Adherence to antiretroviral therapy among HIV and AIDS patients at the Kwa-Thema Clinic in the Gauteng Province, South Africa

by

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DEDICATION

This research report is dedicated to my wife, Elizabeth, my daughter, Darik, my son, Bennias, my new-born baby, Jeriel, for their inspiration, love and support; and to my Lord Jesus Christ for making everything possible.

DECLARATION

I declare that the mini dissertation hereby submitted to the University of Limpopo for the degree of Master of Public Health has not previously been submitted by me for a degree at this or any other university; that is my work in design and execution, and that all material contained herein has been duly acknowledged.

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Eyassu, M. A (Dr)   **Date**

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ACRONYMS AND ABBREVIATIONS

AIDS   Acquired Immune Deficiency Syndrome

ART   Anti-retroviral Therapy

HAART   Highly Active Anti-retroviral Therapy

HIV   Human Immunodeficiency Virus

NNRTI   Non-Nucleoside Reverse Transcriptase Inhibitor

NRTI   Nucleoside Reverse Transcriptase Inhibitor

PI   Protease Inhibitor

PLWHA   People living with HIV and ADS

PMTCT   Prevention of Mother-to-Child Transmission

UNAIDS   United Nations Agency for International Development

VCT   Voluntary Counselling and Testing

WHO   World Health Organisation

DEFINITION OF TERMS (WHO, 2010)

Adherence — Adherence to ART is taking all ARV medication in the correctly prescribed doses at the right time and in the right way while observing any dietary restriction (WHO,2010). In this study adherence to ART refers to patients at Kwa -Thema clinic who are taking the correct prescribed at the right time

AIDS — This refers to a progressive immune deficiency caused by infection of CD4+ T-cells with the human Immunodeficiency Virus (HIV).

CD4+ — This refers to an antigen maker of helper / inducer T-cells that recognises antigens bound in class II MHC protein.

Co-treatment — The treatment of two or more infections simultaneously.

Incidence — The incidence of a disease is defined as the number of new cases that occur during a specified period of time in a population at risk of developing a disease. In this study incidence rate is related to the number of new HIV infection patients per population at risk at Kwa-thema clinic.

Optimal adherence — The proportion of those patients who take their medication ≥ 95% of the time.

Sub-optimal adherence — The proportion of those patients who take their medication < 95% of the time.

Prevalence — This refers to the number of affected persons present in the population at a specific time divided by the number of person in the population at that time. In this study prevalence is related to the rate of adherence to ART in

HIV infected patients at Kwa-thema clinic.

Undetectable viral load   When the virus is not detected in the blood after a laboratory test.

Viral load   Levels of the virus found in the blood per 10 millilitres (mls).

ABSTRACT

Background: The introduction of Antiretroviral Therapy (ART) has shown a tremendous reduction in HIV-related mortality and morbidity in people living with HIV / AIDS. Adherence to ART is the key to a successful treatment outcome. This study investigates the adherence of people living with HIV who are on ART. Since high levels of adherence of more than 95% are required to achieve effective suppression of the viral load, the researcher finds it very important to establish whether the people are pursuing what is expected of them. While the use of ART has brought much excitement and hope to both patients and medical practitioners in the world, it has also brought many new questions and challenges, including adherence issues. Adherence is, therefore, essential to achieve the success of ART.

Aim: The main objective was to determine which factors influence adherence to ART among HIV and AIDS patients.

Methods: This study utilised a quantitative cross-sectional descriptive design that was conducted at the Kwa-Thema Clinic, Ekurhuleni District, Gauteng Province. Data was collected using a structured questionnaire with open- and closed-ended questions where a total of 290 respondents were interviewed. Data was analysed using SPSS software version 22 and the analysed data was presented by means of charts, graphs, and frequency tables.

Results: The findings indicated that the adherence to ART at the Kwa-Thema Clinic was 77%. Factors that were significantly associated with adherence were gender ((χ^2 = 3.78, df = 1, p < 0.05).), level of education ((χ^2 = 3.52, df = 3, p = 0.032), co-treatment of HIV and other infections (χ^2 = 5.46, df = 4, p = 0.019).), ability to follow ART (($\chi2$ = 12.82, df = 1, p = 0.000 < 0.05), and types of ARV drugs.

Recommendation: To enhance ART adherence the study recommends intensification of health education campaign against stigma and gender discrimination. Providing feedback to the patients by the healthcare providers regarding the benefits of ART is important.

Conclusion: It was concluded that the adherence to ART at the Kwa-Thema Clinic was sub-optimal (less than 95%) at 77% but comparable to the adherence levels in other developing countries.

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CHAPTER 1
INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

The Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) have become one of the major health problems in many countries in the world. The disease is widely spread in low and middle income developing countries; such as South Africa, Botswana, and other Sub-Saharan African countries (Jointed United Nations programme on HIV / AIDS (UNAIDS), 2011). However, the introduction of Antiretroviral Therapy (ART) brought dramatic changes to the lives of people (UNAIDS, 2011). People living with HIV have started to live longer and AIDS-related deaths have also been declining due to the availability of the ART programme. Since 1995, around 2.5 million deaths have been averted in low and middle income countries due to increased access to ART (UNAIDS, 2011).

ART requires a high level of adherence to minimise treatment failure and viral resistance (Weiser, Wolfe, & Bangsberg, 2003). There is a very strong relationship between adherence and virologic failure; an adherence level of more than 95% may lead to 22% virologic failure, an adherence level between 80% and 95% level may result in a 61% treatment failure and less than or equal to 80% adherence may have a treatment failure of 80% (UNAIDS, 2011). The shift to the use of highly active antiretroviral therapy (HAART) for treating HIV and AIDS has led to increasingly complex drug regimens (Weiser et al., 2003). These drug regimens present significant challenges to both patients and health care providers with respect to adherence. Without adequate adherence, antiretroviral agents are not capable of suppressing HIV replication owing to insufficient concentrations of drugs in the blood, and may lead to difficulties suppressing plasma viral load (Phelps, Hathcoc, Werdenberg & Schultze, 2010). In addition to being associated with poor short-term viral response, poor adherence to ART accelerates development of drug-resistant HIV. Therefore, identifying and mitigating the factors that reduce adherence to combination antiretroviral agents are important for prolonged viral load suppression (Phelps *et al.*, 2010).

HIV and AIDS is a major health problem in South Africa. The number of infected people with HIV has been estimated at around 5.63 million of a 46 million population (DOH, 2009 & UNAIDS, 2011). The department of Health indicates that the commonest cause of death of HIV and AIDS patients in South Africa is related to non-adherence to ART (DOH, 2009).The rate of HIV infection is continually growing in many parts of South Africa and particularly in Gauteng Province.

It is against this background that the study seeks to determine adherence to antiretroviral therapy among HIV and AIDS patients at the Kwa-Thema Clinic in the Gauteng Province, South Africa.

1.2   PROBLEM STATEMENT

To achieve the full benefits of ART, strict adherence to the treatment instructions is very critical. Sticking to the treatment instructions for a long-term illness is extremely challenging to the patients (WHO, 2004). Medicine on its own might not solve HIV- and AIDS-related issues. Worldwide and regardless of the illness or treatment, many people do not take their medication correctly. While ART has improved the lives of many people worldwide, a lack of adherence to HAART is still a major challenge to HIV and AIDS care resulting in serious public health consequences (UNAIDS, 2011). Failure to adhere to the taking of medication often leads to treatment failure, development of viral mutations, and the emergence of drug resistance strains of the virus (DOH, 2010).

South Africa has made strides in scaling up ART. The primary goal of ART as designed by the Department of Health (DOH, 2010) is to minimise the viral load in HIV infected patients with the purpose of promoting quality of life, as well as reducing of HIV-related morbidity and mortality. However, anecdotal evidence suggests certain problems that contribute to the default rate, for insistence (Bhat, Ramburuth, Singh, Titi, Antony & Chiya, 2010) indicate that some men use their partners' ART irrespective of their status and further explore that the defaulter rate is high among the youth and children under the care of the elderly. There are no much studies about adherence levels in South Africa. A study in the rural part of South Africa indicates that there is 37.5% poor adherence to ART Bhat *et al.* (2010).

The Gauteng Province is one of the high spread of HIV infection in South Africa. In 2008, more than 55% of all South Africans infected with HIV resided in the KwaZulu-Natal and Gauteng Provinces. The HIV and AIDS prevalence in 2008 in the Gauteng Province had been 15.2%. This is an indication that the problem is widely spread (DoH, 2010). It requires responsibility and hard work to control the spread of HIV in the province. Adherence to ART is one of the approaches that enable health care workers to reduce new infections, e.g. during pregnancy (DOH, 2010).

This background motivated the researcher to determine adherence to ART at the Kwa-Thema Clinic in the Gauteng Province, South Africa.

1.3   AIM

The aim of this research project was to determine adherence to antiretroviral therapy among HIV and AIDS patients at the Kwa-Thema Clinic in the Gauteng Province, South Africa.

1.4   RESEARCH QUESTIONS

The research questions of the study are:

- Which socio-economic and demographic factors are associated with adherence to ART at the Kwa-Thema clinic?
- What are the main factors that obstruct adherence to ART at the Kwa-Thema Clinic in the Gauteng Province?
- What are the adherence levels to ART at the Kwa-Thema Clinic?

1.5   OBJECTIVES

The objectives of this study are to:

- describe socio-economic and demographic factors that are associated with adherence to ART among HIV and AIDS patients at the Kwa-Thema Clinic in the Gauteng Province, South Africa.
- identify main factors that obstruct adherence to ART among HIV and AIDS patients at the Kwa-Thema Clinic.

- determine the prevalence rate of adherence to ART among HIV and AIDS patients at the Kwa-Thema clinic.

1.6 LITERATURE REVIEW

A literature review is a process that involves reading, understanding, and forming conclusions about literature with regard to the problem studied (Brink, 2012). This section describes the reviewed literature related to adherence to antiretroviral therapy among HIV and AIDS patients.

1.6.1 Overview of the importance of ART adherence

Adherence to ART is critical to achieving the best results in the management of HIV and AIDS. Successful ART may bring suppression of HIV replication and halt the clinical progression of the disease (DOH, 2010). To get the maximum benefits of ART, over 95% of medication taking is required and anything less than this may lead to rapid development of viral resistance and early treatment failure (Sharon, Morse, Malts, Adrew, Child & Schmelter, 2006). The consequences of poor adherence have a serious impact on individual and public health that may also put pressure on the limited health care resources (DOH, 2010).

1.6.2 Adherence to ART

Adherence to ART has become a great concern because of the possible treatment resistance that might occur for an entire class of ART that could ultimately make that ART ineffective (Nakiyemba, Aurugai, Kwasa & Oyobba, 2005). A person who takes ARVs inappropriately will receive only marginal benefit, but will suffer similar side effects and will minimise their future treatment options (Nwokike, 2004). It is essential that all patients should demonstrate an understanding of the importance of adherence to ART before starting the treatment. Patients must be given complete information about ART as a lifelong treatment process. Empowering patients and assessing their understanding might be regarded as time consuming and labour intensive but it is appropriate in order to achieve the expected results. Various factors can affect patient adherence to ART that influence treatment outcomes. These factors are broadly divided into patient-related, sociocultural, health worker related, and medication types related issues (Holstad, Pace, De & Ura, 2006).

Although community ART distribution may decrease stigma, on the other hand it might prevent some individuals from seeking treatment because they fear losing their anonymity that results in reduced compliance (Fredlund & Nash, 2007). The complexity of multiple drugs (too many medication) and dosing may also lead to the undermining of ART adherence (Wang, He, Li, Yang, Chen, Fennie & Williams 2008) that may further be compounded by undesirable adverse effects (Nakiyemba *et al.*, 2005). Social and psychological support is also a very important motivating factor to treatment adherence (Holstad *et al.*, 2006).

1.6.3   HIV and AIDS treatment adherence in South Africa

An estimated 5.6 million people were living with HIV and AIDS in South Africa in 2009; this is the highest number of people in any country. In the same year, it was estimated that 310 000 South Africans died of AIDS-related causes, reflecting the huge number of lives that the country had lost to AIDS over the last three decades. The prevalence of HIV is 17.8 per cent among those people between the ages of 15 and 49 years (UNAIDS, 2010).

There are few studies about poor adherence levels in South Africa. A study in the rural part of South Africa indicates that there is 37.5% poor adherence to ART Bhat *et al.* (2010). On the other hand; Nachega, Stein, Lehman, Hlatshwayo, Mothopeng, Chaisson and Karstaedt (2004) has found that among patients on ART the level of adherence is above 95% in Soweto. In addition; social, historical, and geographical contexts also influence the adherence rates to ART programmes (Gilbert & Walker, 2009) especially in the context of rural South Africa.

1.7   RESEARCH METHODOLOGY

A cross-sectional descriptive design was used in this study. According to De Vos, Strydom Fouché and Delport (2011), a research design is a method that enables a researcher to plan how a research project is going to be conducted.

This section is an overview of the research methods. The methodology is discussed in detail in Chapter 3 of the research report.

A quantitative research method was used in this study. This method explains phenomena by collecting numerical data that is analysed using mathematically based methods, in particular statistics (Brink, 2006). The researcher aimed at describing factors that influence the adherence to ART among HIV and AIDS patients.

1.7.1 Study area

The study area was at the Kwa-Thema Community Health Clinic that is situated in the eastern part of the Ekurhuleni Municipal District, in Health Region B of the Gauteng Province. The Kwa-Thema Clinic is in the Kwa-Thema township south-west of Springs in the Ekurhuleni Municipal District of the Gauteng Province, South Africa.

1.7.2 Study population

The study population in the study was all adult HIV and AIDS patients above 18 years old who were on ART and attending the Kwa-Thema Clinic.

1.7.3 Study design

A cross-sectional descriptive design was used in this study. This design was chosen, since it is inexpensive and allows data collection to be done in a short period of time.

1.7.4 Sampling method

A systematic sampling method was used for the selection of the participants until the required sample size was obtained.

1.7.5 Sample size

The sample was determined using the following formula of Kothari (2003):

$$n = \frac{z_{\alpha/2}^2 \times p \times q}{e^2}$$

The total numbers of respondents in accordance with the above formula was 290.

1.7.6 Data collection

Data for this study was collected by using a structured questionnaire with both open- and closed-ended questions. A pilot study was conducted at the Kwa-Thema clinic in order to verify whether the data collection instrument was appropriate.

1.7.7 Data capturing and analysis

Data was analysed by use the Statistical Package for Social Science (SPSS) version 22 program and the statistical analyses were present in graphic format. These calculations included bivariate (chi-square) and multivariate (logistic regression) analyses that determine correlates or predictors of adherence to ART.

1.7.8 Ethical considerations

Ethical clearance was obtained from the Medunsa Research Ethics Committee (MREC). Written permission to start the study was also received from the Ekurhuleni District Health Ethics Committee. All the ethical principles of informed consent, autonomy, non-maleficence and beneficence, as well as confidentiality were duly observed.

1.8 SIGNIFICANCE OF THE STUDY

While South Africa is scaling up access to HAART at all health facilities, it is critically important to estimate and monitor the rates of adherence. Unlike other research works on HIV and AIDS, there are very few studies in this area in South Africa. Therefore, this research might be useful to other scholars doing research in this area and for planning interventions of effective strategies for optimising long-term adherence to ART for successful treatment of HIV and AIDS. It might be also useful for creating knowledge and an understanding that benefit healthcare professionals with regard to the adherence level of HIV and AIDS patients in the district.

1.9 ARRANGEMENT OF CHAPTERS

The arrangement of sections in this dissertation is as follows:

- Chapter 1:   Overview of the study;
- Chapter 2:   Literature review;

- Chapter 3: Research methodology;
- Chapter 4: Research findings
- Chapter 5: Discussion and literatures control and
- Chapter 6: Summary, Conclusions, Recommendations and Limitations

CHAPTER 2
LITERATURE REVIEW

2.1 INTRODUCTION

A literature review is a process that involves reading, understanding, and forming conclusions about literature with regard to the problem studied (Brink, 2012). This chapter describes the reviewed literature related to adherence to antiretroviral therapy among HIV and AIDS patients. The researcher searched PubMed, Cochrane Library, and Google Scholar for studies on adherence to ART using search terms, such as "adherence to ART and associated factors". Relevant studies were selected and reviewed. To further broaden the search, some of the references in the selected studies were also reviewed. The results of the searches were helpful to compare and substantiate the study in a scientific way. Information obtained from several studies is presented below.

2.2 OVERVIEW OF THE IMPORTANCE OF ART ADHERENCE

HIV progresses into AIDS and might result in death unless managed appropriately with ART. Adherence of ART is critically important to achieve best results in the management of HIV and AIDS. Successful adherence to ART may bring about suppression of HIV replication and halt the clinical progression of the disease (DOH, 2010). To get the maximum benefits of ART, over 95% of medication taking is required and anything less than this may lead to rapid development of viral resistance and early treatment failure (Sharon et al., 2006). The consequences of poor adherence have a serious impact on individual and public health that may also put pressure on the limited health care resources (DOH, 2010). Antiretroviral treatment is the golden standard for HIV and AIDS treatment in the modern world. It is not a cure but it prolongs the life of people by many years. The treatment consists of drugs that have to be taken every day for the rest of a person's life. The main role of antiretroviral treatment is to keep the level of HIV in the body at a low level. It minimises any weakening of the immune system and allows it to recover from any damage that HIV might have caused already. There are five main types of ARVs (UNAIDS, 2013):

- Nucleoside analogue reverse transcriptase inhibitors (NRTIs) that target an HIV protein called reverse transcriptase;

- Non-nucleoside reverse transcriptase inhibitors (NNRTIs) that also target reverse transcriptase;

- Nucleotide analogue reverse transcriptase inhibitors (NtRTIs) that also target reverse transcriptase; and

- Protease inhibitors (PIs) that target an HIV protein called protease.

Fusion inhibitors target the point where HIV binds into cells of the immune system. Every class of drugs attacks HIV in a different way. To provide successful treatment for a rapidly growing population of HIV-related individuals in developing countries is one of the contemporary public health challenges in the world.

This is a concern in South Africa where a high volume of patients live with HIV-related problems (UNAIDS, 2007). In South Africa, approximately 230 000 HIV-infected individuals were receiving HAART while a further 540 000 were ill with AIDS without receiving HAART(UNAIDS, 2007). When aiming at providing treatment for more than a million South Africans, it is important to map factors that determine the success of ART in the country. The level of adherence determines the level of infectiousness and how long the individual patient will live a productive life. This study focuses mainly on adherence and factors affecting adherence after commencing ART.

2.3 THE ROLE AND GOAL OF ANTIRETROVIRAL THERAPY

The introduction of HAART was a major breakthrough in our world for the fight against the human immunodeficiency virus and complicated AIDS conditions. However, the adoption of ART changes the landscape of HIV infection from a highly fatal condition to a chronic health problem in which people on HAART have started to live longer relatively more healthy lives For instance, with the increasing access to ART in Africa (68% of the global HIV-infected population) HIV-positive people have begun to enjoy the benefits of HAART although mortality from HIV remains unacceptably high with about 1.2 million Africans who died of HIV-related illness in 2010. It represents 69% of the global 1.8 million deaths attributable to the epidemic in that year (Biressaw, Erku Abegaz, Abebe, Taye& Belay, 2013). These statistics

are attributed to the existing challenges related to access to HIV infection treatment, poor organisation of health care infrastructures, inadequate funding, and limited human capital. The consequences of these challenges have an effect on poor continuity of drugs supply and default from HAART or non-adherence to HIV treatment (Fisher, Amico, & Harman, 2006).

Antiretroviral treatment is the golden standard for HIV and AIDS at present. It is not a cure but it prolongs the lives of people and improves their quality of life too. The treatment consists of drugs that have to be taken every day for the rest of a person's life. The main role of antiretroviral treatment is to keep the level of HIV in the body at a low level. It minimises any weakening of the immune system and allows it to recover from any damage that HIV might have caused already. Each class of drugs attacks HIV in a different way. Generally, drugs from two or three classes are combined to ensure a powerful attack on HIV infections. The primary goal of antiretroviral therapy is to improve quality of life with the reduction of morbidity and speedy recovery of the immune system.

In summary, the main role of ART is described as follows: Improvement of the patient's quality of life, reduction of HIV-related morbidity and mortality, restoration and / or preservation of immunologic function and maximal and prolonged suppression of the viral replication (Ministry of Health, 2010). Proper adherence counselling is crucial and should include:

- Why continuous lifelong treatment is necessary and the expected benefits of treatment;
- Adherence and its relation to treatment outcomes;
- Drug resistance;
- The necessity for regular follow-up visits to a health facility; and
- The need to avoid non-prescription drugs, including herbal medication because its interaction with ARV drugs are either unidentified or undesirable (DOH, 2010).

Health workers should play a greater role in assessing and preparing patients to ensure long-term adherence to treatment. This role includes information about using drugs rationally to make future treatment options possible, ensuring regular and

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adequate monitoring of patients, managing complications of treatment, and being able to change or discontinue treatment (DOH, 2010).

2.4 ADHERENCE TO ART

Adherence to ART has become a great concern because of the possible treatment resistance that might occur for an entire class of ART that could ultimately make the ART ineffective (Nakiyemba *et al.*, 2005). A person who takes ARVs inappropriately will only reap marginal benefits while suffering similar side effects and minimising their future treatment options (Nwokike, 2004). It is essential that all patients should demonstrate an understanding of the importance of adherence to ART before starting the treatment. Patients must be given complete information that ART is a lifelong treatment. Empowering patients and assessing their understanding might be regarded as time consuming and labour intensive, but it is appropriate in order to achieve the expected results. Giving a prescription at the first visit without proper adherence counselling amounts to gross negligence by the healthcare professionals. However, this seems to be a common practice in many places (Nakiyemba *et al.*, 2005). Healthcare professionals who do not address the issues of adherence fail in their primary objective of helping HIV-infected patients. At the public level, this may lead to development of multidrug resistant strains amongst the population that would have direct public health implications, such as an increase in mortality and morbidity due to HIV infection (Orell, Bangsberg, Badri & Wood, 2003).

In order to suppress the viral load to undetectable levels (< 50 copies / ml), the rates of adherence have to be above 95% but even with these adherence levels, some patients display detectable HIV RNA (Sharon et al., 2006). One study has found that adherence to HAART of 80 % or greater was significantly associated with improved quality of life over time (Mainheimer Matts, Telzak, Chesney, Child, & Wu, 2005). Another study has shown no association between adherence and quality of life. Adherence to ART is a global problem, for example many studies in developed countries (United States and Europe) reveal that only a minority (20 – 40 %) of patients are able to achieve such high adherence levels. Adherence rates for ART are measured by electronic monitoring and generally range between 50% and 80% (Sharon et al., 2006). The findings from a recent systematic review show that adherence to ART among patients in Sub-Saharan Africa is better than the

adherence rates in North America: among the included African studies (totalling 12 116 patients, 77 % of patients achieved adequate adherence, while the corresponding proportion from North America was 55 % (17 573 patients) (Bhat *et al.*, 2006).

2.5   FACTORS ASSOCIATED WITH ADHERENCE TO ART

Various factors can affect patient adherence to ART; these factors inevitably influence treatment outcomes. The age, education, employment status, income, family type, distance from a clinic, availability of transportation, cost of medication, discomfort about disclosure of HIV status, inadequate knowledge about the disease and medication, use of alcohol and drugs, religious and spiritual beliefs, presence or absence of AIDS symptoms, levels of health education and healthcare satisfaction, as well as the presence of co-morbid conditions are among the various patient-related correlates that may influence adherence to ART(Hostad et al., 2006). Although community ART distribution may decrease stigma, it may hinder some individuals from seeking treatment because of the fear of losing anonymity and, thereby, reduce compliance (Fredlund & Nash, 2007). The complexity of multiple drugs (too many pills) and dosing may also lead to decreasing ART adherence (Wang et al., 2008) that may further be compounded by undesirable and side effects (Nakiyemba *et al.*, 2005). Social and psychological support is also a very important motivating factor for treatment adherence (Holstad *et al.*, 2006). Factors that influence adherence to ART may vary from place to place. Many studies in the USA and European countries classify factors to adherence to ART into: (1) individual factors; such as substance abuse, age, attitude towards treatment, and psychological characteristics; (2) medication characteristics; such as dosing complexity, and number of pills or food requirements; (3) interpersonal characteristics; such as the doctor-patient relationship and other social support; and (4) the general systems where care is administered (Holstad *et al.*, 2006). A study in Zambia about adherence to antiretroviral treatment shows there are three main factors that affect adherence. (1) Factors that are related to patients' beliefs and behaviour which include forgetfulness, experiencing better health, busy work schedules, living alone, excessive alcohol consumption, beliefs about ART, and side-effects. (2) Factors that are related to socio-economic and cultural influences; such

as stigma and discrimination, disclosure of one's status as HIV-positive, concerns about confidentiality, use of alternative treatments, and lack of food. (3) Health service related factors play a role; such as a lack of communication about ART between healthcare professionals and patients, time constraints during consultations, lack of counselling skills and patient follow-up, lack of infrastructure to conduct counselling, and long distances to health facilities.

Clinical outcomes related to improved quality of life with HAART include lower CD4 cell count at HAART initiation, increased CD4 cell count over time, as well as lower initial viral load and the presence of symptoms at HAART initiation. One study has found that adherence of 80% or more is significantly associated with improvement of quality of life over time (Mainheimer *et al.*, 2005) while another shows no association between adherence and quality of life (Liu, Miller, Hays , Golin, Wu, Wenger & Kaplan, 2006). A number of socio-demographic factors are associated with poorer quality of life among PLHA taking HAART, including old age (Mannheimer *et al.*, 2005).

A study by (Liu et al., 2006) found that the adverse effects of drugs contribute to 50% of non-adherence to ART. Factors that are consistently related to non-adherence include side effects and depression; poor social support; patient provider relations; and attitudes, such as mistrust and scepticism about treatment and medication.

Education level and age are identified as important predictors of compliance to ART therapy. Forgetfulness is the most common reason given by patients followed by running out of medication. Other predictors of poor adherence identified are complexity of dosing regimens and pill fatigue. Another group prone to adherence problems is the ones with low literacy levels (Holstad *et al.*, 2006). Some studies have found that people living with HIV / AIDS who have low health literacy show poor treatment adherence and more adverse health outcomes.

Study by Mills et al., 2006 analysis of systematic review finds that while a higher educational level is associated with better adherence, such patients still have difficulties with work-time dosing, as well as with depression and negative thoughts about treatment (Fredlund & Nash 2007). Some findings indicate that patients'

knowledge of an improved CD4+ count and viral load results has a positive impact on adherence.

2.6   EFFECTS OF NON- ADHERENCE

Non-adherence to ART can lead to poor clinical, immunological, and virologic outcomes. At an individual level, the outcome of non-adherence includes incomplete viral suppression, continued destruction of the immune system, decrease of CD4+ cell count, progression of disease, emergence of resistant viral strains, limited future therapeutic option, and higher costs for individual treatment. These outcomes all translate to higher ART programme cost (Phelps *et al.*, 2010). Proper education of patients before the initiation of and during ART is important for the success of adherence in order to prevent unwanted effects (Orell *et al.*, 2003).

2.7   HIV / AIDS TREATMENT ADHERENCE IN DIFFERENT COUNTRIES

2.7.1   Global treatment adherence

According to UNAIDS and WHO estimates, 47% (6.6 million) of the estimated 14.2 million people eligible for treatment in low and middle-income countries were accessing lifesaving ART in 2010; an increase of 1.35 million since 2009. The UNAIDS (2011) reports also highlight that there are early signs that ART is having an impact on reducing the number of new HIV infections when taken correctly as prescribed. At the end of December 2013, there were 35 million people living with HIV. This number is rising, since more people are living longer due to antiretroviral therapy and the number of new HIV infections. Although the number of new infections is declining, it remains very high (UNAIDS, 2014).

A report from UNAIDS (2014) indicates that globally almost 12.9 million people were receiving antiretroviral therapy at the end of 2013. The percentage of people living with HIV who are not receiving antiretroviral therapy has been reduced from 90% in 2006 to 63% in 2013 (UNAIDS, 2014). Of these 12.9 million people, 5.6 million were put on ART since 2010. The rapid increase in antiretroviral access has primarily occurred in a few countries. One third of the increase in the number of people receiving antiretroviral therapy is in South Africa, followed by India at 7%, and

Uganda 6%. Three of every four people receiving HIV treatment are living in Sub-Saharan Africa.

A study on ART adherence in Brazil reveals that adherence prevalence was 75% with a 95% confidence interval of 73.08 – 76.95. The factors that influence non-adherence are missed appointments, more complex regimes, a large number of pills, and level of education (Nemes, Maria, Carvalho, Heraclito, Souza & Maria, 2004).

2.7.2 The epidemic in Sub-Saharan Africa

Of the 35 million people living with HIV, around 25 million are living in Sub-Saharan Africa, the region hardest hit by the epidemic (2014, UNAIDS). In this region, nearly one in every 20 adults is living with the virus.

Since the establishment of ART programme in Sub-Saharan African countries, adherence has been identified as a major challenge and an essential factor for attaining adequate HIV treatment outcomes. Adherence to ART relates to actions of patient who take the correct dose of each ARV medication at the correct time. It has been estimated that an adherence rate of at least 95% is needed to achieve the full effectiveness of HAART treatments while minimising virologic failure and resistance to ART. A meta-analysis of 27 studies from 13 African countries indicates that 77% of patients on ART achieved optimum levels of adherence to such treatment. This analysis, however, is based on pooling studies of a small size that largely represent the era prior to the more organised and subsidised treatment of HIV across Africa.

Kgatlwance, Ogenyi, Cosmas, Madaki, Moyo and Modie (2005) have recorded that in Botswana, patterns in sexual behaviour remain relatively stable since 2000. Their research shows that the ART adherence rate is 77% and comparable to the rates in developed countries. While ART is reducing the viral load of a person living with HIV to undetectable levels, it also reduces the risk of transmitting the virus to an uninfected partner. Studies conducted in east Africa show that ART can be up to 96% effective in preventing HIV transmission among couples (UNAIDS, 2011).

2.8   HIV AND AIDS TREATMENT ADHERENCE IN SOUTH AFRICA

An estimated 5.6 million people were living with HIV and AIDS in South Africa in 2009. In the same year, it was estimated that 310 000 South Africans died of AIDS-related causes, reflecting the huge number of lives that the country lost to AIDS over the last three decades. The prevalence of HIV is 17.8 % among South Africans between the ages of 15 and 49 (UNAIDS, 2010).

As previously mentioned in this study there are few studies about poor adherence levels in South Africa. A study in the rural part of South Africa indicates that there is a 37.5% poor adherence rate to ART (Bhat et al., 2010). On the other hand; Nachega et al., 2004) have found that among patients on ART, the level of adherence is above 95% in Soweto. Another study by Dlomo (2010) in rural KwaZulu-Natal has found that adherence to ART is 79%, which is considered to be high and satisfactory compared to other developed countries. This indicates that the adherence level of ART may vary from place to place across South Africa due to a plethora of factors; such as sociocultural, economic, and demographic variables.

In addition; social, historical, and geographic contexts also influence the adherence rates to ART programmes (Gilbert & Walker, 2009), especially in the context of rural South Africa.

2.9   MEASUREMENT OF ART ADHERENCE

A number of various methods are used to measure adherence. Generally, this measurement is broadly classified as either objective data obtained independently from the patient or subjective data that is based on the opinion of the patient (Wilson, Cotton & Bekker, 2008).

Objective ART adherence assessments include:

- **Pill counts:** This technique is used by counting returned medication to estimate the number of doses taken by the patient and frequently used to calculate adherence. To calculate adherence, healthcare practitioners need to have access to four variables; i.e. number of tablets returned, number of tablets dispensed, number of days between the visits (e.g. 28 days), and the number

of doses of medicine per day. Although pill counts at home may decrease the risk of pill dumping, it requires a dedicated team of counsellors to visit the clients at home and may not be a practical arrangement when monitoring adherence on a large scale (Wilson *et al.*, 2008).

- **Pharmacy refill data:** This is the type of adherence assessment in which the number of times a patient receives medication over a fixed period are expressed as a percentage of the number of times they should have collected medication. This is the easiest method of objectively recording adherence and is suited to monitoring adherence in large antiretroviral programmes. (Wilson *et al.*, 2008).

- **Electronic monitoring:** This technique requires electronic devices that record each time a bottle is opened and the information recorded in the devices is analysed electronically when the bottle is returned. The method is expensive, since it uses sophisticated computer software. However, it is one of the best means of objectively assessing adherence in developed countries. (Wilson *et al.*, 2008).

- **Therapeutic drug monitoring:** It is used by determining plasma concentration of antiretroviral drugs and may be useful in the case of selected patients. The use of this tool to measure adherence on a large scale is not practical because it measures the current plasma level of drugs that may not be a true reflection of the patient's adherence status. Sometimes it may even overestimate adherence, particularly when a patient takes the prescribed medication closer to the date of a clinic visit. (Wilson *et al.*, 2008).

Subjective adherence methods are not impressive, but results are obtained by adopting a non-judgmental attitude and gaining the patient's trust. These methods include:

- **Recall questionnaires:** The most common and widely used tools to collect adherence data usually ask the patient to recall doses missed over the past few days. When asked by the health care team, many people fail to admit to missing a dose. This method could be useful as a research tool, since more open and accurate responses might be expected when results are not reported to the clinical team. (Wilson *et al.*, 2008).

- **30-day visual analogue scale:** It requires a graphic recording that measures how the patient has taken his medication for the past one month. (Wilson *et al*., 2008).

2.10 CONCLUSION

Despite its importance, maintaining optimal levels of ART adherence has proven to be difficult for the majority of people living with HIV. Evidence indicates that adherence to ART is not only a problem in countries where resources are limited, since it also affects developed countries. Many studies agree that adherence to ART in HIV patients is affected by similar groups of factors that are broadly classified as socioeconomic factors, health team and system related factors, condition-related factors, therapy-related factors, and patient-related factors.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 INTRODUCTION

Chapter 2 presents literature related to adherence to ART and describes the research methodology that was followed to achieve the objectives of this study.

The choice of methodology was guided by considering the objectives of the study, as well as the time and resources available. Most of this chapter outlines and substantiates the methods used in this study. This chapter explains the methodology that was used in the entire study. The chapter looks at the study area, study design, target and study populations, sampling techniques, research instruments, ethical considerations, data collection, data quality control, as well as data management and analysis.

3.2 RESEARCH METHODS

A quantitative research method was used in this study. Quantitative research aims at explaining phenomena by collecting numerical data that is analysed using mathematically based methods, in particular statistical calculations (Brink, 2006).

There are four main types of research questions that quantitative research is particularly suited to finding an answer to:

- The type of research question that demands a quantitative answer;
- Numerical changes can likewise accurately be studied by using quantitative methods;
- To find interrogate the state of something, we often want to explain phenomena; and
- Quantitative research is especially suited for testing *hypotheses*.

The researcher applied quantitative methods by converting the data information in to numerical values in which factors have an association with or affect adherence to ART among HIV and AIDS patients.

3.3 STUDY AREA

The Kwa-Thema Community Health Clinic is situated in the eastern part of the Ekurhuleni Municipal District in a Health Region B of the Gauteng Province. The Kwa-Thema Clinic is in the Kwa-Thema township, situated in the south-west of Springs in the Ekurhuleni District of Gauteng, South Africa. A black local authority with municipal status was established in 1984. The population comprises over 120 000 inhabitants (Statistic South Africa, 2013) with a density of 7 100/km^2 living in an area of 13.93km^2. According to Census 2011, the majority of the population are black (99.7%). The clinic has six units; namely primary health care, obstetrical unit, HIV clinic, well baby clinic, dental clinic, and an allied unit. The primary health care unit where the study was conducted received 80 to 120 patients per day. At the time of the study, two trained primary health care nurses and two doctors attended to patients during the day while one doctor and one trained primary health care nurse are available after hours. The referral hospitals of the clinic are the Far East Rand Hospital and the Pholosong Hospital. The researcher is one of the mentors who supervise the HIV programme in the area.

3.4 STUDY POPULATION

The respondents of study population were all adult HIV and AIDS patients older than 18 years who were on ART and who visit the Kwa-Thema Clinic.

3.5 RESEARCH DESIGN

A cross-sectional descriptive design was used in this study. According to De Vos, Strydom Fouché and Delport (2011), a research design is a method that enables a researcher to plan how a research project is going to be conducted. Cross-sectional studies are sometimes carried out to investigate associations between risk factors and the outcomes of interest. They are limited, however, by the fact that they are carried out at one point in time and give no indication of the sequence of events whether exposure occurred before, after, or during the onset of the disease outcome. In this light, it is impossible to infer causality.

Cross-sectional studies are carried out either at one point in time, or over a short period. They are usually conducted to estimate the prevalence of the outcomes of

interest for a given population, commonly for the purposes of public health planning. Data can also be collected on individual characteristics, including exposure to risk factors, alongside information about the outcomes. In this way, cross-sectional studies provide a snapshot of the outcomes and the characteristics associated with it at a specific point in time. The study design provides information about the presence and strength of associations between variables that are factors associated with adherence to ART. The researcher described the factors related to the problem studied which is adherence to ART among HIV and AIDS patients who were attending the Kwa-Thema Clinic in the Gauteng Province. The researcher selected the above research design because it required less time and fewer resources. It was also the best suited design for the purposes of this study

3.6 SAMPLING METHOD

The researcher selected the sample for this study without the reference to exposure, which are factors or outcomes in relation to adherence to ART (De Vos *et al.*, 2011).

After signing an informed consent form, patients who satisfied the inclusion criteria were invited to participate in the study. A systematic sampling method was used for the selection of the respondents until the required sample size was obtained.

Systematic sampling is a method of selecting sample members from a large population according to a random starting point and a fixed, periodic interval (De Vos *et al.*, 2011). In the clinic, ± 100 patients were attended to per day and ± 50 patients started on ART every working day, except on Fridays because these days are reserved for administration. Respondents were selected randomly (every 3rd patient from the registered book for the day) while waiting to be seen by the clinic doctors. On each day, respondents who met the inclusion criteria were as much as 100 patients who paid the clinic a follow-up visit. After a pill count by the nurse and with limited resources, the investigator invited only the first 15 patients on ART to participate in the study on each day until the required number of 290 was met.

3.7 INCLUSION CRITERIA

Adult patients who were 18 years and older on ART and who attended the Kwa-Thema Clinic were selected. Only adults were included in the study because there

was no facility for ART of children. Only patients who were willing to sign consent forms for the study were included in the study.

3.8 EXCLUSION CRITERIA

Clients who are diagnosed HIV+ and had not yet started on ART were excluded because the study was about adherence to ART (it requires at least one month on ART medication). Those patients who were younger than 18 years were excluded from the study because of lack of facility for ART of children in Kwa-Thema clinic. Patients who were not on ART and the ones who refused to give consent were also excluded from the study.

3.9 SAMPLE SIZE

The sample was determined by using following formula by Kothari (2003):

$$n = \frac{z_{\alpha/2}^2 \times p \times q}{e^2}$$

where $z_{\alpha/2}$ is the *z*-value from the standard normal distribution table corresponding to $(1-\alpha)100\%$ confidence level and α is the level of significance, p is the proportion of HIV and AIDS patients on ART who did not adhere, $q = 1 - p$ and e were an acceptable error margin (precision of measurement). Estimates of average rates of adherence to antiretroviral therapy ranges from 50% to 75% (UNAIDS / WHO, 2010). Using the upper range for non-adherence, 95% level of significance and a 5% error margin, the sample size for this study was approximately:

$$n = \frac{z_{\alpha/2}^2 \times p \times q}{e^2} = \frac{1.96^2 \times 0.25 \times 0.75}{0.05^2} \approx 288 = 290$$

3.10 DATA COLLECTION

The researcher used a structured questionnaire with both open- and closed-ended questions to collect data for this study. A structured questionnaire is a group or sequence of questions designed to elicit information from an informant or respondent when either asked by an interviewer, or completed unaided by a respondent (De Vos

et al., 2011). When an interviewer is involved, the questionnaire is sometimes referred to as an interview. When used as an interviewing method, the questions are asked exactly as they are written, in the same sequence, using the same style, for all interviews. (De Vos *et al.*, 2011). Nonetheless, the structured questionnaire can sometimes be left a bit open for the interviewer to amend with the purpose of suiting a specific context. A questionnaire is a list of questions that are answered by the respondent and that provide indirect measures of variables under investigation (De Vos *et al.*, 2011). The questionnaire in this study was designed to include demographic parameters; namely age, sex, education, family type, employment and income, levels of medication adherence, reasons for missed doses, adverse effects, and other aspects related to ART adherence. It also consisted of sections about socio-demographic data and factors that influenced adherence to ART.

The data questionnaire was well structured and standardised according according to the ones for similar studied in the past (Nakiyemba, *et al.*, 2005). The researcher adopted the questioners from those studies and considered it to be a reliable tool.

3.11 PILOT STUDY

A pilot study is a small study conducted in advance of a planned project, specifically to test aspects of the research design and to allow necessary adjustments before final commitment to the design. It is more common in large quantitative studies, since adjustments after the beginning of fieldwork is less possible than in qualitative work.

A pilot study was conducted at the Kwa-Thema Clinic in order to verify whether the data collection instrument was appropriate. A specifically designed structured interview schedule was used to collect data from the respondents. The interview schedule was piloted with 10 patients who were excluded from participating in the actual study. The ten respondents in the pilot study were not added in the main study, since the researcher made adjustments to the instrument after the pilot study had been concluded. During the pilot phase, the interviewers identified ambiguous words and sentences. The interviewers assisted the researcher to rephrase some items. At the conclusion of each interview, the patient was asked how they felt about the nature, style, and timing of the questions. All identified problems were addressed

during revision of the data collection instrument. Some questions were restructured to avoid ambiguities and interviewers were trained to ask questions in a similar way.

3.12 DATA CAPTURING AND ANALYSIS

Data was entered in a computer using Microsoft Excel Office and the Statistical Package for Social Science (SPSS) program by the researcher after data capturing codes had been developed. The principal investigator assisted by a statistician analysed the data by using version 22 of the SPSS software program. Various types of descriptive statistics (such as frequency tables, graphs / charts, and summary measures) were used to explore the essence and details of the data collected. Further, generalised linear models were used to investigate the factors that affected adherence of ART.Descriptive and inferential statistical tests were employed. These tests included bivariate (chi-square) and multivariate (logistic regression) analyses to determine correlates or predictors of adherence to ART. Different statistics and measures of association were applied to test a null hypothesis at p-value 5% and 95% confidence levels to calculate a range of likely values for the differences in mean outcomes (adherence levels) of the respondents. Because the sample size was larger than 60, z-tests were used to calculate p-values for those dependent variables that were continuous and that were independent categorical variables. There were also exposure variables with more than two categories, and hence, analysis of variance calculations were conducted specifically to compare adherence levels between different categories.

3.13 RELIABILITY AND VALIDITY

Reliability is the extent to which the results of a study are consistent over time; the study would at another time produce the same results under similar conditions and with the same methodology (Golafshani, 2003). The researcher collected the data personally. This approach made the data more reliable for the entire study period as the researcher was available to clarify questions when the need arose. A standardised questionnaire was used for all respondents during this study. Such a questionnaire minimises instrumental or observer variations (De Vos *et al.*, 2011).

Validity of the research instrument determines whether the results of a study are truly what a researcher intends to measure and how truthful the results are (Golafshani,

2003). The researcher had tested the questionnaire by conducting a pilot study that assisted with improving the validity of the main study.

To reach a validated result, the researcher considered gathering the information related to adherence from the patients (self-report), checking their records, and the pill count for purposes of comparing the outcome before concluding whether the respondents adhered to ART or not.

3.14 BIAS

Bias is deviation from results, interpretation from the truth, or any trend in any research activity that can lead to conclusions that differ systematically from the truth (De Vos *et al.*, 2011).

- The researcher did not allow anything that could have influenced the respondents to respond in a certain way to items in the questionnaire.
- Every respondent who met the inclusion criteria was included in the study. Participation was totally voluntary. Patients were informed that their participation in the study did not affect their treatment at the clinic. The researcher took great care to avoid bias in the study. Respondents were not given any token of appreciation or reward in order to avoid bias in the study.

3.15 ETHICAL CONSIDERATIONS

Denzin and Lincoln (2006) point out that every researcher has to observe the ethical principles while conducting a research project. The following ethical standards were considered in this study:

3.15.1 Permission to conduct the research

Ethical clearance was obtained from the Medunsa Research Ethics Committee (MREC). Written permission to start the study was also received from the Ekurhuleni District Health Ethics Committee.

3.15.2 Informed consent

The researcher obtained written informed consent from the respondents before data collection had started. All the information was provide in a language that could be

understood unambiguously by respondents. The researcher explained to the respondents that they had the right to withdraw from participating at any time during the data collection period (Brink, 2006).

3.15.3 Autonomy

The researcher withheld the respondents' identity by using secret codes during their participation that could not afterwards be used to identify any particular respondent. Respondents were informed about the right to self-determination that referred to the right to respond or not and the right to withdraw from the study at any time. Respondents were fully informed about their right to refuse or not to provide any information or answer to any question when they felt it would violate their rights (Brink, 2006).

3.15.4 Non-maleficence and beneficence

The researcher protected the respondents from any form of physical, emotional, social, or legal harm and discomfort during the data collection process. The researcher did not do anything without being aware of the respondents and when the respondents wanted to terminate their participation in the study, the researcher would have fully accepted their decision (De Vos *et al.*, 2011)

3.15.5 Confidentiality and anonymity

Anonymity is defined as nameless (Brink, 2006). The respondents' dignity was maintained by the researcher during the study. Respondents' privacy was maintained during data collection by responding to the questionnaire in a private room. Neither their names, nor any identifying information appeared in the questionnaire. Respondents were assured that no real names are used in naming files; instead, codes were allocated and the data would be kept in a safe place (De Vos *et al.*, 2011)

3.16 SUMMARY

This study involved the use of quantitative methods, self-reports by the patients, and objective assessment by the health workers using pill count methods.

CHAPTER 4
RESEARCH RESULTS AND DISCUSSIONS

3.17 INTRODUCTION

This chapter presents the findings of this study based on data analysis by using the SPSS version 22 program. The chapter includes the following results: Socio-demographic information related to ART adherence, proportion of the respondent adherent to ARV treatment, knowledge of the respondents about ART and its influence on ART adherence, treatment regimen, co-management of HIV, and other social-cultural factors that influence adherence to ART. The results are presented in three main sections:

- SECTION A: Socio-economic and demographic factors;
- SECTION B: Factors that obstruct adherence to ART; and
- SECTION C: Prevalence rate of adherence to ART.

3.18 DATA MANAGEMENT

The replies of the respondents to the questionnaire met all expected targets. Data was sorted, coded, and entered into the computer using Microsoft Excel and SPSS software version 22. Graphic representation, such as bar and pie charts, as well as tables were used to summarise the findings of each section in the questionnaire. Analysis of contingency tables was conducted and the Chi-square statistic was used to test the association between variables using a five per cent level of significance. The researcher was assisted by a biostatistician during data analysis process.

3.19 SECTION A: SOCIO-DEMOGRAPHIC AND SOCIO-ECONOMIC FACTORS RELATED TO ADHERENCE TO ART

3.19.1 Gender of respondents

The majority (67.9%) of the respondents in this study were female and their male counterparts comprised 32.1% of the sample (Figure 4.1).
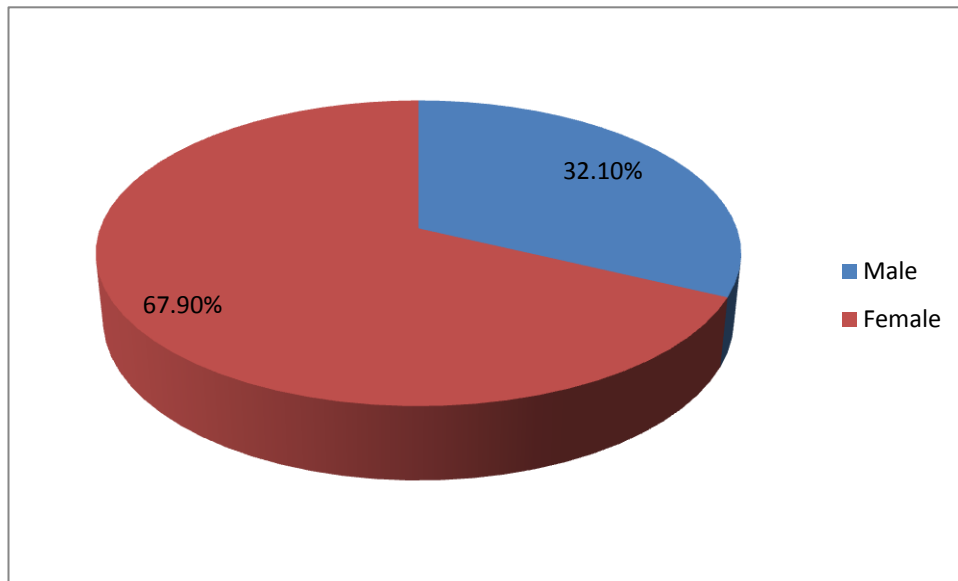
Figure 3.1:   Percentage distribution of respondents' gender at the Kwa-Thema Clinic

A further analysis of the respondents' gender in terms of adherence to ART showed that among female respondents 80.2% adhered to ART while among the male respondents 69.9% adhered to treatment. It indicated that more females adhered to ART than males. The statistical analysis using the Chi-square test of independence showed that there was a significant relationship between the gender of respondents and adherence to ART (χ^2 =3.78, df = 1, p < 0.05).

3.19.2 Age of respondents

The respondents' ages ranged from 18 to older than 60 while the biggest age group was between 40 and 49 years old. Most of the respondents were in the reproductive age group of between 20 49 years. Respondents in the age group between 50 59 years and the group of respondents who were older than 60 years were 16.9% and 3.9% respectively. This finding indicated that the majority of patients at the Kwa-Thema Clinic who participated in the study were in the age group of between 40and 49 years (33.8%) and they were more aware of their status and were undergoing ART (Figure 4.2)
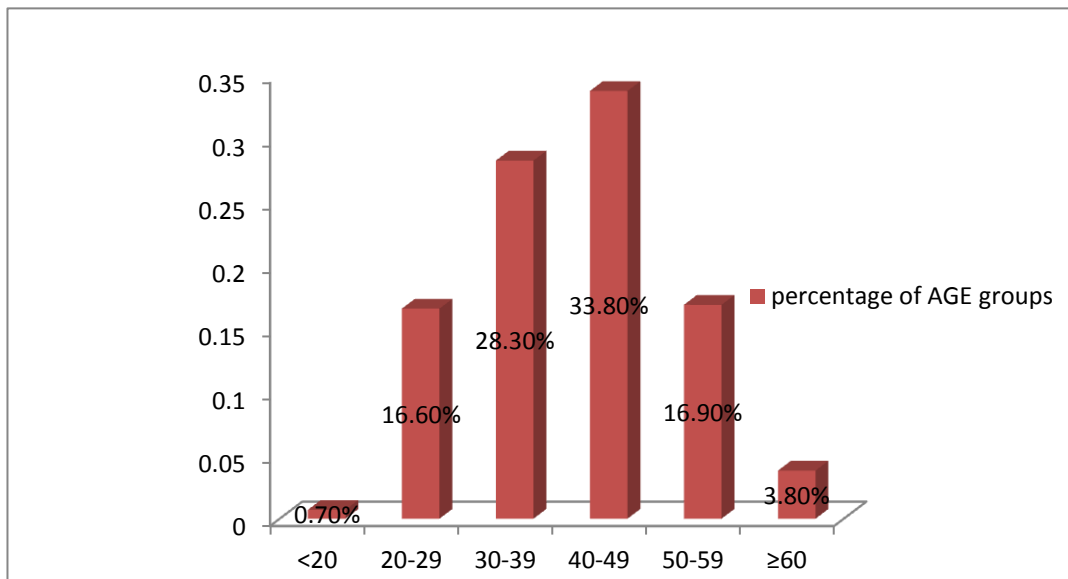
Figure 3.2: Percentage of respondents' age groups at the Kwa-Thema Clinic

However, the results indicated that the age of respondents did not influence ART adherence (x^2 = 3.5, with df = 5 and p = 0.61). Adherence to treatment according to findings of this study was similar between younger and older respondents.

3.19.3 Marital status of the respondents

Table 4.1 presents the marital status of the respondents. Among the respondents, the majority were single (72.4%) and the married ones were 16.6%; others marital statuses (widowed, cohabitation) were 11%.

Table 3.1: Percentage distribution of marital status of the respondents at the Kwa-Thema Clinic

Marital status	Frequency	Percentage
Single	210	72.4%
Married	48	16.6%
Other	32	11.0%
Total	290	100%

The results suggest that unmarried people were the largest category who knew their HIV status and who were taking ARV treatment. However, the chi-square statistic

revealed no significant association between marital status of respondents and adherence to ARV treatment ($\chi^2 = 0.45$ with df =2, p= 0.8 > (0.05).

3.19.4 Employment status of respondents

As indicated in Figure 4.3, the percentage of unemployed respondents was 60.7% that was very high in comparison with the employed (39.1%). However, statically there was no significant association between occupation of respondents and ART adherence ($\chi^2 = 1.09$ with df =1 p=0.296). This could be a result of easily accessible and free provision of ART by the public health sector.
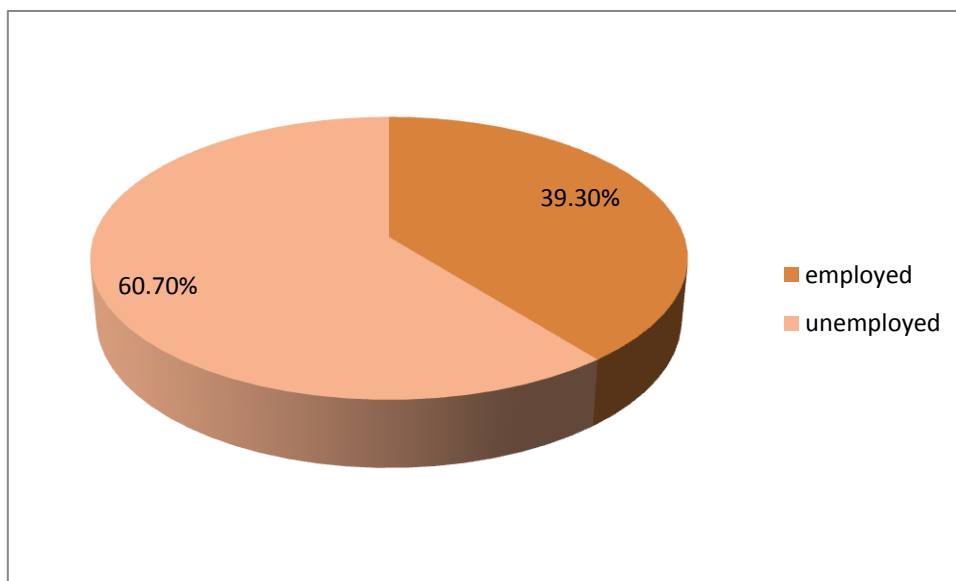
Figure 3.3:   Employment status of respondents at the Kwa-Thema Clinic

3.19.5 Level of education attained by respondents

The percentage distribution of educational status of the respondents is illustrated Table 4.2. The majority of them completed secondary school (66.9%), followed by those who had primary school education (20.3%), 7.9 % had tertiary education, and the least were of them (4.8%) had no formal education.

Table 3.2:   Educational level of the respondents at the Kwa-Thema Clinic

Education Level	Frequency	Percentage
No education	14	4.8%
Primary	59	20.3%
Secondary	194	66.9%
Tertiary	23	7.9%
Total	290	100%

A more thorough analysis of adherence status indicated that as education level increases, adherence levels also increases. The adherence level of those at tertiary level was 87%, followed by secondary education (75.3%), and the least was noted as the ones without any formal education (64.3%). A significant association was noted between the level of education and adherence to ARV treatment (χ^2 = 3.52; df = 3, p = 0.032).

3.20 SOCIO-CULTURAL FACTORS

3.20.1 Respondents' attitude towards ARV treatment, family, friends, and community support

A majority of respondents (88.3%) indicated that they did not avoid friends or relatives and that they were actually supported by friends during ARV treatment. The rest of the respondents (11.7%) either suffered from stigma, or were not supported by relatives or friends. All respondents (100%) had a positive attitude toward ART and they all approved ART for the management of AIDS. The researcher not that there was no statistically significant association between adherence to ART and support from family, friends, and the community (χ^2 = 0.25; df = 1; p = 0.62).The findings are indicated in Figure 4.4.
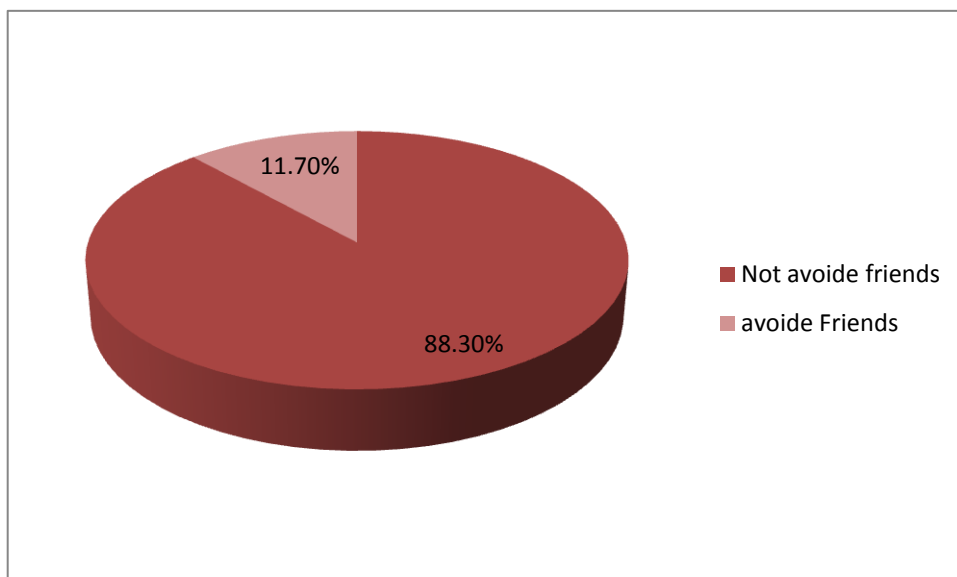
Figure 3.4: **Distribution of respondents according to whether they received support from family, friends, and the community**

3.21 SECTION B: ARV TREATMENT REGIMEN AND CO-TREATMENT OF HIV AND OTHER INFECTIONS

3.21.1 Knowledge about benefits of ART

The researcher noted that the majority of respondents (81.4%) knew that ART reduced the viral load and prevented progression to AIDS. The findings revealed that 2.8% of respondents said ART cured HIV and AIDS illness while 8.3% said ART reduced pain. Only 7.6% of respondents said they did not know of any benefits of ART (Table 4.3).

Table 3.3: **Distribution of respondents according to knowledge about benefits of ART at the Kwa–Thema Clinic**

Knowledge of benefits of ARV	Frequency	Percentage
Curing	8	2.8%
Reducing pain	24	8.3%
Reducing progression	236	81.4%
Do not know	22	7.6%
Total	290	100%

Respondents demonstrated that they did have substantial knowledge about ART. However, no significant association existed between knowledge about ART and adherence (x^2 =1.52; df=3, p = 0.68 (p > 0.05). This might be due to the fact that despite patients being aware of the benefits of ART and the importance of adherence, there were other factors like support versus lack of support and socioeconomic conditions that led to not adhering to treatment. Most respondents (64.1%) said they had no more frequent sickness, 35.9% were optimistic towards ART and admitted that their CD4+ count (indicated on patients' cards) improved after taking ART drugs for at least one month (Figure 4.5).
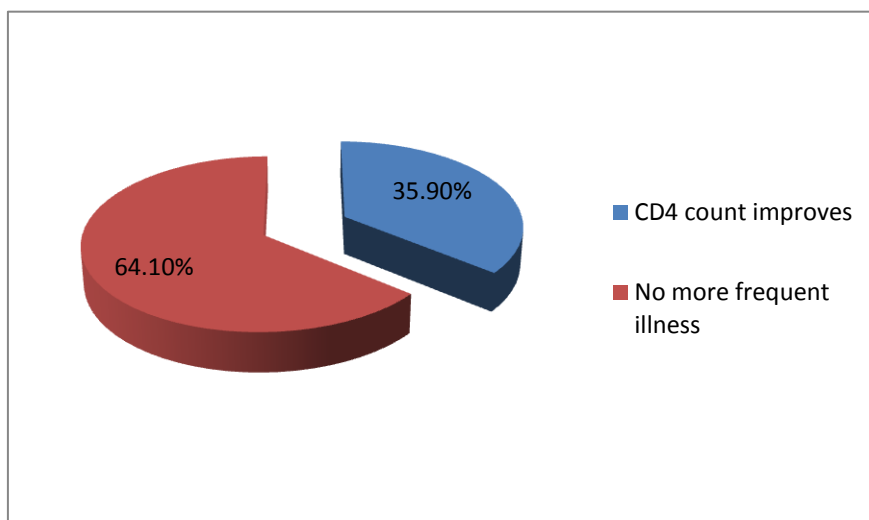
Figure 3.5:   Distribution of respondents by gained benefits of ART

This finding indicated that respondents' perception of ART was very positive and most of them were knowledgeable about ART drugs.

3.21.2 The ART regimen the respondents were taking

The majority of respondents (67.6%) were taking a TDV-containing regimen followed by a D4t combination (15.9%), and AZT (15.5%). Other types of regimens constituted 1% (Table 4.4).

Table 3.4: Distribution of respondents by types of ART drugs they were taking

ART Drugs	Frequency	Percentage
D4t	46	15.9%
TDV	196	67.6%
AZT	45	15.5%
Others	3	1%
Total	290	100%

Regarding the ARV drugs combination the majority of the respondents were getting EFV (77.9%), followed by NVP (18.6%), and other regimens constituted 3.45%.

With regard to the effect of individual ARV drugs that were analysed by means of binary logistic regression, the model selected D4t at p = 0.012 and NVP (p = 0.021 (< 0.05)) in which the side effects of both drugs were more compared to others (Table 4.5).

Table 3.5: Regression analysis of effects of ARV drugs on ART adherence

		B	S.E.	Wald	df	Sig.	Exp(B)
	D4t	.886	.352	6.332	1	.012	2.425
	EFV	-.450	.517	.758	1	.384	.637
	NVP	-1.445	.627	5.309	1	.021	.236
	Constant	.215	1.551	.019	1	.890	1.240

3.21.3 DOSES OF TREATMENT MISSED AND DURATION OF RESPONDENTS' TREATMENT

The majority of the respondents (80.7%) did not miss any doses of ART medication whereas 7.6% missed two doses, and 7.2% missed more than four doses (Table 4.6).

Table 3.6:   Distribution of respondents by doses missed of ART drugs

Doses Missed	Frequency	Percentage
None	234	80.7%
Two	22	7.6%
Three	13	4.5%
Four and above	21	7.2%
Total	290	100%

In terms of the duration of the ART treatment, 40.7% were taking treatment for more than 36 months and 13.8% took their medication for less than six months. However, the researcher noted that there was no significant association between the length of duration and adherence to ART (χ^2 = 4.28; df = 4, p = 0.370).

Table 3.7:   Distribution of respondents' length of ARV medication

Duration of treatment	Frequency	Percentage
≤ 6 months	40	13.8%
6 - 12 months	54	18.6%
12 - 24 months	45	15.5%
24 - 36 months	33	11.4%
≥ 36 months	118	40.7%
Total	290	100%

3.21.4 Reason(s) for missing dose(s) of ART regimen

The study found that 8.3% of respondents who did not adhere to treatment said that they complained about the burden of too many pills, 2.76% felt better and therefore they missed treatment doses, 2.41% said that they missed their treatment doses due to travel or migration to other places, 2.07 % said they missed ART doses because they were very ill. The rest of the respondents said they missed their ART due to the

side effects of the drugs (1.72%), economic related problems (1.38%), and social stigma (0.67%) (Table 4.8).

Table 3.8: Distribution of respondents according to reason(s) for missing treatment

Reasons of missing doses	Frequency	Percentage
Pills burden	24	8.3%
Side effect of ARV Drugs	5	1.72%
Travel / Migration	7	2.41%
Feels better	8	2.76%
Too ill	6	2.07
Economic situations	4	1.38
Stigma	2	0.67
Did not miss	234	80.69
Total	290	100%

The findings confirmed that respondents had various reasons which caused them to miss treatment doses. A significant association existed between reasons for missing treatment doses and adherence to ART (χ^2 = 297 with df = 7, p < 0.0001).

3.21.5 Source of ART drugs

The majority of respondents (96.6%) said that government health facilities were the source of ART drugs whereas 0.7% said that they would get ART drugs from a chemist when they ran out of ART drugs, 1.4% said that they would get ART drugs from friends, and another 1.4% said that they could get ART drugs from mission hospitals (Table 4.9).

These findings indicated that the majority of respondents (96%) were aware of where they should get their ART medication. Therefore, ART re-supply was not a problem to patients. No significant association existed between the knowledge about where to get ART supplies and adherence to ART (x^2= 3.43, df =3, p = 0.35, > 0.05).

Table 3.9:   Distribution of respondents by source of ART drugs

Source of ART drugs	Frequency	Percentage
Chemist	2	0.7%
Friends	4	1.4%
Public sector	280	96.6%
Others	4	1.4%
Total	290	100%

3.21.6 Co-treatment of HIV and other infections

Most respondents (63.45%) were not being treated for HIV and any other infection at the same time. Nearly a third (29.30%) of the respondents were being treated for other chronic disease, 3.45% of respondents received treatment for co-infection HIV and TB, 2.07% were treated for a fungal infection, and 1.73 % were being treated for other bacterial infections (Table 4.11).

Table 3.10: Distribution of respondents according to whether they were undergoing Co-infection treatment of HIV and other infections or not

Other types of infection on Rx	Frequency	Percentage
TB treatment	10	3.45%
Fungal infection	6	2.07%
Antibiotics other than for TB	5	1.73%
Other diseases (specify)	85	29.30%
No other treatment	184	63.45%
Total	290	100%

A significant association existed between treatment for both HIV and other infections and adherence to ART (χ^2 = 5.46, df = 4, p = 0.019). More than a quarter (29%) of

the respondents who had to co-manage HIV and other diseases did not adhere to ART and they mentioned pill burden as the reason.

3.21.7 Distance from the facility

The majority of respondents (90%) had to travel less than 10km to collect their medication from a clinic. Only 1.4% was collecting their ART medication by travelling more than 20km (Table 4.11).

Table 3.11: Distribution of respondents according to their distance from the clinic

Distance	Frequency	Percentage
< 5km	145	50%
5-10km	115	39.7%
10-20km	26	9%
➢ 20km	4	1.4%
Total	290	100%

However, no association was observed between distance from the facility and ART adherence in this study (x^2 =1.87; df =3, p = 0.6; since P> 0.05).

3.21.8 The influence on adherence to ART of health care facilities and health care providers

The majority of respondents (96.6%) said that they were able to follow their ART, 97.63% said that they knew the importance of following the course of treatment strictly and only 2.4% said that they did not know the importance of strictly following the course of ART. Most of the respondents (95.9%) admitted that they were counselled, especially before they had started with ART. Most of the respondents (97.6%) agreed that it was important for HIV+ patients to be counselled, while they were continuing with ART because it helped to improve ART adherence. Most of respondents (98.6%) said that privacy was maintained during consultations while only 1.4% said privacy was not maintained. This finding showed that health care

providers adequately informed their patients with regard to their ART medication. A significant association existed between the ability to follow ARV treatment and adherence ($\chi2$ =12.82, df =1, p = 0.000 < 0.05).

3.22 SECTION C: RESULTS ABOUT THE PROPORTION OF ADHERENCE TO ART

In this study, the ART users' adherence to ART status was assessed by using self-report assessments for a period of one month and pharmacy pill count records by the health providers. The findings showed that self-report assessments indicated that 82.8% adhered to ART while 17.2% did not. With respect to physician assessment, the findings showed that adherence to ART is 76.9% in comparison with non-adherence of 23.1% (Table 4.12).

Table 3.12: Percentage distribution of proportion of adherence to ART at the Kwa-Thema Community Health Clinic

	Self-report		Physicians assessment	
	frequency	%	frequency	%
Adherence	240	82.80%	223	76.90%
Non-adherence	50	17.20%	67	23.10%
Total	290	100%	290	100%

There was no significant difference between self-reporting and health providers' assessments of ART adherence (Pearson Chi-Square = 180.7, with df = .1 and p-value < 0 .0001).

3.23 CONCLUSION

Although in this study adherence levels were adequate (77%), it still remained at a sub-optimal level of adherence, since it was lower than 95%. Patients had excellent knowledge of HIV / AIDS, subscribed to global HIV care standards, and had strong relationships with their medical practitioners. Other factors that were not predictive of adherence to ART included age, marital status, dosing schedules, symptom improvement and stigma. However; gender, educational level, side effects of ART

medication, and co-infection while being on HIV treatment were significant reasons for not adhering to ART.

CHAPTER 5

DISCUSSION OF THE FINDINGS AND LITERATURES CONTROL

4.1 OVERVIEW OF THE DISCUSSION AND FINDINGS

In Sub-Saharan African countries where ART medication has been introduced, adherence is a major challenge and an essential factor for achieving optimal HIV treatment outcomes. Adherence to ART relates to the capability of a patient to take the appropriate dose of each ART medication at the right time and exactly as prescribed. Studies estimate that an adherence rate of at least 95% is needed to achieve the full effectiveness of HAART treatment while minimising virologic failure and resistance to ART (Lima , Harrigan , Murray , Moore , Wood , Hogg, 2008).

A meta-analysis of 27 studies from 13 African countries found that 77% of patients on ART achieved an optimal level of adherence to such treatment (Mills et *al.*, 2006). Reasons for poor adherence to ART are likely to vary from place to place, with some reasons being specific to a particular geographical setting. Like in other studies, some factors related to adherence to ART in this study are identified and briefly explained in this chapter.

The main aim of this study was to identify factors that obstructed adherence for people on ART, focusing on the levels and consistency of adherence, as well as the association between adherence and factors influencing adherence to ART. Not much is known about achievable levels of ART adherence in resource-limited settings. This chapter contains a discussion about key findings of the quantitative results presented in the preceding chapters in light of the literature review.

4.2 DEMOGRAPHIC INFORMATION

There were twice as many female (68%) than male (32%) respondents in the sample. The relatively low number of males attending the clinic was not surprising and consistent with other studies. Studies have found that females are more likely to attend Voluntary Counselling and Testing (VCT) services and to actively seek health care than males (Shisana *et al.*, 2005). The findings relating to the high proportion of females at the Kwa-Thema Clinic in this study also support other findings that HIV-infection is more common in women than in men. Another possible reason was that

more males receiving ART at the clinic were working. Therefore, they were either not able to collect the medication, or they could not wait and were always in a hurry to leave the clinic. Less male patients were able to give consent to participate in the study. This exacerbated the disparity in the sample. Statistical analysis showed that there was a significant association between gender of respondents and adherence to ART ($\chi2 = 3.78$, df = 1, p = 0.03 < 0.05).

This finding was similar to the finding of Abah *et al.* (2010) indicates that in South Africa, the gender of the respondents was influences adherence to ART.

Another finding by Nyambura (2009) in Kenya and the Botswana study by Weiser *et al.* (2003) contain contradicting results that indicate no association between gender and adherence to ART.

With regard to the age group of the respondents, more than 50% were between the ages of 30 and 50 years. This showed that the adult population was more willing to check their HIV status than the younger age groups. These findings indicated that the age of an individual was not significantly associated with adherence to ART. Similar results were reported in Ethiopia (Negash & Ehlers, 2013) and a Nigerian study reports no significant association between age and ART adherence levels (Afolabi, Ijadunola, Fatusi, & Olasode, 2009).

Other similar studies by Abah *et al.* (2004) and Nyambura (2009) arrive at different findings when they indicate that the age of respondents influences adherence to ART. According to their findings, the trend indicates that adherence to ART increases while patients on ART are getting older and decreases as the age advances above 60 years. The reasons for their findings are based on the observation that the youth suffer most from stigma and denial while the elderly find it difficult to understand and follow ART instructions. The findings of this study indicated that stigma was not a major problem for adherence to ART, since people were well informed about the nature and the characteristics of HIV infection. The researcher elaborates on this issue in the findings about family support and ART adherence.

This study found that there was no significant association between marital status and adherence levels; however, more women than men adhered to prescribed ART

regimens. This finding is supported by a South African study that shows women adheres more readily than men, based on self-reported adherence rates validated by viral suppression, CD4 cell counts, and clinical outcomes (Boulle, Michaels, & Hildebrand, 2004). Other studies in Ethiopia by (Negash *et al.*, 2013) and in Kenya (Nyambura (2009) show no significant association between marital status and adherence to ART.

Using logistic regression models to determine predictors of adherence to ART by Weiser *et al.* (2003) agrees with the findings of this study that marital status does not influence adherence to ART.

With regard to occupation, many studies indicate that employment plays a role in the adherence to ART. A study conducted in Senegal, Botswana and Costarica (castro, 2005) reports that patients who are employed are likely to adhere to ART but the findings. In this study, the findings pointed in a different direction. This could be due to the free accessibility of ART offered by government, as well as the presence of the welfare grant support programme to the needy that might assist with minimising those types of problems.

Education is one of the factors identified in this study that had an association with ART adherence. The adherence level of those respondents with tertiary education was 87%, followed by secondary education (75.3%), and the least adherent group was the ones (64.3%) without formal education. A significant association was noted between level of education and adherence to ART (x^2 = 3.52; df = 3, p = 0.032, < 0.05). The study found high levels of education increased a patient's adherence to ART. A likely reason is that those patients could easily understand and follow the instructions of the health providers of ART. These findings are supported by studies on HIV+ patients in South Africa and the USA among whom the ones who lack education do not adhere to ART Abah *et al.*, 2004; Stone, 2004, Nyambura, 2009). However, the findings from Botswana by Weiser *et al.* (2003) indicate that lower levels of education are associated with higher adherence.

SOCIO-CULTURAL FACTORS

Unlike in many studies, the finding in this study about social conditions showed that there was no significant association between support and adherence to ART. Similar studies by Nyambura (2009) in Kenya and Mills *et al.* (2006) have found that there is a significant relationship between support and adherence to ART. The study in Botswana by Weiser, *et al.* (2003) agrees with the findings of this study, since it reports no significant association between stigma and adherence to ART. This might be due to the fact that community members were well informed about HIV in South Africa and that people were not afraid if their HIV+ status was known to other people. The mass campaign by the government for VCT might also contribute to the absence of fear in disclosing one's status.

4.3 ART REGIMEN OF THE RESPONDENTS

Various studies report that the side effects of ART medication are one of the causes of non-adherence to the treatment by HIV patients. In this study, there was a significant association between some ART drugs, such as D4t and NVP and adherence. The side effect profile of D4t and NVP is higher than that of other ART medication. This finding is supported by other studies (Mills, *et al.*, 2006; Byakika, Tusiime, Oyugi, & Tumwikirize.,2005). But the study in Botswana by Weiser *et al.* (2003) has found that there is no significant association between side effects of ART medication and adherence of ART.

This latter finding differs from the findings of this study that showed medication side effects were a significant predictor of adherence. Patients who live in resource-limited countries may be more accepting of side effects than their counterparts in resource-rich settings due to the financial sacrifice required to secure therapy combined with the well-known physical, social, and emotional morbidity associated with untreated problems of HIV / AIDS.

With regard to knowledge of HIV / AIDS, respondents demonstrated that they did have substantial knowledge about ART. However, no significant association existed between knowledge about ART and adherence. Not even symptoms improvement of HIV / AIDS was associated with patients' adherence to ART. These findings are supported by a similar study in Botswana (Weiser *et al.* 2003) that indicate there is

no significant correlation between medication adherence and patient knowledge, traditional medical perceptions, and symptoms improvement. This might be the case because other factors like support versus lack of support and socioeconomic conditions are stronger indicators of adherence than patients' knowledge about the benefits of ART and the importance of adherence.

The findings of the study indicated that there was a significant association between reasons provided for missing ART medication and adherence to ART. This finding is supported by studies on AIDS patients in the USA, Canada, Belgium, Brazil, and Botswana that show forgetfulness, fear of side effects, feeling better, feeling too sick, and pill burden are reasons for ART non-adherence (Mills *et al.*, 2006).

4.4   CO-INFECTION TREATMENT OF HIV AND OTHER INFECTIONS

The researcher noted that respondents who were taking other medication in addition to ART drugs are less likely to adhere to ART therapy. This finding is supported by the findings of similar studies conducted in Kenya (Nyambura, 2009; Mills *et al.*, 2006). They have found that HIV patients who are taking other medications in conjunction with ART are more likely not to adhere to their ART medication. The heavy burden of pills, drug interaction, or adverse effects might impede the patients' adherence to their ART medications

4.5   HEALTH CARE PROVIDERS' INFLUENCE ON ADHERENCE TO ART

A significant relationship existed between the ability to follow ART treatment and adherence (χ^2 = 12.82, df = 1, p = 0.000, p < 0.05). Healthcare providers reminded the respondents of the importance of follow-up visits to the health facility. Respondents knew the importance of following the course of treatment and had proper information about side effects that could result from medication. They were also aware of to the actions that ensured ART adherence, the importance of counselling before starting and during treatment, and the importance of privacy during consultation. These findings are supported by a similar study done on HIV patients and health care providers where exit interviews, observation, focus group discussion, and key informant interviews demonstrate that patients who are adequately informed about antiretroviral therapy adhere to ART (Abah *et al.*, 2004) and (Nyambura, 2009)

In relation to travel distance to the health facility where ART medication was collected – unlike the results of other studies – it showed no effect on ART adherence levels in this study. A similar study in Botswana by Weiser *et al.* (2003) reports that people travel 800km to 1 000km to get the medication. In their study in contrast with this study, they have found that there is an association between distance from the source of ARV medication and adherence of ART. The reasons that distance is not a huge problem in South Africa is the establishment of well-structured HIV / AIDS programmes by government and equitable and easy public access to ART medication.

4.6 ADHERENCE TO ART

It is important to have an optimum level of adherence (above 95%) to achieve the best outcomes in the management of HIV-infected patients. Due to various factors, the personal and organisational level of adherence to ART varies from place to place. The objective assessment of the adherence rate at the Kwa-Thema Clinic was 77% and the proportion of non-adherence rate was 22% which indicated that the level of adherence in the area was sub-optimal (< 95%).

In comparison with other similar studies in South Africa, for example in Soweto by Nachega *et al.* (2004), the level of adherence to ART at the Kwa-Thema Clinic was less than the Soweto findings (95%) of the adherence level to ART. However, the ART adherence rate of (77%) in this study was relatively high compared to findings in developed countries on HIV+ patients among whom ART adherence was 55% (Mills *et al.,* 2006).

The findings of this study suggested that the adherence rate to ART among respondents at the Kwa-Thema Clinic was comparable to those in most countries. In developed countries, the rates of patient-reported adherence ranged between 40% and 70%. Also, the level of adherence observed in this study was consistent with findings in Uganda, Senegal, and Botswana (Mills *et al.*, 2006).

The analysis indicated that of the respondents, 77% said they had never missed the pills, 77% always remembered to take their medication and that they were able to manage side effects. That was a reliable indicator of possible adherence. The rapid replication and mutation rate of HIV requires very high levels of adherence (> 95%)

to achieve reliable suppression of the viral load. The remaining 23% of the respondents in this study who had missed their pills were did not comply with the required 95% adherence rate.

4.7   CONCLUSION:

Adherence rates at the Kwa-Thema Clinic appeared to be comparable with those in many developed countries despite the fact that patients at the Kwa-Thema Clinic faced many structural and economic barriers to treatment. In this study, factors such as gender, education, cultural perceptions, and social barriers influenced the level of adherence to the treatment of HIV patients. Close supervision and health education about ART should improve adherence and, consequently, treatment outcomes for patients receiving therapy in resource-poor settings.

Further studies need to include a focus on the evaluation of the costs to implement multicomponent interventions. More reliable, valid, and objective methods to measure adherence, such as electronic monitoring, should also be considered instead of merely relying on pill count or self-reporting measures.

CHAPTER 6

SUMMARY, CONCLUSIONS, RECOMMENDATIONS, AND LIMITATIONS

5.1   INTRODUCTION

In the previous chapter, at the researcher emphasises various factors; such as patient-related, socio-cultural, ART medication, and others conditions that affect the level of treatment adherence after an in-depth discussion of the issue in Chapter 2. In Chapter 3, the approach to conducting this study is discussed in detail. Using descriptive quantitative research, the researcher was able to identify some factors that influenced the ART adherence status at the Kwa-Thema Clinic; the research approach is well presented in Chapter 4. This chapter summarises the findings of the research, describes the implications of the study findings and the conclusions based on the research findings, as well as provides recommendations and suggestions for further research.

5.2   SUMMARY OF FINDINGS

5.2.1   Socio-demographic and economic factors

The study set out to establish the association of factors that influence adherence to ART among HIV patients. The socio-economic factors related to adherence to ART that were identified by this study included patient factors; such as gender, educational level, and socioeconomic factors. Furthermore, cultural factors such; as absenteeism from work, denial, lack of family support, community and employer support, preference for traditional medicine, and belief in spiritual healing (religion) profoundly influenced adherence to ART.

5.2.2   Factors that obstruct adherence

Other conditions that also affected adherence to ART included antiretroviral regimen (that is the number of drug regimens) per day, number of pills per regimen, and therapeutic class composition of drug regimen. The researcher also noted that

management of co-infections influenced adherence to ART negatively. Healthcare infrastructure and quality of relationships with healthcare providers determined whether patients adhered to ART or not.

5.2.3 Prevalence of adherence

The study demonstrated that the research objectives had been met. The study findings indicated that the level of adherence at the Kwa-Thema Clinic was 77%. Even though it was higher than in some developed countries, it remained suboptimal (less than 95%).

5.3 RECOMMENDATIONS

Based on the findings of the study, the researcher makes the following recommendations to enhance the adherence level.

5.3.1 Socio-demographic and economic factors

- Intensify health education campaigns that address stigma and gender discrimination.
- Promote family and community support for people living with HIV and AIDS.
- The high levels of adherence may not guarantee adherence for a long time, therefore, it is crucially important that adherence should be monitored regularly with simple practical methods like pill count and patient recall.
- The study indicated that there were fewer male than female patients attending the clinic. Programmes that specifically target men on HIV / AIDS issues need to be established. This will assist with increasing the enrolment of men, assisting them understand the gender issues related to HIV / AIDS, and finally mobilising them to protect and support women in fight to treat and prevent HIV / AIDS.

5.3.2 Factors that obstruct adherence

- Providing feedback to the patients by the healthcare providers about the advantages of the ART to their bodies is important. This will encourage them not to skip their medication.

- Training sessions are required to gain the knowledge how to disseminate information that is appropriate to a patient's level of understanding. It will empower patients with the correct knowledge about good adherence practice.

- Knowledge, talking and showing CD4 count and viral load is therefore very important as both part of the training and regular feedback during the time of visits to build trust of the medication.

- Continuous operational research on adherence since adherence is dynamic. Research is urgently needed to determine patient-important factors for adherence.

5.3.3   Prevalence of adherence

- Although the study indicated the relatively high levels of adherence, the development of some guidelines for implementing adherence management strategies are necessary which may include, the issue of continuous adherence counselling; bringing treatment closer to the people; family care model approach to HAART, practical reminders, adherence case management and medication organizer.

- Continuous operational research on adherence since adherence is dynamic. Research is urgently needed to determine patient-important factors for adherence.

5.4 FUTURE RESEARCH

- The following topics are recommended for further research:
- Psychological factors and adherence to ART.
- Investigating sexual behaviours for people on ART
- There is need for a study on co-treatment of AIDS and other infections

5.5 CONCLUSIONS

5.5.1   Socio-demographic and economic factors

There are many factors which affect the adherence of ART.it advisable to overlook adherence of ART within the context of socio –economic factors. In this study factors such as Gender, education, cultural beliefs and social barriers influence the level of

adherence in the treatment of HIV patients. There is also a need for an effective and sustainable information, education and communication strategy nationwide to address the problem of HIV stigma and gender discrimination, which is a proven barrier to care and adherence to therapy. Government and non-governmental agencies are particularly joined to make this a priority for lasting HIV/AIDS prevention and control in the country

5.5.2 Factors which hinders adherence

Co-treatment of HIV and other infections remains a major challenge which requires closed follow up and supervisions by health providers. The type and side effects of ART drugs were the most significant treatment barrier in this study.

The new program of fixed dose ARV medication may help to minimize the possible side effects of ARV drugs which caused by individual drugs. Longitudinal quantitative studies documenting adherence to ART over several years are needed to more accurately determine the consistency of patients' adherence over years. A longitudinal study is more likely to produce reliable answers as the researcher will be able to establish a better relationship with the patient, as well as being able to document changes in adherence over a period of time

5.5.3 Prevalence of adherence

The adherence rates found in this study are comparable to other studies. Most of the studies report adherence rates of between 70 and 90 per cent adherence. ART predictably leads to an immunological benefit characterised by an increased CD4 cell count that reduces the risk of AIDS-related disease progression and death. This rate is low for good virologic, immunologic, and clinical outcomes. Near perfect adherence, however, is required to maximise the likelihood of long-term clinical success. Adherence is complex and a multi-dimensional approach is required to remove the barriers that would strengthen the influence of the facilitators.

In conclusion, adherence is an important predictor of viral suppression, reversal of progression to AIDS, and death. The effectiveness of treatment outcomes with expanding access to ART in resource-limited settings such as South Africa would require a thorough understanding of the adherence barriers that are unique to

resource-poor settings. The level of adherence rates at the Kwa-Thema Clinic appear to be suboptimal (< 95%). Nonetheless, it remains comparable to other developing countries despite the fact that patients at the Kwa-Thema Clinic face structural and economic barriers to treatment.

Expanded access to subsidised ART should improve adherence and, consequently, treatment outcomes for patients receiving therapy in resource-poor settings.

5.6   LIMITATIONS OF THE STUDY

The study was only conducted at one clinic and the results may not be generalised to other health settings in South Africa. The study used a cross-sectional design. With this design, no conclusion about causal links can be drawn. This is because prevalence is a mixture of incidence and duration of the disease; cross-sectional studies have challenges in distinguishing between factors that cause the disease and those that prolong the disease (De Vos *et al.*, 2011).

Another weakness of this study was the inability to fully investigate the effects of various factors that influenced adherence to ART. This weakness resulted from the fact that the information was not recorded properly. A cohort study that incorporates a qualitative component could address such an objective.

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APPENDIX A: MEDUNSA RESEARCH & ETHICS COMMITTEE CLEARANCE CERTIFICATE

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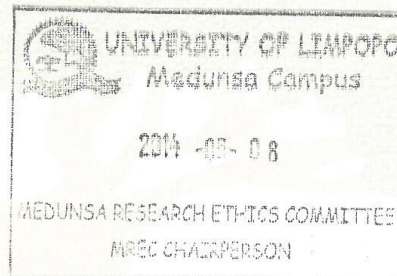
MEDUNSA RESEARCH & ETHICS COMMITTEE

CLEARANCE CERTIFICATE

MEETING: 04/2014

PROJECT NUMBER: MREC/HS/116/2014: PG

PROJECT:

Title: Adherence to antiretroviral therapy among HIV and AIDS patients at Kwa-Thema clinic in Gauteng province, South Africa

Researcher: Dr. M Eyassu
Supervisor: Dr. TM Mothiba
Co-supervisor: Prof N Mbambo-Kekana
Other involved HOD: P Kekana (Public Health)
Department: Medical Sciences, Public Health & Health Promotion
School: Health Sciences
Degree: MPH

DECISION OF THE COMMITTEE:

MREC approved the project.

DATE: 08 May 2014

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MEDUNSA RESEARCH ETHICS COMMITTEE
MREC CHAIRPERSON

DR C BAKER
DEPUTY CHAIRPERSON MREC

The Medunsa Research Ethics Committee (MREC) for Health Research is registered with the US Department of Health and Human Services as an International Organisation (**IORG0004319**), as an Institutional Review Board (**IRB00005122**), and functions under a Federal Wide Assurance (**FWA00009419**)
Expiry date: **11 October 2016**

Note:	
i)	Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee.
ii)	The budget for the research will be considered separately from the protocol. PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

Finding Solutions for Africa

PROUDLY SOUTH AFRICAN

UNIVERSITY OF LIMPOPO ENGLISH CONSENT FORM

Statement concerning participation in a Research Project.

Name of Study: Adherence to antiretroviral therapy among HIV and AIDS patients at Kwa-thema clinic in Gauteng province, South Africa.

I have read the information on read/heard the aims and objectives of the proposed study and was provided the opportunity to ask questions and given adequate time to rethink the issue. The aim and objectives of the study are sufficiently clear to me. I have not been pressurized to participate in any way.

I understand that participation in this Study is completely voluntary and that I may withdraw from it at any time and without supplying reasons. This will have no influence on the regular treatment that holds for my condition neither will it influence the care that I receive from my regular doctor.

I know that this Study has been approved by the Medunsa Campus Research and Ethics (MREC), University of Limpopo (Medunsa Campus). I am fully aware that the results of these results of this Study will be used for scientific purposes and may be published. I agree to this, provided my privacy is guaranteed.

I hereby give consent to participate in this Study.

....

Name of patient

....

Place.   Date.   Witness

_____

Statement by the Researcher

I provided verbal and/or written* information regarding this Study. I agree to answer any future questions concerning the Study as best as I am able. I will adhere to the approved protocol.

....   ………………..   ....……

Name of Researcher   Signature   Date   Place

APPENDIX C: IFOMU LEMVUME

UNIVERSITY OF LIMPOPO : IFOMU LEMVUME

Isitatimende mayelana nothatha iqhaza ocwaningweni lwethu

Igama Locwaningo :Ukunamathela ekuthatheni amapilisi okwelashwelwa ingculazi(imishwanguzo) kuziguli ezinengculazi nesilamulela ngculazi eKwathema kiliniki eGoli, Emzansi Afrika. Ngifundile ngolwazi / ngizwile ngezinjongo nenhloso yocwaningo oluhlongozwayo futhi ngizonikezwa ithuba lokubuza imibuzo. Injongo nenhloso yalolucwaningo iyangingculisa. Angiphoqwanga ukuba ngizihlanganise nalolucwaningo.

Ngiyaqonda ukuthi ukuzibandakanya kulolucwaningo kungokuzithandela ngokuphelele futhi mina ngingahoxa kulolucwaningo noma ngasiphi isikhathi futhi ngaphandle kokunika isizathu. Lokhu ngeke kube nomthelela ekwelashweni kwami futhi ngeke kube nomthelela ekukwenakekelweni engikuthola kudokotela wami njalo.

Ngiyazi ukuthi loluncwaningo luvunywe yiNyuvesi yase Limpopo(Medunsa) Impatho(ethics)(MREC). Nginolwazi olugcwele lokuthi imiphumela yalolucwaningo izosetshenziselwa ezesayensi futhi ingavezwa emabukwine. Ngiyavumelana nalokhu, uma imfihlo yami iqinisekisiwe.

Ngiyavuma ukuzibandakanya nololucwaningo

....

Igama lakho..

....

Indawo   Zingakhi   Ofakazi

_____

Isitatimende somucwaningi

61

Ngilunikile ulwazi ngoncwaningo ngomlomo/ ngangombhalo. Ngiyavuma ukuphendula noma imiphi imibuzo engavela maqondana noncwaningo njengoba ngikwazi. Ngizowenza uncwaningo njengezivunyelwano engisenzile ne Nyuvesi(ethics).

....

.... ……………….. ....…… ....

Igama lomcwaningi   Sayina   Zingakhi   Indawo

APPENDIX D: REQUEST FOR ETHICAL CLEARANCE FROM THE EKURHULENI RESEARCH COMMITTEE

EKURHULENI HEALTH DISTRICT

Enquiries: Dr. M. A. Eyassu

Tel: 011 878-8548

GAUTENG PROVINCE
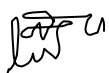HEALTH
REPUBLIC OF SOUTH AFRICA

Date 10May2014

To: Ekurhuleni Health District Research committee

My name Dr. MA Eyassu a student of master of public health program at university of Limpopo would like to apply for ethical clearance from Ekurhuleni research committee.

The purpose of the study is to fulfil my master degree in public health.

Your co-operation in this regard is highly appreciated.

Regards,

Dr. MA Eyassu

APPENDIX E: ETHICAL   CLEARANCE   FROM   THE   EKURHULENI
RESEARCH COMMITTEE

APPENDIX F: INDEPENDENT STATISTICAL ANALYSIS

APPENDIX 2

STATISTICAL ANALYSES

The Chairperson,
Medunsa Campus Research and Ethics Committee (MCREC),
Box _____
UNIVERSITY OF LIMPOPO
Medunsa Campus

Dear Sir/Madam
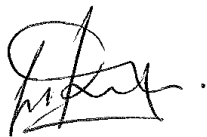
STATISTICAL ANALYSES

I have studied the research protocol of <u>MELAKU ALAZAR EYASSU (Dr)</u>

titled: <u>Determinants of adherence to antiretroviral therapy among HIV/AIDS adult
patients: A case study at Kwa-Thema clinic Gauteng Province</u>

and I agree/do not agree * to assist with the statistical analyses.

Yours sincerely,

_____
Signature: Statistician

Legesse Kassa Debusho (PhD)
_____
Name in block letters

30/10/2013
_____
Date

* Please delete which is not applicable. If you do not agree to assist with the statistical analyses,
    please provide reasons on a separate sheet.

10

APPENDIX G: ENGLISH VERSION OF THE QUANTITATIVE DATA COLLECTION TOOL (STRUCTURED QUESTIONNAIRE)

Structured interview guide for the HIV and AIDS patients who are on treatment.

(A) Basic Information

1. Date of interview._____

2. Study site._____

3. Code of the interview ……………………………

(B) Socio-Demographic Information

4. Sex/ Gender of respondent (1) Male [ ] (2) Female [ ]

5. Age in years: ………

6. What is your current marital status?

1). Single (not married and not living with a partner) [ ]

2) Married (monogamous/polygamous) [ ]

3). Separated (currently not living together but not divorced) [ ]

4) Divorced [ ]

5) Widowed/ widower [ ]

6) Co-habiting (not married but lives with a partner) [ ]

7). Number of children…………………………….

(C) Socio-Economic Information

8). what is your employment status?

1) Employed with job [ ]

2) Business/self-employed. [ ]

3) Pensioner [ ]

4) Unemployed [ ]

(D) Food and Nutrition Security.

9) What is the main source of food for your household?

1) Purchase (market/grocery

2) Household farm/garden

3) Relatives/friends

4) Welfare/NGO support [ ]

5) Other (specify)…………..

(E) Level of Education and Knowledge on ARV drugs

10). What is your level of education?

1) No formal education [ ]

2) Primary education [ ]

3) Secondary education [ ]

4) University/college education [ ]

11). In your own view what are ARV drugs used for?

1) Curing [ ]

2) Reducing pain [ ]

3) Reducing progression of HIV [ ]

4) I don't know [ ]

(F)Treatment Regimen and Co-management.

12) Which ART drugs are you currently taking?

1) Stavudine (d4T) 1) No 2) Yes

2) Lamivudine (3TC) 1) No 2) Yes

3) Efavirenze (EFZ) 1) No 2) Yes

4) Nevirapine (NVP) 1) No 2) Yes

5) Tenofovir 1) No 2) Yes

6) Zidovudine (ZDV or AZT) 1) No 2) Yes

7) Abacavir (ABC) 1) No 2) Yes

8) Didanosine (ddl) 1) No 2) Yes

9) Lopinavir/Ritonavir 1) No 2) Yes

10) Other (specify)   1) No 2) yes

13) Treatment duration (in months)

1) Less than 3

2) 3–6

3) 7–12

4) 13–24

5) 25–36

6) > 36

14) Many people find it hard to remember to take every single dose, in the last two weeks, how many doses have you missed?

 (1) None   (2) Two   (3) Three   (4) Four   (5) 5 or more

If there are missed doses, how many items of ARV drugs?

1. Single Drug
2. TWO Drugs
3. Three Drugs

15) Reasons for non-adherence   1. Yes   2. No

	1. Yes	2. No
1. Too many pills?		
2. Is the quantity of pills a barrier?		
3. Duration of treatment too long?		
4. Duration of treatment a barrier?		
5.Side effects with ARV medication?		
6. Side effects a barrier?		
7. ARV cost a problem?		
8. ARV cost a barrier?		

9. Frequency of required clinic visits a barrier?		
10. Reason that visit frequency is a barrier?		
11. Can't leave work?		
12. Live too far away?		
13. Can't leave work and live too far?		
14. Long clinic waits?		
15. Too sick to travel?		
16. Must pay at each visit?		
17. Frequent travel or migration?		
18. Travel/migration a barrier?		
19.Is hunger a barrier to treatment?		
20. Overall economic situation a barrier?		
21. Stigma a barrier?		
22. Stop when asymptomatic?		

16) Where can ARV drugs be obtained?

1) Chemist/ pharmacy [ ]

2) Friends/ relatives [ ]

3) Government Health central, hospitals and clinic [ ]

4) Mission hospitals/clinics [ ]

5) Don't know [ ]

6) Other specify_____.

17. Distance of health facility in which you getting ARV medication from residence area?

   1) less 5km 2) 5 to 10km 3)10 to 20km 4) more than 20km

18). What other drugs (besides anti-retroviral) are you currently on (tick as appropriate)

Tick Drug How many times per day

(1) Pain killers   1. No   2. Yes

(2) Appetitive stimulants/vitamins   1.No   2. Yes

(3) Sleeping pills   1.No   2. Yes

(4) TB treatments   1.No   2. Yes

(5) Antibiotics (other than for TB) 1. No   2. Yes

(6) Fungal infection treatments   1.No   2. Yes

(7) Others specify………………...1.No   2. Yes

(G) Practice of Health Care Providers and Patients on ART

19). Are you able to follow ARV therapy regimen?   1. No, [ ] 2.Yes, [ ]

20). Were you told the importance of completing the full course of treatment?

   1. No, [ ]   2.Yes, [ ]

21). Were you told about the side effects and interactions of these drug(s) given?

    1. No, [ ] 2.Yes, [ ]

22). Have you received any counselling during your treatment?

    1. No, [ ] 2.Yes, [ ]

23). Do you think counselling is useful for HIV patients on treatment?

    1. No, [ ] 2. Yes, [ ]

24). Was privacy maintained during consultation?

    1. No [ ] 2.Yes [ ]

(H) Social-Cultural Factors

Attitude/ perceptions towards ART

25). What is your opinion regarding ART therapy

1) Approve [ ] (2) Disagree [ ] (3) Undecided [ ]

26). Do you avoid friends or relatives because of your illness? 1. No, [ ] 2.Yes, [ ]

27). In the last one month did you have any family or community member who supported (reminded or encouraged) you to take your ARV medications?

1. No [ ] 2.Yes [ ]

28). If yes, who was the person who supported you?

1) Spouse   1. No   2. Yes

2) Immediate member of family (specify)   1. No   2. Yes

3) Nurse   1. No   2. Yes

4) Doctor   1. No   2. Yes

5) Social Worker/Community Health Worker   1. No   2. Yes

6) Friend   1. No   2. Yes

7) Other specify…………..1. No   2. Yes

29). Do you think that ARV will have a positive effect on your health? 1. No   2. Yes

30). What benefits have you gained from using ARV drugs

 (1) Gained more weight/energy [ ]

(2) No more frequent sickness [ ]

(3) Child grows normally now [ ]

31). Do you think ARV drugs can prevent the child you are expecting from HIV.

1. Yes   2. No

32) Is there any one in your house hold taking ARV drugs like you?   1) yes   2) No

33) Self-assessment of adherence

 1) Adherent   2) Non-adherent   3) Gaps in treatment

34) Physician/nurse assessment of adherence (using pill count)

 1) Adherent   2) Non-adherent

APPENDIX H: ISIZULU VERSION OF THE QUANTITATIVE DATA COLLECTION TOOL (STRUCTURED QUESTIONNAIRE)

Imibuzo ehlekile ngesandulela ngculazi (HIV) nengculazi(AIDS) kuziguli elilashwelwa lesisifo(eziphuza imishwanguzo).

(A) Ulwazi olujwayelekile

1. Ilanga lokubuzwa_____

2. Indawo obuzelwa kuyo._____

3. Inombolo yokubuzwa ……………………………

(B) Ulwazi ngezenhlalo zakho

4. Ubulili bakho (1) Owesilisa[ ] (2) Owesifazane [ ]

5. Iminyaka yakho: ………

6. Isimo sakho somshado simi kanjani ?

1). Awushadile (awushadanga futhi awuhlalisani nomlingani) [ ]

2) Ushadile (ngesilungu / isithembu) [ ]

3). Nihlukene (Nishadile ngokwephepha kodwa anisahlali ndawonye) [ ]

4) Nihlukene ngokwephepha [ ]

5) Umfelwa/umfelokwazi[ ]

6)Uyahlalisana (Awushadile kodwa uhlalisana nowesilisa/owesimame) [ ]

7). Isibalwo sezingane………………………….

(C) Ulwazi ngesimo sakho somnotho

8). Ingabe sime njani isimo sakho somsebenzi?

1) Uqashiwe unomsebenzi[ ]

2) Ungusomabisinisi/ Uyazisebenza. [ ]

3) Uhola impesheni [ ]

4) Awusebenzi [ ]

 (D)Ukudla nokuzondla.

9) Nikuthola kanjani ukudla ekhaya?

1) Niyakuthenga ezitolo

2) Nikuthola engadini emafama noma engadini

3) Nondliwa izihlobo/abangani

 4. Nondliwa ihlalakahle [ ]

5) Ngenye indlela (cacisa)…………..

(E) Ulwazi ngemishanguzo yesifo sengculazi

10). Ufunde kangakanani?

1) Awufundanga [ ]

2) Ufunde amabanga aphansi [ ]

3)Ufende amabanga aphezulu [ ]

4) Ufunde enyuvesi/ekoleji [ ]

11). Ngokubona kwakho imishwanguzo uyiphuzelani?

1) Ukwelaphapheka[ ]

2Ukhwehlisa izinhlungu [ ]

3) Ukunciphisa ukuqhubeka kwengciwane lengculazi[ ]

4) Angazi [ ]

(F) Izinhlobo zemishwanguzo yokwelashwa ingculaza

12) Uphuza eyipho inhlobo yemishwanguzo?

1) Stavudine (d4T) 1) Cha 2) Yebo

2) Lamivudine (3TC) 1) Cha 2) Yebo

3) Efavirenze (EFZ) 1) 2) Cha Yebo

4) Nevirapine (NVP) 1) Cha 2) Yebo

5) Tenofovir 1) Cha 2) Yebo

6) Zidovudine (ZDV or AZT) 1) Cha 2) Yebo

7) Abacavir (ABC) 1) Cha 2) Yebo

8) Didanosine (ddl) 1) Cha 2) Yebo

9) Lopinavir/Ritonavir 1) Cha 2) Yebo

10) Okunye (cacisa)

13) Isikhathi esingakanini ngezinyanga uphuza imishanguzo yengculazi

1) Ngaphansi kwe 3

2) 3–6

3) 7–12

4) 13–24

5) 25–36

6) > 36

14) Abantu abaningi bakutholakunzima ukukhumbula ukuphuza imishwanguzo yabo njalo, kulamaviki amabili edlule uhlohlwe kangakhi ukuphuza imishwanguzo yakho?

 (1) Azange   (2) Kabili   (3) Kathathu (4) Kanye   (5) Kahlanu nangaphezulu

Owuphi umshwanguzo owukhohliwe/ isikhathi esingakanani

1

2

3

4

5

Isizathu sokungaphuzi imishwanguzo

1,yebo   2.Cha

1.Amapilisi maningi?		
2.Amapilisi amaningi ayakuvimbela ukuthi uwaphuze?		
3.Isikhathi eside sokuphuza amapilisi?		
4.Isikhathi eside siyangivembela ekuthatheni amapilisi?		
5.Imiphumela emibi yemishwanguzo?		
6.Imiphumela emibi yemishwanguzo iyangivimbela?		
7.Imishwanguzo iyabiza?		
8.Inani lomushwanguzo kulangivimba?		

9.Isibalo sesikhathi okumele uvakashele ekliniki?		
10.Isizathu sokuthi isibalo sokuvakashela ikliniki sikuvimbela wukuthi?		
-Angikwazi ukushiya umsebenzi?		
-.Ngihlala kude?		
-.Angikwazi ukushiya umsebenzi futhi ngihlala kude ?		
-Ulinda kakhulu ekliniki ?		
-Ngigula kakhula ngenke ngizwazi ukufika ?		
16.Kumele ukhokhe njalo mawuvakashela ekliniki?		
17.Ngihlala ngivakashela izindawo ezahlukene?		
18.Ngivinjwa mukhuthi ngihla ngizula?		
19.Indlala iyangivimba ekuphuzeni imshwanguzo?		
20.Isimo sami somnotho?		

21.Ukungafuni ukubonwa ngiphuza imishwanguzo kuyangivimba?		
22.Ngiwayekile ngoba ngipholile ?		

16) Itholakala kuphi imishwanguzo?

1) Ekhemisi [ ]

2) Ebanganeni/Izihlobo [ ]

3) Esibhendlela/ emaclinic [ ]

4) Esibhendlela sesonto- emishini [ ]

5) Angazi[ ]

6) Okunye (cacisa)_____.

17. Imigamo oyihambayo uma uyolanda imishwanguzo ingakanani?

   1) Ngaphansi 5km 2) Phakathi ko 5 no 10km 3) Phakathi ko 10 no 20km 4) Ngaphezulu ko 20km

18)Eyiphi futhi imithi oyiphuzayo ngaphandle kwemishwanguzo (khetha kulamapilisi abhaliwe) ushonokuthi uyiphuza kangakanani?.

(1) Amapilisi ezinhlungu

(2) Amavitamini

(3) Amapilisi okulala

(4) Amapilisi eTB

(5) Amanye amapilisi ngaphandle kweTB

(6) Amapilisi esifo sesikhumba no ma umlomo

(7) Amanye (cacisa)………………...

(G) Ukwenziwe abelaphi nezigula eziphuza imshwanguzo

19). Uyayiqonda imishwanguzo yakho? Cha, [ ] Yebo, [ ]

20). Bakuchazele ukubaluleka kokuphuza nokuqeda imishwanguzo yakho?

   Cha, [ ] Yebo, [ ]

21). Bakuchazele ngemiphumela emibi yokuphuza imishwanguzo?

   Cha, [ ] Yebo, [ ]

22). Ukewathola ukwalulekwa ngenkathi uphuza imishwanguzo?

   Cha, [ ] Yebo, [ ]

23). Ucabanga ukuthi ukwalulekwa kubalulekile kumuntu ophuza imshwanguzo?

   No, [ ] Yes, [ ]

24). Basingcinile na isidima sakho ngenkathi bekhuluma nawe?

   Cha, [ ] Yebo, [ ]

(H) Ezokuhlala nanasiko

Isimilo nemicabango ngemishwanguzo

25). Ucabanga ukuthi sikhona na isidingo semishwanguzo?

 1) Ngiyavuma [ ] (2) Angivumi [ ] (3) Angazi [ ]

26). Yini eyenza ungavumi?.........................

27). Uyababaleke abangani noma izihlobo zakho ngenxa yokugula kwakho?

Cha, [ ] Yebo, [ ]

28). Kulenyanga ephelile kukhona abomndeni bakho noma abomphakathi abakuxhasile noma abakukhumbuzile ukuthi uphuze imshwanguzo yakho ? Yebo [ ] Cha [ ]

29).Makube uyavuma, wobani?

(Ketha oyedwa)

1) Umlingani wakho [ ]

2) Abomndeni [ ]

3) Unesi [ ]

4) Udokotela [ ]

5) Abezenhlalakakhe [ ]

6) Umngani [ ]

7) Abanye (cacisa)…………..

30). Ucabanga ukuthi imishwanguzo izokusiza empilweni yakho ? Cha, [ ] Yebo, [ ]

31). Uzuzeni ngonguphuza kwakho imishwanguzo?

 (1) Ngiphakamile ngokomzimba nangamandla [ ]

(2) Angisaguli kakhulu [ ]

(3) Ingane isikhula ngendlela efanele [ ]

32). Ucabanga ukuthi imshwanguzo iyakwazi ukuvikela ingane oyikhulelwe ekubeni ingatholi ingciwane lengculaza.

1. Yebo   2. Cha

33) Kukhona omunye ekhaya ophuza imshwanguzo njengawe? 1) yebo   2) Cha

34) Uzibona uyiphuza kahle imshwanguzo yakho?

   1) Ngiyiphuza kahle   2) Angiyiphuzi kahle   3) Nginokukhohlwa ukuyophuza

35) Isibalo samapilisi esiguli: angakanani amapilisi angaphuzwanga yisiguli kusukeka kwinyanga endlulile?

   1) elilodwa, 2) amabili 3) amathathu 4) amane 5) mahlanu 6) > amahlanu

36) Mawengaphuzwanga , eyiphi lemishwanguzo?

1.   2.   3.

37) Ngokubona kukadokotela/unesi uyiphuza kahle na imshwanguzo?

 1) Uyiphuza kahle   2) Akayiphuzi kahle

APPENDEX I: **STUDY SCHEDULE**

Protocol writing	January 2012 to August 2013
Senior Degrees Committee submission for approval to MREC	Sept and Oct 2013
Re-Submission to MREC for ethics approval. Literature review Chapter 2	April, 2014
Approval from Ekurhuleni Health Ethics Committee. Research Methodology Chapter 3	April,2014
Data collection	Starts May to June 2014
Data entry and analysis	July 2014
Discussion of Findings Chapter 4	July to August 2014
Conclusion, Limitations and Recommendations Chapter 5	July to August 2014
Report Writing up	September to October 2014
Submission for examiner	November 2014

APPENDIX J: ESTIMATED BUDGET FOR THE STUDY

All the costs of the study were covered by the investigator because the researcher didn't have funding for this project.

Activities	Estimated costs
• Transport (petrol) for data collection X 20 days over a period of two, from Germiston to Kwa-Thema clinic X50kilos return per day X 20 = 1000 @ AA rate of R3.45 per kilo	R 3 450.00
• Stationery, Papers ,inks, capturing	R 2 500.00
• Telephone	R 1 500.00
• Language editing	R 6 800.00
• Printing and binding of the dissertation x 6 copies	R 6 800.00
• Cathering cold drinks, biscuit, tea.for respondents	R 2 000.00
Total	R 23 050.00

Note: There is no food parcel in the clinic but the researcher will provide tea and cold drinks for those voluntary respondents after conducting the interview.

APPENDIX K: EDITING CONFIRMATION

* The stars that tell the spade when to dig and the seeds when to grow *

* Isilimela – iinkwenkwezi ezixelela umhlakulo ukuba mawembe nembewu ukuba mayikhule*

P O Box 65251
Erasmusrand
0165

27 November 2014

Dear Dr M A Eyassu

CONFIRMATION OF EDITING THE THESIS WITH THE TITLE <u>ADHERENCE TO ANTIRETROVIRAL THERAPY AMONG HIV AND AIDS PATIENTS AT THE KWA-THEMA CLINIC IN THE GAUTENG PROVINCE, SOUTH AFRICA</u>

I hereby confirm that I have edited the abovementioned document as requested.

Please pay particular attention to the editing notes AH01 to AH91 for your revision.

The tracks copy of the document contains all the changes I have effected while the edited copy is a clean copy with the changes removed. Kindly make any further changes to the edited copy since I have effected minor editing changes after removing the changes from the tracks copy. The tracks copy should only be used for reference purposes.

Please note that it remains your responsibility to supply references according to the convention that is used at your institution of learning.

You are more than welcome to send me the document again to perform final editing should it be necessary.

Kind regards

André Hills
083 501 4124