaires. So my total sample size was 280 patients. During the data collection period, 4 patients declined to take part the study. For the remaining 276, 5 either got lost from data collectors or get spoilt because of incomplete information. Eventually only 271 participants were eligible to be used for data analysis.

3.6 Inclusion and Exclusion Criteria

3.6.1 Inclusion Criteria

The inclusion criteria of this study were patients who have been on ART for at least six months from this clinic.

3.6.2 Exclusion Criteria

This study was excluded from patients who are not independently taking medications like prisoners and mentally ill patients. Similarly, patients transferred in from other clinics in the last 6 months were also excluded from the study.

3.7 Data Collection

The research assistants (nurses) collected the data by means of interviews that was based on researcher-administered questionnaire. When the patient fulfilled the required criteria, a questionnaire was completed from him/her. These questionnaires were completed by two nurses working in the clinic. Since HIV infection is attached with stigma in Somaliland, clinic staffs were the only who can interview these patients. Having this in mind, the researcher chose two nurses from the clinic and trained for two days to familiarize them with the data collection exercise.

The researcher himself also interviewed three key stakeholders including a medical doctor in the clinic, a nurse working in the clinic and the clinic medical advisor. The baseline CD4 count records were reviewed. The last CD4 count (which happened to be checked during the data collection period) was also reviewed and compared with the baseline count.

3.8 Data Quality Control

The validity of the instruments were ascertained by expert judgment by research experts including the research supervisor and the KIU Research and Ethics Review Committee because according to Amin (2005) content and construct validity is determined by expert judgment. To test the reliability of the instruments, it was piloted with 50 patients who had similar characteristics with study target population but did not take part the actual study. The Cronbach's coefficient alpha was computed in determining the internal consistency of the instruments and it yielded 0.81.A reliability coefficient of 0.70 and above is considered acceptable (Fraenkel & Wallen, 2000).

3.9 Data Analysis

After data collection was completed, the researcher and two assistants entered the data in to SPSS (Statistical Package for Social Science) software. When data entry was completed, data cleaning was done. Simple frequencies were run to find out the level of ART adherence in one day and 7-days prior to the patient was interviewed. To find out whether there is association between independent variables and the dependent variable, cross-tabulation tables were run. To determine whether these associations are significantly related, chi square test was used with a p-value of (<0.05).

3.10 Study Variables

The independent variables of this study are the factors that lead to ART non-adherence in HGH HIV Clinic. These factors include patient factors (age, educational level, etc.) and service (patient–provider relationship) factors, regimen-related factors and system of care factors. The dependent variable was ART non-adherence among these patients.

3.11 Limitations of the Study

Since this study has used structured questionnaires one cannot discount the possibility of social desirability bias and recall bias-respondents may have overestimated their adherence. Cross-sectional study which measures the adherence of patients at once but did not give adherence level over a period since people's adherence may be different at different times and under varying situations. A more accurate set of figures about adherence was more likely to emerge from a longitudinal prospective study than from any cross-sectional studies.

This study, however, provided important information about the level of adherence and the factors that are associated with it.

To address the effects which the recall bias may have on the results of the study, the respondents were asked to about ART adherence within the last one week. This period is short enough for the respondents to remember their adherence better as compared to one month or longer. To reduce the social desirability bias, the respondents were made to understand that they would not be penalized for failing to take their medications on time and as prescribed.

3.12 Ethical Considerations

Approval and permission was obtained from the Kampala International University Research and Ethics Review Committee. Data collection permission was obtained from Somaliland AIDS Commission (SOLNAC). Hospital and clinic administration were informed and were given a copy of the approval letter. Due care was taken to ensure that all those who agree to participate in the study do so voluntarily and give written informed consent. Before the participants sign the consent form, the researcher/research assistant explained the aims and objectives of the research to all those involved and they were given an opportunity to ask questions for clarification. Participants were told that they can withdraw from the research at any time without facing any penalties. Participants were informed that any information collected will be kept confidential and that no names will appear on research documents. It was made clear that any harm to the respondent, if any from this study will be accounted for the researcher.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0 Introduction

In this chapter, the researcher presented and interpreted the results of the study in tables and charts. The data presented here is to answer the following questions:

1. What is the level of ART adherence among patients attending HGH HIV Clinic?
2. Which factors are leading to ART non-adherence among patients attending HGH HIV Clinic?
3. What are the stakeholders doing to improve the level of ART adherence among patients attending HGH HIV Clinic?

In the following table, the researcher summarized all demographic and socioeconomic status variables.

4.1 Socio-Demographic Section

	Category	Frequency	Percent (%)
Gender	Male	84	31.0
	Female	187	69.0
Total		**271**	**100**
Educational Level	No Schooling	197	72.7
	Primary	52	19.2
	Secondary+	22	8.1
Total		**271**	**100**
Age Brackets	16 to 34 Years	99	36.5
	35 and above years	172	63.5
Total		**271**	**100**
Marital Status	Single	29	10.7
	Married	100	36.9
	Widowed/Divorced/Separate	142	52.4
Total		**271**	**100**
Who do you live with?	Alone	34	12.5
	Family/friends	237	87.5
Total		**271**	**100**

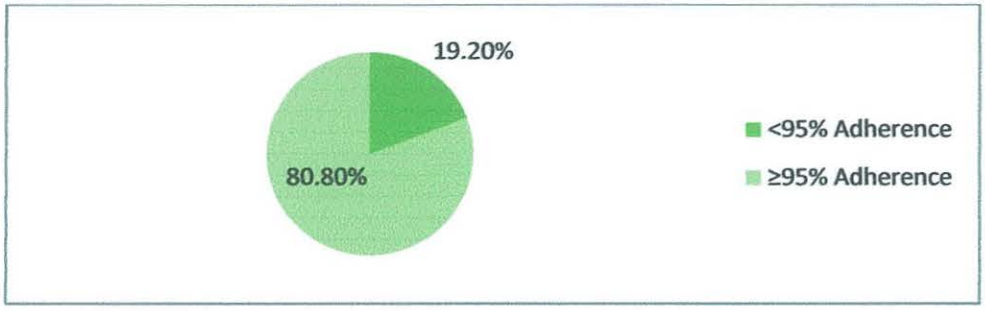
Source:Primary

As the above figure is depicting, the majority of the respondents (69%) were females and 31% were male. This shows that majority of the interviewed patients receiving ARTs from this clinic were females which in turn suggest that almost 2 thirds of the patients receiving ARTs from the clinic are women. This could mean that women seek medical care more readily than men. Almost three quarters(72.7%) of the respondents had had no formal education at all while the rest had primary, secondary or tertiary education. This makes very necessary that any information-related to their care should be tailored to their level of education. Almost two thirds (63.5%) of the respondents aged 35 years or above while the rest (36.5%) aged between 16 and 34 years. These findings show that the patients getting ARTs from this clinic were already in their middle age. Out of the total respondents, only 36.9% were married, 52.4% had a previous broken marriage while 10.7% had not married before. This means that majority of these patients do not have a spouse to help them live with the infection positively. The vast majority of the respondents (87.5%) lived wih either their families or friends and the rest (12.5%) lived alone. This suggests that vast majority could get some social support from their families and friends.

4.2 Objective One: ART Adherence Level among Respondents

Respondents were asked their level of adherence for the last seven days. Their responses were used to calculate their ART adherence on time and dose either <95% or ≥95% of the time.

Fig. 4.2Dose and time adherence combined for 7 days



Source: Primary

Out of the total respondents, 80.8% of them said they had taken their HIV medications for 95% or more of the time and dose while the rest (19.2%) said they had taken the prescribed medications for less than 95% of the time and dose. Though majority showed optimum adherence behavior, a quite significant number are taking ARTs sub-optimally. This calls for some interventions to improve their adherence behavior.

4.3 Objective Two: Factors That Lead To ART Non-Adherence among Respondents

The study explored what factors that may lead to ART non-adherence among the respondents. The factors that the study explored included gender, age, means of transport to the hospital, period the patient lived with HIV, distance from hospital and the period the patient were on ART.

4.3.1 Gender and ART Adherence Behavior

The researcher explored whether ART adherence behavior of male respondents differs from the female respondents. The cross tabulation has shown that out of the total male respondents, 82.1% (n=69) had taken ART as per schedule and dosage in 95% or more of the time while the remaining 17.9 %(n=15) were sub-optimally adherent (<95%). For females, 80.2 %(n =150) had optimally adhered to ARTs where the remaining 19.8%(n=37) sub-optimally adhered to ARTs. To ascertain if this small difference between male and female adherence behavior is statistically significant or not, the researcher ran Chi square tests. The results showed that there is no significant difference in adherence behavior among male and female respondents (X^2=0.139, df=1, p=0.709). This shows that adherence of male and female in this study were almost the same and that sex is not associated with no-adherence.

4.3.2 Age and ART Adherence Behavior

The study explored if there is any relationship between varying age groups and adherence behavior. Among the respondents in the 15-30 years age bracket, 78.3 %(n=54) had adhered optimally to ART while the rest (21.7%) had a level below optimum adherence. For those aged 31-45 years, 81.1% optimally adhered to ART dose and time where the rest sub-optimally adhered. Among those aged above 45 years, 83.1% had ART adherence level of 95% or higher while the remaining 16.7% (n=27) had lower adherence level in ART dosage and time. This study shows that there is no significant difference between varying age groups and ART adherence behavior (X^2=0.489, df=2, p=0.783). This shows that the age group was not associated with adherence and we do not need programs targeting different age groups.

4.3.3 Transport to Hospital and ART Adherence Behavior

The study aimed to determine if there is any significant relationship between the means the

respondents come to the hospital and ART adherence behavior.

Table. 4.3 Transport to Hospital and ART Adherence Behavior Crosstab

			Dose and time adherence combined		Total
			<95% adherence	≥95% adherence on time an dose	
How do you get here	Foot	Count	34	94	128
		% within how do you get here	26.6%	73.4%	100.0%
	Public transport	Count	12	87	99
		% within how do you get here	12.1%	87.9%	100.0%
	Private car	Count	6	38	44
		% within how do you get here	13.6%	86.4%	100.0%
Total		Count	52	219	271
		% within how do you get here	19.2%	80.8%	100.0%

Source: Primary

As this figure depicts, 73.4% (n=94) of those who come to hospital on foot had adhered to ART optimally while the rest (26.6%) were sub-optimally adherent to ART dosage and schedule. Among those come on public transport, 87.9% (n=87) had taken ARTs as prescribed (both time and dosage) while the rest (12.1%) said they took less than 95% of the time. Of those come on private car, 86.4% (n=38) reported to have adhered ARTs optimally while the remaining 13.6% had adhered below the expected dosage and timing of ARTs. These figures show that there is some difference between ART adherence and the means that respondents come to hospital. To ascertain whether this relationship is significant statistically, the researcher used Chi square test. The results showed that there is significant relationship between how respondents come to hospital and ART adherence behavior ($X2=8.552$, $df=2$, $p=0.014$). These results suggest that

those came on foot had sub-optimal adherence compared to those came on foot. This means making services closer to the clients or giving them transport services could improve their adherence behavior.

4.3.4 Marital Status of Respondent and ART Adherence Behavior

The study aimed to determine whether there is relationship between the marital status of respondents and adherence behavior. The cross tabs have shown that 79.3% (n=23) of those who said they have never got married had optimal adherence to ART timing and dosage while the rest (20.7%) had sub-optimal adherence. Among those who were married at the time of data collection (n=100), 80% had optimal adherence while the remaining 20% had sub-optimal adherence. Of those who have ever got married (widowed/separate/divorced), 81.7% (n=116) had optimal adherence while the rest (18.3%) had sub-optimal adherence. When Chi square test was run, the slight difference in the table was not statistically significant (X^2=0.155, df=2,p=0.925).

The study sought whether there is any relationship between the number of people living in the household of the respondent and ART adherence behavior. The results of the cross tab have shown that 73.5% (n=34) of those said to have lived alone, had optimum adherence while the rest (26.5%) had poor adherence. Among those lived with family (n=229), 81.7% had optimum adherence while the rest (18.3%) had sub-optimal adherence. Of those lived with friends, 87.5% had optimum adherence while the rest had poor adherence. The study found that there is no statistically significant relationship between who the respondents lived with and ART adherence(X^2=1.5, df=2, p=0.472). This means those lived alone were not different from those lived with families and friends when it comes to ART adherence. This could be affected by the fact that those lived alone were small number compared to those lived with others.

4.3.5 Distance from Home to Hospital and ART Adherence Behavior

The study aimed to determine whether there is a relationship between the approximate distances of patient has to cover from home to hospital and ART adherence.

Table. 4.4 Distance and ART Adherence Behavior Crosstab

			Dose and time adherence combined		Total
			<95% adherence	≥95% adherence on time an dose	
Distance from home to hospital	≥5km	Count	42	136	178
		% within what is the approximate distance from home to hospital	23.6%	76.4%	100.0 %
	<5km	Count	10	83	93
		% within what is the approximate distance from home to hospital	10.8%	89.2%	100.0 %
Total		Count	52	219	271
		% within what is the approximate distance from home to hospital	19.2%	80.8%	100.0 %

Source: Primary

As this figure is depicting, 76.4% (n=136) of those lived within 5km of hospital area, had optimum adherence while the rest (23.6%) had sub-optimal adherence. Among those covered more than 5km to get to hospital, 89.2% (n=83) had optimum adherence while only 10.8% had sub-optimal adherence. This shows those lived far from hospital were less adhered to ARTs than those lived nearby hospital. The Chi square analysis shows that there is significant relationship

between distance from home to hospital and ART adherence (X^2=6.497, df=1, p=0.011). This suggests that covering long distances by the patient to collect the ARTs can lead many patients not to come their medications on time.

4.3.6 Service Waiting time and ART Adherence Behavior

The study explored whether there is any relationship between service waiting time and ART adherence behavior. The cross tabs have shown that 81.5% (n=185) of those said they wait less than 20 minutes, had optimum adherence behavior while rest (18.5%) had sub-optimal adherence. Among those waited between 20-40 minutes, 77.3% (n=34) had adhered to ART timing and dosage more than 95% of the time while the rest (22.7%) had adherence less than 95%. Although it seems that those waited longer had lower optimum adherence, this is not more than chance alone (X^2=0.424, df=1, p=0.515). Almost all the respondents waited services less than 1 hour and were not associated with any poor adherence behavior.

4.3.7 Family Size and ART Adherence

The study sought whether there is relationship between respondent family size and ART adherence. The tabulation has shown, 82.1% (n=170) of those who live with a family size of six people and above, had more than 95% ART adherence while 17.9% (n=37) of them showed less than 95% ART adherence. On the other hand, for those who said they live with one to six individuals, 76.6% (n=49) indicated more than 95% to ART adherence while the rest (23.4% of the respondents) had less than 95% of ART adherence. Although the results seemed that those lived with a family size of 1-6 people had better adherence behavior to ART medication, the chi square results shows that there is no significant difference of family size with ART adherence(X^2=0.976, df=1, p=0.323). This shows that patients living with large family size were not different from those living with smaller members. This means that there is no need to have interventions targeting particular family size as they do not differ in ART adherence.

4.3.8 Earning Income and ART adherence

This study aimed also whether there is relationship between those earns their income and ART adherence behavior. The results of the cross tabulation have shown that 84.7% (n=116) of those said they don't earn their own incomes, had more than 95% confidence level to the ART adherence while 15.3% (n=21) showed optimal confidence level to ART adherence. At the same

time; for those said they earn their own income, 76.95 (n=103) reported more than 95% ART adherence while the rest (23.1%) showed below standard ART adherence. The chi square analysis indicated that there is no significant difference between those earn their income and those who do not in ART adherence. (X^2=2.662, df=1, p=0.103). As the services were all free of charge and cost of was not a barrier, they all can come to the services provided they live nearby or have a transport.

4.3.9 Period lived HIV infection and ART Adherence

The study aimed to find out if the adherence behavior changes with the period the respondent lived with HIV.

Table. 4.5 Initial HIV Diagnosis and ART Adherence Crosstab

			Dose and time adherence combined		Total
			<95% adherence	≥95% adherence on time an dose	
How long has it been since you were with HIV?	6months - 3 years	Count	40	118	158
		% within How long has it been since you were with HIV?	25.3%	74.7%	100.0 %
	4 years and above	Count	12	101	113
		% within How long has it been since you were with HIV?	10.6%	89.4%	100.0 %
Total		Count	52	219	271
		% within How long has it been since you were with HIV?	19.2%	80.8%	100.0 %

Source: Primary

As the tabulation explains; for those respondents who have reported that they had the infection between six months and three years, 74.7% (n=118) showed an optimum ART adherence while 25.3% (n=40) reported less than 95% ART adherence. At the same time, 89.4% of those said between four years and above had optimum ART adherence while 10.6% (n=12) showed less than 95% ART adherence. The results have shown that the longer the respondent lived with HIV, the longer s/he adheres to ART medication (X^2=9.177, DF=1, p=0.002). This finding means those lived longer with HIV have better adherence than those lived with it relatively shorter period. This suggests that they have developed some coping mechanisms that helped them adhere more to the medications. Those lived with HIV longer periods could help the newly diagnosed learn how to cope with it.

4.3.10 Family's Awareness to Respondent HIV status and ART adherence

As far as their families were concerned, respondents were asked whether their families knew their HIV status or not. The cross tabulation depicted that 73.1% (n=38) of the 52 respondents who said their families had no information about their HIV status showed optimal Adherence to the ART medications, while 26.9% (n=14) of the same group reported less than 95% ART adherence. On the same question, 82.6% (n=181) of those reported that their families knew their HIV status had optimal adherence to ART medications where 17.4% (n=38) showed less than 95% ART adherence. The chi square analysis showed that there was no significant difference of whether families knew their HIV status or not to the ART adherence behavior (X^2=2.483, df=1, p=0.115). This means that the patients who disclosed their HIV status to their families were not different than those who did not disclose to them. Disclosing patients' family does not improve or change ART adherence as shown by this study.

4.3.11 Friends' Awareness to Respondent HIV Status and ART Adherence

The study sought to find out if there was any difference in ART adherence among respondents their HIV status was known to their friends and those not known by friends. In reference to cross tabulation analysis; 80% (n=156) of the respondents whom their HIV status was not known to their friends had optimal adherence on time and dose while only 20% of them had less than 95% adherence on time and dose. For those reported that friends knew the HIV status, 83.3% (n=35) showed optimal adherence on time and dose, where the rest (16.7%) of the responses indicated less than 95% adherence on time and dose. On the other hand, 82.4% (n=28) of those who were

not sure if their friends knew their HIV status reported 95% or more adherence on time and dose while 17.6% of them showed less than 95% adherence. From the chi square analysis, there was no significant differences of whether friends knew about their HIV status or not and ART adherence behavior. (X^2=0.307, df=2, p=0.858). Patients whose HIV status was known to their friends were not different than those who did not disclose to their friends.

4.3.12 History of Mental Illness and ART Adherence

The study explored the relationship between history of mental illness of respondents and ART adherence on time and dose. The vast majority, 80.2% (n=207) of those who said they had no treatment from mental illness, reported optimum adherence on time and dose, while only 19.8% (n=51) had less than 95% ART adherence on time and dose. On the other hand, 92.3% (n=12) of those reported yes they had treatment from mental illness, showed optimality on adherence while 7.7% signified less than 95% adherence on time and dose. The chi square analysis showed that there was no significant difference between respondents who said they had no treatment from mental illness and those who said they had treatment and their optimal and sub-optimal ART adherence. (X^2=1.164, df=1, p=0.281). This suggests that there is no need to have different interventions or approaches of management for patients who had experienced some mental illness than those who did not.

4.3.13 Respondents' Knowledge on the difference between HIV and AIDS and ART Adherence

The study explored whether there is relationship respondent's knowledge on difference between HIV and AIDS, and ART adherence behavior. The results of the cross tabulation have shown that out of 199 respondents who said they didn't know the difference between HIV and AIDS, 82.9% (n=165) had optimal adherence to time and dose, while 17.1% (n=34) reported less than 95% ART adherence. For those who knew the difference, 75% (n=54) showed 95% or higher ART adherence, while the remaining 25% reported minimal ART adherence of less than 95%. Accordingly, the results from the chi square showed that there was no significant difference between the respondent's knowledge of the difference between HIV and AIDS and their behavior on ART adherence. (X^2=2.136, df=1, p= 0.144). The patients who had relatively good knowledge about HIV were not significantly different than those who had lower knowledge.

4.3.14 Knowledge on what CD4 measures and ART adherence

The study sought to find out whether there is relationship between respondents knowledge on what CD4 measures and their behavior on ART adherence.

In reference to the above cross tabulation, 81.1% (n=185) of those said they did know had optimal ART adherence while 18.9% of the respondents reported less than 95% adherence. On the other hand, 79.1% (n=34) of those reported they knew what CD4 measures had 95% or higher ART adherence, while 20.9% (n=9) showed less than 95% adherence. The chi square analyzes showed that there was no differences between respondent's knowledge on what CD4 measures and their behavior on ART adherence. (X^2=0.100, df=1, p=0.752). This means the clients who knew what CD4 measures were not different in adherence than those who did not know.

4.3.15 Respondent's Knowledge on how ARTs work and ART Adherence

The study aimed to determine whether there is relationship between respondents' knowledge on how ARTs work and ART adherence behavior.

Among those respondents who didn't know how ARTs work; 83.6% (n=112) had optimal adherence while 16.4% (n=22) reported less than 95% ART adherence. For those knew how ARTs work; 78.1% (n=107) showed 95% or higher ART adherence while the rest with 21.9% the respondents reported sub-optimal adherence to the ART medication. In addition, the chi square analysis also showed that there was no significant difference between the respondent's knowledge on how ARTs work and their behavior on ART adherence. (X^2=1.312, df=1, p= 0.252). Patients who did not know how ARTs work were not different in adherence than those who did not know.

4.3.16 Respondent's Knowledge on how food can interfere Some ART absorption and Adherence Behavior

The study sought to determine whether there is difference in ART adherence among respondents who knew that some ARTs should be taken with empty stomach and those who did not know.

The cross tabulation analysis has shown that above three quarters (78.6%) (n=33) of those strongly disagreed or disagreed to the statement 'Some ARTs have to be taken on an empty stomach while others may be taken with food' had optimal adherence while 21.4% (n=9) had sub-optimal adherence of less than 95%. For those agreed with the above statement, 82.1%

(n=179) reported optimum adherence while 17.9% (n=39) showed sub-optimality to ART adherence. For the 'Don't know group' (they do not either agree or disagree with the statement), 63.6% (n=7) had optimal adherence where the rest (36.4%) of respondents reported less than 95% ART adherence. From the chi square analysis, there was no significant difference between the respondents who knew that some ARTs should be taken with empty stomach and those who do not know (X^2=2.466, df=1, p=0.291).This means that knowing that some foods affect absorption of some ARTs did not make him/her have better adherence than those who do not know.

4.3.17 Respondent's Knowledge on the importance of not missing a dose and ART Adherence

The study explored whether there is difference in ART adherence among respondents who knew that it is important not to miss ART doses and those who think so. The cross tabulation showed that 80% (n=208) of those either strongly agreed/agreed to the statement 'for my medicines to work best, I should not miss a dose or take late' had optimal adherence while 20% (n=52) reported less than 95% ART adherence. On the other hand; for the respondents who do not know the importance of this statement, 100% (n=11) showed optimal adherence to the ART medications. From the chi square analysis, there was no significant difference between respondent's agreement or disagreement on whether they had decided not to miss a dose when medicines worked well and their behavior on ART adherence. (X^2=2.722, df=1, p=0.099). This study did not show any difference in adherence in patients who knew the importance of not missing a dose and those who do not know.

4.3.18 Respondent's level of education and ART medications

The study aimed to find out whether there is relationship between respondent's level of education and ART adherence. The results have shown that 83.2% (n=164) of those who had no formal education showed optimal adherence while 16.8% (n=33) reported less than 95% adherence. Among those with primary and higher education, 74.3% (n=55) had optimal adherence while the rest (25.7%) showed sub-optimal adherence. The chi square analysis showed that there was no significant difference between respondent's level of education and their behavior on ART adherence. (X^2=2.763, df=1, p=0.096). These findings did not show any association between patients' level of education and ARTs adherence.

4.3.19 Chewing Kat and ART adherence

The study explored whether there is difference in ART adherence between Kat chewers and those who do not chew. The results of the cross tabulation have shown that 79.7% (n=47) of those chewed Kat had optimal adherence where 20.3% (n=12) showed sub-optimal adherence. For those who don't chew; 81.1% (n=172) reported 95% or higher adherence while the rest 18.9% (n=40) had less than 95% adherence. There was no significant difference between respondent's chewing behavior and their ART adherence. (X^2=0.064, df=1, p=0.800). This means that chewing Kat did not predispose the patients to be less adhered to the ARTs than those who do not.

4.4 Objective Three: Interventions Being Put Forward To Improve ART Adherence Behavior

The study explored the interventions being put forward to improve the ART adherence. To achieve this, the researcher himself has conducted key informant interviews with clinic staff including nurses, doctors and the medical advisor of the organization that supports the clinic.

The majority of the key informants cited that they sometimes have put in place some mechanisms to improve patients' adherence behavior. These mechanisms include having guardian/guarantor for patient before they start ART treatment and he/she helps find patients if they fail to show up for appointments. Other mechanisms that were mentioned included thorough and regular counseling before and after starting the ARTs. The respondents also mentioned that they monitor how patients appear on appointments, patients improvements both clinically (signs and symptoms improvement) and biochemically (CD4 counts) and pharmacy refill records. One of the doctors in the clinic said like this 'We use many tactics to monitor patient's adherence and these methods complement each other. Before we start ARTs we spend some time with each individual patient to make him/her understand how ARTs work and what could spoil their effectiveness. This thorough counseling is one of the ways we intend to improve ARTs adherence. How the patients keeps appointment is another way we use for ART adherence monitoring- generally patients who keep clinic appointments may have better adherence than those who dodge. Pharmacy refill records, clinical improvement and progress in CD4 cell count are also other ways we monitor whether the patient is taking the medications as prescribed'.

When asked how they deal with patients who fail to attend scheduled appointments and whether

there is any mechanism for clinic staff to know if the patient is sick, has died or dropped out, he said 'When patients are enrolled for ART, we ask them to bring their guardian-any person the patient trust-) to the clinic and the guardian's contacts are obtained. If the patient fails to show up on appointments, we call the guardian. When the patient is off ARTs for 3 months and above, we consider him/her 'ART defaulter'.

The key informants mentioned that they do not use transport system to support the patients come from their homes to hospital. A clinic nurse said "We used to have a car that transports patients with HIV and Tuberculosis (TB) co-infection from our clinic to the TB hospital and that is longer available".

To make the services closer to the community, the respondents cited that they sometimes bring PMTCT medications to the facilities that have delivery wing.

The respondents also mentioned that they direct patients to a local organization, called Talo-wadaag, which supports financially and gives some dry food to patients. This organization also gives regular counseling in their setting. A clinic nurse said "We send patients to Talo-Wadaag organization where they further counseling and some dry ration". The medical doctor mentioned that they had enough supply of ARTs since the opening of this clinic.

Answering the question, 'If resources were not a problem, what do you think would be some useful intervention approaches to improve ART adherence rates at your clinic', the clinic medical advisor said: 'improved psychosocial support services, assisting in payment of school fees of those patient who have children and nutritional support since many patients fail to take medications because of inadequate food security, extra training for staff on counseling would have helped these to adhere better to medications'. Continuing his answer 'these interventions would have reduced stigma, increased the health literacy of these patients, helped stop Kat chewing and related substances and would have helped them divert from traditional healers'. These findings show that there are already some interventions that are already in place to improve or monitor patient's adherence. This means that these interventions have kept many patients in an optimum adherence and that there is still a room for improvement.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

In this chapter, the researcher discussed the important findings of this study. The findings were discussed in line in the order of the objectives. The findings of the study were compared and contrasted with varying findings from other studies conducted elsewhere in the world.

5.1 Discussion of Results

In here, the researcher compared his findings with the work already done by other researchers around the region. The researcher discussed the findings of each objective at a time.

5.1.1 ART Adherence Level among Respondents

The researcher found out that 80.8% patients on ART at HGH HIV Clinic had optimum adherence (≥95% of time and dose) while the rest had adherence level that was below 95% which can lead HIV can develop resistance against ART. This level of adherence is very close to what was found by Dagnew (2009) in Ethiopia (80.2% of optimum adherence). Similarly Abaasa (2008) in Uganda found 78.2% of good adherence. These results are much higher than results by Weiser (2003) and Bangsberg (2000). On the other hand, these findings are significantly lower what was found in Ethiopia by Tiyou et al (2008) where 95% of respondents had ≥95% adherence to time, food and dosage. Ministry of Health of Rwanda and partners (2011) found 3 days-adherence level of 94%. This high adherence level was also shown by a survey conducted by Shumba et al (2013), which revealed that 97% of the patients had not missed their doses in the last week and 93% of patients had not missed appointments in the past three months.

5.1.2 Factors Leading To ART Non- Adherence among Respondents

The researcher assessed the factors that led patients to be non-adherent on ART. The assessed factors included age, sex, marital status, educational level, the means they come to the hospital, income level and many others. I have discussed the most important factors in the following paragraphs.

This study shows that there is no significant difference between varying age groups and ART

adherence behaviour (X^2=0.489, df=2, p=0.783). The results of this study is similar to the findings of some other studies done elsewhere including Chesney et al. (2000), Weiser et al. (2003), Amico et al. (2006), Amberbir et al.(2008) and Dagnew (2009). In contrast to this, some studies found that there is significant association between age of the patient and ART adherence. For example, Stone et al. (2001) state that the younger the patient, the more likely it was that they would miss doses. Glass et al. (2006), in a Swiss cohort study, also found that the younger the patient, the less likely it was that that they would adhere to the ART schedule. A study by Wenger (2002) showed that the older the patient, the higher was the rate of ART adherence.

For the means they come to the hospital, the study found out that those come by car (private or public) had better adherence level than those come on foot. This was supported by two studies done in Uganda and Botswana that showed cost of the transport was hindering patients reach the hospital to re-collect their doses (Hadon et al, 2007).

This research found out that marital status does not play a significant role in adherence of ART among patients attending HGH HIV Clinic ((X^2=0.155, df=2, p=0.925). Similarly, Dagnew (2009) found that ART adherence behavior and marital status are not significantly related. Weiser et al (2003) found similar findings.

The findings of this study showed that there is significant relationship between distance from home to hospital and ART adherence (X^2=6.497,d.f=1, p=0.011). A study conducted by Markos et al. (2008) found that patients who lived less than 47 kilometres or exactly 47 km away from the health facility were more likely to adhere to the ART regimen than those who lived more than 47 km from the facility. In contrast to this finding, Golin et al. (2002) that states that ready access to care is not statistically significantly related to ART adherence.

According to this study, family size played no role in the adherence behavior of the respondents. This is in contrast what Ministry of Health of Rwanda et.al (2011) found- Living in a large household was associated with lower adherence rates possibly due to the lack of privacy in taking medication, and the lack of support where there is no disclosure.

The time they lived with HIV was significantly-related to adherence behavior. The longer they had HIV, the better their adherence behavior

5.1.3 Interventions Being Put Forward to Improve Art Adherence

The clinic staff mentioned that they try to keep patients after they start by using varying techniques. These techniques include thorough counseling and giving detailed information about

ARTs to patients. Failure to give patients enough information may lead patient stop medications at their will or when they experience expected side-effects. According to WHO recommendations (2003), patients need to be adequately informed about their treatment schedule and the importance of adhering to the treatment regimen. Lack of proper information to patients for regarding ARTs were seen in Uganda and Botswana (Hardon et al. ,2007). Getting the contacts of guardian/guarantor and having regular appointments with the patient was mentioned as a means of getting improving ART adherence in this clinic.

Pharmacy refills was another way monitoring patients adherence behavior. This mechanism was used elsewhere in the world and Sub-Saharan Africa. It is assumed that patients who collect their medications regularly are adhering to the treatment (Population Council et al2004). His method has the advantage of being a simple and an objective measure of adherence.

Nevertheless, this method is not without pitfalls. For one, the assumption that collecting medications when due is equal to perfect adherence is erroneous as patients may not actually be taking them, could be sharing them with kith and kin, or pill dumping.

The respondent also cited that they call patients if they do not show up to collect their ARTs.

The study explored whether respondents would suggest other services to be included in the clinic to improve ART adherence of patients. The respondents cited that adding more services could improve ART adherence among these patients. The suggested services included more training for clinic staff on counseling, school fees support for patients who children and nutritional support.

5.2Conclusions

5.2.1-In conclusion, this study found out that 80.8% of patients attending Hargeisa Group Hospital HIV Clinic had adherence level of 95% or more. As ART adherence is very important for their effectiveness, this level is needs to be improved.

5.2.2-There are several factors that led these patients to fail to adhere taking the ART medications. These factors included lack of transport to the hospital, living far away from the clinic and being with HIV less than 3 years. The study assed other factors and were found to be non-significant. These factors include age of the respondent, marital status, educational background, living alone, Kat chewing, knowledge on ARTs, CD4 and Viral measurements, disclosure of HIV status to friends and families and having

hospitalized before.

5.2.3-The key informant interviews with the clinic staff and management have shown that they use some techniques to track patients' adherence behavior. The cited ones were having contacts of the patient guardian, allowing the guardian to collect for the patient, pharmacy refill and showing up on appoints. The key informants mentioned that there are no transport services to take patients to clinics and they take PMTCT ARTs to the MCHs that mothers can deliver. They also reported that they direct HIV patients to a local organization that gives more counseling and some nutritional support to them.

5.3 Recommendations

5.3.1 Objective 1

i. Government and other stakeholders should endeavor to improve and monitor of patients' ART adherence.

5.3.2 Objective 2

i. Make the ART providing Clinics closer to the community as the transport to the only center in Hargeisa is challenging to many of the patients who cannot pay the cost of the transport. This can be achieved by opening new HIV clinics in the other parts of Hargeisa or where it is not possible to establish outreach programs that distribute ARTs on monthly basis

ii. Establish support groups of people with HIV so that those lived with HIV longer can support newly diagnosed people. In these groups they would share experiences.

5.3.3 Objective 3

i. To give refresher trainings to the clinic staff in order to improve counseling services

ii. Develop strategies to ensure food security in households with people living with HIV and AIDS

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APPENDIX I

ARTA dherence Key Informant Interview Guide

Name of the interviewer: Date:

Location:

Position of the respondent:

1. What type of transport services do you provide to support patients come to collect their medications?
2. Who is allowed to collect ARTs for the established patient?
3. How is an individual patient's adherence to ART monitored in this clinic? If not why?
4. Do you have a formal system in place to monitor whether patients receiving ARTs attend scheduled appointments? If yes describe how this is done
5. If a patient does not attend, how do you know if they are ill, have died or have dropped out? Please describe how this is done and how it is recorded?
6. At what point is a patient considered an ART program dropout or defaulter?
7. If resources were not a problem, what do you think would be some useful intervention approaches to improve ART adherence rates at your clinic?
8. Which underlying problem or barrier to adherence would these interventions deal with?
9. What plans do you have to bring ARTs closer to the patients living areas?
10. How frequent do you experience ART stock-outs?
11. Are social groups that support patients to adhere to medications?

APPENDIX II

Adherence Questionnaire

SECTION A: Socio-Demographic

Patient Number:

CD4 (baseline):

Subsequent CD4 Counts (list in order):

Remaining pill count:

Last date given ARTs:

1. Sex: □ Male □ Female

2. Age in years:

3. Address: How do you get here (transport)? ----------

4. Educational level: □illiterate □ literate□Primary □ Secondary □ Tertiary

5. Marital status:

6. Do you live: □ Alone □ with Family □ with Friends □ Other (specify) ----------

7. What is the approximate distance from home to hospital

□less than 5km □ More than 5km

8. for how long do you spend waiting services?----------

9. Are health workers friendly?----------

10. Do you get desired services? □ yes □ No

11. Where you live:

11a. How many people live in the house including you?

□ less than 3 □ 3 to 6 □ 7 to 9 □ more than 10

11b. How many rooms are there in the house?

□ 1 □ 2 □ 3 □ more than 3

11c. Is your water supply source:

□ Piped into house □ A stand pipe □ Other

If Other, please specify:_____

11d. Is there electricity in your house?

□ Yes □ No

11e. Does your household has:

- kerosene lamp (faynuus)
- TV set
- Mobile phone
- Fixed phone
- Fringe
- VCR/DVD

11f. Does any member of your household have:

- A watch
- A bicycle
- A car
- A sewing machine

12. Do you earn your own money? □Yes □ No ,

If yes, □full time □ part-time

If yes, how do you earn money?

- Crop farming
- Livestock rearing
- Haftooley
- Chat seller
- Grocery vendor
- Tea café
- Shop
- Driver
- Other , please specify.....

13. What is your average weekly income? (include pension, public assistance, support from family/friends, etc.)

□ less than $ 7□

more than $7

14. How long has it been since you were diagnosed with HIV infection?

□ less than 1 year □ 1-3 years □ 4-6 years □ more than 6 years

15. Have you had HIV-related previous hospitalizations? □ Yes □ No

If Yes, what year?_____

If Yes, please specify the reason for hospitalisation:_____

SECTION B: Psychosocial History

16. Is your family aware of your HIV status?

□ Yes □ No □ Don't Know

17. Are your friends aware of your HIV status?

□ Yes □ No □ Don't Know

17a. If Yes and you are taking antiretroviral medication, do they help you take your medication?

□ A lot □ Somewhat □ A little □ Never □Not applicable

18. Have you ever been treated for a mental illness?

□ Yes □ No

If Yes, please specify:_____

19. In the past four (4) weeks, have you been unable to cope with all the things you need to do?

□ Never □ Sometimes □ Often □ Always

20. In the past four (4) weeks, have you felt down (depressed)?

□ Never □ Sometimes □ Often □ Always

21. If you are feeling down (depressed), is there someone you can talk to?

□ Yes □ No

21a. If Yes, is he/she (check as many as apply):

□ A family member □ A friend

□ A colleague at work □ A member of a support group

□ A doctor □ A nurse

□ A social worker □ Another member of the healthcare team

□ Other, please specify_____

21b. If you have no one to talk to, what do you do to relieve stress or when you have a problem?_____

22. Do you drink alcohol? □ yes □ No

If yes, how often:

□ Daily, more than 3 drinks

□ Daily, less than 3 drinks

□ Weekly, less than 5 drinks

□ Rarely/Occasionally

23. How often do you smoke cigarettes?

□ Regularly, more than 5 cigarettes/day

□ Regularly, less than 5 cigarettes/day

□ Occasionally

□ stopped (how long ago):

□ Never

24. How often do you chew Kat?

□ Daily

□ Weekly

□ Occasionally

□ Never

25. Do you take any other substances?

□ Yes

□ No

If yes, please list them_____

SECTION C: HIV Knowledge

YES NO DON'T KNOW

26. Do you understand the difference between HIV and AIDS? ( )

( ) ( )

If Yes, please explain:_____

27. Do you know what a CD4+ T cell count measures?

( ) ( ) ( )

If Yes, please explain_____

28. Do you know what viral load measures?

() ( ) ( )

If Yes, please explain_____

29. Do you know how antiretrovirals work?

() () ()

If Yes, please explain_____

30. The following statements are attempts to capture respondents knowledge and beliefs about taking antiretroviral medicines.

	Strongly Agree	Agree	DK	Disagree	Strongly Disagree
30a. I have to take them for the rest of my life.	()	()	()	()	()
30b. Someantiretrovirals have to be taken on an empty stomach and others may be taken with food.	()	()	()	()	()
30c. The time at which the medication is taken will influence its effectiveness.	()	()	()	()	()
30d. Missing doses and/or taking them late or incorrectly will determine if the treatment works.	()	()	()	()	()
30e. For my medicine to work best, I should not miss a dose, nor take it late or incorrectly.	()	()	()	(	)
30f. Drug resistance develops when myantiretrovirals are missed and/or taken late or incorrectly.	()	()	()	()	()

SECTION D

31. How long have you been taking these medications?

- 6 months
- 7-12 months
- 13-24 months

- >24 months

32. How many doses have you missed yesterday?

- None
- One
- Two

33. How many doses have you taken earlier or later than schedule yesterday?

- None
- One
- Two

34. How many doses have you missed last 7 days?

- None
- One
- two
- More than two

35. How many doses have you taken earlier or later than schedule for the last 7 days?

- None
- One
- Two
- More than two

36. Which of the following reasons represent or would represent a major problem to you when you are taking medication? (multiple responses are allowed)

- Number of pills
- Fear of side effects
- Having side effects
- Frequency of dosing
- Interference with daily schedule
- Privacy to take medication not available
- Fear of disclosure of HIV status
- Other Please specify:_____

APPENDIX III

Consent Form (Ogolaansho)

Anigoo ah Dr. Adam Haibehfarah, ahnaardaywaxkabartaJaamacadda Kampala eeCaalamiga ah eekutaalwaddankaYugaandha,waxaankaacodsanayaainaadkaqaybqaadatocilmibaadhisloogutalog elayinaankudhamaystirtowaxbarashadayda.Waxaalagaagabaahanyahayinaadkajawaabtosuaalaha sidaacadah.Jawaabahaaadbixinaysowaxaarkikarauunanigaiyoqofkaform-kakaabuuxiyey.

Kaliyaujeedadacilmi-baadhistaniwaainwaxlagaogaadosidadadkuu qaadataandawooyinkacimrigadheereeya(ARTs)eelagubixiyocusbitaalkan.

Haddiiaaddoontowaadiskadaynkartaainaad form-kanbuuxisoiyadaooaanay wax culays ah lagaasaareynaddeeggalaguuqabto.Waxaa kale ookuu furan inaadbadhtankakagatagtoiyadoonlaguugucadhooneyn.

Mar haddiicilmi-baadhistanikuegtahayuunwaraysiiyofaylkaagaoo la eegayo, wax dhib ah lama filayoinaycaafimaadkaagasoogaadho.

Natiijadacilmi-baadhistanwaxaaloo gudbindoonaawasaaraddacaafimaadkaiyocidkastaoocaafimaadkeena wax kusookordhinaysa.

Haddiiaadrabtoinaadheshonuqulkamid ah natiijadanooga tag telefoonnambarkaagaiyociwaankaagasiaankuulasooxidhiidhno marka ay diyaarnoqoto oo la filayodhamaadkasanadkan

Magacaagahakuqorin

Saxiix.....

APPENDIX IV

Consent Form (English)

I am Dr. Adam Haibeh Farah, a Master of Public Health student at Kampala International University in Uganda. I would like to request from you to participate a study that will help me complete my studies. You are expected to answer the questions at your best and voluntarily. All the information you are giving us will be kept confidential and will be seen only by myself and the research assistant. The information will be stored in a safe environment and your identification data will be kept separate from the other information you are giving us. No one will know that you have given this information when it is published. The study aims to gather information about patients' adherence behavior on ART medications. You have the right to decline to complete this form without any negative consequences about the services you are given. You can also stop after you have started completing the form without penalty.

Since this study will involve only interviews and document review, we are not expecting you face any health or physical risks.

The results of this study will be shared with the university, ministry of health and any other partner who can contribute to improvement of health status.

If you are interested to get the results of this study, please leave your contacts with the research assistant. We will contact you when it is ready.

Do not write your name in the form.

Signature.....

KAMPALA INTERNATIONAL UNIVERSITY
WESTERN CAMPUS
LIBRARY
P.O. BOX 71 BUSHENYI

APPENDIX V

Approval letter

KAMPALA INTERNATIONAL UNIVERSITY

Western Campus
P.O. Box 71, Bushenyi
Tel: 0392961215, 0772463671
E-mail: admin@kiu.ac.ug

Postgraduate Studies and Research Directorate (PGSRD)

19th June 2012

Adam Haibeh Farah
MPH/0016/102/DF

LETTER OF APPROVAL

This is to certify that your research proposal entitled "***ANTIRETROVIRAL THERAPY ADHERENCE AMONG PATIENTS ATTENDING AT HARGEISA GROUP HOSPITAL HIV CLINIC***" was reviewed by the Board, Postgraduate Studies and Research; Research Subcommittee of Kampala International University-Western Campus (KIU-WC) in its meeting of 26th March, 2012 for its Scientific validity and Ethical appropriateness. The Committee approved that you may start conducting the research.

Signed by:

Chairman, Research Sub-Committee

Date/Stamp