

FACTORS ASSOCIATED WITH ANTI RETRO VIRAL  
THERAPY ADHERENCE AMONG HIV-INFECTED MEN AT CHILOMONI  
HEALTH CENTRE IN BLANTYRE DISTRICT.

MASTER OF SCIENCE IN COMMUNITY HEALTH NURSING THESIS

BY

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FACTORS ASSOCIATED WITH ANTI RETRO VIRAL  
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HEALTH CENTRE IN BLANTYRE DISTRICT.

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## DECLARATION

I, Lilian Mercy Lijoni hereby declare that this thesis is my original work and has never been presented in part or whole for any other awards or purpose before. All resources utilized in this piece of work have been fully acknowledged by means of referencing. This original piece of work is submitted for a Masters of Community Health Nursing degree.

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## CERTIFICATE OF APPROVAL

The undersigned certify that this represents the student's own work and efforts and has been submitted with my approval.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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**Supervisor**

## DEDICATION

I am dedicating this Thesis to my deceased parents Langton and Jean Masauli who through the years have taught me to live a principled life and to treasure everything that is true, honest, pure, just and of a good report. May your souls rest in peace.

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## ABSTRACT

Low adherence to anti retro viral therapy (ART) increases morbidity and mortality rates among AIDS patients and promotes the emergence of ART resistance. Little is known regarding factors associated with adherence to ART among HIV-infected men at Chilomoni Health Centre in Blantyre District where the research was done.

The purpose of the study to explore factors associated with adherence among HIV-infected men receiving Anti retro viral Therapy at Chilomoni Health Centre in Blantyre District. A quantitative cross sectional study was conducted to explore factors associated with adherence among HIV-infected men receiving Anti retro viral Therapy at Chilomoni Health Centre in Blantyre District and permission was granted by relevant authorities to conduct the study.

Between May 19 to July 07 2014, 237 HIV-infected men were systematically randomly sampled from all HIV-infected men attending ART clinic at Chilomoni Health Centre. They gave a written consent before joining the study. Two hundred thirty seven questionnaires were completed at the clinic before the respondents left for home and were personally collected by the researcher. Descriptive analysis was used to analyze the data.

This study found that there are variations in respondents' knowledge of HIV/AIDS and the importance of adhering to Anti retro viral therapy. Most of the HIV-infected men (83.3%) had positive perception about patient level factors affecting their adherence to ART, medication level factors helping them to adhere to ART and the clinic level factors making it possible for them to adhere to ART. The respondents perceived that they received adequate support for them to adhere to ART. However, all the respondents 100% were not adhering to ART.

In conclusion, it has been observed that despite HIV-infected men having knowledge on HIV and AIDS and the importance of adhering to ART, perceiving positively to patient, medication and clinic level factors and receiving support from family, friends and health care workers they are still not adhering to ART.

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## ABBREVIATIONS AND ACRONYMS

ADQ	Adherence Determinants Questionnaire
AIDS	Acquired Immune Deficiency Syndrome
ART	Anti retro viral Therapy
ARV	Anti retro viral
CDC	Centre for Disease Control
CCAP	Church of Central Africa Presbyterian
CHAM	Christian Hospital Association of Malawi
COMREC	College of Medicine Research and Ethics Committee
CT	Counseling and Testing
DOT	Directly Observed Therapy
HAART	Highly Active Anti retro viral Therapy
HMIS	Health Management Information System
HIV	Human Immune-deficiency Virus
ILO	International Labour Organisation
KCN	Kamuzu College of Nursing
MDHS	Malawi Demographic Health Survey
MSF	Medecins San Frontières
MOH	Ministry of Health
NAC	National AIDS Commission
NACP	National AIDS Control Programme
NSO	National Statistics Office
PLWA	People Living With HIV/AIDS

SPSS	Statistical Package for Social Science
UNC	University of North Carolina
USAID	United States Agency for International Development
WHO	World Health Organisation

## CHAPTER ONE

### INTRODUCTION

#### **Introduction and Background Information**

Sub-Saharan Africa has the most serious HIV and AIDS epidemic in the world. In 2012, roughly 25 million people were living with HIV, accounting for nearly 70 percent of the global total. In the same year, there were an estimated 1.6 million new HIV infections and 1.2 million AIDS-related deaths (AVERT 2014). Furthermore, as well as healthcare and households, HIV and AIDS have impacted significantly upon the education sector, labour and productivity and the wider economy. However, since 2001, the annual number of new HIV infections in sub-Saharan Africa has decreased by 34 percent. This is largely due to the scaling up of antiretroviral treatment (ART) across the region, which reduces the chance of onwards transmission (AVERT 2014).

According to UNAIDS (2015) report, the world has exceeded the AIDS targets of Millennium Development Goal (MDG) 6 and is on track to end the AIDS epidemic by 2030 as part of the Sustainable Development Goals (SDGs). New HIV infections have fallen by 35% and AIDS-related deaths by 41%. The global response to HIV has averted 30 million new HIV infections and nearly 8 million (7.8 million) AIDS-related deaths since 2000, when the MDGs were set (UNAIDS, 2015).

In Malawi, out of a population of 15.4 million almost one million people are living with HIV and AIDS and it is the leading cause of death amongst adults in Malawi and largely contributes to the country's low life expectancy of just 54.2 years (AVERT,

2013). Overall 12.9% of women and 8.4% of men are HIV-positive. HIV prevalence is 17.4% in urban areas and 8.9% in rural areas (National Statistical Office (NSO), 2011).

Malawi's inspirational goal was to provide universal access of ART by 2010. Fulfillment of this goal means having 170,000 patients on treatment and each year increasing this number of patients becoming eligible for ART (Mbirimtengerenji, Jere, Lengu, & Maluwa, 2013). However, despite not achieving this goal, substantial progress has been made in the provision of antiretroviral therapy (ART).

By the end of the 3<sup>rd</sup> quarter, 2011 an estimated 488,845 people had been ever started on ART with 296,246(72%) retained alive on ART (World Health Organisation (WHO), 2012). Additionally by 2012 all admitting hospitals and health centres, both for the government and Mission facilities, were distributing the ARVs in the country. This includes Zomba Mental Hospital in Zomba district which also provides HIV testing and ART to both in-patients, discharged persons with mental disorders, and the surrounding community. These strategies have decreased the prevalence of HIV in Malawi from 12.0% in 2004 to 10.6% in 2010 among persons aged 15-49 years (Ministry of Health (MOH), 2012). Furthermore, by the end of September 2014, 745,133 patients had ever initiated on ART and a total of 521, 319 were alive on ART (MOH), 2014).

Adherence to Anti retro viral therapy is vital for public health and for individual outcomes as it is the principal treatment for HIV and AIDS because sub-optimal adherence can result in resistant viral strains and disease progression (Walkup, et al., 2012; Skovdal, Campbell, Nhongo, Nyamukapa, & Gregson, 2011). Therefore, an adherence of >95% is recommended for patients taking Anti retro viral (ARV) therapy to

prevent the evolution of drug-resistant HIV and subsequent treatment failure (Skovidal et al. 2011; Tiyou, Belachew, Alemseged & Biadgilign, 2011).

Adherence can be expressed quantitatively as a percentage of expected treatments actually taken but its accurate measurement is very difficult (WHO, 2006). There is no gold standard for adherence measurement. While adherence can be ensured by directly observed treatment, this may not be practical for twice - daily therapy which has to be taken for life. As a result levels of adherence can only be estimated by the use of indirect measures (WHO, 2006).

The most commonly used methods include pill counts, pharmacy refill records, various self- reporting tools such as questionnaires and visual analogue scales, measurement of blood levels, and electronic drug monitors which monitor the number of times the cap of a pill container is removed (WHO,2006).

In Malawi, more especially in urban health centres, adherence is measured by pill count, pharmacy refill, not missing appointments and reviewing the master cards of patients, (MOH, 2006; Mbirimtengerenji et al. 2013; Gawa, 2011). However, a study by (Muula & Kataika, 2008) found that men were unlikely to access treatment out of fear of marital consequences. Men testing positive were perceived to have contracted HIV as a result of infidelity and most women think that HIV transmitted from one spouse to another is indicative of husbands 'infidelity. Given that the desire for marital harmony affects men's willingness to access testing services, men clearly face a barrier in obtaining and maintaining treatment. Moreover, ART services are often provided in wards or sites in the health facilities that clearly identify patients' HIV status to others,

impeding their right to privacy. This lack of anonymity prevents some people living with HIV (PLHIV) from using nearby ART facilities (Mekonnen, Sanders, Tibebe & Emmart, (2010).

Furthermore, a study to explore equity and access to ART in Ethiopia also found that men were more likely than women to discontinue ART. While there was no explicit gender analysis of this finding, common reasons included lack of resources such as food and money for transport and medical costs and situational factors including stigma, addiction and incarceration. Additionally, once enrolled onto ART, many men are deterred from attending the monthly consultations that require them to go to the ‘AIDS clinic’ and wait in long queues together with other AIDS patients. In such a situation, they are unable to keep their status a secret and many find this prospect intolerable.

Data for men’s gender barriers have not been well researched or discussed. As a result, little is known about gender issues that are a barrier for HIV-infected men in adhering to HIV treatment (Mekonnen et al., 2010). A study by Muula & Kataika, (2008) which assessed equity in the uptake of Anti retro viral in Malawi found that in the Malawi HIV treatment programme, men are under-represented despite free treatment. The study also recommended that there be further exploration of the barriers to treatment that men face in accessing care in Malawi and further assessment of the factors associated with ART adherence.

The above findings and recommendations clearly show that men have problems in accessing and adhering to ART. Therefore, there is need to explore factors associated with ART adherence among men at Chilomoni Health Centre in Blantyre district. The

results can help the government find strategies to improve men access ART services without fear of stigma.

### **Statement of the Problem**

Non-adherence to Antiretroviral therapy is a major challenge to Acquired Immuno- Deficiency Syndrome (AIDS) care, and the risks associated with it are extensive (WHO, 2006; Adefolalu & Nkosi, 2013). It can lead to poor health outcomes and significantly decreased life expectancy. Furthermore it may increase the risk of secondary transmission and the development of resistant viral strains (WHO 2006; Adefolalu & Nkosi, 2013).

In Malawi, out of 8.4% HIV-positive men only 16% are on ART (NSO, 2011). This shows that men are under-represented in HIV treatment programmes despite free treatment (Muula & Kataika, 2008). At Area 18 Clinic in Lilongwe a study showed ART adherence rate of 80.6% in men (Thonyiwa, Lakati, Nyagero, & Houseinipour (2011) and yet adherence of >95% is recommended for patients taking ARV therapy to prevent the evolution of drug-resistant HIV and subsequent treatment failure (Skovdal et al. 2011; Tiyou et al., 2011). This leads to the rate of AIDS-related mortality rate in men to be higher than in women in many places in Africa which includes Malawi, (Skovdal et al., 2011). Some contributors to HIV and AIDS literature suggest that factors that are associated with ART adherence among men need to be explored to prevent AIDS progression (Makwiza, et al., 2009). This study therefore, will explore factors that are associated with Anti retro viral therapy adherence among HIV- infected men at Chilomoni Health Centre in Blantyre district.

## **Definition of Terms**

### **Adherence**

Medication adherence usually refers to whether patients take their medications as prescribed (e.g., twice daily), as well as whether they continue to take a prescribed medication (Ho, Bryson, Rumsfeld, 2009). Adherence includes several operational subunits of definition. For example, adherence to dosage means number of pills taken as prescribed, adherence to schedule means taking pills consistently on time and finally dietary adherence is taking pills as prescribed with/ after/ or before meal (Sahay, Reddy & Dhayarkar 2011).

In this study, adherence was defined as not missing any doses from the previous month to the current visit (which is usually 28 days or one month), according to self reports by the HIV-infected men. In this view, any person who has not missed the drug for 28 days is deemed to have adhered 100% as assessed by self report. Non-adherence is therefore defined in this study as missing any dose within the 28 days. Any person who has missed any dose will be regarded as having adhered less than 100%.

### **Anti retro viral therapy**

This is the main type of treatment for HIV or AIDS. It is not a cure but it can stop people from becoming ill for many years. The treatment consists of drugs that have to be taken every day for the rest of a person's life (AVERT, 2014). Standard Anti retro viral therapy (ART) consists of the combination of at least three Anti retro viral (ARV) drugs to maximally suppress the HIV virus and stop the progression of HIV disease (WHO, 2013).

A high level of sustained adherence is necessary to suppress viral replication and improve immunological and clinical outcomes; decrease the risk of developing ARV drug resistance and reduce the risk of transmitting HIV (WHO, 2013). The drugs used in this condition are often referred to as: Anti retro viral, ARVs, anti-HIV or anti-AIDS drugs.

In this study, Anti retro viral therapy referred to treatment of HIV infection in Malawi with three Anti retro viral drugs in combination which are Tenofovir, Lamivudine and Efavirenz as first line combination (5A) and Atazanavir and Duomume as second line combination (7A).

### **Associate**

According to Merriam-Webster Dictionary (2014), “associate” means to bring together or into relationship in any of various intangible ways while Oxford Advanced Learner's Dictionary (2014) defines associate as: if one thing is associated with another, the two things are connected because they happen together or one thing causes the other. In this study, associate refers to factors that are associated with HIV infected men to adhere to or not adhere to Anti retro viral treatment.

### **Factors**

A factor is defined by the Oxford Advanced Learner's Dictionary (2013) as one of the several things that cause or influence something. For this study, a factor is anything that is associated with how an HIV-infected man takes or adheres to his Anti retro viral drugs.

## **Man**

Oxford Advanced Learner's Dictionary (2013) defines man as an adult male human. In this study, a man is referred to as any male client 18 years and older who is HIV positive, on ART for more than six months and attends HIV and AIDS treatment clinics at Chilomoni Health Centre managed by the staff of Chilomoni Health Centre.

## **Chilomoni Health Centre**

Chilomoni Health Centre is one of the 18 public clinics that are run by the Blantyre District Health Office in partnership with the Blantyre City Assembly. It has both curative and preventive health care services. It has a catchment population of 73,358 of which 7884 are HIV positive. Total number of HIV positive men is 1782 and 1702 are on Anti retro viral therapy. Chilomoni Health Centre is among the health centres which form Blantyre District Clinical ART Network called managed clinical network format which follows a hub and spoke model. This is where smaller facilities receive clinical support from a larger and more experienced facility in the hub. In this case (Queen Elizabeth Central Hospital). The patients receive care closer to home while benefiting from the experience and expertise available in the hub facility (O'Hare, et al., 2011). The staff in the hub facility maintains their expertise as a result of regular continued professional development and by working day to day with clinicians who have many years of experience in the field. The staff in the spokes will receive regular updates and feedback from the hub staff (O'Hare, et al. 2011).

## **Knowledge on HIV and Antiretroviral therapy.**

The Oxford dictionary (2012) defines knowledge as the information, understanding and skills that is gained through education or experience. For the purpose

of this study, knowledge shall be assessed in terms of: if the users know that ARV do not cure and are supposed to be taken for life, if clients know the importance of adhering to Anti retro viral therapy, if they know the importance of compliance to diet and that life expectancy improves with Anti retro viral.

The level of knowledge shall be graded on a scale with higher numbers depicting higher levels of knowledge.

### **Purpose of the Study**

The purpose of the study was to explore factors associated with Anti retro viral therapy adherence among HIV-infected men at Chilomoni Health Centre in Blantyre district.

### **Study Objectives**

The objectives of the study were to:

1. To assess HIV-infected men's knowledge of HIV and AIDS and importance of adhering to Anti retro viral Therapy.
2. To identify the factors that motivates HIV-infected men to adherence to Anti retro viral Therapy.
3. To describe the kind of support which HIV-infected men need to adhere to Anti retro viral Therapy.
4. To determine HIV-infected men's adherence level to Anti retro viral Therapy.

## **Research Questions**

Research objective one

1. What is HIV-infected men's knowledge of HIV and AIDS and importance of adhering to Anti retro viral Therapy?

Research objective two

2. What motivates HIV-infected men to adherence to ART? What are the barriers to Anti retro viral Therapy adherence among male clients?

Research objective three

3. What kind of support do HIV-infected men need to adhere to Anti retro viral Therapy?

Research objective four

4. What is the level of Anti retro viral Therapy adherence in HIV-infected men?

## **Significance of the Study**

The study is significant because it is the first of its kind to reveal that although HIV-infected men at Chilomoni Health Centre might have knowledge on HIV and AIDS and the importance of adhering to ART, have support from family, friends and health workers or have positive perception regarding patient, medication and clinical level factors they are still not helped by these factors to adhere to ART.

The study findings give an insight to the HIV-infected men's of knowledge; the factors that motivate them, the support that they need to adhere to ART and the ART adherence levels. The findings therefore, may be useful to personnel working at the ART clinic to make recommendations about ART services for HIV-infected men at the Health Centre. They may also be used by policymakers and program managers in Malawi on ways of improving and/or maintaining adherence levels to ART in HIV-infected men as access to ARV medicines is being scaled up nationwide.

## CHAPTER TWO LITERATURE REVIEW

### **Introduction**

The review of literature intends to provide a context of the study and give an insight into the depth of the existing body of knowledge on the topic under study. It illustrates how the topic has previously been researched and identifies gaps and disparities within findings of similar studies that were conducted elsewhere. The literature review also clarifies the significance of the study (Polit & Beck, 2006). This literature review concentrates on: knowledge of HIV-infected men on HIV and AIDS and importance of adhering to Anti retro viral Therapy, the factors that motivate HIV-infected men to adherence to Anti retro viral Therapy. Furthermore the kind of support which HIV-infected men need to adhere to Anti retro viral Therapy was reviewed. Finally, what determines HIV-infected men's adherence level to Anti retro viral Therapy was also reviewed.

In addition, this literature review is also an extension of the previous knowledge and theory and a guide for further research action. It has helped to allocate relevant methodologies used in previous researches such as setting, design, sample and sampling methods, instruments, and inclusion and exclusion criteria for participants in the studies. Articles related to factors associated with HIV-infected men have been reviewed. Studies done globally, regionally and locally have been reviewed. The literature search focused on English language articles and was dated between 2006 and

2014. However, a research article dated 1986 has been cited because it contains relevant information from a primary source which was not available in more recent publications.

An extensive search of research articles from electronic data bases such as Pubmed, Science Direct and websites (online) was conducted. In addition, the website of international organizations such as WHO, UNICEF, as well as the United Nations were also searched for relevant publications and information. It is acknowledged that relevant articles might have been available in other data bases. The key words that were used when looking for the research articles included HIV and AIDS, Anti retro viral therapy, adherence, HIV-infected men, knowledge, client level factors, medication level factors, clinical level factors, and support for HIV-infected men. While numerous articles relating to the topic under study were retrieved from the data bases, the literature search yielded very little on research that had been conducted in Malawi.

The reviewed literature will be presented under the following sub-headings: global update on HIV treatment, treatment of HIV infection in Malawi, HIV-infected men's knowledge on HIV and AIDS and ART adherence, factors associated with ART adherence: patient, medication, clinic level factors, support that HIV-infected men need to adhere to ART and ART adherence.

### **Global update on HIV treatment**

WHO (2013) reports that, massive global expansion of access to HIV treatment has transformed not only the HIV epidemic but the entire public health landscape, demonstrating that the right to health can be realized even in the most trying of

circumstances. The remarkable increase in access to life-saving ART continued in 2012. Fully 1.6 million more people were receiving ART in low- and middle-income countries at the end of 2012, compared with a year earlier – the largest annual increase ever – with the greatest contribution coming from the WHO African Region. The 300 000 people who were receiving ART in low- and middle-income countries in 2002 increased to 9.7 million in 2012.

Nevertheless, WHO (2012), continues to report that, substantial additional effort is needed to enable 15 million people to access ART in 2015, the target agreed to by United Nations Member States in June 2011 at the General Assembly High-Level Meeting on AIDS in New York. The 9.7 million people receiving ART in 2012 represented 65% of that 15 million target, up from 54% at the end of 2011. The overall progress, however, masks some important disparities in access to ART. In most regions, including the WHO African Region, men eligible for ART appear to be less likely to be receiving it than women as generally, men are more likely than women to begin treatment late. By end-2011, 109 countries had reported sex-disaggregated data for people receiving ART, with the data showing a total female-male ratio of 59% to 41%. In this WHO African Region, men comprised only 36% of the people receiving ART but accounted for 44% of the people eligible for ART. Similar disparities have been documented at the country level in Kenya, Malawi, South Africa and Zambia. Furthermore, HIV testing rates are also consistently lower among men than women, and men tend to have lower CD4 cell counts when accessing treatment. AIDS-related mortality rates also appear to be higher among men than women in the WHO African Region, a pattern that is partly explained by the fact that they often present late for care.

There are several possible explanations for men being underrepresented among people receiving ART. High rates of HIV testing within antenatal care facilities may partly explain the greater access of women to ART. Men generally also tend to have poorer health-seeking behaviour than women and in settings where men are more likely than women to have paid work, the opportunity costs of visiting treatment facilities may discourage some men from starting or continuing on ART.

### **Treatment of HIV Infection in Malawi**

There has been an increase in the access of ART globally and this has changed the prevalence of the HIV epidemic and thus improved the health of the people. This shows that people's right to health is being achieved even in low-income countries including Malawi (WHO, 2013).

To achieve this, the government of Malawi adopted a blood screening policy shortly after the first AIDS case in Malawi was diagnosed in 1985 (AVERT, 2013). Subsequently, a public education strategy on HIV and AIDS was developed (Partners in Hope, 2011). In 1989, the government established the National AIDS Control Program (NACP) within the Ministry of Health and Population (AVERT, 2013). Furthermore, the Cabinet Committee on HIV and AIDS Prevention and Care was formed to provide policy and political direction to NACP. During the 1990s, Malawi developed medium-term plans for HIV and AIDS and, as part of the country's larger decentralization process, district AIDS coordinators and district AIDS coordination committees were established. In 1996, the government and its partners evaluated the response to date. It was found that despite high awareness of HIV and AIDS, behavior change had been minimal and HIV incidence continued to increase. NACP's inability to provide the required technical leadership was

also discussed at this meeting. In response, the government developed and launched a national strategic framework for HIV and AIDS in October 1999 at which time the president declared HIV and AIDS a national emergency (AVERT 2014). By the end of year 2000, the government's efforts to grant NACP the autonomy to implement the strategic framework were proceeding slowly. Additionally, NACP remained understaffed thereby impeding its ability to function. Given the limitations of NACP, the National AIDS Commission (NAC) was established in July 2001 to coordinate multi-spectral implementation of the strategic framework (AVERT, 2013; Partners in HOPE, 2011). Anti retro viral which delay the onset of AIDS in people living with HIV, were first made available through the public sector at three sites in Malawi in 2003 (AVERT, 2012). There was no national policy or guidance on (HAART). Médecins sans Frontières (MSF) had been implementing a (HAART) program at Chiradzulu District Hospital since 2001 (McGuire et al., 2012). After at least three drug counseling sessions, (HAART) was proposed (free of charge). Patients presenting with clinically advanced HIV were selected for treatment on the basis of CD4 counts or WHO clinical staging criteria. Supply was based on local market competition, including quality-assured, registered generics.

During the first few months, patients returned for drug resupply/counseling and clinical check-up at frequent intervals. A CD4-cell count was performed every six months. HIV viral load testing was not available in most settings. In November 1999, the University of North Carolina (UNC) Project in Lilongwe and the University of North Carolina Hospitals Infectious Disease Clinic began a program whereby patients' unused Anti retro viral from U.S.-based clinics was donated to Malawi. The program was directed to treat UNC Project and Lilongwe Central Hospital employees or affiliates of these institutions (AVERT 2014). Patients were eligible if their CD4 count was below

200 and a six-month supply of a three-drug combination was available. In January 2000, NAC launched a pilot HAART program in the referral centers in Lilongwe and Blantyre. Its partners included the University of North Carolina at Chapel Hill. Initial medication availability was limited to AZT and 3TC combination therapy (and was not free to patients). In October 2001, Cipla's Triomune (D4T/3TC/NVP) was substituted as the preferred agent (and at 50 percent less cost). Demand for medications increased dramatically after this price reduction, although loss to follow-up was common.

The Malawian government had mounted an impressive response to the HIV and AIDS epidemic. This has been reflected by a steady decline in HIV prevalence; from 14 percent in 2003 to 10 percent in 2011 and new annual HIV infections; from 100,000 new infections in 2003 to 46,000 in 2011 (AVERT, 2014). The government and international donors have both made commendable efforts to increase access to treatment and to improve prevention initiatives. By June 2011 there were 449 ART clinics, owned by government, mission, NGOs and the private sector (303 static clinics and 146 outreach / mobile clinics). Out of these 58 were ART facilities in the private sector, charging a nominal MK500 (US\$1.1) per monthly prescription of drugs per patient. By the end of June 2011, there were a cumulative total of 451,546 clinic registrations, representing 382,953 (85%) patients with newly initiated ART and 68,190 (15%) ART patients transferred between clinics. Out of all clinic registrations, 39% were males and 61% were females, 91% were adults and 9% were children (<15 years). Private sector clinics accounted for 17,099 (3.8%) of total patient registrations (Government of Malawi, 2012).

The ART program in Malawi has grown significantly since it started in 2003. In this year only 3,000 PLHIV were on treatment. At the time ARVs were not free and were

costing about MK2, 500 (US\$5.4) per month which most people could not afford. With the introduction of the free ART program largely supported by the Global Fund the number of people on ART started growing: it was 12,848 by December 2004 and by December 2011, 382,953 had ever been started on ART (Government of Malawi, 2012). This may be due to the fact that the treatment is being given free of charge to eligible patients with HIV and that all ART delivery sites receive quarterly supervision and evaluation by the HIV Unit of the Ministry of Health and its partners (Libamba et al., 2007). However, only 39% of all clinic registrations were males indicating that there is also an under-representation in HIV treatment (Government of Malawi, 2012). Furthermore, at Chilomoni health centre in Blantyre, only 37.9% (1702) out of 1782 HIV-infected men were eligible for HIV treatment (HMIS, Chilomoni Health Centre, 2014). This low uptake of ART is similar to WHO African Region, where only 36% of the men were receiving ART but accounted for 44% of the people eligible for ART (WHO, 2013). This may also be due to that men eligible for ART are more likely than women to begin treatment late (Government of Malawi, 2012). This under-representation may confirm men's poor health seeking behaviour (Muula, & Kataika 2008). On the other hand, high rates of HIV testing within ante-natal care facilities may partly explain the greater access of women to ART (Government of Malawi, 2012). Additionally, shortage of human and financial resources available has hindered greater progress in ART access. Despite the problem encountered in the ART programme, the government of Malawi continued with its efforts to make ART accessible to all eligible clients. This was evidenced by the scaling-up of the national ART programme in 2004 using a structured approach. There was also a focus on one generic, fixed-dose combination treatment with stavudine, lamivudine and nevirapine. Treatment was delivered free of charge to eligible patients

with HIV and there was a standardized system for recruiting patients, monthly follow-up, registration, monitoring and reporting of cases and outcomes. All ART delivery sites receive quarterly supervision and evaluation by the HIV Unit of the Ministry of Health and its partners (Libamba et al.2007; Tweya, et al. 2014).

By the end of September 2014, there were 707 static ART sites in Malawi, managed by government, mission, NGOs and the private sector. Out of these, 95 were ART facilities in the private sector, charging a nominal MK500 (US\$1.1) per monthly prescription of drugs per patient (MOH, 2014). Furthermore, implementation of the Malawi Integrated Clinical HIV Guidelines which started in July 2011 triggered a massive surge in new ART initiations. A total of 29,893 patients initiated ART in the third quarter of 2014 and 6,754 patients (18% already on treatment out of all 37,082 clinic registrations) were registered as a transfer in. Additionally, there were a cumulative total of 929,253 clinic registrations, representing 745,133 (80%) patients who newly initiated ART and 174,411 (19%) patients who transferred between clinics. 9,709 (1%) out of all clinic registrations were patients who re-initiated ART after treatment interruption. Out of all registrations, 36% were males and 64% were females, 91% were adults and 9% were children (<15 years). Private sector clinics accounted for 28,369 (3.1%) of total patient registrations. Out of the 745,133 patients ever initiated on ART, 521,319 (69%) were retained alive on ART, 71,525 (9%) were known to have died, 158,580 (21%) were lost to follow-up and 3,418 (<1%) were known to have stopped ART. An estimated 476,195 adults and 45,124 children (<15 years) were alive on ART by the end of September 2014 (MOH, 2014).

However, factors such as the scale of the epidemic and the shortage of human and financial resources available have hindered greater progress. Gaps in Malawi's HIV response, such as the lack of data on high-risk groups, as well as legislation that criminalizes them, mean that greater effort is needed before Malawi can be said to be implementing a combined prevention approach. Malawi is using Anti retro viral therapy referred to treatment of HIV with three anti-retroviral drugs in combination which are Tenofovir, Lamivudine and Efavirenz as first line combination (5A) and Atazanavir and Duomume as second line combination (7A)(Chitowe, QECH, ART clinic, 15/07/14). Various ways are used to measure client's adherence levels, such as: pill count, pharmacy refill, not missing appointments and reviewing the master cards of patients (WHO, 2006; Mbirimtengerenji et al., 2013; Gawa, 2011). Therefore factors associated with ART adherence among men need to be explored so that facilitators and barriers to ART adherence among men at Chilomoni Health Centre can be identified and acted upon. This may encourage the men to adhere to ART so that HIV suppression can be sustained, risk of drug resistance can be reduced, and overall health can be improved, as well as decreased risk of HIV transmission (AIDSinfo, 2014).

### **Knowledge of HIV-infected men on HIV and AIDS and ART adherence**

Knowledge about HIV and AIDS has been identified as a powerful tool to prevent the transmission of this disease (Olowookere, Fatiregun & Adewole 2012). Currently, a large percentage of the Malawian population has good and accurate knowledge about all aspects of the HIV and AIDS epidemic (Government of Malawi, 2012). Forty- five percent of men and 41% of women have comprehensive knowledge about AIDS and this has doubled from 22% in the 2004 Malawi Demographic Health Survey (MDHS) among

women while for men, the increase in comprehensive knowledge about HIV has been more moderate, and is up from 39% in the 2004 MDHS (NSO, 2011). Furthermore, men and women age 40-49 are less likely to have comprehensive knowledge about AIDS than their younger counterparts. However, this knowledge gained about the disease has not changed attitude or modified behaviour to the expectation of the population. For example, a study conducted in 2005 by the University of Ibadan, Ibadan, in south-western Nigeria, reported that 16.6% of sexually active students used condoms for protection during intercourse in the three months before the study among over 90% of students who possessed a good knowledge about HIV and AIDS and its transmission (Olowookere et al., 2012). This means that patient's knowledge about their disease and treatment is not always adequate because some patients may lack understanding of what the treatment does in their bodies to improve their health. Other patients may not have adequate knowledge on the disease and the consequences of non-adherence or the importance of regular clinic attendance (Jin, Sklar, Oh, & Li, 2008). Available studies suggest that a good understanding of HIV and AIDS and awareness of the consequences of non-adherence are associated with good adherence. (Kamera, 2011; Mbirimtengerenji et al., 2013; Okonkwoh, 2011; Sendagala, 2010; Sumbi, 2010). Therefore health providers should give patients enough education about disease and treatment.

A study by Rubin, (2005) found that educating the patients about their disease state and general comprehension of medications would increase their active participation in treatment. Furthermore, making sure patients understand the drug dosing regimen could also improve adherence. Understanding the relationship between adherence and disease progression, the consequences of poor adherence and impact it will have on the life of an individual client and the whole family is very important (Jin et al., 2008).

Furthermore, a client who is more knowledgeable about HIV, the importance of maintaining the recommended adherence levels would tend to follow all the instructions regarding medication intake as compared to the client with no such information. However it is important for health providers to make sure that patients remember what has been taught or discussed by writing in their health passport to enhance understanding as written instructions can work better than verbal ones. A study by Reddy, Prasad, Kaul, Kakarala, Krishnanand, et al. (2012) showed that provision of the both written and verbal instructions to patient enhances compliance and patient satisfaction. Johnstone, Standford, & Tyndall (2008) also found that the combination of verbal and written health information enables the provision of standardized care information to patients and/or significant others, which appears to improve knowledge and satisfaction.

Available studies suggest that a good understanding of HIV and AIDS and awareness of the consequences of non-adherence are associated with good adherence (Kamera, 2011; Mbirimtengerenji et al., 2013; Okonkwoh, 2011; Sendagala, 2010; Sumbi, 2010). Consequently, misinformation and misconception about treatment can compromise individuals' ability to adhere to ART. Cases of lacking accurate information abounds, leading to some HIV and AIDS patients sharing medications as well as not taking their dose correctly. Therefore, knowledge on HIV and AIDS is very important for patients to help them understand the importance of ART adherence. In all these studies, the sample size of respondents was more than 100 and was conducted on both males and females except for one study whose respondents were females only. All the studies used pre-tested instruments. This shows the reliability and validity of the data. However the results may have limited generalization to the whole population as the studies were conducted in both rural and urban areas, on both males and females.

## **Factors Associated with Anti retro viral therapy Adherence**

There are a variety of factors which influence ART adherence. Therefore before measures are implemented to improve adherence, it is essential to identify the main factors that prevent clients to take their medications as required (Nziva, 2011). World Health Organization (WHO, 2014) characterizes these factors as “Interacting Dimensions” that exert positive or negative influences on treatment adherence. They include socio-economic, health care team and systems related, condition related, therapy related and patient related factors.

### **Patient level factors.**

Patient level factors represent the resources, knowledge, attitudes, beliefs, perceptions and expectations of the patient (WHO, 2014). Patient beliefs and behaviours play an important role in adherence and is a critical link between a prescribed regimen and treatment outcomes. Studies have shown that patient beliefs about illness and the efficacy of the treatment regime affect adherence (Mills, et al., 2006). The most common patient-related factors reported to affect adherence include: forgetfulness; anxieties about possible adverse effects; lack of self-perceived need for treatment; lack of perceived effect of treatment; misunderstanding and nonacceptance of the disease; misunderstanding of treatment instructions; low attendance at follow-up or counseling classes; frustration with health care providers; feeling stigmatized by the disease and inadequate knowledge and skill in managing the disease symptoms and treatment (WHO, 2014). Patients need to be motivated to follow their treatment plan. This is influenced by the value that they have on following the regimen for example the cost-benefit and the

degree of confidence in being able to follow it. (WHO, 2014). Therefore, Patient's intrinsic motivation should be strengthened by educating patients on the importance of taking their medication regularly to increase their perception on the importance of adherence to ART. This can in turn strengthen their confidence and self-management skills can also be improved (AIDSinfo, 2014; WHO, 2014). Patients who develop self-management skills will be able to make decisions on how they can generate income for themselves and their families to prevent poverty. Poverty has a significant role as a social determinant of HIV and AIDS and the spread of the virus as well as access and adherence to ART treatment. Lack of money prevents patients from collecting medication on time as the long distance to the clinic hinders them from collecting the treatment (Reda & Biadgilign, 2012; WHO, 2014). Furthermore, patients' beliefs that medications need to be taken with food leads them to avoiding taking medications whenever food is unavailable thereby interfering with adherence. Sometimes patients are forced to choose between paying for transportation to the ART facility and using the money for food (Reda & Biadgilign, 2012; Sahay et al., 2011).

A study by Wasti, Sinkhanda, Randall, Freeman & Teijlingen (2012) found that money emerged as the most commonly mentioned barrier to adherence as most respondents reported economic worries related to the cost of transport, prescription, diagnosis, and food. Transport costs emerged as a key theme and PLHIVA often did not have enough money to go to the health facility to get their repeat prescription. In Malawi a study by Kamera (2011) also found economic worries related to transport and food as a barrier to ART adherence. Therefore, patients need to be helped on how they can be financially sound to be able to support themselves. However these studies have limitations as they cannot be generalized because they used mixed methods.

Economic stability may improve ART adherence when clients have disclosed their HIV status as disclosure of one's HIV status has been identified as a significant predictor of increased adherence to ART. A study by Li, et al. (2010) found that HIV disclosure is a necessary facilitator to ART adherence. The findings suggested that it is very important for physicians to know their patients' disclosure status before administering ART and disclosure should be discussed during pre-ART counseling. For those who have not disclosed their HIV status providers should explain the importance of disclosure for the success of ART and help them to make a disclosure plan if possible. However, providers must always respect a patient's choice. Additional efforts, like taking medication with routine daily events, should be made to ensure adherence for patients who do not wish to disclose their status. Furthermore, it is very important to establish a supportive environment that will facilitate the disclosure decision not only for the purpose of ART but also to promote normal life for people living with HIV/AIDS (Li et al., 2010). However better adherence was found to correlate well with males, white ethnicity, older age, higher level of education and literacy while depression, active drug or alcohol consumption result to poor adherence to ARV drugs. (Nziva, 2011; WHO, 2014). Considering these observation clients should be encouraged to disclose their HIV status so that they can be supported by their families and community.

#### **Medication level factors.**

There are many medications -related factors that affect adherence. Most common are those related to the complexity of the medical regimen as other HAART include up to 20 pills to be taken throughout the day and have specific food and fluid related instructions. These are often difficult to be followed by the majority of the clients as the higher the pill burden the lower the adherence level (Nziva, 2011). The other factors

include lifelong treatment, difficulties faced in the past regimen, frequent changes in treatment, the outcome of the treatment and if any problems occur, how they will be dealt with or supported (WHO, 2014). Clients on twice daily doses or less report better adherence as compared to those with three or more daily doses as these can lead to serious side effects including nightmares, hallucinations, neuropathy and diarrhea (Do, 2011; Kamera, 2011; Nziva, 2011; Sumbi, 2010; WHO, 2014). These Side effects can lead to decreased adherence as clients will not continue taking them fearing worst conditions. (Mbirimtengerenji et al., 2013; Wasti, et al., 2012). For example, side-effects of medications were found to contribute to 9% of the reasons leading to non-adherence among patients in Botswana (Bauleth, 2013).

In Malawi, side effects have also been found to be a causative factor for missing pills due to nausea, vomiting and sensory neuropathy (Kamera, (2011). However the true rate of drug side effects in Malawi is not known but it has been estimated that 20-25% of patients develop at least mild side effects from Triomune (Government of Malawi, 2012). Despite this Malawi continues to increase access to alternative first line regimens for such patients. In 2011, 89% of HIV positive patients were on the first line, 9% were on alternative first line and less than 1% was on the second line regimen (Government of Malawi, 2012). For some patients whose drugs are not well tolerated in their bodies, they stop taking them leading to non adherence (Barnnert, et al., 2013; Bauleth, 2013). As a result ARVs with less complex regimen should be given to patients to encourage adherence. However these studies have limitations as they cannot be generalized because they used qualitative methods.

### **Clinical level factors.**

Having ARVs with less complex regimen can only improve ART adherence if health services and facilities in sub-Saharan Africa does not pose as a serious hindrance to adherence. There is lack of adequate health facilities or services in sub-Saharan Africa and when they are available they do not have good equipment or have none at all and infrastructures are of poor quality (Uzochukwu, et al., 2009). Some of these health facilities are also located far away from the patients and sometime some of the patients do not have transport to travel long distances to the clinic to receive their antiretroviral treatment hence end up missing their doses which affect their adherence, (Okonkwoh, 2011; Uzochukwu, et al., 2009; WHO, 2014).

In 2014 the World Health Organization (WHO) has also reported that some of the negative clinical factors that affect ART adherence are lack of knowledge and training for health care providers on managing chronic diseases, overworked health care providers, lack of incentives and feedback on performance, short consultations, weak capacity of the system to educate patients and provide follow-up, inability to establish community support and self-management capacity, lack of knowledge on adherence and of effective interventions for improving it.

Additionally, late opening hours, waiting time, convenience of scheduling appointments, integrated services and confidentiality have been reported as other aspects of a clinical setting that may be associated with lack of adherence. Sendagala, (2010), reports that a study done in Botswana found that 30% of patients cited frequency of clinic visits as a barrier to treatment adherence and there were patients who missed out on clinical tests and medication refills because of confidentiality concerns (Sendagala, 2010). Secondly, there are inadequate rooms in health facilities that would allow for

confidentiality. Furthermore, the study found that three doctors were sharing one consultation room and consulting with three different patients at the same time. This practice can stop some patients from attending consultations or from communicating openly, and so affects their adherence (Reda & Biadgilign, 2012).

Therefore access to reliable primary health care is needed as it is related to increased adherence to HAART whereas missed clinic appointments are associated with virology failure (Sendagala, 2010).

### **Support that HIV-infected men need**

#### **Client- Provider Relationship.**

Client-provider relationship includes the patient's overall satisfaction and trust in the provider and clinic staff, the patient's opinion of the provider's competency, the provider's willingness to include the patient in the decision-making process and the affective tone of the relationship. For example, warmth, openness and cooperation, and the adequacy of referral (Do, 2011; Jin et al., 2008).

Health-care provider characteristics and provider-patient relationship variables have also been found to mediate patient adherence. For example, since the medication regimen and the patient's lifestyle greatly affects adherence physicians play a critical role in recommending an appropriate ART combination and diet (Do, 2011). A meaningful and supportive relationship between the patient and health care provider can help to overcome significant barriers to adherence. Factors that have been identified as strengthening the patient-health care provider relationship include perception of provider competence, quality and clarity of communication, compassion shown by the provider, involving the patient as an active participant in treatment decisions and convenience of

the regimen (Sendagala, 2010). Patients become frustrated with health care providers when misunderstandings occur as they will not be able to treat the patient effectively such that treatment might become complex for the patient. If patients have side-effects, these might not be managed well as the health worker will label the patient to be uncooperative (Sendagala, 2010). Therefore, patients' medication adherence may improve by enhancing the relationship and communication between patients and health care providers (Sendagala, 2010).

### **Client-Family Relationship.**

Family and friends can be supportive with practical, financial and emotional assistance although support may be limited to mental and psychological support such as, motivation and understanding. The form of help offered to PLWHA depends on what the people in their environment can offer (Cornet, 2008). Social support for medication adherence plays a critical role in supporting patients to adhere to their medications. Patients whose families offer no or erratic supports have difficulties in adhering to their medication schedules (Sanjobo, 2007). A study done by Jin et al., (2008) found that clients who have emotional support and help from family members, friends or healthcare providers are more likely to be adherent to treatment. The social support helps patients in reducing negative attitudes to treatment, having motivation and remembering to implement the treatment as well.

On the other hand a study by Sayles, Wong, Kinsler, Martins & Cunningham, (2009) which looked at the association of stigma with self-reported access to medical care and Anti retro viral therapy adherence in persons living with HIV and AIDS found that stigma was also associated with poor access to care leading to non-adherence to

ART. In addition to the general knowledge of the population about HIV and AIDS and ART treatment, stigma also is an important determinant of adherence in the settings of sub-Saharan countries (Reda & Biadgilign, 2012). HIV infected stigma is common among ARV users and is often associated with poor adherence to HIV medication and non-disclosure of positive HIV status (Moratioa, 2007; Munyadzwe-Gabe, 2008). However studies of interventions to facilitate disclosure are lacking (Sayles et al., 2009; Root & Whiteside, 2013; Achappa, et al., 2013).

Therefore, family members and friends can play the role of treatment partners and provide much needed support and health-care providers need to encourage patients to disclose their status and to take their ART as scheduled because sub-optimal adherence can result in resistant viral strains and disease progression (Skovdal et al., 2011; Walkup, et al., 2011; Wasti et al., 2012).

### **Adherence to Anti retro viral Therapy**

The relationship between adherence and therapeutic success has been demonstrated across a range of highly active Anti retro viral therapy (HAART) regimens including Nucleoside reverse transcriptase inhibitors, Protease inhibitors and Non-nucleoside reverse transcriptase inhibitors. Through the suppression of plasma HIV-1 RNA, HAART has been shown to improve CD4 cell counts and, in turn to decrease morbidity and mortality among HIV-infected patients. These benefits of HAART in the management of HIV are well established in a number of settings (Stekler et al., (2012). However, the success will depend on the patients' ability to adhere to ART which is influenced by factors which may be within or beyond the clinical environment. An extremely high level of adherence (>95%) is required to guarantee treatment

effectiveness due to rapid replication and mutation rate of HIV. Some reports have a differing view, that virologic success is possible with less than 95% adherence (Bangsberg, 2006).

In Sub Saharan Africa, initial findings about adherence have been promising. A meta-analysis by Mills et al. (2006), found that a pooled estimate of 77% of patients in African settings achieved adequate adherence of > 95% of prescribed pills compared with just 55% of patients in North American settings. In addition, high levels of adherence and positive outcomes of ART have been observed in some home based ART care studies and in a multi-site studies including Botswana, Tanzania and Uganda (Mills et al., 2006; WHO 2006). Strict adherence to Anti retro viral therapy (ART) is key to sustained HIV suppression, reduced risk of drug resistance, improved overall health, quality of life, and survival, as well as decreased risk of HIV transmission (AIDSinfo, 2014; Walker & Hirsh, 2013; Wakibi, Ng'ang'a & Mbugua, 2011).

Conversely, poor adherence is the major cause of therapeutic failure as it is often characterized by increased morbidity, premature death and economic loss. Furthermore, it results in rapid disease progression, development of complications, low quality of life and increase the cost of care both direct and indirect, increased risk of treatment failure, emergence of drug resistance, loss of therapeutic options which threatens already achieved success in HIV control (Adefolalu & Nkosi, 2013; Cauldbeck, et al. 2009; Unyeonoro, Ebenebe, Ibeth, Nwamoh, & Emelumadu, 2014). In Malawi by the end of June 2011, 276,987 patients were alive and on ART equivalent to 67% coverage of the estimated population in need of ART. An effective health sector response to HIV based on increased ART has dramatically reduced AIDS death. In 2010 AIDS mortality was at

53,000 and 46,000 in 2011. As such achieving adherence to ART is a critical determinant of long-term outcome in HIV infected patients.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **Introduction**

Methodology refers to the steps, procedures and strategies for gathering and analyzing data in a research study (Polit & Beck, 2006). This section gives an overview of the research process that was followed to investigate the topic under study. It gives an account of the research design, study place, sample size, instrumentation, validity and reliability of the instrument, data collection procedures, data management, data analysis, limitations of the study and ethical consideration.

#### **Design**

This study adopted a quantitative, non-experimental, descriptive cross-sectional design. The design is the blue print for a study that guides a researcher in making decisions before a situation arises in which the decision has to be carried out (Poddar, 2014). This study was underpinned by a positivist paradigm whose traditional model is underlying a scientific approach which assumes that fixed and orderly reality can be objectively studied. As a positivist the researcher was independent of the phenomenon under study and she did not engage with the phenomenon or the participants being researched.

According to Ryan, (2006) positivists believe in value free research so that personal values have no influence on the results of a study. Additionally positivists rely on numerical

analysis of data. Thus, the researcher only collected numerical and ordinal data that would be subjected to statistical analysis.

The study design is considered valid because the results from this study will be generalised to other settings, since the study utilised a data collection tool which was adapted from Sendagala, (2010). This tool has incorporated Adherence Determinants Questionnaire (ADQ) scale that has been tested in a number of adherence studies to measure aspects of the adherence behaviour of Participants (Morgan, 2015; Mancebo, Pinto, Rasmussen & Eisen 2008). Threats to the validity of this study design included reactive effects whereby participants may have under-reported some behaviours which they deemed socially unacceptable. The use of a self administered questionnaire may have helped in minimizing this threat because it was less confronting to participants. Codes and not their identification details were used to ensure anonymity of respondents. This might have also helped to minimise this threat because respondents were assured that their responses could not be traced back to them.

### **Study Place**

The study was conducted at Chilomoni Health Centre in Blantyre district. Chilomoni has a catchment population of 73,358. Data from the ART Clinic at Chilomoni Health Centre indicated that from October 2013 to January 2014 a total of 1702 HIV-infected men revisited the clinic for Anti retro viral therapy. Chilomoni Health Centre was selected because it is one of busiest clinics in Blantyre district and it offers anti-retrovirus therapy to men, women and children. The setting was suitable for the study because the researcher is a Residence of Blantyre district and the research assistant was recruited from Blantyre hence they had easy access to the health centre.

## Study Population

The target population included all 1702 HIV-infected men on ART at Chilomoni Health Centre who were aged 18 years and above. These men had been attending the Anti retro viral clinic at Chilomoni Health Centre in Blantyre district for six months or more. The target population of HIV-infected men at the health centre was big enough to suffice the sample size.

## Sample Size

The sample size was calculated based on the percentage of ART adherence rate among HIV-infected men from a recent study conducted at area 18 Clinic in Lilongwe district by Thonyiwa, Lakati, Nyagero, Houseinipour (2011). They found that adherence rate among men was 80.6%. The formula for calculating sample size for descriptive statistics by Creswell (2009) was used to calculate the sample size as below:

$$\text{Estimated sample size} = [z^2 (p) (1 - p)]/d^2$$

The confidence interval was set at 95%. As such Z was 1.96; where the normal variate corresponding to the level of significance; p was anticipated proportion of ART adherence among men at Area 18 Clinic in Lilongwe while d was desired level of precision or allowable error, which in this study was set at 5% (0.05)

Therefore:

$$n = [z^2 (p) (1 - p)]/d^2$$

$$n = 1.96 \times 1.96 \times 0.81(1-0.81) / (0.05 \times 0.05)$$

$$n = 3.84 \times 0.81 \times 0.19 / 0.0025$$

$$n = 236.3904$$

$$n = 237 \text{ HIV-infected men on ART.}$$

The researcher drew a systematic random sample of 237 respondents from the population of 1702 HIV-infected men on ART through systemic random sampling. Systematic random sampling ensured that all the HIV-infected men on ART had equal chances of being selected for participation in the study. The first man was chosen randomly from the first 3 HIV-infected men seated on the clinic queue and then every 3<sup>rd</sup> man from him was being selected until the required number of 237 participants was generated.

The researcher achieved the sample size of 237 by personally approaching the HIV-infected men who were seated on the clinic queue and explaining the study to them. Those who agreed to participate in the study were asked to sign a consent form. The sample size of 237 was large enough for the study. According to Burns and Groove (2007), the quantitative study sample should be at least 30.

The inclusion criteria were: HIV-infected men who:

- Agreed to participate in the study after the study had been explained.
- Were attending ART clinic at Chilomoni Health Centre in Blantyre district.
- Were 18 years and above.
- Have been receiving ARVs for not less than six months.
- Gave a written consent to participate in this study.

### **Data collection Instrument**

Instrumentation refers to the application of specific rules to the development of a measurement instrument (Burns & Groove, 2007). The collection of data was done using a self-administered questionnaire. Questionnaires are used to gather a broad spectrum of

information from respondents and are presented in a consistent manner providing less opportunity for bias while they also facilitate analysis. (Polit & Beck, (2006).

The questionnaire, (Appendix 1) had five sections, A, B, C, D, and E.

Section A requested demographic data which included age, level of education, religion, ethnic group, number of children and occupation. Section B comprised of a likert scale which was requesting data regarding the participant's level of knowledge on ART adherence. The likert scale had five responses (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree). According to Pallant (2011), a likert scale should have up to six responses and this gives a researcher a wider range of possible scores and also increases the availability of statistical analyses. As such the responses had been increased from 3 in Sendagala (2010) to 5. Section C consisted of a likert scale which had questions on participant's motivation to take ART. The questions were developed by the researcher except for those under clinical level factors which were adapted from Sendagala (2010). The number of responses for these questions had been increased to 5. Section D consisted of a likert scale which had questions which asked about participant's level of support which they receive when taking ART. Some questions in this section were developed by the researcher (Question 49-52) while the rest were adapted from Sendagala (Question53-63). The number of responses had also been increased from 3 to 5. Section E was adopted from Morisky, (1986). This section had 2 scale categories on question 64-68 and 70-71 while question 69 has a 5 scale category. The section requested data regarding Respondent's level of adherence to ART.

The questions in the questionnaire were aimed at eliciting the association of knowledge, motivation and support given to HIV-infected men to ART adherence. The instrument was translated to Chichewa which is a local language to enable respondents understand the

questions as most of them were of low literate level. Quantitative data which was ordinal on a five point scale about factors that are associated with ART adherence was collected using the tool. The tool also used to collect numerical and nominal data on demographic characteristics of the respondents.

### **Validity and Reliability of the Instrument**

Burns and Groove (2007) describe the validity of the instrument as the determination of the extent to which the instrument reflects the phenomenon under study. They also describe the reliability of the instrument as the consistency of measure obtained by the instrument.

The demographic data requested in this study included age, level of education, religion, ethnic group, number of children and occupation. These were requested because the content validity of this demographic data was established through the extent to which the variables were central to previous studies on the four concepts; knowledge, motivation, support and adherence to ART (Alagaw, Godana, Taha, Dejene, 2011; Okonkwoh, 2011; Nziva, 2011; Watt, 2008). Since some questions in the instrument were developed by the researcher, the questionnaire was presented for review to the senior colleagues in clinical practice and the study supervisor to make an input because of their experience in practice and quantitative research. This helped in refining the questions for better meaning, clarity and conceptualisation. After approval of the questionnaire, it was pre-tested on five men who met the eligibility criteria for the main study at Chilomoni Health Centre which was a study setting.

The pre-test was done prior to main data collection exercise in order to identify ambiguous and/or leading questions, estimate completion time and to familiarise with the natural flow of the interview. This was done with the aim of ensuring reliability and validity of the data collection instrument.

## **Data Collection Procedure**

Data collection is a systematic process of gathering information in order to answer research questions or objectives (Burns & Groove, 2007). Firstly, the researcher and the research assistant presented themselves to the Health Centre-In-Charge at Chilomoni Health Centre to express their intention to commence data collection after getting ethical approval from the College Of Medicine Research and Ethics Committee (COMREC) Appendix 6 with permission from the Health Centre-In-Charge. The researcher then went to the ART Clinic where she further introduced herself and explained the study to the person running the clinic. Together with the person running the clinic the researcher identified a room in which data collection took place. The researcher and male research assistant worked together to identify the potential participants for the study. Once the clients had gathered at the Anti retro viral therapy clinic at Chilomoni Health Centre and had a group health talk in the morning, the person in charge of the ART clinic together with the researcher and a male research assistant introduced themselves to the patients and informed them about the study.

The researcher employed a face to face recruitment procedure by personally inviting and explaining the study to the HIV-infected men who were systematically randomly selected from the queue to participate in the study. Those who agreed to participate were asked to give a written consent (Appendix 3). Having returned the written consent participants were handed a self reporting questionnaire which they completed after attending the clinic. Participants that were illiterate or had problems with eye sight but were interested to take part in the study were assisted by the male research assistant to complete the questionnaire. Completed questionnaires were immediately collected and checked for completeness. Data collection was completed during the first week of July, 2014.

## **Data Management**

The researcher personally distributed and collected the questionnaires and ensured the highest level of confidentiality to prevent data contamination. This was done to limit access of collected data to the researcher only. During the research period the hard copies of the collected data were kept secured in a locked cabinet accessible only to the researcher. Each questionnaire was given a code for its identification. The researcher coded the data then entered it on the computer and analyzed it using SPSS version 16 (Pallant, 2011).

Soft copies of data were secured with a password known only to the researcher. At the end of the study the soft copies and hard copies of the data were stored in a secure place that was arranged together with the supervisor at Kamuzu College of Nursing. The data were kept secured for a period of five years after which the hard copies will be destroyed by incineration and soft copies will be deleted from the storage device.

## **Data Analysis**

Data analysis is a process of summarizing, organizing, interpreting and numerically communicating study findings (Burns & Groove, 2007). Data were analysed using SPSS version 16. Prior to analysis coded data were entered in the SPSS package on a computer. Data entry were done simultaneously with data collection and it was finished a week after completion of data collection. Descriptive statistics (mean, median, standard error of means, percentages and frequencies) were used to summarise, describe and synthesize data and to calculate parameters in the form of graphs, frequency distributions, variability as well as contingency tables.

### **Dissemination of findings**

The study findings will be disseminated through presentations on meetings such as continuous professional development gathering, health facility management team's meetings, conferences and seminars. Written reports will be made and submitted to College of Medicine Research Ethics Committee, to staff and students of Kamuzu College of Nursing, Ministry of Health headquarters and Blantyre District Health Office. Researcher intends to submit a manuscript to a journal for consideration of possible publication.

### **Ethical Consideration**

The researcher explained the nature and benefits of the study to the HIV-infected men (Appendix 3). She ensured that the respondents were not harmed in any way. Their names did not form part of demographic data thus respecting their privacy and maintaining confidentiality. Respondents were informed that they would not benefit directly from the study but that the information which they provided could be utilised in making recommendations about HIV and AIDS care. Respondents were informed that only aggregated data would be analysed and presented. They were informed that all hard copies of data collected would be locked in a cabinet in the researcher's place of residence and would be incinerated five years after the end of the study. They were also informed that any electronic data would be secured by a password known only to the researcher and that it would be deleted at the end of the study.

The study proposal was presented to College of Medicine Research and Ethics Committee (COMREC) for ethical approval (Appendix 5&6). Permission and clearance were sought from the District Health Office for Blantyre to carry out the study at their health facility (Appendix 7&8). A written informed consent (Appendix 3) was obtained from participants

who were randomly sampled and who agreed to participate in the study. The participants were informed that they were free to withdraw at any time if they felt uncomfortable about any aspect during the course of the study. They were also made aware that there will be no punishment or any kind of reprimand should they choose to refuse or not to answer any question.

## **Conclusion**

This chapter has presented a description of the study design, setting, study population, sample size, instrument, and the strength and limitation of the study. It has also given an overview of methodology and procedures which were followed and utilised to collect manage and analyse data for this study. It has also highlighted the ethical considerations that were followed to ensure that neither the study participants nor the researcher were harmed in any way.

## **CHAPTER FOUR**

### **FINDINGS OF THE STUDY**

#### **Introduction**

The findings of the study are presented in this chapter. Quantitative data about demographic characteristics of the participants will be presented first. This will be followed by descriptive statistics on the respondent's responses regarding their perception on factors that motivate them to ART adherence. All the data was collected using a self administered questionnaire which had five sections (Appendix 1).

Section A focused on demographic characteristics of respondents. Section B, C and D of the questionnaire comprised a likert scale which was requesting data regarding the respondent's level of knowledge on HIV and AIDS and ART adherence, motivation to take ART and the support they need when taking ART. Section E assessed respondent's level of adherence to ART using Morisky 8-item measurement scale.

Data were analysed using Statistical Package for the Social Sciences (SPSS) version 16.0 which was developed by Nie, Hull and Bent in 1968 with the aim of turning raw data into information essential to decision-making (<http://www.spss.com.hk/corpinfo/history.htm>, (n.d).

The analysis of data was guided by the research questions for the study. The study findings in this section are presented in form of narratives, tables and graphs.

## **Sample Realization**

The realization of the sample was achieved through face to face recruitment using systematic sampling. Two hundred thirty seven (237) HIV- infected men were approached and all of them accepted to participate in the study. Two hundred and thirty seven (237) questionnaires were given out to respondents and 237 completed questionnaires were returned. Some of the respondents, twenty in number (20), were assisted by male research assistant to complete the questionnaire because they were either illiterate or had poor eye sight. In total 237 completed questionnaires were returned representing 100% response rate. A hundred percent response rate was reached because respondents completed the questionnaires right away at the clinic and the researcher collected the completed questionnaires immediately after they were completed.

## **Demographic Data of Respondents**

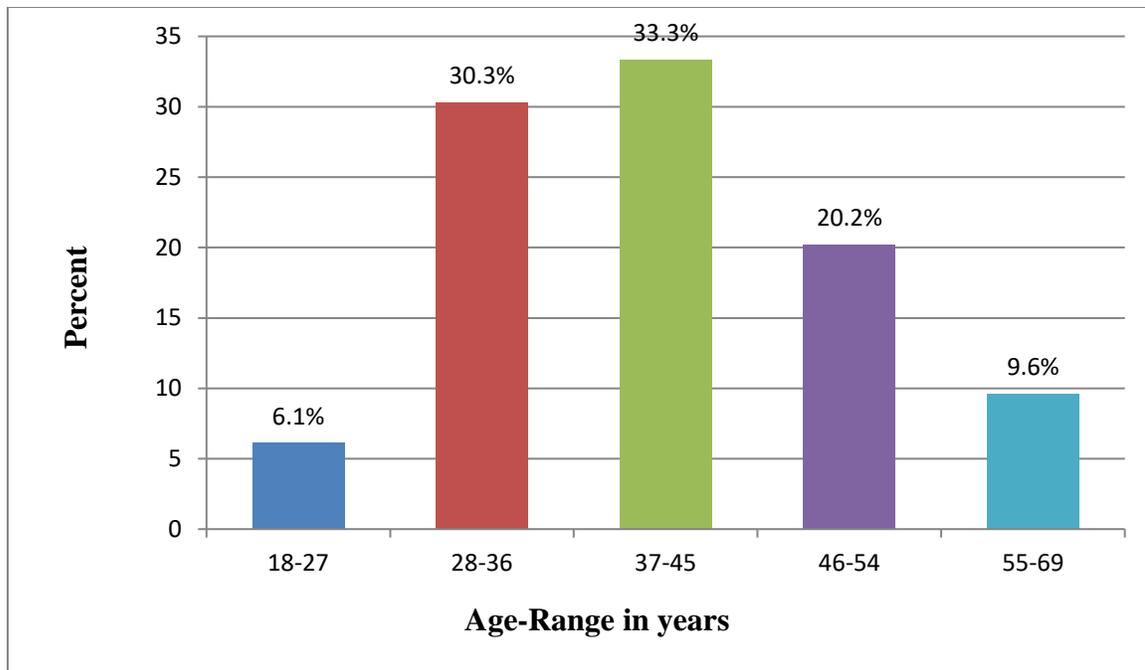
The results on the following demographic data: age, educational level, religion, ethnic group, number of children of respondents and occupation will be presented in this section. However, the Chi square test showed that there were no significant differences in respondents' demographic characteristics and their level of knowledge about HIV and AIDS since all the p values were  $>.05$ . (Table 1).

**Table 1:** The relationship between respondents' demographic characteristics and their level of knowledge about HIV and AIDS

Demographic characteristics	$\chi^2$	df	p
Age	75.328	75	.47
Education level	90.943	100	.73
Religion	110.633	125	.817
Ethnic group	112.821	125	.78
Occupation	106.637	125	.88

#### **Age of Respondents.**

The results of this study indicated that the age of respondents ranged from 18 to 69 years with an average age of 40.7. The study results also indicated that the majority of the respondents (33.3%, n= 79) were in the 37-45 years age bracket (figure 1). This shows that the respondents in this study were generally in the sexually active and reproductive age group who may have a greater chance of spreading HIV and AIDS.



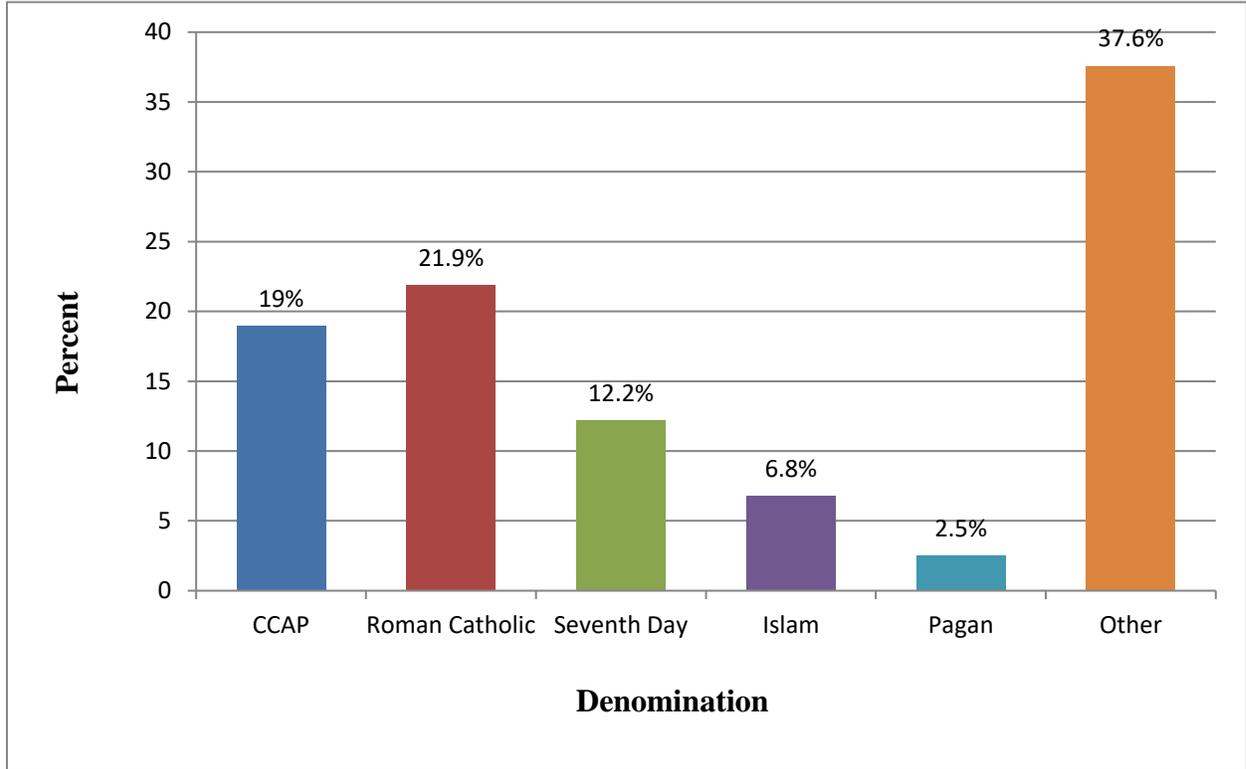
**Figure 1: Graph showing distribution of respondents according to age.**

#### **Education level of respondents.**

The findings of this study revealed that most of the respondents (53.6%; n=127) were Primary School Leaving Certificate (PSLC) holders, 19.0% (n=45) had attended school up to junior certificate and 16.5% (n=39) of the participants had attained the Malawi School Certificate of Education (MSCE) level. Respondents with tertiary education (diplomas) constituted 3.0% (n=7) while 8.0% (n=19) had no formal education. This shows that many respondents had some form of education.

#### **Religion of respondents.**

The findings of this study showed that 21.9% (n=52) of the respondents were Roman Catholics and 19.0% (n=45) were affiliated to Church of Central Africa Presbyterian (CCAP). It was also clear from the study findings that 2.5% (n=6) were pagans (Figure 2)



**Figure 2: Graph showing distribution of respondents according to religion**

**Ethnic groups of participants.**

The respondents in this study belonged to different ethnic groups and the majority (33.8%; n=80) were Lomwes followed by Ngonis (24.5%; n=58), Yaos (13.1%; n=31) and Tumbukas (3.4%; n=8). The rest of the respondents 13.1% (n=31) belonged to other ethnics groups. The majority of the respondents were of Lomwe tribe since data was collected in the south west region of Malawi where Lomwe tribe is one of the dominant tribes.

**Number of children belonging to each respondent.**

The findings of this study showed that 91.6% (n=80) of respondents had children while 8.4% (n=20) did not. The mean number of children per respondent was 3.0. However the actual number of children ranged from 0 to 10. The mean number of children (3) indicates that

most of the respondents had small families which they may be able to care for and be able to remain healthy.

**Occupation of respondents.**

It was clear from findings of this study that all respondents had some occupation of some kind. For instance, 31%, (n=75) of respondents were business people and farmers comprised of 25% (n=10.5) (Table 2).

**Table 2: Table showing percentage of respondent’s occupation**

<b>Occupation</b>	<b>Frequency</b>	<b>Percentage</b>
Farmer	25	10.5
Businesspeople	75	31.6
Driver	8	7.6
Teacher	1	.4
Other	118	49.8

**Respondents’ Knowledge and Experience about HIV and AIDS**

The study findings showed that there are variations in respondents’ knowledge level of HIV and AIDS and the importance of adhering to Anti retro viral therapy (Table4.3). The study revealed that 97.9% (n=232) of the respondents believed that compliance to a diet suggested by the health worker is important to a person who has HIV and AIDS. In addition 92.9% (n=220) of respondents reported that life expectancy of patients with HIV and AIDS improves once they receive ART. This shows that most of the respondents had some knowledge about HIV and AIDS. Furthermore the findings indicated that most respondents (97%; n=230) agreed with the statement that compliance to ART prescribed by health workers is essential. Others (80.6%,

n=191) also indicated that Anti retro viral treatment is the only effective treatment plan available to combat the effects of HIV and AIDS.

However 81.8% (n=191) of the respondents felt that substance and/or alcohol abuse will not impair the effectiveness of ARV drugs in combating HIV and AIDS. This may mean that some respondents had no adequate knowledge about HIV and AIDS.

**Table 3 Respondents knowledge and experience about HIV and AIDS**

<b>Statement</b>	<b>Disagree (1, 2) n (%)</b>	<b>Neutral (3) n (%)</b>	<b>Agree (4, 5) n (%)</b>
HIV and AIDS is a curable disease	118 (49.8)	29 (12.2)	90 (38.0)
Anti retro viral Therapy (HIV and AIDS treatment) has many side effects	107 (45.1)	25 (10.5)	105 (44.3)
Life expectancy of HIV and AIDS patients improve once they receive Anti retro viral treatment	12 (5.1)	5 (2.1)	220 (92.9)
Compliance to diet as suggested by the health professional is important to a person who has HIV and AIDS	4 (1.7)	1 (0.4)	232 (97.9)
Compliance to the Anti retro viral treatment prescribed by the health professional is essential	7 (2.9)	0 (0)	230 (97.0)
Substance and/or alcohol abuse will not impair the effectiveness of the Anti retro viral treatment	35 (14.8)	8 (3.7)	194 (81.8)
I expect to be cured from HIV in the future	47 (19.9)	37 (15.6)	153 (64.6)
Anti retro viral treatment are the only effective treatment plan available to combat the effects of HIV and AIDS	30 (12.6)	16 (6.8)	191 (80.6)

## **Respondents' perception about factors that influence adherence to Anti retro viral therapy**

This section is going to present the findings of this study on respondents' perceptions about factors that influence ART adherence namely: patient, medication and clinic level factors.

### **Respondent's perception regarding patient level factors.**

The findings of this study showed that respondents perceived that patient level factor affect their adherence to ART (Table 4). Many respondents (92.4%; n=219) perceived that they have ability to successfully stay on treatment. In addition almost all of the respondents (97%; n=230) reported that they have made a commitment to follow their treatment plans. Nonetheless some respondents (37.9%; n=90) perceived that religious constraints like fasting prevent them from adhering to ART and 22.7%; n=54) perceived that it was not easy to disclose their HIV status to their spouses, friends, neighbours and colleagues.

**Table 4: Respondent's perceptions regarding patient level factors**

<b>STATEMENT</b>	<b>Disagree (1, 2) n (%)</b>	<b>Neutral (3) n (%)</b>	<b>Agree (4, 5) n (%)</b>
Being the sole provider for my family motivates me to adhere to ART	11 (4.6)	6 (2.5)	220 (92.8)
I find it easy to disclose my HIV status to my spouse, friends, neighbours and colleagues	54 (22.7)	17 (7.2)	16 (70.1)
I have the ability to successfully stay on treatment	11 (4.7)	7 (3.0)	219 (92.4)
Availability of food helps me to always comply with ART	51 (21.5)	32 (13.5)	154 (64.9)
I have accepted my health status	5 (2.1)	2 (0.8)	230 (97)
I enjoy the quality of life I live	24 (10.2)	11 (4.6)	202 (85.3)
I am able to develop pill-taking skills	8 (3.4)	1 (0.4)	228 (96.2)
The suggested ARV treatment plan is convenient for me and my family	8 (3.4)	4 (1.7)	2(94.9)
The treatment plan is not difficult to follow	9 (3.8)	4 (1.7)	224 (94.5)
I have a mental health problem	227 (95.8)	0 (0)	10 (4.2)
Following my prescribed treatment plan will help me to be healthy	7 (2.9)	3 (1.3)	227 (95.7)
I have made a commitment to follow my treatment plan	5 (2.1)	2 (0.8)	230 (97)
I need assistance from the health professionals in order to stick to my treatment	13 (5.5)	3 (1.3)	221 (93.2)
If I stick to my treatment plan rigorously, I find that I am able to deal with daily personal problems	17 (7.2)	10 (4.2)	210 (88.6)
I realize that strict adherence to the treatment plan is essential for the ARV treatment to be effective	9 (3.8)	5 (2.1)	223 (94.1)
ARV drugs will be effective even if I do not take them regularly	189 (79.7)	5( 2.1)	43 (18.1)
Support Groups help me to share with my fellow clients	38 (16.0)	30 (12.7)	169 (71.3)
Anti retro viral medicines give me the opportunity to continue living	9 (3.8)	23 (2.5)	222 (93.7)
Religious constraints like fasting prevents me to Anti retro viral treatment adherence	124 (52.3)	23 (9.7)	90 (37.9)
Living alone in the house does not prevent me from adhering to Anti retro viral treatment	32(19.5)	3(1.3)	202 (75.2)

### **Respondent’s perception about medication level factors.**

It is clear from the findings of this study that respondents perceive that medication level factors help them to adhere to ART (Table 5). Almost all the respondents (91.5%; n=217) reported that tablets are not many and are easy to take. Furthermore 92.8% (n=220) felt that they follow dietary instruction. However some respondents (20.7%; n=49) reported that they are bothered by ART side-effects and others (68.8%; n=163) indicated that they are not bothered with ART side effects.

**Table 5: Respondents perception about medication level factors**

<b>STATEMENT</b>	<b>Disagree (1, 2) n (%)</b>	<b>Neutral (3) n (%)</b>	<b>Agree (4, 5) n (%)</b>
The tablets are not many and easy to take	15(156.3)	5 (2.1)	217 (91.5)
The frequent doses do not worry me	15 (6.3)	7 (3.0)	215 (90.7)
The side-effects of the Anti retro viral treatment do not bother me	49 (20.7)	25 (10.5)	163(68.8)
I follow dietary instruction (with or without food)	6 (2.5)	11 (4.6)	220 (92.8)
Forgetting to take Anti retro viral treatment contributes to my non-adherence	39 (16.4)	6 (2.5)	192 (81.1)
Alcohol use has been linked to non-adherence	55 (23.2)	5 (2.1)	177 (74.6)
Reminders aid me in adhering to ART	14 (5.9)	7 (3)	216 (91.1)

### **Respondent’s perception about clinic level factors.**

The findings of this study revealed that the clinic level factors make it possible for individuals to adhere to ART (Table 6). Majority of respondents (91.1%; n=216) perceived that the ART clinic is easily accessible and almost all the respondents (91.6; n=217) reported that drugs are always available at the Anti retro viral therapy clinic. However 32.5% (n=77) of the respondents disagreed with a

statement that waiting time is short while 56.5% (134) perceived that the waiting time at the clinic is short.

**Table 6: Respondent’s perception about clinic level factors**

<b>STATEMENT</b>	<b>Disagree (1, 2) n (%)</b>	<b>Neutral (3) n (%)</b>	<b>Agree (4, 5) n (%)</b>
The ART clinic is easily accessible	17 (7.1)	4 (1.7)	216(91.1)
Transport costs to the ART clinic are affordable	50(21.1)	12(5.1)	179(73.9)
The waiting time is short	77(32.5)	26(11)	134(56.5)
My appointment dates for drug refills are convenient	23 (9.8)	15(6.3)	199(84.0)
The clinic is adequately staffed	36(15.2)	18(7.6)	183 (77.2)
The drugs are always available at the Anti retro viral therapy clinic	16(6.7)	4(1.7)	217 (91.6)
The physical environment of the clinic appears neat and welcoming	27 (11.4)	10(4.2)	200 (84.4)

### **Respondent’s Perception about the Support they Need**

This section will present perceptions of the respondents related to support they need to adhere to ART. The finding of this study indicated that respondents feel that they receive adequate support which helps them to adhere to ART (Table 7). Almost all of the respondents (91.5%; n=216) reported that support of friends or family help them to adhere to ART. Some (97.9%; n=232) felt that health workers give them clear instructions on how medication should be taken. Furthermore 87.3% (n=207) of respondents indicated that their family members remind them to take their tablets regularly.

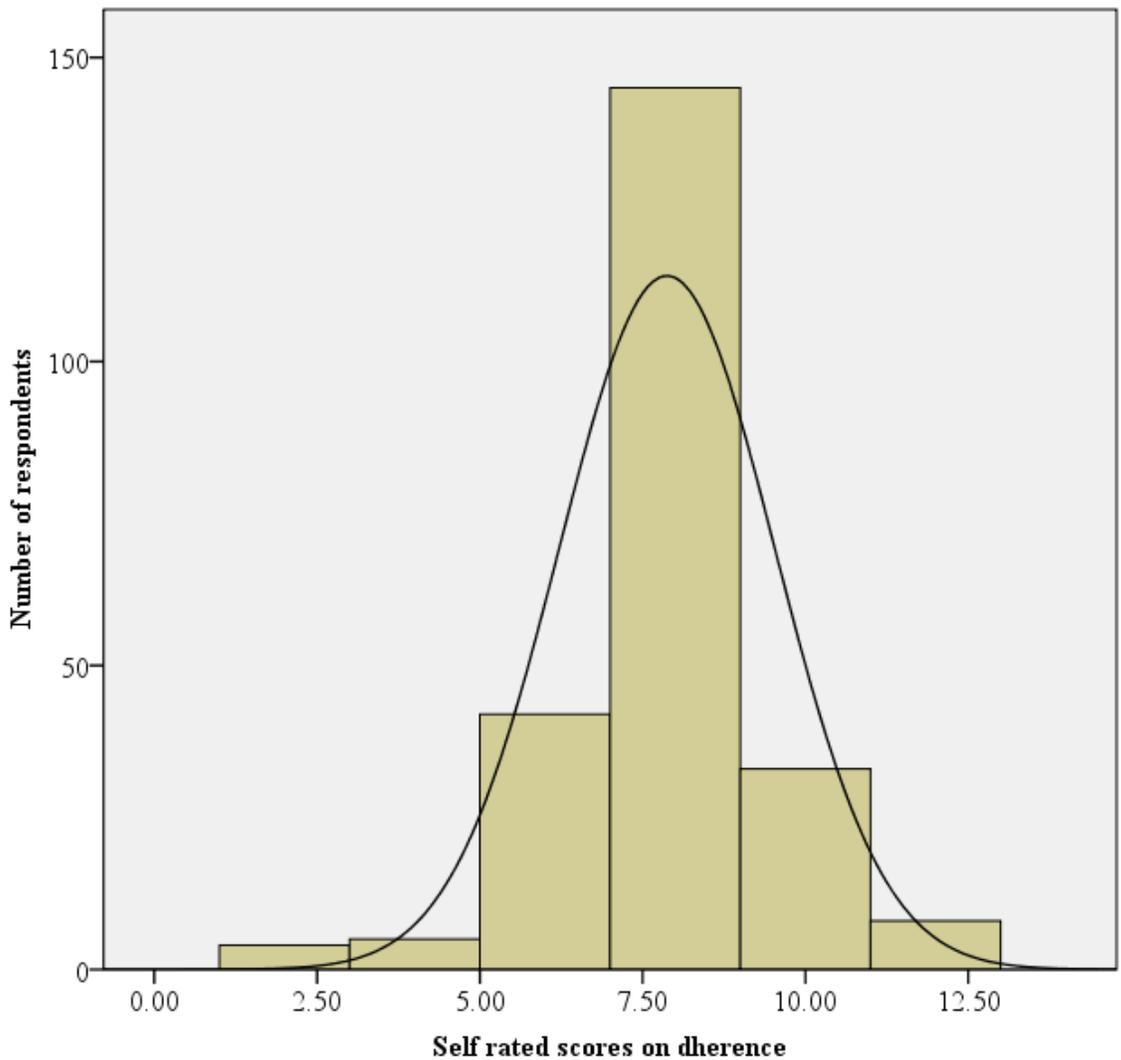
**Table 7: Support needed by respondents**

<b>STATEMENT</b>	<b>Disagree (1, 2) n (%)</b>	<b>Neutral (3) n (%)</b>	<b>Agree (4, 5) n (%)</b>
Support of friends or family help me to adhere to Anti retro viral treatment	15 (6.3)	6 (2.5)	216 (91.5)
Education given to my family members on ART helps them to support me	9(3.8)	10 (4.2)	218 (92.0)
My family members remind me to take my tablets regularly	25 (10.5)	5 (2.1)	207 (87.3)
Stigma by my relatives and community makes me fear to take my ART	170 (71.7)	4 (1.7)	63 (26.6)
Health workers listen carefully to what I have to say	8 (3.4)	7 (3.0)	222 (93.7)
Health workers are patient with me	15(6.3)	8 (3.4)	214 (90.2)
Health workers answer all my questions	11 (4.6)	7 (3.0)	219 (92.4)
Health workers responses to my queries attest to their medical knowledge ability	5 (2.1)	5 (2.1)	227 (95.8)
Health workers use medical terms which I easily understand	5 (2.1)	8 (3.4)	224 (94.5)
Health workers show respect for my confidentiality	5 (2.1)	3 (1.3)	229 (96.6)
Am always treated in a friendly and courteous Manner	8 (3.3)	9 (3.8)	220 (92.8)
Health workers give clear instructions on how medication should be taken	3 (1.3)	2 (0.8)	232 (97.9)
Health workers treat me with dignity	4 (1.7)	7 (3.0)	226 (95.3)
Health workers show respect for life	6 (2.5)	1 (0.4)	230 (97.0)
Health workers are empathetic	9 (3.8)	2 (0.8)	226 (95.3)

### **Men's Level of Anti Retro viral Therapy Adherence**

The level of adherence for each respondent was measured using Morisky 8-item scale which was adapted. The items on the scale had bivariate responses (Yes=2 and No=0). Question 69 was also converted to dichotomous variable (Never= Yes=2, Once in a while= No=0, Sometimes=No=0, usually= No=0, All the time=No=0). The total score for each respondent on Morisky 8-item scale was computed using SPSS version 16 and findings showed that all respondents had a score of less than 15.2. which is equal to 95%.

The expected score (100%) for each respondent was 16. It was expected that those who were adhering to ART should score >95%. This shows that all the respondents were not adhering to ART (Figure 3).



**Figure 3: Histogram showing respondents level of adherence to Antiretroviral Therapy**

## **CHAPTER FIVE**

### **DISCUSSION AND RECOMMENDATIONS**

#### **Introduction**

The chapter presents a discussion of the study findings and the interpretation of the same in relation to reviewed literature and objectives which guided the study. Demographic characteristics (age, education level, religion, ethnic group, number of respondent's children and occupation of respondents) will be discussed first then the discussion will centre on the following objectives of the study: (1) to assess HIV-infected men's knowledge of HIV and AIDS and the importance of adhering to Anti retro viral therapy; (2) to identify the factors that motivate HIV-infected men to adhere to Anti retro viral therapy; (3) to describe the kind of support which HIV-infected men need to adhere to Anti retro viral therapy and (4) to determine HIV-infected men's level of adherence to Anti retro viral therapy. Finally a conclusion of the discussion will be made and it will be followed by the limitation of the study and the recommendation.

#### **Demographic Characteristics of the men**

The Chi square test showed that there were no significant differences in respondents' demographic characteristics and their level of knowledge about HIV and AIDS since all the p values were  $>.05$ . (Table 4.1). Therefore, the discussion will focus on the results as they came.

### **Age of Respondents.**

The results of the study indicated that the majority of the respondents (33.3%, n= 79) were in the 37-45 years age bracket and the ages of the respondents ranged from 18 to 69 years with an average age of 40.7 ( figure 1). This shows that the respondents in this study were generally young to middle-aged HIV-infected men who could understand and make informed choice on importance of adhering to ART. Any adherence below 95% in ART has been linked to treatment failure and risk of developing resistance to ARV (Adefolalu & Nkosi, 2013).

National Statistics Office, (2011) reveals that the prevalence rate of HIV-infected men aged 40-44 years is 21% and those aged 50-54 years is 13%. This may be consistent with this study where the majority of the respondents were between 18 and 69 years old. There was no association between ART adherence levels and the age of respondents as all the respondents were not adhering to ART in this study (figure 4.3). These findings are also corroborated by Adefolalu, (2013) who found no consistent correlation between demographic characteristics and patient adherence levels. However some studies have shown that old age is associated with good adherence compared to young age (Cauldbeck et al, 2009; Karpiak, 2014; Wakibi, Ng'ang'a & Mbugua, 2011). This may be attributed to older patients' familiarity with medication usage and their increasing awareness of HIV as a disease that requires optimal adherence (Cauldbeck et al, 2009). Conversely, this was not the case in this study as both the old and the young respondents were not adhering to ART. This may imply that there are various factors that influence ART adherence apart from age. According to Ross, Aung, Campbell & Ogunbanjo (2011), factors which most influenced adherence were patient-related such as acceptance, disclosure, determination, and family support; Disease-related such as symptomatic illness and treatment-

related treatment related such as improvement on ARTs. Healthcare worker-related factors such as relationships, and adherence classes were also found to influencing ART adherence.

### **Education level of Respondents.**

Most of the respondents (53.6%; n=127) had PSLC while (19.0%; n=45) had attended school up to junior certificate and 16.5% (n=39) of the participants had attained Malawi School Certificate of Education (MSCE) level. Respondents with tertiary education (diplomas) constituted 3.0% (n=7) while 8.0% (n=19) had no formal education. This study found that many respondents had some form of education which could have influenced their adherence to Anti retro viral therapy. For instance 92% (n=218) had some form of education and there were some (8%; n=19) with no formal education. It is evident that low education levels in patients are associated with inadequate disease related knowledge and poor treatment adherence (Bauleth, 2013). This is supported by Mitiku, Abdosh & Teklemariam, (2013) of Ethiopia who found that respondents who had high school education and above (90.7%) were adhering more to treatment than those who were illiterate (80%). Dissimilar results from Cauldbeck et al., (2009) show that education level is not associated with lower medication adherence as verbal instructions to patients who are illiterate seem equally as effective as written instructions which are given to all patients. These conflicting findings were also uncovered by a systematic review of studies that were done in low and middle-income countries which found that higher education was associated with adherence although some studies found that there is negative association between education and adherence (Sahay, et al., 2011).

### **Religion of Respondents.**

Religion was not associated with ART adherence in this study because all the respondents who were from diverse religious background were not adhering to ART (figure 4.3).

As evidenced by the findings of this study 21.9% (n=52) of the respondents were Roman Catholics and 19.0% (n=45) were affiliated to Church of central African Presbyterians (Figure 2).

Similar results from Finoccharia-Kessler et al. (2011) show that religious/spiritual beliefs (i.e., perceiving God as in control of one's health) predicted lower ART adherence. The potential impact of religious/spiritual beliefs on health outcomes may depend on an individual's interpretation of their role in determining their health, viewing God as a source of inspiration and strength to do what needs to be done versus abdicating full responsibility to God. On the contrary, findings by Tumwine, Neema, & Wagner (2012) suggest that high religious beliefs among people with HIV and AIDS (PHAs) can help them cope better with the experience of living with HIV and that it is possible for high religiosity to be either supportive of high ART adherence levels or a barrier to ART adherence among some people living with HIV. Therefore a religious belief is particularly problematic for health outcomes such as ART adherence that require a high degree of patient involvement (Finoccharia-Kessler et al. (2011).

#### **Ethnic groups of respondents.**

In this study ethnic groups did not influence the men to adhere to ART as all the men were non-adherent to ART. There were Lomwes (33.8%; n=80), Ngonis (24.5%; n=58), Yaos (13.1%; n=31) and Tumbukas (3.4%; n=8) who participated in this study. The Lomwe tribe which was in majority during data collection is one of the dominant tribes in the south west region of Malawi. According to 2010 Malawi Demographic and Health Survey (NSO, 2011), HIV prevalence is highest among the Lomwe ethnic group (17 percent) followed by the Yaos 13% and this may explain why the Lomwes were the majority in this study.

### **Number of respondents' children.**

In this study having children did not motivate respondents to adhere to ART. Although the majority of them (91.6%; n=80) had children who ranged from 0 to 10 and the mean number of children per respondent being 3. This did not influence them to adhere to ART adherence. The small families that they had may have made them to have a desire to live a healthy life so that they could continue to care for their families but this did not influence them as a result they were all non-adherent to ART.

### **Occupation of respondents.**

In this study both the employed and unemployed were non-adherent to ART (Figure 3). Findings of this study showed that 31%, (n=75) of the respondents were business people and farmers comprised of 25% (n=10.5) (Table 4.2). This is similar to results found by Sumbi, (2010) where employed patients seemed to exhibit comparatively lower levels of adherence. On the contrary, Nachega et al. (2014) found that patients with HIV infections who were employed were 27% more likely to adhere to ART than those who were unemployed. Furthermore the International Labor Organization (ILO) (2013) found that employment is likely to positively impact on ART as the patients are financially secure thus are able to provide for food and cope with structural barriers such as lack of transport or money to attend clinic visits, collect pharmacy refills and make out-of-pocket payments for any other health services at public health sites or in the workplace. However it was also found that in many developing countries people who were living with HIV and were unemployed lacked financial security for their basic needs which could lead them to be non-adherence to ART.

## **Respondents' knowledge and experience about HIV and AIDS**

The findings of this study showed that there are variations in respondents' level of knowledge about HIV and AIDS and the importance of adhering to ART. It is clear that 97.9% (n=232) of the respondents believed that it is necessary for HIV patients to comply with a diet as suggested by a health worker. Furthermore many respondents (92.9%; n=220) felt that life expectancy of patients with HIV/AIDS improves once they receive ART. This shows that most of the respondents had some knowledge about HIV and AIDS and its treatment. This can also be supported by the findings by Mbirimtengerenji et al. (2013) state that it is apparent that ART adherence among women in Malawi is influenced by their level of knowledge. There is better adherence to ART among patients who know that ARTs are effective (Sendagala, 2010). While the respondents in this study had good knowledge on HIV and AIDS and ART adherence the results showed that the respondent's ART adherence was below the recommended >95%. This is consistent with Indilli, Jullu, Mugusi, & Tannar, (2012) who found that knowledge of ART benefits, adherence requirements and legibility are not related to ART adherence. However it is evident that patients who have inadequate knowledge regarding ART have poor adherence levels of below 50% as compared to those clients who were knowledgeable about the disease (Nziva, 2011). This shows that patients must be equipped with adequate knowledge about HIV and AIDS if they are going to adhere to ART. According to Wakibi et al. (2011), respondents in Kenya regarded adherence to HAART extremely important to HIV treatment and translated this knowledge into positive belief about the necessity of HIV medication. In agreement are Olowookere, Fatiregun, & Adewole (2012) who found that respondents with adequate knowledge about HIV and AIDS tended to be more adherent to ART. However this study did not assess whether the respondents had adequate knowledge about HIV and AIDS. Thus one can

assume that respondents in this study had poor adherence to ART due to lack of adequate knowledge.

Literature suggest that patients who understand their HIV disease and the relationship between treatment, adherence and successful outcome report high levels of ART adherence (Mugusi et al., 2009). Conversely, some respondents in this study showed that they lacked adequate information about HIV and AIDS. For instance 81.8% (n=191) of the respondents reported that substance and/or alcohol abuse will not impair the effectiveness of ARV drugs in combating HIV and AIDS. This is a public health concern because it is clear that alcohol and drugs can lead to poor ART adherence. Hansana, (2013) assert that illicit drug use is a contributing factor to ART non-adherence among patients. In addition alcohol abuse hinders ART adherence because it makes patients to forget to take their medications.

Alcohol may also directly interfere with effectiveness of ART and patients who consume alcohol are nine times more likely to fail to comply with ART compared with sober patients (Alcohol Alert, 2010). Failure to take ART as prescribed can lead to a higher viral load and an increasing likelihood that the virus will become resistant to the therapy (Reda & Biadgilign, 2011). Therefore it is essential that health workers educate patients about the effects of alcohol on HIV treatment through counseling. This may assists the patient in developing positive beliefs and perception towards the disease. It also helps in setting goals and increases the self-efficacy of the patient (Adefolalu & Nkosi, 2013). Furthermore information received from counseling, friends and family support as well as a cordial relationship with doctors at the clinic are identified by patients as important factors that motivate patients to continue taking the Anti retro viral treatment (Okonkwoh, 2011)

## **Respondents' perception about factors that influence adherence to Anti retro viral therapy**

### **Respondent's perception regarding patient level factors.**

This study showed that respondents perceived that patient level factor affect their adherence to ART (Table 4). Almost all respondents (97%; n=230) indicated that they made a commitment to follow their treatment plans and some (92.4%, n=219) felt that they have the ability to stay on treatment successfully. This shows that the respondents had positive self perception about their treatment. Despite these positive perceptions the respondents were still not adhering to their treatment. It is documented that complexity of the ART regimens and treatment plan influenced an individual's willingness and ability to adhere to therapy and patients with higher self-efficacy beliefs about using Anti retro viral agents have better adherence (Sendagala, 2010). For instance disclosing about ones HIV status may help an individual to adhere to ART. In this study some of the respondents (71%, n=166) reported that they had disclosed their HIV status to their spouses and friends. Disclosing one's HIV status has been associated with good adherence because patients can get both physical and psychological support from their spouses and other family members with regards to treatment adherence (Sendagala, 2010; Pennap, Abdullahi & Bako, 2012; Sumbi, 2010). Therefore health workers must explain the importance of disclosure during counseling sessions so that individuals can successfully adhere to ART (Wasti et al., 2012). Conversely, all respondents in this study did not adhere to their medication although many respondents agreed having disclosed their status to family and friends. This might happen due to various factors like stigma and discrimination.

In a study that was conducted by Nziva, (2011) in Kenya, it was found that 41% of the respondents faced stigmatization and discrimination as a result of disclosing their HIV status. It is also well documented that fear of disclosure acts as a barrier to ART adherence in an African

setting (Indilli et al., 2012). This might be true for this study where 22.7% (n=54) of the respondents had not disclosed their HIV status to family members and friends. A study in Nepal found that 4.7% of respondents who were non-adherence to ART had hidden their status from their family and friends (Shigdel, Klouman, Bhadari & Ahmed, 2014). It further reveals that stigma in the community and from family members impairs adherence to treatment since it makes the affected persons to experience negative emotions and the fear of disclosing their HIV status and unwillingness to take ART in the presence of others. It is clear from the findings of this study that religious beliefs also affect adherence to ART among patients. In this study some respondents (37.9; n=90) perceived that religious constraints like fasting prevent them from adhering to ART. This is consistent with Pennap et al. (2012) who found that there was 80% adherence rate to ART during the month of Ramadan among Muslims who were fasting in Nigeria.

Similarly, Wasti et al. (2012) found that local culture, especially religious activities and festivals such as “Teej” for Hindu women and “Ramadan” for Muslims are barriers to ART adherence in Nepal. It can be logical to argue that religious beliefs may be one of the barriers to ART adherence in various societies. However in Malawi where there are many Christians, some people do not take or stop taking ART because of their Christian doctrine of spiritual healing. This is common among Pentecostal churches where they emphasise on deliverance and spiritual healing. For this to be countered health workers must be incorporating discussions about spiritual beliefs into adherence counseling which may foster ART adherence among patients.

### **Respondent’s perception about medication level factors.**

The findings of this study suggest that medical level factors can promote or hinder ART adherence (Table 5). Almost all the respondents (91.5%; n=217) in this study reported that

tablets are not many and are easy to take. However some respondents (20.7%; n=49) indicated that they are bothered by ART side-effects. Okonkwoh, (2011) asserted that side-effects from Anti retro viral medication are one of the factors that contribute to non-adherence to treatment. This is collaborated by Bauleth, (2013) who found that treatment side-effects impacted on treatment defaulting among patients. As such one can conclude that a side effect is one of the reasons which make respondents in this study to have poor ART adherence. Studies that were done elsewhere have revealed that patients who have side-effects are more likely to be non-adherent (Mills et al., 2006; Wasti et al., 2012). Despite patients tolerating side effects of a treatment, it is still important that health care personnel help patients to adhere to therapy through appropriate support and routine management of side effects, including counseling on possible side effects, and how to and where to seek help when side effects occur (Equal Treatment, 2009). The fact that the benefits of taking treatment regularly usually outweigh the side effects should be stressed by health care personnel (Kamera, 2011) so that patients can make informed decisions to be adherent to treatment.

#### **Respondent's perception about clinic level factors.**

This study revealed that the clinic level factors assist patients to adhere to ART (Table 6). Nearly all respondents (91.1%; n=216) felt that the ART clinic is easily accessible. Furthermore, almost all the respondents (91.6; n=217) indicated that drugs are always available at the Anti retro viral therapy clinic. This is consistent with Nziva, (2011) who found that 94.4% of the respondents in his study in Kenya reported that the Anti retro viral drugs were always available and easily accessible. The availability of these drugs may help patients to continue taking their medication without interruption due to shortages. In Malawi ARVs are available at all health facilities across the country including private and faith based organizations. The Ministry of

Health has also been working in collaboration with several sectors including NGOs, Civil societies to ensure easy accessibility and availability of ARVs especially in remote areas (Government of Malawi, 2012). The accessibility has been simplified by the fact that the treatment is provided at no cost to all clients who are eligible for treatment and the services are taken close to where people reside. For example a total number of 381,000 PLHIV aged 15+ years were eligible for ART in 2011 and 89% of these patients were on the first line while 9% were on alternative first line and less than 1% were on the second line regimen (Government of Malawi, 2012). This indicates that the HIV-infected people are able to access ART services without many problems. However it was clear that respondents had varying views regarding waiting time at the clinic. Some respondents (32.5%; n=77) perceived that waiting time is long while others 56.5% (n=134) felt that the waiting time is short. The long waiting time may discourage patients to go to the clinic. Joglekar and colleagues (2011) claim that long waiting hours make patients reluctant to visit the clinic anymore. The long waiting time may be due to shortage of health workers and increased number of patients accessing the clinic. Therefore, it may be necessary to increase the number of clinic staff so that patients are timely served and consequently promoting their adherence. Amanyire and colleagues, (2010) in their study found that although both the clients and providers could access the clinic and good care was provided they still admitted that clinics were very busy, congested, and overwhelmed. All the providers were not eager to take on more clients as there was need for more space, more trained staff, and more resources before they could expand access to ART care.

## **Respondent's perception about support they need**

### **Client-Family Support.**

This study found that respondents feel that they receive adequate support which helps them to adhere to ART (Table 7). Most respondents (91.5%; n=216) indicated that support from friends or family assist them to adhere to ART. In support of these findings are Mituku et al. (2013) who found adherence rate of 86.7% among patients who had support from their families and 88.2% among those who had support from friends and other organizations. This may imply that support from family and friends are instrumental in facilitating ART adherence. This is consistent with a large body of literature which shows that family support is associated with ART adherence (Obirikorang, Selleh, Abledu & Fofie, 2013; Sasaki et al. 2012; Watt et al., 2008). Similarly, the findings of this study revealed that most respondents (87.3%; n=207) reported that their family members remind them to take their tablets regularly. Conversely, even though patients may have family support they may miss some doses of their ART while in working places and other places outside home. This means that family support alone is not adequate to increase the uptake of ARV but also support from friends, the community, government, NGOs, and other groups supporting PLWHA needs to be emphasized (Mitiku et al, 2013; Sahay et al. 2011).

Furthermore, it is evident that strong patient-provider relationship is an essential component for supporting and sustaining in-patients who are chronically ill (Watt et al., 2008). Establishing a trusting patient-provider relationship over time and maintaining good communication may help to improve adherence and long-term outcomes. However building trust and developing skills for successful patient/provider communications demand time, effort, knowledge, and practice (Watt et al., 2008) therefore health workers must have effective

interpersonal skills and adequate knowledge and skills for caring of these people. This may help in creation of trusting relationship that can foster ART adherence among patients.

In this study it was revealed that health workers give the patients clear instruction on how to take medications. This may be a clear indication of a good relationship that exists between patients and providers and such relationships have been associated with adherence to ART in some settings (Indilli et al. 2012).

### **Men's level of Anti-Retrovirus Therapy adherence**

The findings of this study showed that all (100%; n=237) respondents were not adhering to ART (<95%) (figure 3) and these results are concurring with the findings by Shingdel, Klouman, Bhadari & Ahmed, (2014) who found a lower ART adherent rate of 91.1% among men in Nepal. These findings are contrary to Mills et al. (2006) who found out that 77% of patients in Africa achieved adequate adherence of 95% .

The poor ART adherence maybe attributed to various factors such as patients behavior. Studies have shown that a patient's behavior is the critical link between a prescribed regimen and treatment outcomes and as such interventions need to target patient's behavior such as disclosure of one's HIV status in order to improve adherence to ART (Alagaw, Godana, Taha, Dejene, 2011).

Although 70.1% (n=166) of the respondents in this study had disclosed their status to at least their spouses and friends, but this was not encouraging as 30% of the respondents who had not disclosed their HIV status were many and may affect the attainment of MGD 6. Disclosing one's status is an important issue in ART management (Meless, Dago-Akribi, Cacou, Eboua & Aka, 2013). This behavior shows that respondents at this study site were not complying with

national guidelines for managing HIV and AIDS patients on ART. Besides that, about 91.2% (n=216) of respondents reported that they had support from family members in the form of emotional/psychological, physical, and food provision after disclosing their status. These behaviors may promote optimal adherence among these patients because family members and friends could remind the patients to take the ART and provide psychosocial support that may promote ART adherence. Other studies have shown a significant association between poor psychological status and non-adherence (Obirikorang et al. 2013). However the findings of this study show that despite respondents having this support from others, they were still not adhering to ART. There might have been other contributing factors that led these men not to adhere to ART.

From a patient perspective, non adherence is often a consequence of one or more behavioral, structural, and psychosocial barriers (e.g., depression and other mental illnesses, neuro cognitive impairment, low health literacy, low levels of social support, stressful life events, high levels of alcohol consumption and active substance use, homelessness, poverty, nondisclosure of HIV sero status, denial, stigma, and inconsistent access to medications) (AIDSinfo, 2014). Therefore, adherence counseling should target specific personal barriers to ART adherence like: lack of family support, health and sexual life concerns, desire to have children and family instability (Mayanja, et al. 2013).

## **Conclusion**

Non-adherence was found to be high among the respondents in this study as all (100%; n=237) HIV-infected men were far below the required >95% adherent to ART. There were a number of reasons for not adhering such as side effects of the drugs, long waiting hours at the

clinic, shortage of staff, religious beliefs, disclosure with the most common being forgetfulness. These challenges need to be addressed on an individual level, health setting and the community as well to foster treatment success. These findings may form a basis for improving clinical care of patients by developing an adherence programme that will adequately prepare patients and guardians prior to initiating treatment and provision of an ongoing ART adherence support. Respondents were able to access the ART clinic with minimum problems and were provided with the needed resources (ART). This needs to be maintained to encourage patients to stay on treatment.

However it was observed that there was lack of provision of HIV-related information, and evaluation of a patient's knowledge about HIV disease. Facilitators and potential barriers to ART adherence may not have been identified as health education or individual counseling were not being done at the clinic. This may have contributed to non-adherence at the setting as the patients need to be reminded on HIV and AIDS issues such as the importance of ART adherence which was not being met. Furthermore there is the need for more information, education, and communication campaigns targeted at the general public to eliminate or reduce stigma against the patients. Overall the study reviewed a remarkable opportunity for improving ART services at Chilomoni Health Centre in Blantyre District.

#### Limitation of the Study

Although this study provides an insight into the nature of HIV-positive men's adherence to Anti retro viral medication there were several significant limitations.

The sample space of the research work was not big enough to explore all the possible factors limiting adherence as some might not have been captured. A bigger sample space and

time is important to explore all the possible factors and experiences of HIV-infected men undergoing ART treatment in Blantyre District.

Selection bias may have occurred as only those patients who were on ART at the time of data collection were included whereas those who were lost to follow-up or could not go to clinics for medication re-supply were left out.

The study did not have an objective measure of actual adherence for example blood tests, to verify self-reports since this method has limitations. Thus, a better understanding of the validity of such data is important. However since literature has shown that self report provides reliable information in soliciting information on missed doses than pill count then patients who admitted missing their doses in this study implied that they had truly missed their drugs. Even though measuring adherence using patients' self-report can be easily replicated in most resource-limited settings making it a good measure for comparison (Zelege, 2012). There might have been no subject of overestimation as respondents in this study used a self administered questionnaire which might have made them to express their views freely without fear of the researcher or her assistant.

Since this was a cross sectional study adherence was only assessed at a single point in time hence adherence levels found in this study may not be very accurate. A prospective type of cohort study of HIV- infected men on ART should be done to understand and evaluate adherence at the clinic. Communication bias, recall bias, and the desire to satisfy the interviewers should have also affected the responses and this may not have precisely reflected adherence levels and factors that determine ART adherence in this study.

## Recommendations

This study suggest that patients face challenges with regard to taking their Anti retro viral medication since all of the respondents (100%; n=0) do not adhere to treatment. As such the following recommendations were made for practice, policy, education and research.

### **Practice**

This study recommends that care providers should create supportive environments which can promote adherence for patients who are on ART. This can be achieved by the development of positive long-term relationships between healthcare workers and patients. This has been cited by participants as central to achieving optimal adherence (Scott et al., 2014). Healthcare providers should promote strategies for reminders such as cell phones, alarm clocks and family members. These strategies should be covered during education and counseling in order to address the issue of forgetfulness or deliberate skipping of medication.

Furthermore shortage of staff at the ART clinic and long waiting time were narrated by respondents as challenges to ART adherence. The government should therefore train and deploy more staff to ART clinics so that clients are attended to on time to motivate them to adhere to their treatment. ART adherence, monitoring and counseling can be shifted to lay cadres such as the Health Surveillance Assistants without compromising the effective implementation of ART program. Engaging other support systems in form of treatment supporters to deal with adherence issues and addressing patients specific needs at either hospital/clinic or community level could ease the workload of hospital ART team and eventually improve treatment adherence. Task shifting of ART services from physicians to other providers is supported by WHO guidelines and allows medical staff to focus on more complicated cases and its safety and efficacy has been demonstrated(Medecins Sans Frontières(MSF),2013).

Given the magnitude and importance of poor adherence to medication regimen it is important to use evidence-based strategies to improve medication such as investigating the causes of non-adherence so that strategies can be put in place to improve the ART adherence. The government should improve ART infrastructure at the setting to enable the staff counsel clients in privacy. Limited rooms may prevent the health workers from counseling the clients when they come for refilling of their medication. At the same time, the clients may not tell the health workers the problems they encounter when taking their treatment. This may lead to non adherence.

Utilization of a multidisciplinary team approach should be used so that the clinicians, nurses, pharmacy assistants and counselors will be available to coordinate some of the adherence-related activities. This also increases the likelihood that patients will find someone on the care team to whom they can comfortably relate and from whom they can get needed information about their medications (Sumbi, 2010).

## **Education**

As all the respondents were non-adherent to ART there is need to identify barriers and discuss and educate the patients about them. This is usually the mainstay of ART programmes in any setting. Education and counseling empowers the patient to be part of the treatment process. Knowledge about the disease, its symptoms, treatment and side-effects of the medications are crucial information that has to be passed on to the patient (Adefolafu, 2013). Furthermore during counseling potential barriers to adherence are identified and addressed. Counseling assists the patient in developing positive beliefs and perception towards the disease. It also helps in setting goals and increases the self-efficacy of the patient.

Health care workers need to update their knowledge and skills on the caring of patients on ART. This can assist them to be able to continuously educate patients on the importance of adhering to ART to prevent them from developing drug resistance. Sub-optimal adherence can result in resistant viral strains and disease progression (Skovdal et al., 2011; Walkup, et al., 2011; Wasti et al., 2012). Therefore, improving HIV and AIDS education for health workers and the general public is critical for achieving universal access to treatment (AVERT, 2014).

## **Research**

Since all the respondents were not adherent to ART there is need to conduct research focusing on behaviors, perceived norms and cultural specific issues which may provide insights into subjective barriers to ART adherence and develop empirically supported behavioral interventions to enhance adherence to ART. Empirically tested objective adherence measurement tools and approaches to assess adherence in clinical/programme settings are required. Theory based interventions to optimize adherence need to be designed, tested and implemented (Sahay et al., 2011). Furthermore there is also need to conduct a qualitative study to explore and describe HIV-infected men's perceptions about the utilization of Anti retro viral therapy in order to have an in-depth understanding of

## References

- Achappa, B., Madi, D., Bhaskaran, U., Ramapuram, J.T., Rao, S., & Mahalingam, S. (2013). Adherence to Antiretroviral Therapy among People Living with HIV *North American Journal of Medical Science*, 5(3), 220-223.
- Adefolafu, A. O. (2013). *Self-Efficacy and Beliefs about Medications: Implications for Antiretroviral Therapy Adherence*. Retrieved on December 1, 2013 from: [http://uir.unisa.ac.za/bitstream/handle/10500/10571/thesis\\_adebolalu\\_ao.pdf?sequence=1](http://uir.unisa.ac.za/bitstream/handle/10500/10571/thesis_adebolalu_ao.pdf?sequence=1)
- Adefolalu, A.O., & Nkosi, Z.Z. (2013). The Complex Nature of Adherence in the Management of HIV/AIDS as a Chronic Medical Condition. *Journal of Diseases*, (1), 18-35.
- Alcohol Alert (2010). *Alcohol and HIV AIDS: Intertwining Stories*. Retrieved on October 12, 2014 from: <http://pubs.niaaa.nih.gov/publications/AA80/AA80.pdf>
- Amanyire, G., Wanyenze, R., Alamo, S., Kwarisiima, D., Sunday, P., & Sebikaari, G. (2010). Client and Provider Perspectives of the Efficiency and Quality of Care in the Context of Rapid Scale-Up of Antiretroviral Therapy. *Journal of AIDS Patient Care STDS*, 24(11), 719–727.
- AIDSinfo, (2014). *Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents*. Retrieved on July 27, 2014 from: <http://aidsinfo.nih.gov/guidelines/html/1/adult-and-adolescent-arv-guidelines/30/adherence-to-art>
- Alagaw, A., Godana, W., Taha, M., & Dejene, T. (2013). Factors associated with antiretroviral

- treatment adherence among adult patients in Wolaita Soddo Hospital, Wolaita Zone, Southern Ethiopia. *Journal of AIDS and HIV Research*, 5(2), 52-58.
- AVERT (2013). *HIV & AIDS in Malawi*. Retrieved on June 14, 2013. From: [www.Avert.org/aids-malawi.htm](http://www.Avert.org/aids-malawi.htm)
- AVERT (2014). *Universal Access to HIV Treatment*. Retrieved on September 05, 2014 from: <http://www.avert.org/universal-access-hiv-treatment.htm>
- AVERT (2014). *Impact of HIV and AIDS in sub-Saharan Africa*. Retrieved on July 09, 2015 from: <http://www.avert.org/impact-hiv-and-aids-sub-saharan-africa.htm>
- Bangsberg, D.R. (2006). Less Than 95% Adherence to Nonnucleoside Reverse-Transcriptase Inhibitor Therapy Can Lead to Viral Suppression. *Journal of Clinical Infectious Disease*, 43 (7), 939-941.
- Barnett, W., Patten, G., Kerschberger, B., Conradie, K., Garone, D.B., van Cutsem, G. et al. (2013). Perceived adherence barriers among patients failing second-line antiretroviral therapy in Khayelitsha, South Africa. *South African Journal HIV Medicine*, 14(4),170-176.
- Bauleth, M.F. (2013). *Factors Associated with Poor Adherence amongst Patients Receiving Antiretroviral Therapy at the Intermediate Hospital Oshakati in Namibia*. Retrieved on July 10, 2014 from: <http://etd.uwc.ac.za/xmlui/handle/11394/2930>
- Burns, N. & Grove, S.K. (2007). *The practice of nursing research: conduct, critique and utilization* (3<sup>rd</sup> ed.). Philadelphia: W.B Saunders.
- Cauldbeck, M.B., O'Connor, C., O'Connor, M.B., Saunders, J.A., Rao, B., Malles, V.G. et al.

- (2009). *Adherence to anti-retroviral therapy among HIV patients in Bangalore, India*  
Retrieved on August 17, 2014 from: <http://www.aidsrestherapy.com/content/6/1/7>
- Cornet, M. (2008). *Overcoming barriers in ART-adherence-The role of social support and in antiretroviral treatment in Kayunga, Uganda*. Retrieved on May 16, 2014 from:  
<http://dare.uva.nl/cgi/arno/show.cgi?fid=116789>
- Crossan, F. (nd.). Research Philosophy: Towards an understanding: *Nurse Researcher Journal*,  
*11 (1)*, 46-55.
- Creswell, J.W. (2009). *Research designs: Qualitative, quantitative and mixed methods approach*. London: Sage.
- Do, H.M. (2011). *Antiretroviral Therapy (Art) Adherence among People Living with HIV/AIDS (PLHIV) in the North of Vietnam: a Multi-method Approach*. Retrieved on November 13, 2013 from: [http://eprints.qut.edu.au/45756/1/Hoa\\_Do\\_Thesis.pdf](http://eprints.qut.edu.au/45756/1/Hoa_Do_Thesis.pdf)
- EQUAL Treatment (2009). *Side effects; all you need to know about flu; Difficulties with adherence in Africa; Factsheets on common side effects and adherence* from: Retrieved on October 02, 2014 from: <http://www.tac.org.za/community/files/file/etmag/ET28/ET28English.pdf>
- Finocchiaro-Kessler, S., Catley, D., Berkley-Patton, J., Gerkovich, K., Williams, K., Banderas, J. et al. (2011). *Baseline Predictors of Ninety Percent or Higher Antiretroviral Therapy Adherence in a Diverse Urban Sample: The Role of Patient Autonomy and Fatalistic Religious Beliefs*. Retrieved on October 19, 2014 from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3049424/>

Ho, P.M., Bryson, C.L., & Rumsfeld, J.S. (2009). *Medication Adherence*. Retrieved on August 02, 2015 from: <http://circ.ahajournals.org/content/119/23/3028.full>

Gawa, L.G., (2011). *Factors Affecting Adherence to Antiretroviral Therapy (ART) Among Children Aged 7-15 Years Attending Queen Elizabeth Central Hospital (QECH) ART Clinic In Blantyre*. Retrieved on December 14, 2013 from: [http://www.medcol.mw/commhealth/mph/dissertations/Gawa\\_L\\_%20MPH%20Thesis\\_17\\_04\\_2012.pdf](http://www.medcol.mw/commhealth/mph/dissertations/Gawa_L_%20MPH%20Thesis_17_04_2012.pdf)

Government of Malawi,(2012). 2012 *Global Aids Response Progress Report: Malawi Country Progress Report: Malawi Country Report for 2010 and 2011*.Retrieved on June 13, 2013 from: [http://www.unaids.org/en/dataanalysis/knowyourresponse/countryprogressreports/2012countries/ce\\_MW\\_Narrative\\_Report%5B1%5D.pdf](http://www.unaids.org/en/dataanalysis/knowyourresponse/countryprogressreports/2012countries/ce_MW_Narrative_Report%5B1%5D.pdf)

Hansana, V., Sanchaisuriya,P., Durha, P.J., Sychareun, V., Chaleunvong, K., Boonyaleepun S. et al. (2013). *Adherence to Antiretroviral Therapy (ART) among People Living with HIV (PLHIV): a cross-sectional survey to measure in Lao PDR*. Retrieved from: <http://www.biomedcentral.com/1471-2458/13/617>

Idindili, B., Jullu, B., Mugusi, F., & Tanner, M. (2012). A case control study of factors associated with non-adherence to ART among HIV INFECTED people in Pwani region eastern Tanzania. *Tanzanian Journal of Health Research, 14 (3), 1-12*.

International Labour Organisation (ILO), (2013). *The impact of Employment on HIV Treatment adherence*. Retrieved on October 24, 2014 from: [http://www.ilo.org/wcmsp5/groups/public/---ed\\_protect/---protrav/---ilo\\_aids/documents/publication/wcms\\_230625.pdf](http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---ilo_aids/documents/publication/wcms_230625.pdf)

Jin, J., Sklar, G. E., Oh, V.M.S., & Li, S.C. (2008). Factors affecting therapeutic compliance: A

- Review from the patient's perspective. *Journal of Therapeutics and Clinical Risk Management*, 4 (1), 268-286.
- Johnson, A., Sandford, J. & Tyndall, J. (2008). *Written and verbal information versus verbal information only for patients being discharged from acute hospital settings to home*. Retrieved on August 12, 2014 from: <http://www.ub.edu/farmaciaclinica/projectes/webquest/WQ1/docs/johnson.pdf>
- Joglekar, N., Paranjape, R., Jain, R., Rahane, G., R. Potdar, R., K.S. Reddy, K.S. et al. (2011). Barriers to ART adherence & follow ups among patients attending ART centres in Maharashtra, India. *Indian Journal of Medical Research*, 134 (6), 954-959.
- Kamera, H. (2011). *The Effect of Home Follow up Visit in Enhancing Antiretroviral Therapy Adherence among HIV and AIDS Patients in a Rural Setting*. Retrieved on April 12, 2014 from: [http://www.medcol.mw/commhealth/mph/dissertations/Kamera\\_Hilda\\_dissertation\\_Aproved.pdf](http://www.medcol.mw/commhealth/mph/dissertations/Kamera_Hilda_dissertation_Aproved.pdf)
- Karpiak, (2014). *Adherence to antiretroviral therapy (ART) in older adults living with HIV/AIDS*. Retrieved October 13, 2014 from: <http://www.apa.org/pi/aids/resources/exchange/2014/01/anti-retroviral-therapy.aspx>
- Libamba, E., Makombe, S.D., Anthony D., Harries D.D., Schouten, E.J., Joseph, K et al. (2007). Malawi's contribution to "3 by 5": achievements and challenges *Bulletin of the world Health Organisation*, 85(2), 156-160.
- Li, L., Lee, S., Wen, Y., Lin, C., Wan, D., et al. (2010). Antiretroviral Therapy Adherence among Patients living with HIV/AIDS in Thailand. *Journal of Nursing Health Science* 12(2):212-220.
- Makwiza, I. Nyirenda, L. Bongololo, G. Banda, T. Chimzizi, R. & Theobald, S. (2009). *Who has*

*access to counseling and testing and anti-retroviral therapy in Malawi – an equity analysis.* Retrieved on July, 15, 2013 from: <http://www.equityhealthj.com/content/8/1/13>

Mancebo, M.L., Pinto, A., Rasmussen, S.A. & Eisen, J.L. (2008). Development of the Treatment Adherence Survey-patient version (TAS-P) for OCD. *Journal of Anxiety Disorder, 22 (1), 32-43.*

Markos, E. Worku, A. & Davey, G. (2008). *Adherence to ART in People living with HIV/AIDS at Yirgalem Hospital, South Ethiopia.* Retrieved on February 20, 2014 from: <http://www.ajol.info/index.php/ejhd/article/viewFile/10068/31342>

Mayanja, B.N., Kabunga, E., Masiira, B., Lubega, R., Kaleebu, P. & Seeley J.(2013). *Personal barriers to antiretroviral therapy adherence: case studies from a rural Uganda prospective clinical cohort.* Retrieved on August 10, 2015 from:<http://www.ncbi.nlm.nih.gov/pubmed/24235929>

Mbirimtengerenji, N. D., Jere, G., Lengu, S., & Maluwa, A (2013). Factors That Influence Anti-Retroviral Therapy Adherence among Women in Lilongwe Urban Health Centres, Malawi. *World Journal of AIDS, 3(1), 16-25.*

McGuire, M., Pinoges, L., Kanapathipillai, E., Munyenembe, T., Huckabee, M., Makombe, S et al.(2012). *Treatment Initiation, Program Attrition and Patient Treatment Outcomes Associated with Scale-Up and Decentralization of HIV Care in Rural Malawi.* *Journal of PLOS MEDICINE 7(10), e38044*

Medecins Sans Frontières (MSF), (2013). *Reaching Closer to Home Progress implementing*

*Community-based and other adherence strategies supporting people on HIV treatment Experiences from DRC, Lesotho, Malawi, Mozambique, South Africa & Zimbabwe.*

Retrieved on October 30, 2014 from: [http://www.msf.org/sites/msf.org/files/reaching\\_](http://www.msf.org/sites/msf.org/files/reaching_)

Mekonnen, Y., Sanders, R. S., Tibebe, S. & Emmart, P. (2010). *Equity and Access to ART in Ethiopia: Washington, DC: Futures Group, Health Policy Initiative, Task Order*

1. Retrieved on November 2, 2013 from: [http://www.healthpolicyinitiative.com/Publications/Documents/1262\\_1\\_Ethiopia\\_ART Equity\\_FINAL\\_acc.pdf](http://www.healthpolicyinitiative.com/Publications/Documents/1262_1_Ethiopia_ART_Equity_FINAL_acc.pdf)

Meless, G.D., Dago-Akribi, H. Cacou, C., Eboua, T.F., Aka, A.E. & Oga, A.M. et al. (2013).

Notification of HIV status disclosure and its related factors in HIV-infected adolescents in 2009 in the Aconda program (CePreF, CHU Yopougon) in Abidjan, Côte d'Ivoire, The PRADO-CI Study. *Journal of the International AIDS Society, 15 (1), 18569.*

Merriam-Webster Dictionary (2014). *Associate*. Retrieved on July 12, 2014 from: <http://www.merriam-webster.com/dictionary/associate>

Mills, E. J., Nachenga, J. B., Bangsberg, D. R., Singh, S., Rachlis, B., Wu, P. et al. (2006).

HAART Adherence: A Systematic Review of Developed and Developing Nation Patient Reported Barriers and Facilitators. *Journal of PLOS MEDICINE, 3(11), e438.*

Mitiku, H., Abdosh, T., & Teklemariam, Z. (2013). *Factors Affecting Adherence to Antiretroviral Treatment in Harari National Regional State, Eastern Ethiopia*. Retrieved on August 12, 2014 from: <http://www.hindawi.com/journals/isrn/2013/960954/>

Moratioa, G. (2007). *Psychosocial Factors That Affect Adherence to Antiretroviral Therapy amongst HIV/AIDS patients At Kalafong Hospital*. Retrieved on November 23, 2014 from: <http://upetd.up.ac.za/thesis/available/etd-08052008-122226/unrestricted/dissertation.pdf>

- Morgan, C., McBeth, J., Cordingley, L., Watson, K., Hyrich, K.L., Symmons, D.P.M. et al.(2015).*The influence of behavioural and psychological factors on medication adherence over time in rheumatoid arthritis patients: a study in the biologics era.* Retrieved on July 12, 2015 from:<http://rheumatology.oxfordjournals.org/content/early/2015/05/12/rheumatology.key105.full>
- Morisky D.E., Green L.W. & Levine D.M.(1986). Concurrent and predictive validity of a self Reported measure of medication adherence. *Journal of Medication Care*, 24(1), 67-74.
- Mugusi, F., Mugusi, S., Bakari, M., Hejdemann, B., Josiah, R. & Janabi M. (2009).Enhancing adherence to antiretroviral therapy at the HIV clinic in resource constrained countries; the Tanzanian experience. *Journal of Tropical Medicine and International Health*, 14 (10), 1226-1232.
- Muula, A.S. & Kataika, E. (2008). *Assessment of Equity in the Uptake of Anti-Retroviral in Malawi.* Retrieved on July 09, 2013 from: <http://www.equinetafrica.org/bibl/docs/DIS58FINmuula.pdf>
- Munyadzwe-Gabe, G. (2008). *A study on the influence of HIV related stigma and alcohol use on adherence to antiretroviral therapy among adults on treatment at the infectious disease care clinics in Princess Marina and Nyangabgwe referral hospitals in Botswana.* Retrieved on October 12, 2014 from: <http://scholar.sun.ac.za/handle/10019.1/3295>
- Nachega, J.B., Uthman, O.A., Peltzer, K., Richardson, L.A., Mills, E.J., Amekudzi, K. et al. (2014). *Association between antiretroviral therapy adherence and employment status: systematic review and meta-analysis.* Retrieved on October 20, 2014 from: <http://www.who.int/bulletin/onlinefirst/BLT.14.138149.pdf?ua=1>
- National Statistical Office, (NSO). & ICF Macro, (2011). *Malawi Demographic and Health*

*Survey 2010. Zomba, Malawi, and Calverton, Maryland, USA*

- Nziva, M. M. (2011). *Factors Influencing Adherence to Antiretroviral Therapy among Sero-Positive Clients at Mbagathi District Hospital-Nairobi*. Retrieved on July 27, 2014 from: <http://erepository.uonbi.ac.ke/bitstream/handle/11295/62789/Full%20Text1.pdf?sequence=3>
- Obirikorang, C., Selleh, P. K., Abledu, J. K. & Fofie, C. O. (2013). Predictors of Adherence to Antiretroviral Therapy among HIV/AIDS Patients in the Upper West Region of Ghana Retrieved on October, 10 from: <http://www.hindawi.com/journals/isrn/2013/873939/>
- Okonkwoh, C. (2011). *Factors Affecting Antiretroviral Treatment Adherence amongst Young Adults Living with HIV/AIDS in, Yaba, Lagos, Nigeria*. Retrieved on June 12, 2014 from: <http://edepot.wur.nl/202013>.
- O'Hare, B., Mwambene, J., Malisita, K., Lungu, M., Kudzala, A., Masumbuka, W. et al. (2011). *Blantyre District Clinical ART Network*. Retrieved on July 12, 2014 from: <http://www.medcol.mw/paediatrics/uploads/BCAN.pdf>
- Olowookere, S.A., Fatiregun, A.A. & Adewole, I.F. (2012). Knowledge and attitudes regarding HIV/AIDS and antiretroviral therapy among patients at a Nigerian treatment clinic. *Journal of Infection in Developing Countries, 6(11), 809-816*.
- Oxford Advanced Learner's Dictionary (2014). *Associate*. Retrieved on July 12, 2014 from: [http://www.oxfordlearnersdictionaries.com/definition/english/associate\\_1](http://www.oxfordlearnersdictionaries.com/definition/english/associate_1)
- Oxford Advanced Learner's Dictionary (2013). *Factors*. Retrieved on July 12, 2014 from: [http://www.oxfordlearnersdictionaries.com/definition/english/factor\\_1](http://www.oxfordlearnersdictionaries.com/definition/english/factor_1)

Oxford Advanced Learner's Dictionary (2013). *Man*. Retrieved on July 12, 2014 from:  
[http://www.oxfordlearnersdictionaries.com/definition/english/man\\_1](http://www.oxfordlearnersdictionaries.com/definition/english/man_1)

Oxford Dictionaries (2012). *Knowledge*. Retrieved on November 12, 2014 from:  
<http://www.oxforddictionaries.com/definition/english/knowledge>

Pallant, J.(2011). *Checking the Reliability of a Scale*. Retrieved on August 12, 2015  
from:[https://prezi.com/axy5menlr4w\\_/checking-the-reliability-of-a-scale-j-pallant/](https://prezi.com/axy5menlr4w_/checking-the-reliability-of-a-scale-j-pallant/)

Poddar, A.(2014). *Research Methodology - research design*. Retrieved on July 18, 2014 from:  
<http://www.slideshare.net/Poddar25/reserch-methodolgy-research-design>

Partners in HOPE, (2011). *Quick HIV stats-Malawi*. Retrieved on December 10, 2014 from:  
<http://pihmalawi.com/11.html>

Pennap G. R., Abdullahi, U. & Bako, I. A (2012). *Adherence to highly active antiretroviral therapy and its challenges in people living with human immunodeficiency virus (HIV) infection in Keffi, Nigeria*. Retrieved on May 28, 2014 from:  
<http://www.academicjournals.org/JAHR>

Polit, D. & Beck, C.T. (2006). *Essentials of Nursing Research: Methods, Appraisals & Utilisation (6<sup>th</sup> ed.)*. New York: Wolters Kluwer/Lippincott/Williams & Wilkins Health.

Polit, D. & Beck, C.T. (2010). *Essentials of Nursing Research –Appraising Evidence for Nursing Practice. (7<sup>th</sup> ed.)*. New York: Wolters Kluwer Company.

Polit, D. F., & Beck, C. T. (2013). *Essentials of nursing research: Appraising evidence for*

- nursing practice* (8<sup>th</sup> ed.). Philadelphia: Wolters Kluwer/Lippincott/Williams & Wilkins Health.
- Reda, A. A. & Biadgilign, S. (2012). *Determinants of Adherence to Antiretroviral Therapy among HIV-Infected Patients in Africa*. Retrieved on July 24, 2014 from: <http://www.hindawi.com/journals/art/2012/574656/>
- Reddy, S., Prasad, M.G.S., Kaul, S., Kakarala, S., Krishnanand & Singh, S. (2012). Assessment of Patient Remembrance and Satisfaction of Post Surgical Instructions: Verbal Vs Verbal and Written Instructions: *A Clinical Trial. Journal of Dentistry*, 2 (4), 246-250.
- Ross, A.J., Aung, M., Campbell, L. & Ogunbanjo, G.A. (2011). Factors that positively influence adherence to antiretroviral therapy by HIV and/or AIDS patients and their caregivers. *African Journal of Primary Health Care and Family Medication*, 3(1), 196-200.
- Root, R. & Whiteside, A. (2013). *A qualitative study of community home-based care and antiretroviral adherence in Swaziland*. Retrieved on July 17, 2014 from: <http://www.jiasociety.org/index.php/jias/article/view/17978/3222>
- Ryan, R.(2006). *Post-positivist approaches to research*. Retrieved on October 12, 2014 from: [http://eprints.maynoothuniversity.ie/874/1/post-positivist\\_approaches\\_to\\_research.pdf](http://eprints.maynoothuniversity.ie/874/1/post-positivist_approaches_to_research.pdf)
- Rubin, R. (2005). Adherence to pharmacologic therapy in patients with type 2 diabetes mellitus. *The American Journal of Medicine*, 118 (5), 27-34.
- Sahay, S., Reddy, S.K., & Dhayarkar, S.(2011). Optimizing adherence to antiretroviral therapy. *Indian Journal of Medical Research*, 134 (6), 835-849.
- Sasaki, Y., Kakimoto, K., Dube, C., Sikazwe, I., Moyo, C., Syakantu, G. et al. (2011). Adherence to antiretroviral therapy (ART) during the early months of treatment in rural Zambia: influence of demographic characteristics and social surroundings of patients. *Annals of Clinical Microbiology and antimicrobials*, 11(1), 34.
- Sanjobo, N. (2007). *Adherence to antiretroviral treatment in Zambia*. Retrieved on July 14, 2014

from:<https://www.duo.uio.no/bitstream/handle/10852/30149/MasterNawaxSanjobo.pdf?sequence=1>

Sayles, N., Wong, M.D., Kinsler, J.J., Martins, D. & Cunningham, W.C. (2009). *Association of stigma with self-reported access to medical care and ART adherence in persons living with HIV/AIDS*. Retrieved on February 17, 2014 from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2762503/>

Scott, K., Campbell, C., Madanhire, C., Skovdal, M., Nyamukapa, C. & Gregson, S. (2013). *In what ways do communities support optimal antiretroviral treatment in Zimbabwe?* Retrieved on October 04, 2014 from: <http://heapro.oxfordjournals.org/content/early/2013/03/15/heapro.dat014.full>

Sendagala, S. (2010). *Factors affecting the Adherence to Antiretroviral Therapy by HIV Positive Patients Treated In A Community Based HIV/Aids Care Programme In Rural Uganda: A Case Of Tororo District*. Retrieved on June 12, 2013 from: [Uir.unisa.ac.za/bitstream/handle/10500/5356/sendagala\\_s.pdf?sequence=1](http://uir.unisa.ac.za/bitstream/handle/10500/5356/sendagala_s.pdf?sequence=1)

Shigdel, R., Klouman, E., Bhandari, A. & Ahmed, L.A. (2014). Factors associated with adherence to Anti-retroviral therapy in HIV-infected patients in Kathmandu District, Nepal. *Journal of HIV/AIDS-Research and Palliative Care*, 6 (1), 109-116.

Skovdal, M., Campbel, C., Nhongo, K., Nyamukapa, C. & Gregson, S. (2011). Contextual and psychosocial influences on antiretroviral therapy adherence in rural Zimbabwe: towards a systematic framework for programme planners. *The International Journal of Health Planning and Management*, 26 (3), 296–318.

- Stekler, J.D., Wellman, R., Holte, S., Maenza, J., Stevens, C.E., Corey, L. et al.(2012). *Are there benefits to starting HAART during primary HIV infection? Conclusions from the Seattle Primary Infection Cohort vary by control group*. Retrieved on November 11, 2014 from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3410712/>
- Sumbi, M. V. (2010). *Assessment of Factors Influencing Adherence to Antiretroviral Therapy At Nyeri Provincial Hospital in Central Kenya*. Retrieved on July 30, 2014 from: <http://irlibrary.ku.ac.ke/bitstream/handle/123456789/687/Victor%20Sumbi.pdf?sequence=3>
- Tiyou, A. Belachew, T. Alemseged, F. & Biadgilign, S. (2011). *Predictors of Adherence to Antiretroviral Therapy among People Living With HIV/AIDS in Resource-Limited Setting of Southwest Ethiopia*. Retrieved on July 12, 2013 from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2988692/>
- Tumwine, C., Neema, S., & Wagner, G. (2012). *Reasons Why High Religiosity Can Co-exist Clients in Uganda with and Precipitate Discontinuation of Anti-retroviral Therapy among Different HIV: An Exploratory Study*. Retrieved on November 03, 2014 from: <http://www.ncbi.nlm.nih.gov/pubmed/24432189>
- Tweya, H., Ben-Smith, A., Kalulu, M., Jahn, A., Ng'ambi, W., Elizabeth Mkandawire, E. et al (2014). Timing of antiretroviral therapy and regimen for HIV-infected patients with tuberculosis: the effect of revised HIV guidelines in Malawi. *BMC Public Health* 14(1), 183.
- Thonyiwa, V.M., Lakati, J., Nyagero, M., & Houseinipour (2011). *Factors affecting adherence*

*to antiretroviral therapy among adult AIDS patients at Area 18 ART Clinic in Lilongwe Malawi.* Retrieved on December 12, 2013 from: [Pag.ias2011.org/Abstracts.apx?AID=1660](http://Pag.ias2011.org/Abstracts.apx?AID=1660)

United Nations Programme on HIV and AIDS (UNAIDS) (2015). *UNAIDS announces that the goal of 15 million people on life-saving HIV treatment by 2015 has been met nine months ahead of schedule.* Retrieved on August 3, 2015 from: [http://www.unaids.org/en/resources/presscentre/pressreleaseandstatementarchive/2015/july/20150714\\_PR\\_MDG6report](http://www.unaids.org/en/resources/presscentre/pressreleaseandstatementarchive/2015/july/20150714_PR_MDG6report)

Unyeonoro, U.U., Ebenebe, U.E., Ibeth, C.C., Nwamoh, A.U., & Emelumadu, O.F. (2014). Adherence to antiretroviral therapy among people living with human immunodeficiency virus/acquired immunodeficiency syndrome in a tertiary health facility in South Eastern Nigeria. *Journal of HIV Human Reproductive, 1(2), 58-63.*

Uzochukwu, B.S.C., Onwujekwe, O.E., Onoka, A.C., Okoli, C., Uguru, N.P. & Chukwuogo, O.I. (2009). Determinants of non-adherence to subsidized anti-retroviral treatment in southeast Nigeria. *Journal of Health Policy Plan, 24 (3), 189-196.*

Wakibi, S.N., Ng'ang'a, Z. W., & Mbugua, G. G. (2011). *Factors associated with non-adherence to highly active antiretroviral therapy in Nairobi, Kenya.* Retrieved on October 01, 2014 from: <http://www.aidsrestherapy.com/content/8/1/43>

Walker, B.D., & Hirsh, M.S (2013). Antiretroviral Therapy in Early HIV Infection. *New England Journal of Medicine, 368 (3), 279-281.*

Walkup, J.T., Akincigil, A., Chakravarty, S., Olfson, M., Bilder, S., Amin, S. et al. (2011). *Bipolar Medication Use and Adherence to Antiretroviral Therapy among Patients with*

*HIV-AIDS and Bipolar Disorder*. Retrieved on March 31, 2013 from:

<http://www.ncbi.nlm.nih.gov/pubmed/21363906>

Wasti S.P., Simkhada, P. Randall, J. Freeman, J. V., & van Teijlingen, E. (2012). *Factors Influencing Adherence to Antiretroviral Treatment in Nepal: A Mixed-Methods Study*.

Retrieved on March 01, 2013 from: <http://www.plosone.org/article/info:doi/10.1371>

Watt, M. H., Maman, S. Golin, C. E., Earp J. A., Eng, U. Bangdiwala, S. et al.(2008). *Factors associated with self-reported adherence to antiretroviral therapy in a Tanzanian setting*.

Retrieved on February 02, 2013 from: <http://www.ncbi.nlm.nih.gov/pmc/articles/>

PMC3534771/

World Health Organisation, (2006). *Patient Monitoring Guidelines for HIV care and*

*Antiretroviral Therapy*. Retrieved on June 02, 2014 from:

<http://www.who.int/3by5/capacity/ptmonguidelinesfinalv1.PDF>

World Health Organisation, (2012). *Country Cooperation Strategy at a glance: Health and Development*. Retrieved on September 20, 2013 from: [http://www.who.int/countryfocus/cooperation\\_strategy/ccsbrief\\_mwi\\_en.pdf](http://www.who.int/countryfocus/cooperation_strategy/ccsbrief_mwi_en.pdf)

World Health Organisation, (2013). *Results, Impact and Opportunities*. Retrieved On July 16, 2014 from: [http://www.unaids.org/en/media/unaids/contentassets/documents/unaids\\_publication/2013/20130630\\_treatment\\_report\\_en.pdf](http://www.unaids.org/en/media/unaids/contentassets/documents/unaids_publication/2013/20130630_treatment_report_en.pdf)

World Health Organisation, (2013). *Consolidated Guidelines on the use of antiretroviral drugs for treating and preventing HIV infection. Recommendation for a public Health Approach*. Retrieved on September 24, 2014 from: <http://apps.who.int/iris/bitstream/>

10665/85321 [http://apps.who.int/iris/bitstream/10665/85321/1/9789241505727\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/85321/1/9789241505727_eng.pdf)

World Health Organisation, (2014). *Adherence to long-term therapies – Evidence for action.*

Retrieved on July 12, 2014 from: <http://apps.who.int/medicinedocs/en/d/Js4883e/7.2.html>

Zelege, A. B. (2012). *Factors That Influence Adherence To Antiretroviral Therapy Among*

*Adults at Nekemte Referral Hospital In Ethiopia.* Retrieved on October 12, 2014 from:

[http://uir.unisa.ac.za/bitstream/handle/10500/8878/dissertation\\_zelege\\_ab.pdf?sequence=](http://uir.unisa.ac.za/bitstream/handle/10500/8878/dissertation_zelege_ab.pdf?sequence=)

5

## APPENDICES

### Appendix 1: Instrument for the study-English Version

CODE\_\_\_\_\_

#### Section A

##### Demographic Characteristics

1. What is your age in years? \_\_\_\_\_

*Please circle the option which applies to you*

2. Indicate your highest education qualification

- Primary school leaving certificate
- Junior certificate of education
- Malawi school certificate
- Diploma
- Degree
- Other specify\_\_\_\_\_

3. What is your religion?

- CCAP
- Roman Catholic
- Seventh Day
- Islam
- Pagan
- Others Specify\_\_\_\_\_

4, What is your ethnic group?

- Chewa
- Tumbuka
- Lomwe
- Yao
- Ngoni
- Others specify\_\_\_\_\_

5. How many children do you have? \_\_\_\_\_

6. What is your occupation?

- Farmer
- Businessperson
- Driver
- Teacher
- Other specify\_\_\_\_\_

### SECTION B

<i>You will be asked about factors that are associated with ART adherence in HIV-infected men.</i>						
<b>To what extent do you agree with the following statements? Tick number that apply on each statement: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.</b>						
Question Number	ITEM	1	2	3	4	5
	<b>Knowledge about HIV and AIDS and importance of adhering to Anti retro viral Therapy</b>					
<b>7.</b>	HIV and AIDS is a curable disease					

8.	Antiretroviral Therapy (HIV and AIDS treatment) has many side effects					
9.	Life expectancy of HIV and AIDS patients improve once they receive Anti retro viral treatment					
10.	Compliance to diet as suggested by the health professional is important to a person who has HIV/AIDS					
11.	Compliance to the Anti retro viral treatment prescribed by the health professional is essential					
12.	Substance and/or alcohol abuse will not impair the effectiveness of the Anti retro viral treatment					
13.	I expect to be cured from HIV in the future					
14.	Anti retro viral treatment are the only effective treatment plan available to combat the effects of HIV and AIDS					
15.	Being the sole provider for my family motivates me to adhere to Anti retro viral treatment					

### SECTION C

<i>You will be asked about factors that are associated with ART adherence in HIV-infected men.</i>						
<b>To what extent do you agree with the following statements? Tick number that apply on each statement: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree</b>						
<b>Question</b>	<b>ITEM</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

Number							
	<b>Patient level factors</b>						
16.	I find it easy to disclose my HIV status to my spouse, friends, neighbours and colleagues						
17.	I have the ability to successfully stay on treatment						
18.	Availability of food helps me to always comply with ART.						
19.	I have accepted my health status						
20.	I enjoy the quality of life I live						
21.	I am able to develop pill-taking skills						
22.	The suggested ARV treatment plan is convenient for me and my family						
23.	The treatment plan is not difficult to follow						
24.	I have a mental health problem						
25.	Following my prescribed treatment plan will help me to be healthy						
26.	I have made a commitment to follow my treatment plan						
27.	I need assistance from the health professionals in order to stick to my treatment						
28.	If I stick to my treatment plan rigorously, I find that I am able to deal with daily personal problems						
29.	I realize that strict adherence to the treatment plan is essential for the ARV treatment to be effective						
30.	ARV drugs will be effective even if I do not take them						

	regularly					
31.	Support Groups help me to share with my fellow clients					
32.	Anti retro viral medicines give me the opportunity to continue living					
33.	Religious constraints like fasting prevents me to Anti retro viral treatment adherence					
34.	Living alone in the house does not prevent me from adhering to Anti retro viral treatment					
	<b>Medication level Factors</b>					
35.	The tablets are not many and easy to take					
36.	The frequent doses do not worry me					
37.	The side-effects of the Anti retro viral treatment do not bother me					
38.	I follow dietary instruction (with or without food)					
39.	Forgetting to take Anti retro viral treatment contributes to my non-adherence					
40.	Alcohol use has been linked to non-adherence					
41.	Reminders aid me in adhering to ART					
	<b>Clinical Level Factors</b>					
42.	The ART clinic is easily accessible					
43.	Transport costs to the ART clinic are affordable					
44.	The waiting time is short					
45.	My appointment dates for drug refills are convenient					

46.	The clinic is adequately staffed					
47.	The drugs are always available at the Anti retro viral therapy clinic					
48.	The physical environment of the clinic appears neat and welcoming					

### SECTION D

<i>You will be asked about factors that are associated with ART adherence in HIV-infected men.</i>						
<b>To what extent do you agree with the following statements? Tick number that apply on each statement: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree</b>						
<b>Question Number</b>	<b>ITEM</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
	<b>Support which HIV-infected men need to adhere to ART</b>					
49.	Support of friends or family help me to adhere to antiretroviral treatment					
50.	Education given to my family members on ART helps them to support me					
51.	My family members remind me to take my tablets regularly					
52.	Stigma by my relatives and community makes me fear to take my ART					
53.	Health workers listen carefully to what I have to say					
54.	Health workers are patient with me					

55.	Health workers answer all my questions					
56.	Health workers responses to my queries attest to their medical knowledge ability					
57.	Health workers use medical terms which I easily understand					
58.	Health workers show respect for my confidentiality					
59.	Am always treated in a friendly and courteous Manner					
60.	Health workers give clear instructions on how medication should be taken					
61.	Health workers treat me with dignity					
62.	Health workers show respect for life					
63.	Health workers are empathetic					

### SECTION E

**Assessing levels of adherence to HIV-infected men utilizing Morisky 8-Item Medication Adherence scale.**

You have indicated that you are taking ART, Individuals have identified several issues regarding their medication taking behaviour and we are interested in your responses. There is no right or wrong answer. Please answer each question based on your personal experience with your medication.

*Please tick the correct answer*

NUMBER	QUESTION	YES	NO
64.	Do you take your ART medication on daily basis?		

65.	People sometimes miss taking their medicines for reasons other than forgetting. Thinking over the past 28 days, were there any days when you did not take your medicine?		
66.	Have you ever cut back or stopped taking your medicine without telling your doctor because you felt worse when you took it?		
67.	Did you take all your medicines yesterday?		
68.	Do you sometimes stop taking your medicine?		
69.	<p>Do you have difficulty remembering to take all your medicine? If yes how often? (Tick the response that suits you best.)</p> <p><input type="checkbox"/> A. Never/rarely  <input type="checkbox"/> B. Once in a while  <input type="checkbox"/> C. Sometimes  <input type="checkbox"/> D. Usually  <input type="checkbox"/> E. All the time</p> <p>When you feel like your symptoms are under control, do you  Sometimes stop taking your medicine?</p>		
70.	When you travel or leave home do you sometimes forget to get with you your medication?		
71.	Do you feel troubled about following your treatment plan		

**THANK YOU VERY MUCH FOR YOUR PARTICIPATION IN THE STUDY**

Appendix 2

Instrument for the study- Chichewa version

CODE ya oyankha\_\_\_\_\_

**Gawo Loyamba**

1. Kodi muli ndi zaka zingati? \_\_\_\_\_

*Chonde zungulizani yankho lomwe likunkhuzana ndi inu.*

2. Kodi maphunziro anu munalekera pati?

1. Pulaimale
2. Folomu 2
3. Folomu 4
4. Dipiloma
5. Digili
6. Zina nenani\_\_\_\_\_

3. Kodi mumapemphera mpingo wanji?

1. CCAP
2. Katolika
3. A Seven
4. Chisilamu
5. Sindipemphera
6. Mipingo ina nenani\_\_\_\_\_

4. Kodi ndinu wa mtundu wanji?

1. Mchewa
2. Mtubuka
3. Mlomwe
4. Muyao
5. M'ngoni
6. Mitundu ina nenani \_\_\_\_\_

5. Kodi muli ndi ana angati? \_\_\_\_\_

6. Kodi mumagwira ntchito yanji?

1. Ulimi
2. Kugulitsa Malonda
3. Kuyendetsa Galimoto
4. Uphunzitsi
5. Zina nenani \_\_\_\_\_

## GAWO LACHIWIRI

<i>Mufunsidwa za zinthu zomwe zimapangitsa a bambo kuti azimwa mankhwala wotalikitsa moyo (ART) Mwakathithi</i>						
<b>Kodi mukugwirizana nawo motani mayankho awa. Chongani yankho lomwe mwagwirizana nalo motere: 1= sindikugwirizana nazo mpang'ono ponse, 2= sindikugwirizana nazo, 3= Ndiripakati-kati, 4= ndikugwirizana nazo, ndipo 5=ndikugwirizana Nazo kwambiri.</b>						
<b>Kudziwa kwanu za matenda a Edzi ndikufunikira komwa mankhwala wotalikitsa moyo (ART) mwakathithi</b>						
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>7.</b>	Matenda a Edzi amachilisika					
<b>8.</b>	Mankhwala a matenda a Edzi amapeleka zobvuta zambiri kwa munthu wodwala matendawa.					
<b>9.</b>	Chiyembeko cha moyo chimachulukira munthu akamalandila mankhwala wotalikitsa moyo (Anti retro viral treatment).					
<b>10.</b>	Kudya chakudya chabwino monga azaumoyo amalangizira ndikofunika					
<b>11.</b>	Kusatira malagizo a zaumoyo pakamwedwe ka mankhwala wotalikitsa moyo (Anti retro viral treatment) moyenera ndikofunika.					
<b>12.</b>	Kugwiritsa nchito mankhwala ozunguza bongo kapena kumwa mowa kumachepetsa mphamvu ya mankhwala wotalikitsa moyo (Anti retro viral Treatment).					
<b>13.</b>	Ndikuyembekeza kuchira ku matenda a edzi m'tsongolo muno.					

14.	Mankhwala ndiye njira yodalilika yotchepetsa matenda a edzi.					
15.	Kufunikira koyang'anira banja langa kumandilimbikitsa kumwa mankhwala otalikitsa moyo (Anti retro viral Treatment).					

### GAWO LACHITATU

<i>Mufunsidwa za zinthu zomwe zimapangitsa a bambo kuti azimwa mankhwala wotalikitsa moyo (ART) Mwakathithi.</i>						
<b>Kodi mukugwirizana nawo motani mayankho awa. Chongani yankho lomwe mwagwirizana nalo motere: 1= sindikugwirizana nazo mpang'ono ponse, 2= sindikugwirizana nazo, 3= Ndiripakati-kati, 4= ndikugwirizana nazo, ndipo 5=ndikugwirizana Nazo kwambiri.</b>						
<b>Zokhuzana ndi wodwala</b>						
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
16.	Ndimachiona chosabvuta kuulula za matenda anga a HIV and AIDS kwa mkazi wanga, anzanga, ndi ophunzira anzanga.					
17.	Ndili ndi chidwi chokhala pa mankhwala popanda bvuto lina lirilonse.					
18.	Chakudya chimapezeka nthawi zonse.					
19.	Ndinabvomeleza za matenda anga					
20.	Ndimasangalala ndi moyo womwe ndikukhala					

<b>21.</b>	Ndimakwanitsa kupanga dongotsolo la kamwedwe ka mankhwala.					
<b>22.</b>	Ndodomeko yakamwedwe ka mankhwala ndiyobvomerezeka kwa ine ndi apa banja langa.					
<b>23.</b>	Ndodomeko ya mankhwala ndiyosabvuta Kutsatira.					
<b>24.</b>	Ine ndimadwala misala					
<b>25.</b>	Kutsatira ndodomeko ya kamwedwe ka mankhwala izandithandiza kukhala ndi nthazi.					
<b>26.</b>	Ndapanga chisankho kutsatira kamwendwe ka mankhwala anga					
<b>27.</b>	Ndikufuna chilimbikitso cha ogwira nchito m'chipatala kuti ndipitirire kumwa mankhwala.					
<b>28.</b>	Ndikamwa mankhwala mwandodomeko, ndimatha kuthananawo mabvuto anga a tsiku ndi tsiku.					
<b>29.</b>	Ndikuzindikira kuti kusatira kamwedwe ka mankhwala wotalikitsa moyo mwa kathithi kungathandize kuti mankhwalawa agwire ntchito bwino.					
<b>30.</b>	Mankhwala wotalikitsa moyo (Anti retro viral Treatment) athakugwira nchito bwino Ngakhale nditsasatire kamwedwe kache bwino.					
<b>31.</b>	Magulu a anthu wodwala Edzi amandithandiza kukambirana ndi adzanga zamatendawa.					
<b>32.</b>	Mankhwala wotalikitsa moyo (Anti retro viral Treatment) amandithandiza kusalikitsa moyo.					
<b>33.</b>	Kutsala chakudya kumandilepheletsa kutsatira					

	ndodomeko ya kamwedwe ka mankhwala otalikitsa moyo (Anti retro viral Treatment).					
34.	Kukhala ndekha panyumba sikumandilepheretsa kumwa mankhwala a ART.					
	<b>Zokhuzana ndi Mankhwala</b>					
35.	Mapiritsi samakhala ambiri komanso osabvuta kumwa.					
36.	Kumwa mankhwala kawiri-kawiri sikumandidandaulitsa					
37.	Mabvuto omwe mankhwalawa amapereka sandidandaulitsa ine.					
38.	Ndimasatira malangizo achakudya omwe ndimapatsigwa					
39.	Kuiwala kumwa mankhwala wotalikitsa moyo kumaonjezera kusatsatira ndondomeko ya kamwedwe ka mankhwalawa.					
40.	Kumwa mowa kumantandizira kusatsatira ndondomeko ya kamwedwe ka mankhwala wotalikitsa moyo (Anti retro viral treatment).					
41.	Zinthu zomwe zimandikumbutsa kuti ndimwe Mankhwala zimandithandiza kuti ndizimwa mankhwalawa mwandodomeko					
	<b>Zokhuzana ndi Kuchipatala</b>					
42.	Kuchipatala ndikosabvuta kufikako					
43	Thirasipoti siyodula ndikamapita kuchipatala					

44.	Timadikira nthawi yochepa kuti tilandire mankhwala.					
45.	Masiku okatengera mankhwala kuchipatala alibe bvuto ndiine.					
46.	Kuchipatala kuli madotolo okwanira.					
47.	Mankhwala amapezeka nthawi zonse kuchipatala.					
48.	Malo akuchipatala ndi aukhondo komanso a ulemu.					

### GAWO LACHINAYI

<i>Mufunsidwa za zinthu zomwe zimapangitsa a bambo kuti azimwa mankhwala wotalikitsa moyo (ART) Mwakathithi.</i>						
<b>Kodi mukugwirizana nawo motani mayankho awa. Chongani yankho lomwe mwagwirizana nalo motere: 1= sindikugwirizana nazo mpang'ono ponse, 2= sindikugwirizana nazo, 3= Ndiripakati-kati, 4= ndikugwirizana nazo, ndipo 5=ndikugwirizana Nazo kwambiri.</b>						
	<b>Thandizo lomwe abambo amafuna kuti azitha kumwa mankhwala a ART mwakathithi</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
49.	Chilimbikitso chomwe abale anga amandipatsa chimandipangitsa kuti ndizimwa mankhwala a ART					
50.	Maphunziro omwe abale anga amaphunzitsidwa za matendawa zimawanthandiza kuti andithandize bwino.					
51.	Abale anga amandikumbutsa kumwa mankhwala					
52.	Kutsalidwa ndi abale ndi anthu ena kumandilepheretsa kumwa mankhwala wotalikitsa moyo.					

53.	Adotolo amavetsela bwino lomwe ndikamalankhula.					
54.	Amadekha nane					
55.	Amayankha manfuso anga onse.					
56.	Wogwira ntchito m'chipatala amaonetsa ukadaulo wao akamayankha manfuso anga					
57.	Amagwiritsa ntchito mawu achipatala omwe amaveka bwino					
58.	Amapeleka ulemu pa chinsisi changa.					
59.	Amandithandiza mwa msangala nthawi zonse.					
60.	Amandipatsa malangizo moyenelera pakamwedwe kamakhwala					
61.	Madokotala amaonetsa umunthu akamandithandiza					
62.	Madokotala amapeleka chilimbikitso cha moyo watsogolo					
63.	Madokotala amavetsetsa bvuto lathu					

### GAWO LACHISANO

**Adapted Morisky Medication Adherence Scale (MMAS-8-Item) in chichewa language.**

**Mwanena kuti mukumwa mankhwala a ART amene munayamba pamene munapezeka ndi HIV. Anthu anapeza zinthu zosiyanasiyana zokhudzana ndi khalidwe lawo la kamwedwe ka mankhwala, ndipo tikufuna kumva kwa inu pa zomwe mwakumana nazo. Palibe yakho lokhoza kapena lolakwa. Chonde yakhani funso lililonse poganizira zomwe inuyo mwakumana nazo pakumwa mankhwalawa.**

*Chonde chongana yakho lokhuzana ndi inu.*

NAMBALA	FUNSO	INDE	AYI
64.	Kodi mumamwa mankhwala a ARV tsiku ndi tsiku?		
65.	Polingirira pa Masiku twete eyiti a m'buyomu, pali Masiku ena omwe simunamwe mankhwala anu?		
66.	Kodi munayamba mwachepesapo, kapena kusiya kumwa mankhwala anu musanauze dokotala wanu?		
67.	Kodi munamwa mankhwala anu dzulo?		
68.	Kodi nthawi zina mumasiya kumwa mankhwala?		
69.	Kodi ndi kangati kamene mumabvutikila kumwa mankhwala anu onse? (Chongani <i>mokhuzana ndi mayankhowo</i> ).  ___sindinaiwalepo  ___Mwakamodzi-ikamodzi  ___Nthawi zina  ___Kawiri-kawiri  ___Nthawi zonse		
70.	Mukakhala ndi ulendo kapena mukachoka pakhomo panu mumatenga mankhwala anu nthawi zonse?		
71.	Kodi mumasautsika ndi ndondomeko yomwela mankhwala?		

**ZIKOMO CHIFUKWA CHOTENGA NAWO GAWO MUKAFUKUFUKU YU.**

## Appendix 3

### Information Sheet and Consent form-English Version

#### **Introduction and Purpose**

My name is Lilian Lijoni Registered Psychiatric Nurse/Midwife currently pursuing a Masters degree in Community Health Nursing at Kamuzu College of Nursing, a constituent college of the University of Malawi. I am conducting a study on factors that are associated with ART adherence among men at Chilomoni Health Centre in Blantyre District as a partial fulfillment of this programme. I wish to ask you to take part in this study. Before doing that, I want to let you know the reason of including you in the study, benefits, expectations of the investigator and possible risks that may be encountered in the course of the study.

You have been chosen to participate in the study because you are one of the men attending ART clinic at Chilomoni Health Centre in Blantyre district. There will be 237 HIV-infected men participating in the study. You will not directly benefit from the study; nevertheless, the results may help in making recommendations about the care of patients who are on ART. If you consent to participate in this study, you will be required to answer a questionnaire which will last for 30 to 45 minutes to complete.

You are free to participate, to refuse, or not to answer any question that you do not want or withdraw at any time during the interview in the study. There will be no punishment or any kind of reprimand should you choose to refuse or not to answer any question. Please note that all information to be collected from you shall be kept safe and will only be accessible by the investigator and her supervisor. Your information will be identified with codes and not by name. Your particulars will not be included in the report for this study and only aggregated data shall be presented. If you have questions, please do not hesitate to contact the following people: Lilian

Lijoni, Kamuzu College of Nursing, Lilongwe campus, Private Bag 1, Lilongwe. You can also reach her through a cell phone number 0888311510/0993729516 or email address: [lilianlijoni56@yahoo.com](mailto:lilianlijoni56@yahoo.com). Mr. G. Chorwe-Sungani (Research supervisor) of Kamuzu College of Nursing can also be contacted in case of failed attempt to reach this investigator. He can be reached through his email address: [genesischorwe@kcn.unima.mw](mailto:genesischorwe@kcn.unima.mw) or mobile phone number: 0999214679. For clearance issues, you can contact COMREC secretariat, College of Medicine, Private Bag 360, Chichiri, and Blantyre 3. Email Address: [Comrec@medcol.mw](mailto:Comrec@medcol.mw)

If you have understood the information above and you have no questions or your questions have been answered to your satisfaction, you can be served with a consent form to give your consent to participate in the study.

**CONSENT FORM STATEMENT**

I have read and understood the information above and my questions have been answered to my satisfaction. I have been assured that any publications or research dissemination will not bear any names. I am aware that I am at liberty to withdraw from the study at any time should I so desire. I hereby give consent by signing this form to participate in the study, and allow the investigator to use data obtained from me. I voluntarily agree to take part in the study.

.....	-----	-----
Participants name	Signature	Date
-----	-----	-----
Name of Interviewer	Signature	Date

**THANK YOU FOR YOUR CONSENT.**

## Appendix 4

### Information Sheet and Consent form-Chichewa Version

#### **Kalata Yofotokoza za Kafukufuku**

##### **Mau Oyamba**

Dzina langa ndine Lilian Lijoni. Ndine m'odzi mwa ophunzira za unamwino wa kumudzi ku sukulu yaukachenjede ya Kamuzu College of Nursing. Ndikuchita kafukufuku wa zomwe zimapangitsa abambo kuti azimwa mankhwala otalikitsa moyo (ART) mwakathithi pano chipatala cha Chilomoni m'boma la Blantyre. Ndikukupemphani kuti mutenge nawo gawo pa kafukufukuyu. Musanatero, ndiyamba kukufotokozerani chifukwa chochitira kafukufukuyu, ubwino wake, zoyembekezera ndiponso zoopya zomwe zingakhalepo nthawi imene tikupanga kafukufukuyu.

##### **Kufunika kwa kafukufukuyi**

Cholinga cha kafukufuku ameneyu ndikufuna kudziwa za zomwe zimapangitsa abambo kuti azimwa mankhwala otalikitsa moyo mwakathithi pano pa chipatala cha Chilomoni m'boma la Blantyre. Inuyo mwasankhidwa kutenga nawo gawo pa kafukufukuyu chifukwa ndinu amodzi mwa abambo omwe mumatenga mankhwala otalikitsa moyo pa chipatala chino cha Chilomoni m'boma la Blantyre. Kafukufuku ameneyu akhala akuchitika kwa abambo 237 omwe ali ndi kachilombo ka HIV komanso amatenga mankhwala otalikitsa moyo pa chipatala chino. Palibe ubwino umene inuyo mukhale mukupeza panthawi ya kafukufukuyi koma zotsatira zake zingathandizire kuti anthu omwe ali ndi kachilombo ka HIV komanso ali pa mankhwala a ART azitha kuthandizidwa bwino. Mukabvomereza kutenga nawo gawo pa kafuku-fukuyu mufunsidwa kuyankha mafunso omwe atenge pafupifupi mphindi makhumi anayi ndi mphabu zisano.

## **Ndondomeko ya Kafukufuku**

Muli omasuka kukana, kapena kusayankha mafunso ena amene mungafunsidwe mukati mwa kafukufukuyi ngakhalenso kusiya kumene ngati mwayamba kale kuyankha ena mwamafunso amene ali mukafukufukuyi. Pakhala palibe chilango chilichonse choperekedwa kwa inuyo mukakana kapena kusiya kutenga nawo gawo.

Dziwani kuti uthenga wonse otengedwa nthawi yakafukufukuyi, usungidwa mwachinsinsi ndiponso pamafunso sipalembedwa dzina lanu koma nambala yokha. Pa nthawi yakafukufukuyi, sipakuyembekezeka zovuta kapena kuvulala kwina kuli konse kotero muli omasuka kuyankha mafunso onse bwino-bwino amene mufunsidwe mosaopa.

Ngati muli ndi mafunso, mukulimbikitsidwa kufunsa kwa Anthu awa: Lilian Lijoni, Kamuzu College of Nursing, Lilongwe campus, Private Bag 1, Lilongwe. Mukhozanso kuyimba foni ya m'manja pa nambala izi: 0888311510/0993729516 ngakhalenso kuzera pa email address iyi: [lilianlijoni56@yahoo.com](mailto:lilianlijoni56@yahoo.com) Mungathenso kulankhulana ndi a Mr. G. Chorwe (oyang'anira za kafukufukuyi) apa Kamuzu College of Nursing kudzera pa email address iyi: [genesischorwe@kcn.unima.mw](mailto:genesischorwe@kcn.unima.mw) kapena pa foni ya m'manja iyi: 0999214679. Muli omasuka kufunsanso ku COMREC secretariat pa keyala iyi: Wapampando wa COMREC, College of Medicine, Private Bag 360, Chichiri, Blantyre 3. Mukhozanso kuwalemba pa email Address iyi: [Comrec@medcol.mw](mailto:Comrec@medcol.mw)

## **Mawu omaliza**

Ngati mwamvetsetsa ndiponso mulibe mafunso kapena nkhwana zina zili zonse zokhuzana ndi kafukufukuyi, mukhoza kulandira nawo kalata imene mungasayinire kusonyeza kumvetsetsa ndiponso kuvomera kutenga nawo gawo.

CONSENT STATEMENT-Chichewa version

Kalata yovomereza Kutengapo Mbali pa Kafukufuku

Ndafotokozeredwa ndiponso ndawerenga momveka bwino za kafukufukuyi ngakhalenso mafunso anga onse ayankhidwa mogwira mtima. Ndatsimikidziridwa kuti zina langa silizapezeka pena paliponse pa kafukufukuyi m'malo mwake pazakhala nambala. Ndikupereka chilolezo change chotenga nawo mbali pa kafukufukuyi modziwa kuti ndili omasuka kukana ngakhalenso kusiya mkati mwa zokambirana mukafukufukuyi. Ndasankha mwaufulu ndi mosaumiridzidwa Kutengapo Mbali mkafukufukuyi.

-----

Dzina la Otenga nawo mbali mkafukufuku	Sayini la otenga nawo gawo	Tsiku
---	----------------------------	-------

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Dzina la ofunsa mafunso	Sayini ya ofunsa mafunso	Tsiku
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**ZIKOMO KWAMBIRI.**

## Appendix 5

### Submission Letter to COMREC

#### SUBMISSION LETTER TO COMREC

University of Malawi,  
Kamuzu College of Nursing,  
Private Bag 1,  
Cell: 0888311510/0993729516  
Email: lilianlijoni56@yahoo.com  
**Lilongwe.**  
20<sup>th</sup> December, 2013.

The Chairman,  
College of Medicine Research and Ethics Committee (COMREC),  
Private bag 360,  
Chichiri,  
**Blantyre 3.**

Dear Sir,

#### **SUBMISSION OF RESEARCH PROPOSAL FOR APPROVAL**

I am a postgraduate student pursuing Master of Science Degree in Community Health Nursing. I hereby submit my research proposal on a study titled **“EXPLORING FACTORS THAT INFLUENCE ANTI-RETROVIRUS THERAPY ADHERENCE AMONG MEN AT CHILOMONI HEALTH CENTRE IN BLANTYRE DISTRICT.**

This is part of partial fulfillment for the requirements of the award of Master’s Degree in Community Health Nursing.

You may contact me for further clarification where necessary on the above address, cell phone numbers or the email address.

Yours Sincerely,



Lilian Mercy Lijoni.

Appendix 6



Appendix 7: Application for permission to conduct a research project at Chilomoni Health  
Centre

Kamuzu College of Nursing

Private Bag 1

Lilongwe.

10<sup>th</sup> December, 2013.

The District Health Officer,  
Blantyre District Health Officer  
Private Bag 66

Blantyre

Dear Sir/Madam

**Application for permission to conduct a research project at your health centre**

I am a second year postgraduate student at Kamuzu College of Nursing pursuing a Master's degree in Community Health Nursing.

In partial fulfillment of this programme, I am required to carry out a research project on any topic of interest within this field of my specialization. The topic of my study is entitled 'Exploring factors that influence anti-retrovirus therapy adherence among men at Chilomoni health centre in Blantyre district'.

I, therefore, write to request for your permission to conduct this study at Chilomoni health centre.

Your favourable consideration shall be greatly appreciated.

Yours faithfully



Lilian Mercy Lijoni

(Principal Investigator)

Appendix 8: Approval to conduct a research project at Chilomoni Health Centre

From : Blantyre District Health Office  
Private Bag 66  
**BLANTYRE**

To : The Officer In-charge  
Chilomoni Health Centres

Copy : Comrec

Date : 10<sup>th</sup> December 2013

**PERMISSION TO CONDUCT A STUDY**

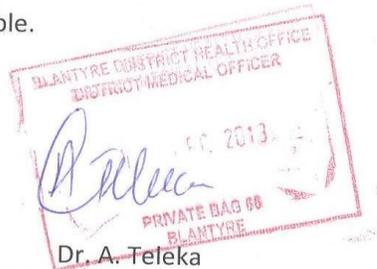
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I write to introduce Lilian Mercy Lijoni. She is a 2<sup>nd</sup> year student studying Master Degree in Community Health Nursing at Kamuzu College of Nursing.

She is conducting a research entitled **“Exploring factors that influence anti-retrovirus therapy among men at Chilomoni Health Centre in Blantyre District.”**

She will be interviewing male patients in the ART clinic. Permission to do this has been granted.

Please assist her where possible.



Dr. A. Teleka

**DISTRICT MEDICAL OFFICER**