Effects of Socioeconomic Factors on Adherence to Antiretroviral Therapy: A Case Study of Kirinyaga County

BY

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UNITED STATES INTERNATIONAL UNIVERSITY AFRICA

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EFFECTS OF SOCIOECONOMIC FACTORS ON ADHERENCE TO ANTIRETROVIRAL THERAPY: A CASE STUDY OF KIRINYAGA COUNTY

BY

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A Research Project Submitted to the Chandaria School of Business in Partial Fulfillment for the Executive Masters of Science in Organizational Development (EMOD)

UNITED STATES INTERNATIONAL UNIVERSITY AFRICA

SPRING 2016
DECLARATION

I declare that this research project is my original work and has not been submitted to any other college or university other than the United States International University of Nairobi for academic credit.

Signed: __________________________          Date: ______________
Gladys Njeri (ID 644368)

This research project has been presented for examination with my approval as the appointed supervisor

Signed: __________________________          Date: ______________
Dr. Paul Wachana

Signed: __________________________          Date: ______________
Dean Chandaria School of Business
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ABSTRACT

The purpose of this study was to investigate the effects of socioeconomic factors on the adherence to antiretroviral therapy. The study was guided by the following research questions: What is the effect of poverty and financial distress on adherence to antiretroviral therapy? What is the effect of transport and infrastructure on adherence to antiretroviral therapy? How does societal perception and support influence adherence to antiretroviral therapy? What is the effect of health centers structures on adherence to antiretroviral therapy?

The population of the study consisted of patients in Kirinyaga County on ART treatment. The sample frame for this study was adopted from Kirinyaga County Director of Health services office. To ensure that every employee had an equal chance of being sampled, a simple random technique was used.

The study utilized a simple random sampling for picking out respondents. Data was collected using structured questionnaires, and analyzed using Statistical Package for Social Sciences (SPSS) software version 21. A total of three hundred and fifty seven (357) questionnaires were dispatched to respondents; two hundred and sixty five (265) were returned back giving the study a response rate of 74.2 %. Descriptive statistics utilized in this study include frequencies, percentages, and mean. For inferential statistics, correlation analysis, regression and multivariate analysis was done to enable easy data interpretation. The presentation of the data was done using Tables, and figures according to each research question.

On the issue of poverty and ART adherence, respondents indicated that lack of finances, ART drugs that are out of reach, and perpetual family financial distress contributed to lack of adherence to ART treatment. Other respondents indicated that lack of employment contributed to the lack of resources to access ART treatment.

On the issue of transport and infrastructure, majority of respondents indicated that lack of transport mechanism enhanced lack of adherence to ART while others indicated that lack of fare to travel to health centers, and poor road infrastructure, had significantly contributed to the lack of adherence to ART treatment.
On the issue of societal perception and support, majority of respondents indicated that even though they do receive family support, they still lacked societal support and acceptance. Others indicated that stigma still exists in the society concerning HIV/AIDS which has contributed to lack of adherence by those who fear being stigmatized.

Finally on the issue of health centers and structural impediments, majority of respondents indicated that poor or lack of resources in the health centers had influence their lack of adherence. Other respondents strongly indicated that lack of skilled staff in health centers in dealing with people living with HIV/AIDS had significantly influenced lack of adherence. Equally, lack of ART in health centers and long waiting lines had significantly influence lack of adherence to ART treatment.

In conclusion, all variables for this study were statistically significant and contributed to lack of adherence to ART treatment by study respondents. The issue of poverty, and family financial distress, lack of transport or even fare to access the health facilities for patience, and stigma that still pervades the society in regards to people living with HIV/AIDS, and finally lack of adequate resources and skilled workers in health centers had significantly influenced lack of adherence to ART treatment in Kirinyaga County.

Recommendations for the future includes the introduction of income generation activities to alleviate poverty among people living with HIV/AIDS, the enforcement of laws that criminalize discrimination based on HIV status, formation of societal HIV/AIDS support groups and providing adequate resources in terms of health centers, ART, and skilled workers will greatly influence adherence to ART treatment.
ACKNOWLEDGEMENTS

I take this opportunity to sincerely appreciate God’s help as I prepared this research proposal. It is only through God’s grace and mercies that I was able to successfully complete this research proposal. I also wish to appreciate and acknowledge Dr. Paul Wachana for his guidance, insight and support which significantly assisted me complete this research proposal successfully.
DEDICATION

I wish to dedicate this research proposal to my family for their endless support and understanding.
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<tr>
<td>AIDS</td>
<td>Acquired Immunodeficiency Syndrome</td>
</tr>
<tr>
<td>ART</td>
<td>Antiretroviral Therapy</td>
</tr>
<tr>
<td>ARV</td>
<td>Antiretroviral</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
</tr>
<tr>
<td>MoH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>SPSS</td>
<td>The Statistical Package for Social Science</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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</table>
CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

The first case of HIV was observed in the United States of America in 1981. Since then millions of persons have died from HIV/AIDS illnesses. However, antiretroviral therapy was developed with the objective of managing the ailments that come with the infection. The first effective antiretroviral therapy drug was developed in the USA in 1987. Since then antiretroviral therapy has continually been developing. Antiretroviral therapy consists of a combination of at least three antiretroviral drugs which are aimed at suppressing the progression of HIV disease. According to Vervoort, Borleffs, Hoepelman and Grypdonck (2007), antiretroviral therapy has significantly reduced the mortality rate for persons living with HIV and AIDS. In addition, ART significantly enhanced the life expectancy of individuals who are infected with HIV/AIDS.

For ART treatment to be effective, an infected person must adhere to entire treatment process. Obirikorang et al (2013) argue that the effectiveness of ART on patients is only achieved if there are maximal levels of ART adherence. Empirical research studies reveal that there are a number of factors that influence patient adherence to ART. Beer and Skarbinski (2014) conducted a research study in the United States of America to determine adherence rate to ART. The findings of this study revealed that there are various factors that either enhance or adversely influence patient adherence to ART. According to Beer and Skarbinski (2014), self-perseverance and social support play a critical role in enhancing patient adherence to ART. However, age, gender, drug use, depression, and patient beliefs can adversely influence patient adherence.

Kikuchi et al (2014) conducted a research study in Rwanda whose core objective was to determine non-adherence to antiretroviral therapy among orphaned children. The findings of their study revealed that psychological differences and distance between caregivers and orphaned children significantly contribute to non-adherence. In addition, economic distress was attributed to be also one of the factors that contribute to non-adherence.
Positive attitude by caregivers will significantly enhance adherence to ART by orphaned children (Kikuchi et al., 2014).

Elisabetta, Daniela, Francesco, Danilo and Carlo (2000) argue that the socioeconomic status of a patient will influence his/her adherence to antiretroviral therapy. This suggests that there are some socioeconomic factors that influence adherence to ART. Patient adherence to antiretroviral therapy (ART) is of utmost importance in the management of Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS) (Obirikorang et al., 2013). However, empirical literature reveals that there are various factors which may adversely influence patient adherence to ART. This study seeks to examine how the following socioeconomic factors influence adherence to ART: poverty, infrastructure, social support, and health centre impediments.

1.2 Statement of the Problem

There are various socioeconomic factors which influence patients’ adherence to antiretroviral therapy. Talam, Gatongi, Rotich, Kimaiyo (2009) conducted a research study in Moi Teaching and Referral Hospital whose findings revealed that that there was low adherence to antiretroviral therapy. In addition, the study findings revealed that adherence to time of taking medication is low. However, there are no adequate studies to guide the government in drawing informed guidelines for strict adherence to ART (AMREF, 2007). Also, studies showing the technical constraints faced by Health workers in handling the ARV users are scanty and no similar studies have been conducted in Kirinyaga County.

Furthermore, approximately 500 adults and 90 children died of AIDS-related conditions in 2011 in Kirinyaga County. Antiretroviral drugs can substantially reduce AIDS-related deaths. If used properly, antiretroviral therapy (ART) can also lower a person’s viral load and prevent onward transmission of HIV. Incidences of non-adherence to ART in the target study area could be high. Studies show that poor households without adequate food and basic sanitation also lack access to preventive and responsive healthcare. It is further necessary to carry out this study because there exists a gap in literature concerning patient adherence to ART treatment in Kirinyaga County. Conducting this study therefore filled this gap in literature.
Also, given that most of the Kirinyaga County dwellers are generally resource-poor, HIV/AIDS patients in the County face many constraints. Studies to seek solutions for the envisaged constraints in the County are also, scanty. This study thus, seeks to generate data on the socioeconomic constraints faced by HIV/AIDS patients in rural areas in adhering to ARV therapy, examine the technical competence and policy constraints faced by Health workers in administering ARV therapy to patients in the Counties as well as identify possible solutions to the challenges and constraints faced by ARV users and health workers in the advocacy of ARV programme in Kirinyaga County.

1.3 Purpose of the Study

The purpose of this study was to investigate the effects of socioeconomic factors on the adherence to antiretroviral therapy. The study used Kirinyaga County as its case study.

1.4 Research Questions

1.4.1 What is the effect of poverty and financial distress on adherence to antiretroviral therapy?
1.4.2 What is the effect of transport and infrastructure on adherence to antiretroviral therapy?
1.4.3 How does societal perception and support influence adherence to antiretroviral therapy?
1.4.4 What is the effect of health centers structures on adherence to antiretroviral therapy?

1.5 Significance of the Study

1.5.1 ART Programs Stakeholders:

The findings from this study will be of significance to all the stakeholders who carry out, fund and support antiretroviral therapy programs in Kenya. This is attributed to the fact that the study will identify socioeconomic challenges that hamper patient adherence to antiretroviral therapy and thus hinder the success of ART programs. In addition, ART stakeholders stand to benefit from this study since this study will identify
measures that can be implemented in order to enhance patient adherence to antiretroviral therapy.

1.5.2. Scholars and Researchers
Scholars and researchers also stand to benefit from this study. This is because the findings from this study can be used as a source of secondary literature for future research studies. In addition, the methodology used in this study can be used by future researchers to carry out a similar study.

1.6 Scope of the Study
Kirinyaga County was used as a case study for this research process. Kirinyaga County is one of the 47 Kenyan counties. The study sourced its data from all the antiretroviral therapy programs that are carried out in Kirinyaga County. The data collection process was carried out between the months of March and May 2015.

1.7 Definition of Terms

1.7.1 Adherence
Adherence refers to an individual’s steady devotion or commitment towards something (Biswas, 2008). In this case, it refers to a patient’s steady devotion to Antiretroviral Therapy (ART): ART constitutes a combination of at least three ARV drugs to suppress HIV virus thus resulting in stopping the progression of the HIV disease (WHO, 2014). Adherence is measured in terms of patient pill balance.

1.7.2 Human Immunodeficiency Virus (HIV)
HIV refers to lentivirus which causes Acquired Immunodeficiency Syndrome (AIDS) (Foster, Levine & Williamson, 2005).

1.7.3 Patient Pill Balance
Patient pill balance refers to when patients come for refill of the drugs they are given just to last up to the next appointment date for refill and check-up. Any balance in the next pill visit is an indication that the patient did not adhere to treatment (Masci, 2011).
1.8 Chapter Summary

This chapter highlights the significance of ART programs to persons living with HIV/AIDS. It further highlights the significance of adherence to ART programs. From the empirical literature studied, it is evident that there are various socio-economic factors that adversely influence patient adherence to ART programs. For this reason, this study sought to identify the socioeconomic factors that contribute to non-adherence to ART within Kirinyaga County. This chapter is divided into the following subsections: background of the study, statement of the problem, purpose of the study, research questions, significance of the study, scope of the study, and the definition of terms.
CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter reviews empirical and theoretical literature on the effects of socioeconomic factors on the adherence to antiretroviral therapy. This chapter is divided into the following subsections: adherence to antiretroviral therapy, socioeconomic challenges that influence adherence to antiretroviral therapy, measures of enhancing adherence to antiretroviral therapy, theoretical review, and the conceptual framework.

2.1.1 Conceptual Framework

According to Creswell (2002), a conceptual framework is made up of the following variables: independent, and dependent variables. The independent variables are the variables which a study seeks to examine in order to determine their impact on a particular subject matter. In this case, the independent variable for the study was socioeconomic factors while the dependent variable was adherence to antiretroviral therapy.

<table>
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<tr>
<th>Independent Variables</th>
<th>Dependent Variable</th>
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<td>Adherence to Antiretroviral Therapy</td>
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<tr>
<td>• Poverty and Financial distress</td>
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<td>• Transport and infrastructure</td>
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<td>• Societal Perception and support</td>
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<tr>
<td>• Health centers structural impediments</td>
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Figure 2.1: Conceptual Framework
2.2 Adherence to Antiretroviral Therapy

Vervoort et al (2007) posit that since the introduction of antiretroviral therapy, the mortality rate for HIV and Aids cases has significantly dropped. In addition, it has enhanced the life expectancy of individuals who have HIV. However, Vervoort et al (2007) argue that poor adherence during ART treatment is a key impediment that is likely to reduce the gains achieved through the ART program. Empirical evidence suggests that there are various factors that contribute to patients not adhering to ART treatment. The lack of patient adherence to ART results in the weakening of the patient’s immune system, and increased destruction of CD4 cells (Vervoort et al., 2007).

Obirikorang et al (2013) conducted a research study whose overall aim was to determine the factors which influence the adherence of patients to antiretroviral therapy. The study was descriptive in research design and was carried out in Ghana. The study sampled 201 individuals who were receiving antiretroviral treatment. According to Obirikorang et al (2013), the effectiveness of ART on patients is only achieved if there are maximal levels of ART adherence. It is for this reason that it was necessary to carry out a study that sought to determine the factors that may hamper ART adherence.

2.3 Socioeconomic Challenges that influence Adherence to Antiretroviral Therapy

Elisabetta et al., (2000) conducted a research study whose findings revealed that the socioeconomic status of a patient will influence his/her adherence to antiretroviral therapy. Peltzer and Pengpid (2013) conducted a qualitative research study whose core objective was to determine the socioeconomic factors that influence antiretroviral therapy. The qualitative study sourced its data from 252 articles which had examined adherence to ART treatment in low and middle income countries. According to Peltzer and Pengpid (2013), the following are the socioeconomic factors which influence patient adherence to antiretroviral therapy: (1) education level; (2) income; (3) occupation status. This section of the study explores empirical literature on the following socioeconomic factors that may influence antiretroviral therapy adherence: poverty and financial distress, level of education, transport and infrastructure, societal perception and support, and health centers structural impediments.
The patterns of infection have been shown to vary globally depending on the social and economic conditions of the country affected, with poverty having a significant role as a social determinant of HIV/AIDS and the spread of the virus as well as access and adherence to ART treatment (Skovdal et al., 2011). Common reasons reported for missed doses include financial trouble (Landman et al., 2007) that prevent caregivers of children or adult patients from collecting medication on time (Skovdal et al., 2011), distance barrier or lack of transportation facilities to the ART clinic (Ljubicic et al., 2006) vomiting of medication without redosing, incorrect dosing by a caregiver, missed clinic appointments and pharmacy collections, confusion between multiple caregivers, and self-discontinuation or refusal by children (Bangsberg et al., 2003).

Furthermore, patients’ beliefs that medications need to be taken with food leads them to avoid taking medications whenever food is unavailable, interfering with adherence (Landman et al., 2007). Sometimes patients are forced to choose between paying for transportation to the ART facility and using the money for food (Ljubicic et al., 2006). Studies in Uganda and Tanzania reported that transportation costs are considered serious obstacles to taking ART (Busza et al., 2006). This has implications not only for day-to-day adherence but also losses to follow up (Skovdal et al., 2011).

Determinants of ART adherence for HIV-infected persons in sub-Saharan Africa were examined with ethnographic research methods at HIV treatment sites in Jos, Nigeria, Dar es Salaam, Tanzania, and Mbarara, Uganda. The findings indicate that individuals taking ART routinely overcome economic obstacles to ART adherence through a number of deliberate strategies aimed at prioritizing adherence: borrowing and “begging” transport funds, making “impossible choices” to allocate resources in favor of treatment, and “doing without” (Kaaya et al., 2009).

2.3.1 Patient- and Family-Related Challenges

With regard to children, if the mother (or other caregiver) is infected, then she is struggling with her own illness, psychosocial factors, medication regimens, and most often financial burden due to expenses incurred on her own therapy, child’s therapy, and associated cost of medical treatment (Mellins et al., 2004). All of these produce negative influences on adherence. Empirical evidence increasingly suggest that user fees in some centers for antiretroviral therapy (ART) and HIV/AIDS care decrease adherence (Byakika-Tusiime, 2005). These factors on top of the caregivers’ and patients’
experience, knowledge and beliefs on ART (Oyugi et al., 2006), reduce the caregiver’s ability to provide proper care to the child, thereby affecting the necessary adherence over time (Mellins et al., 2004).

Furthermore, factors such as age (especially infancy and adolescence have a negative effect) (Byakika-Tusiime, 2005), refusal of treatment, knowledge of HIV status, clinical stage, and depressive symptoms, male gender, and changes in health status (improvement as well as deterioration) have also been identified as important factors which affect adherence to HAART (highly active antiretroviral treatment) in pediatric patients (Kaaya et al., 2009). Denial and fear of HIV status, misinformation, and misconceptions about HIV (for instance beliefs that ART cures HIV (Oyugi et al., 2006), low availability, accessibility, and acceptance of therapy are some of the obstacles among HIV-infected adolescents.

It is known that mothers tend to hide HIV infection status from their children and disclosure is often delayed until adolescence (Kaaya et al., 2009). Kaaya and colleagues show that only 7.9% children had been made aware of their own HIV infection status in their study in South Africa. Disclosure of HIV infection status is a critical step and has obvious implications for adherence. Starting the disclosure process as early as 8–9 years of age and combining it with specific support, as suggested may result in increased adherence in children. There are similar reports that indicate lack of disclosure as predictors of poor adherence in adults (Byakika-Tusiime, 2005). Self-perceived family support and/or the family’s and the household’s knowledge of the patient’s HIV infection status are considered important predictors of adherence (Kaaya et al., 2009).

2.3.2 Stigma- and Discrimination-Related Challenges
Stigma, on top of the general knowledge of the population about HIV/AIDS and ART treatment, is an important determinant of adherence in the settings of sub-Saharan countries according to studies conducted recently (Simoni et al., 2007). Social or family stigmatization and fear of the consequences of revealing HIV infection status to sexual partners are closely related to poor (Mellins et al., 2004). Family plays a crucial role in any kind of treatment in children (Byakika-Tusiime, 2005), or adults (Oyugi et al., 2006). Major issues related to family or caregiver that influence adherence include presence of anxiety; depression (Mellins et al., 2004); active substance abuse (Mellins et al., 2004); the presence of HIV infection in another family member; fear of disclosure of HIV
positivity to the family; family disruptions; belonging to racial minorities or other vulnerable groups of the population.

Family and community members can both play a positive and negative roles in ART treatment initiation and adherence (Ljubicic et al., 2006). For instance, the stigma associated with HIV infection or AIDS may be more severe than that of other illnesses, creating barriers to treatment initiation and support for adherence that might otherwise be available (Skovdal et al., 2011). On the positive side, family members and friends can play the role of treatment partners and provide much needed support (Ljubicic et al., 2006).

Patients need to be encouraged by health care workers to disclose their status. However, studies of interventions to facilitate disclosure are lacking. Social institutions like the church, nongovernmental organizations (NGOs), and food aid services play a crucial role in issues ranging from creating awareness about the illness, mobilizing support, facilitating treatment, and promoting adherence (Kikuchi et al., 2014). For instance, in an evaluation program about the impact of family nutritional support during the first year of antiretroviral treatment in the west Africa region, family nutritional support for persons living with HIV initiating antiretroviral treatment showed a positive impact after six months (Simoni et al., 2007).

There are different ways in which people living with HIV experience stigma that influences how they access ARVs. For instance, Bunn et al., (2007) argues that social stigma is one of the most pervasive forms of discrimination that PLHIV face. This includes excludes being excluded from family and community events, which in most cases, results in their loss of power, credibility and respect in the community. Further, physical stigma can also include isolation from common areas of sleeping, eating, and areas of worship. On the other hand, do also experience verbal stigma in form of insults, blame, taunts, rumors and gossip that usually affects PLHIV psychologically, and at times rendering them striped of dignity to carry on their lives. While institutional stigma includes may be in the form of job loss due to HIV status, being evicted from housing, loss of career or educational opportunities and even receiving substandard health care (Kaaya et al., 2009).
Thus, in a society, stigma tends to be most ardent and debilitating form of discrimination, since social exclusion people not only suffers psychological anguish, but mental and physical anguish too (Mellins et al., 2004). According to Kaaya et al., (2009), HIV stigma undermines prevention and treatment as people with HIV usually avoid taking treating while those without HIV often avoid being associated or related to those living with HIV resulting in devastating effects on HIV prevention, care and treatment. Equally, stigma has been reported to reduce the likelihood of PLHIV using condoms and accessing preventive services for fear that their status will be known. (Campbell, et al., 2005).

A study conducted in China among migrants found that holding those holding stigmatizing beliefs concerning HIV, were more likely to engage multiple sexual partners, and had enhanced chances of contracting or transmitting sexually transmitted infection. Equally the study found that migrates with stigmatizing beliefs were also less likely to use condoms, or take ARVs (Deng et al., 2007). According to Campbell, et al., (2005), HIV stigma can deter individuals from accessing testing services or even disclosing their status. For instance, in a study Botswana, a survey of HIV patients on antiretroviral therapy found that 40% of the patients deliberately delayed getting tested for HIV due to stigma they perceived was associated with them being seen at the testing centers (Wolfe et al., 2006).

2.3.3 Substance- Abuse-Related Challenges

Drug abuse and alcohol consumption are factors that further threaten proper adherences to ART. Studies have consistently shown that active alcohol use and substance abuse makes it more difficult for patients to adhere to treatment (Masci, 2011). For instance, in Botswana nearly 40 percent of the patients surveyed admitted missing a dose because of alcohol consumption (Simoni et al., 2007). Similar studies also indicate that alcohol is highly related to reduce adherence (Ljubicic et al., 2006). A systematic review in 2009 found that HIV/AIDS patients that used alcohol are 50–60% more likely to adhere less to their prescribed medications (Masci, 2011).
2.4 Influence of Poverty and Financial Distress on ART Adherence.

According to Peltzer and Pengpid (2013), poverty is usually associated with associated with weak endowments of financial resources, due to poor education, low levels of literacy and low to no income earnings. In such instances, people group in poverty category usually also lack marketable skills to seek employment, and are heavily dependent on manual or casual labor for survival. Equally, Masci (2011) notes that people within the poverty bracket are usually associated with poor health status since, either the poor can’t afford regular health check-ups, or usually lack information on the same.

Wolfe et al., (2006) argues that poverty has direct correlation with access to PLHIV accessing ARTs, since households typically have few if any financial resources to use in accessing centres where ART treatment is done. As such, households under poverty find it difficult to adopt practises and behavior that reduce the risk of spreading or reducing HIV or any other sexual related infections (Masci, 2011). Equally, IEC materials and activities hardly reach the poor, and when they do the materials or information are irrelevant to the poor living with HIV since most of the time the IEC materials are in a language they can’t understand (Nachega, Mills & Schechter, 2007).

Ljubicic et al., (2006) argues that fundamental to the condition of poverty for the poor is social and political exclusion. In most cases, HIV programmes are usually neglectful of the interests of the poor. The poor are in most cases not represented in policy making, and hence, don’t have their issues well-articulated. Masci, (2011) on the other hand notes that the absence of effective HIV programmes targeting the poor, and aimed at developing sustainable livelihoods which would not only limit the possibilities of enhancing the socio-economic conditions of the poor, but also enhance their adherence to ARTs. Unless the reality, and conditions of PLHIV particularly the poor are drastically changed, they will continue with behaviors that will keep exposing them HIV infection which will also have far reaching consequences on themselves and their families (Mellins et al., 2004).

Masci, (2011) governmental and non-governmental intervention programs are supposed to be aimed at the poor. In most cases as reported by Nachega, Mills and Schechter (2007), the poor don’t usually care about adherence to HIV, if they are hungry, and don’t have food to feed their children, and do other life affairs that make life’s living tenable.
Therefore, it has been naïve for HIV stakeholders and programmers in Sub Saharan Africa to ignore the most affected populations of the poor, thinking that the poor will go to them for assistance. The very fact that the poor work on menial jobs, moving from place to place hinders effective adherence to programmes by government and NGOs that requires PLHIV to go to them (Berhe, Tegabu & Alemayehu, 2013).

Financial status is attributed as one of the factors that have a significant influence on patient adherence to ART treatment (Peltzer & Pengpid, 2013). The financial status of an individual is significantly pegged on the individual’s income earning levels. Peltzer and Pengpid (2013) argue that individuals who may not have adequate revenue streams may have a challenge in adhering to ART treatment because the treatment is costly. This implies that if the government and various nongovernmental agencies do not assist those living in poverty access ART treatment, most of them will not afford it.

Berhe, Tegabu and Alemayehu (2013) carried out a research study in Northern Ethiopia whose core objective was to determine how patients’ adherence to antiretroviral therapy was influenced by nutritional factors. According to the study, ART assists in the reduction of CD4 cell destruction, the reduction viral replication, and promotes the reconstruction of the immune system. This implies that ART is an effective technique of slowing the progression of the disease and it is imperative for all those with HIV to enroll and adhere to antiretroviral therapy. According to Berhe, Tegabu and Alemayehu (2013), lack of proper nutrition during ART treatment contributes to ART non-adherence. This presents a real challenge to the developing countries whose majority populations live below the poverty line and may lack access to enough quality food. This implies that the poor may have challenges adhering to ART treatment because they may lack access to enough and quality food.

According to Peltzer and Pengpid, (2013), poverty is likely to affect adherence to care, as financial resources may need to be directed elsewhere, funds for travel to a medical clinic that provides ART may not be available, and child-care may not be readily accessible for parents who attend clinic appointments. The combined stresses associated with poverty, such as inadequate housing, community violence, unemployment and forced migration, may obviate an acknowledgement of the importance of regular clinic visits, and what may be perceived as rigid treatment regimens.
In a qualitative study conducted among ART users in Uganda, Tanzania and Botswana, participants reported that they were unable to afford food needed to satisfy their increased appetites following commencement of treatment, especially in the early stages of treatment when their bodies needed extra nutrition to regain lost weight and strength (Hardon et al. 2007). Food insecurity may affect the regularity of ART doses, as some patients have reported taking their medication only when they have food available (Hardon et al. 2007).

In the context of high unemployment in many low income countries, many patients lacking regular employment make themselves available as day laborers to employers willing to pay them a wage. Often, the need for a day’s wages eclipses the potential benefit of a clinic visit (Kagee et al. 2007). The disincentive to seek clinic contact is exacerbated if patients are asymptomatic and have to wait for many hours to interact with a health provider in order to receive a supply of medication. Moreover, frequent absences from work create conditions under which employers may terminate employment if they do not know the reason for such absences. The threat of losing employment for this reason, therefore, often impedes clinic attendance.

In South Africa, AIDS sickness is coupled with eligibility for disability grants, and patients are entitled to a state-funded monthly income because of their illness-related incapacity to work. However, widespread unemployment has meant that disability grants are an important and at times the only source of income, even if patients are well enough to work. When disability grants are tied to AIDS-related indicators, such as CD4 counts or viral load, non-adherence may become an attractive option for patients who fear losing their grant if their CD4 count were to increase (Nattrass 2006).

Positive social and family support have been shown to be associated with good medication adherence (e.g. Holstad et al. 2006). However, difficult living circumstances in low income countries, contributed to by residence in informal settlements, the absence of basic amenities, high rates of migration, overcrowded living conditions, family violence and substance abuse, often create conditions under which the quality of social support to patients is poor. Also, the desire for privacy due to HIV stigma can be a barrier to accessing social support from within a patient’s social network. There exists a
pervasive stereotype that persons living in poverty are unable to take their medications in the way they are required to.

For example, in 2001 Andrew Natsios, former administrator at the United States Agency for International Development (USAID), remarked that he did not believe that providing ART for African patients would be practical as ‘Africans don't know what western time is’ (Africa Action, 2006). His remarks drew considerable criticism and protest, including accusations that they were fuelled by racism against Africans. Existing data refute Natsios’ concerns as there is consistent evidence that patients in various African countries have been successfully retained on ART programmes and that their viral loads have been effectively suppressed (Coetzee et al., 2004). In a series of studies in several resource poor countries such as Rwanda (Demeester et al., 2005), Haiti (Koenig, Leandre, & Farmer, 2004), and Uganda (Weidle et al., 2006), it was demonstrated that high levels of adherence could be achieved.

Similarly, in a study in Cape Town, no association was found between socioeconomic status and ART adherence (Orrel, Bangsberg, Badri, & Wood, 2003). In a meta-analysis of ART adherence in which 31 studies from North America and 27 studies from sub-Saharan Africa were incorporated, it was demonstrated that high levels of adherence could be indeed achieved in African settings but that it remained a concern among patients in North America (Mills et al., 2006). It is evident therefore that the stereotype of African patients living under conditions of poverty as being unable to adhere to ART is false. Yet, despite encouraging data from a series of studies indicating that high levels of adherence is possible, the scale up of treatment to all South Africans living with AIDS presents specific challenges to ensure optimal treatment outcomes.

For example, it has been documented that when disability grants are tied to AIDS-related indicators such as CD4 counts or viral load, non-adherence may become an attractive option for patients who fear losing their grant. As the disability grant for AIDS patients is an important source of income in communities where unemployment is high, a high viral load and low CD4 count may be seen as desirable as these represent access to a grant and therefore a viable alternative to complete destitution (Nattrass, 2005). The question of such financial incentives for non-adherence requires some consideration, particularly in terms of understanding the decision-making process of patients who choose to forgo ART
in favor of retaining their grant and developing strategies to assist them in making decisions that support optimal health outcomes.

2.5 Influence of Education Levels on ART Adherence.

Nsimba, Irunde and Comoro (2010) carried out a study in Tanzania whose overall aim was to determine the factors which influence ART adherence. A total of 207 antiretroviral users participated in the study. The findings from the research process identified the following as the factors which influence antiretroviral therapy adherence: (1) the lack of proper infrastructure; (2) drug related side effects; (3) lack of counseling; (4) the level of education; (5) lack of food; (6) long queues at the ART centers; (7) inadequate knowledge about AIDS. From the study findings, it is evident that the level of education of an individual plays a role in adherence to antiretroviral therapy. Similar findings are presented in a study that was carried out by Peltzer and Pengpid (2013).

Mills et al (2006) conducted a research study in both North America and Sub-Saharan Africa whose core objective was to determine the adherence to antiretroviral therapy. The study was secondary in nature and sourced its data from various peer reviewed journals. The findings of the study revealed that the two regions had an almost similar adherence rate when it came to antiretroviral treatment. The findings further revealed that education is one of the factors that significantly influenced adherence to ART. When a regression analysis was run between education and adherence to ARVs, the study by Mills et al (2006) revealed the existence of a relationship, $r (0.643) \leq 0.05$. This meant that the more education PLHIV had, the more they adhered to ARVs. However, in another study conducted by Kunutsor et al., (2011) in Tanzania on relationship between level of education and adherence to ARTs showed no statistically significant relationship between the levels of education of participants and adherence to antiretroviral therapy $r (0.452), P \geq 0.725$. This findings were in agreement with studies conducted by Mills et al., (2006) and Holstad et al., (2006) which also reported no significant relationship between level of education and adherence to ARVs existed. However, another study that was conducted by Peltzer and Pengpid (2013) revealed that there exists a significant relationship between levels of education and adherence to ART medication $r (0.551) \leq 0.05$.

In a systematic review of studies in low- and middle-income countries, higher education was associated with adherence (Obirikorang et al., 2013) but some studies reported
negative association between education and adherence (Nsimba, Irunde & Comoro, 2010). Psychological state could be a reason behind such findings. In another study among HIV test seekers, anxiety was shown to be associated with higher education (Kunutsor et al., 2011) and this could explain negative association of higher education with ART adherence. Such patients may tend to self-medicate. Mental health was a reported barrier to adherence among Chinese patients (Nsimba, Irunde & Comoro, 2010). Anxiety and mental health should be assessed among patients who might not be accessing correct information leading to non-compliance/ non-adherence.

Nsimba et al., (2010) posits that in as much as some studies had indicate low or no levels of association between education and ART adherence, education still plays a major role in enhancing ART treatment. For instance, they argue that patients need education to be able to boost their literacy levels so as to understand medication prescription, and also to be able to communicate effectively with ART providers. Kunutsor et al., (2011) notes that in rural Sub Saharan Africa, and South East Asia, programs on ART education have not only being facilitated by ART providers, but also programs that enhance general education literacy. This programs have been structured to help enhance utilization of EIC materials, training forums, and workshops on HIV/AIDS.

In other cases, Deng et al., (2007) argues that enhancing education among PLHIV not only enhances adherence, but also lowers levels of stigma. When the whole society is educated, they know better how to treat PLHIV, while at the same time, those with HIV no longer feel threatened by prospects of hopeless live, but feel empowered to live a long health lives. To this, education decreases the level on ignorance concerning HIV/AIDS and ARTs (Mills et al., (2006). In normal routines of handing out ARVs, teaching is conducted before they get the medicines, as a way of enhancing adherence. Campbell, et al., (2005), argues that providing patients with education on ART outcome and proper usage seems to increase adherence. A study conducted by Nsimba et al., (2010) in Tanzania indicated 95% of all ART adherences was due to the fact that health centers had enhance their training and teaching of PLHIV the importance of adhering to the medications that they are given. In cases where PLHIV were not taught, the adherence rate fell done from 95% to 68%. The drop indicated the significance and place of continuous education. Campbell, et al., (2005) suggests that it is not only important for PLHIV to be when are taught the importance of using taking medicine at the right time,
but it is also important for care givers to be taught the same. In cases where care givers were knowledgeable enough, ART adherence rate goes up as indicated by Nsimba et al., (2010) study.

In a study conducted in Zambia by Murray et al., (2009) among urban women, found that lack of adequate information and education regarding HIV and ART medication was associated with 42% of non-adherence to ART. Further, the study highlighted that the absence of education and information about HIV and ART, had led to situations where, the moment patients felt better, or felt like they are not sick, they discontinued the use of ART, thinking that they had been completely of HIV. Lack of education and information was attributed to lack of resources in the ministry of health in Zambia, and in cases where information was available, channels of distribution were not adequate enough to inspire behavior change. Equally, health workers in the study had indicated that they were so overwhelmed to take sufficient time on each patient educating them on HIV or ARTs.

In a similar study conducted in South African Nachega, Lehman, Hlatswayo, Mothopeng, Chaisson and Karstaedt (2005) indicated that the level of knowledge scores among PLHIV attending clinical care, was found to be 86%. Their knowledge was viewed and evaluates in terms of cause of HIV, mode of transmission, ART medication and their health progression. Most (72%) of the respondents in this study had indicated that they had gained knowledge and education through counseling sessions at health facilities, and also through IEC materials. Equally, this knowledge included importance in controlling the infection, importance of good diet, and importance ARTs.

In a study conducted in Rio de Janeiro, Brazil, by Filho et al., (2008) indicated that PLHIV who had access who had access to education on how to ARVs, had 82% adherence levels compared to patients who didn’t. Further, the study suggested that education interventions do help to improve patient and health care provider interactions, which in turn helps to better patience adherence rate. Education therefore is essential in ensuring that patient get enough information to be able to make informed decisions concerning their health and medication. In cases where there is lack of education, patients were found to make decisions out of conjecture and ignorance. To this end, Deng et al., (2007) argues that education levels among patients has a statistically significant relationship with levels of adherence; $r (0.642); P \leq 0.05$. 

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2.5.1 Medication-Related Challenges

Education plays a great role in ensuring that patients are able to read subscribed medicine and take doses recommended (Peltzer & Pengpid, 2013). Characteristics of the commercially available drug formulations such as taste, palatability, size of pills, availability of liquid formulations, and adverse effects (e.g., metabolic complications, lipodystrophy) can significantly affect adherence (Nsima, Irunde & Comoro, 2010). If patients are not able to understand taste, palatability, size of pills, availability of liquid formulations, and adverse effects on their health, then adherence gets affected. Furthermore, the complicated regimen (Berhe, Tegabu and Alemayehu, 2013) to be followed, such as the need for daily administration, dietary restriction, drug interactions, frequency of dosing, dosage, and therefore pill burden or amount of liquid, also influence child’s adherence to therapy (Peltzer & Pengpid, 2013). The above-mentioned medication-related factors are crucial in determining children’s adherence to ART.

Nsima, Irunde and Comoro, (2010), reported that factors associated with non-adherence included lack of education and ignorance. According to a report by Peltzer and Pengpid, (2013), the main reasons mentioned by patients for non-adherence were taste (16%) and child refusal (16%) for ritonavir, and taste (9%) and interference of medication schedule with lifestyle (10%) for nelfinavir (Nsima, et al., 2010). Side effects are also usually associated with irregular medication intake or stopping medication altogether, which are all factors associated with lack of adequate education.

Peltzer and Pengpid, (2013) argues that ARV have side effects that patients need sufficient education about. These side effects include dizziness, peripheral and severe neuropathy and intolerable discomforts. A different study by De Padua et al., (2007) in Brazil indicated that 52.6% of patients on ARTs had reactions during the initial periods of being introduced to ARTs. For most patients, the most notable side effects were gastrointestinal effects. As a result, patients who initially went through this symptoms felt no need to continue on medication, thinking they had been given the wrong medication or they were lied too concerning the medication. Patients’ perceptions of having negative reactions could easily contribute to non-adherence of ART, which could lead to discontinuation of ART usage (Nattrass, 2005).
2.6 Influence of Transport and Infrastructure on ART Adherence.

Mills et al (2006) argue that accessibility to health centers which offer antiretroviral therapy are a major challenge in developing countries particularly countries in Sub-Saharan Africa. This in turn adversely affects the rate of adherence to ART. Mills et al (2006) postulates that Sub-Saharan governments needs to improve their infrastructure if they want to increase the rates of ART adherence within rural areas.

Kunutsor et al. (2011) carried out a research which sought to determine the factors which influence ART adherence. The findings from the research process revealed that one of the factors which influence ART treatment is transport and infrastructure. Similar sentiments are echoed through a study that was carried out by Chesney in 2000. Chesney (2000) carried out a research which sought to determine the factors which influence patient ART adherence. The findings revealed that among the factors that adversely influence patient adherence to ART in developing countries was poor infrastructure. According to Chesney (2000), transport inaccessibility and poor infrastructure significantly influences patient adherence to ART.

Low and middle income countries are characterized by several deficits in environmental infrastructure, notably inadequate transport. As most patients who attend public health clinics do not have private transport they rely chiefly on public means, which are in many cases expensive and unsafe, and in some areas unavailable (Kagee et al. 2007). The limited incomes characteristic of patients in low income countries may in some cases preclude even using public transport. Thus, if clinics are located far from residential townships, patients often have to walk, which may require considerable effort, particularly if they feel unwell.

2.6.1 Health-Care- and Systems-Related Challenges

Structural factors not directly related to patient or medications can also influence adherence. Some researchers have even contended that these could be the most important barriers to ART adherence in resource limited settings (Nachega, Mills & Schechter, 2007). Limited availability and accessibility of antiretroviral medications and healthcare facilities for diagnosis and treatment of HIV/AIDs, out-of-pocket payments, high cost of ART and other health services, presence of healthcare providers experienced in ART
provision, patient-nurse and other provider relationships, health care providers’ beliefs, waiting time and opening hours (Peltzer & Pengpid, 2013), availability of counseling services, and social, economic, or psychological support for people living in both developing as well as developed countries can influence adherence positively or negatively (Ljubicic et al., 2006). Ensuring the privacy of ART clinics and waiting areas need to be given special emphasis as authors of this paper and others documented (Peltzer & Pengpid, 2013). For instance, Skovdal and colleagues reported about patients who refused to leave consultation rooms citing to nurses Mr. so and so is outside (Nachega, Mills & Schechter (2007).

Adherence support and clinic policies are also important predictors of adherence (Obirikorang et al., 2013) as well as lack of adherence monitoring mechanisms ((Ljubicic et al., 2006). Therefore mechanisms involving the transport system must be in place to encourage PLHIV to access ARTs. Failure to develop enhanced transport relieve mechanisms leads to a drop in people accessing ARTs in rural areas. A recent study from South Africa indicates that improving transportation and making it effective for people living with HIV enhances ART adoptions (Kaaya et al., 2009). Therefore it is essential for government to consider enhancing and developing good transport networks particularly in the rural areas to be able to reach and infiltrated local communities that might otherwise forfeit going for ART due to related transport costs.

Social institutions like the church, and nongovernmental organizations (NGOs) should play a crucial role on creating awareness concerning transport challenges facing PLHIV. Equally, Simoni et al., (2007) argues that NGOs should help facilitate PLHIV with necessary transport as part of psychosocial support, and thus enhance treatment, and ART adherence. In most cases, when the poor have a choice between fending their families with food, or using family resources to access ARTs, they always choose the former, and consequentially risk ill health due to none adherence (Kikuchi et al., 2014). According to Campbell, et al., (2005), transport costs can deter individuals from accessing testing services or even disclosing their status. In Botswana, a survey of HIV patients on antiretroviral therapy found that 28% of the patients deliberately delayed getting tested for HIV due to transport related challenges (Wolfe et al., 2006). Therefore the
Significance of transport facilitation for PLHIV cannot be overstated, if governments have the hope of curtailing HIV menace through enhanced adherence (Masci, 2011).

Wolfe et al., (2006) argues that poverty has direct correlation with access to PLHIV accessing ARTs, since households typically have few if any financial resources to use in accessing centres where ART treatment is done. As such, households under poverty find it difficult to adopt practises and behavior that reduce the risk of spreading or reducing HIV or any other sexual related infections (Masci, 2011). Equally, IEC materials and activities hardly reach the poor, and when they do the materials or information are irrelevant to the poor living with HIV since most of the time the IEC materials are in a language they can’t understand (Nachega, Mills & Schechter, 2007).

Ljubicic et al., (2006) argues that fundamental to the condition of poverty for the poor is social and political exclusion. In most cases, HIV programmes are usually neglectful of the interests of the poor. The poor are in most cases not represented in policy making, and hence, don’t have their issues well-articulated. Masci, (2011) on the other hand notes that the absence of effective HIV programmes targeting the poor, and aimed at developing sustainable livelihoods which would not only limit the possibilities of enhancing the socio-economic conditions of the poor, but also enhance their adherence to ARTs. Unless the reality, and conditions of PLHIV particularly the poor are drastically changed, they will continue with behaviors that will keep exposing them HIV infection which will also have far reaching consequences on themselves and their families (Mellins et al., 2004).

The patterns of infection have been shown to vary globally depending on the social and economic conditions such as availability of roads, and health care facilities that are easily accessible (Skovdal et al., 2011). Access to health care facilities should be among the rights citizens of a given state are accorded. However, due to poor planning, and misplaced priorities, most Sub Saharan Africa countries continue to lag behind in provision of basic health care facilities to PLHIV. As a result, most health care facilities that are government funded are usually without medicine, putting PLHIV at a great health risk (Landman et al., 2007).

In a study conducted in Sierra Leone by Skovdal et al., (2011), 54% of rural government health facilities did not have adequate ART supplies, making PLHIV to make several
trips to the health centers in search of medication. Due to the fact that life has a myriad other competing interest, most of the patients either give up, or post pone having the ART till a later date when they are doing running their errands, work, or family related caress. Inadequacies not only in lack of adequate medication, but also inadequate health centers have been found to contribute significantly to non-adherence (Landman et al., 2007)

In other cases, it was reported that some countries like DRC, lack trained health personnel, and as such, end up using untrained stuff in handling and disseminating ARTs (Skovdal et al., 2011). ARTs have to be given in the right amount, right combinations, and dosage for them to be effective. Lack of such compliance puts PLHIV at a health risk, and thus enhances default. In DRC, patience highlighted some of the reasons for missing their dosages as lack of time, lack of money, lack of health facilities and lack of ARTs ((Ljubicic et al., 2006). It is therefore incumbent upon governments to ensure that necessary mechanisms are put in place particularly in the rural areas to establish and develop more health facilities and also to offer more consistent health care advice for PLHIV/AIDS.

Obirikorang et al (2013) argues that it is the government responsibility to ensure that health care facilities are available to all as a fundamental human right. Thus, policy frameworks should be developed to enhance access to health care by all. Further, they argue that when HIV patients can’t access health centers of ARTs, they are not only a health risk to themselves, but also to people they are living with, i.e. caretakers, and sexual partners. Nattrass (2006) argues that other Sub Saharan countries should emulate the policy model adopted by South Africa, where, patients who have HIV are eligible to state-funded monthly income to facilitate not only their health activities, but also economic activities and become viable members of the community. Obirikorang et al., (2013) study in Nigeria found that there exist a significant relationship between availability of health care facilities and patient’s adherence to ARTs.

2.7 Influence of Societal Perception and Support on ART Adherence.

Obirikorang et al (2013) argue that family support and self-perceived wellness are some of socioeconomic factors that influence ART adherence. Bouhnik, Chesney, Carieri, Gallais, Moreau, Moatti, Obadia and Spire (1999) conducted a research study whose overall objective was non adherence among individuals living with HIV. The study
identified a number of factors which influenced patient adherence to ART one being social support.

According to Bouhnik et al (1999), patients who had social support were more likely to adhere to ART treatment when compared to individuals who did not have social support. Claude, Brackis-Cott, Dolezal and Abrams (2004) argue that in order to enhance adherence to ART by children who are infected by HIV, family support is utmost critical. The findings from this study reveal societal support and perception are critical components when it comes to adherence to ART.

2.7.1 Culture and Behavioral factors

Societal cultures and behaviors have been attributed for adherence or lack of adherence to ART treatment (Abrams, 2004). In most African, and alcohol and substance abuse (Claude, Brackis-Cott, Dolezal & Abrams, 2004), have also contributed to lack of adherence. Major barriers to ART adherence in India are economic factors (Nachega, Mills & Schechter, 2007). For instance, not having money for travel to ART center, hunger and waiting time were identified as barriers to ARV adherence similar to African setting (Claude, Brackis-Cott, Dolezal & Abrams, 2004). Lack of money and livelihood issues result in food insecurity. Growing body of literature (Claude, Brackis-Cott, Dolezal & Abrams, 2004), provides evidence that livelihood is an all-encompassing socio-behavioral barrier that can reduce adherence to ART and increase gastrointestinal diseases due to lack of much needed food to go along with ART (Nsimba, Irunde & Comoro, 2010).

Patients need to be encouraged by health care workers to disclose their status. In most cases, patients normally adopt behaviors as espoused within their communities. However, studies of interventions to facilitate disclosure or behavior change are lacking. Civil society organizations (CSOs), should play a crucial role in advocacy to educate and inform communities on issues ranging from creating awareness about the illness, mobilizing support, facilitating treatment, and promoting adherence (Kikuchi et al., 2014). Some of the behavioral change programs should target married couples, adolescence, young adults, schools and even the elderly in the community. Opinion shapers who influence community cultures should also be targeted in advocacy initiatives.
geared at reducing ART adherence and culture conflict. For instance, in an evaluation program about the impact of family nutritional support during the first year of antiretroviral treatment and how a family can live functional fulfilling lives should be enhanced, and advocated for by community leaders (Simoni et al., 2007).

There are different ways in which cultures understand and conceptualize issues around HIV/AIDS. Most cultures resort to discrimination and stigmatization of PLHIV, while others consider them an outcasts, particularly in Sub Saharan African communities (Bunn et al., 2007). For instance, community leaders can effectively use social stigma as one of the ways to chastise a community member who has HIV out of ignorance, or just by following antiquated community norms, and practices. Other forms of culture may include members being shames publicly, being excluded from family and community events, which in most cases, results in their loss of power, credibility and respect in the community (Simoni et al., 2007).

Further, cultural behaviors can cause physical stigma and trauma to those living with HIV, by excluding or isolating them from common areas of sleeping, eating, and areas of worship, which in turn can affect their self-esteem, motivation and resilience or ability to continue adhering to ARTs (Nsima et al., 2010). Equally, some communities may require that PLHIV conduct public sacrifices and rituals as a way of cleansing or being forgiven. This demeaning practices are at times accompanied by verbal insults, blame, taunts, rumors and gossip that affects PLHIV psychologically, and thus, their ability to be seen in public visiting ARTs (Kaaya et al., 2009).

Thus, in a society cultural behavior can also form social stigma debilitating not only PLHIV, but also to their family members (Mellins et al., 2004). This means that a lot of education still need to reach communities that still hold discrimination tendencies towards HIV/AIDS. According to Kikuchi et al., (2014), cultural behavior can undermine prevention and treatment as people with HIV usually avoid taking treating while those without HIV often avoid being associated or related to those living with HIV. As such, this results in devastating effects on HIV prevention, care and treatment. It is the duty of government agencies, the church, the civil society, and other community based organizations to educate the public human rights, social freedoms, and liberties (Campbell, et al., 2005).
In Nepal for instance, people perceive HIV/AIDS as a very bad person’s disease, and as a result of bad karma; meaning people with HIV are being repaid for their bad acts they did in their past (Beine, 2002). Nepalese culture believes that every bad deed doesn’t go unpunished. Good works in the past gets rewarded well in the present life. Equally, Nepalese believe that there is a strong connection between worry and disease (Mellins et al., 2004). Therefore, HIV/AIDS related disease is considered and perceived as a punishment wrongs or for someone worrying himself or herself into the disease (Beine, 2002).

In 2002, when Nepal was experiencing high levels of HIV infections from high-risk behavior of sex-workers, to low risk behavior population like housewives, the society considered it a form of retribution from the gods, who were not happy with the society (Hofstede et al., 2005). Besides personal preference beliefs and choices, there are also many held cultural practices that significantly contribute in the spread of HIV/AIDS. For instance, it is believed that if someone who is HIV positive can just have sex with 108 virgins, he will be cured (Beine, 2002). Such practices makes it difficult to enhance ART adherence when those with HIV know they have an option out. Other such cultural beliefs range from cleaning the penis with urine from a virgin, using Dettol soap or even Coke could cure AIDS and STD (Hofstede et al., 2005).

In India on the other hand, the Nag puja cultural festival is believed to cure HIV; while anal sex is believed to cause HIV among the communities living in Bombay (Pokhrel, Regmi & Piedade, 2008). Equally, there is a contest between having faith in higher powers, and allowing them to guide your decision making in dealing with HIV, or follow treatment, which at times is considered a sign of weakness, and as a result, some patients choose to have faith in a higher power that adhere to ART treatment (Hofstede et al., 2005). Therefore, there is need to sensitive the communities on the importance of seeking and adhering to ART in as much as they continue having faith in the God.

In other cultures like Burma, discussions about sex and sexuality or sexuality are forbidden, while in France, UK, and USA, discussions about sex, sexually, HIV are very open and candid. For instance, Nepali people are bound by the culture of silence around sexual matters (Mellins et al., 2004). In other cultures, values such as shyness are highly respected among women, and therefore prevents them from openly talking about sex and sexuality. Even in family member’s round tables, people do not like hearing or discussing
subjects such as sex, HIV, or any such related subjects (Campbell, et al., 2005). The major problems of families not engaging in conversations about sex is that the young once grow up not knowing the exact truth about HIV or sex, and thus are gullible to customs and beliefs that can mislead them to avoid ART, particularly for those who have HIV, or avoid using protection for those who don’t have HIV, exposing themselves to risk of contracting the disease (Peltzer & Pengpid, 2013)

In African cultures, the spread of HIV was associated with prostitution, wife inheritance, or promiscuity, and thus, most African communities held the belief that HIV/AIDS was a punishment for moral faults like promiscuity or deviant sexual behaviors (Pokhrel, Regmi & Piedade, 2008). Just like in Nepal, most African communities considered HIV infections or related disease as a punishment for bad behavior. It was widely held belief that sex workers and drugs users are sinners and disgraceful, and therefore deserve to be punished for their moral deviance with disease such as HIV (Beine, 2002).

Peltzer and Pengpid (2013) argue that people living with HIV in Asian and African communities are often stigmatized or discriminated upon, and hence, and thus the stigma becomes an obstacle for people with HIV to undertake ARTs. Further, it is the fear of stigmatization, being looked down upon, and discrimination that prevents PLHIV from accessing testing services, thus, become vulnerable to HIV/AIDS infection (Pokhrel, Regmi & Piedade, 2008). Equally, the self-stigma, self-esteem, and hostility in PLHIV/AIDS inhibits them from engaging in discussions about their status, or even disclosing their HIV status to their sexual partners, or even seeking and seeking medical assistance. The more this people remain in the shadows, the more the default adherence to ART, and the more they are at risk of infecting others (Beine, 2002). Therefore, more sensitization one effects of cultural beliefs towards HIV infection should be enhanced as a matter of enhancing knowledge, awareness, and corrective measures that will enhance ART adherence (Kaaya et al., 2009).

2.8 Influence of Health Centres Structural Impediments on ART Adherence.

Nsimba, Irunde and Comoro (2010) argue that structural impediments or inadequacies in health centers offering ART treatment contribute to patient in-adherence. In particular, lack of skilled personnel in ART, lack of enough personnel, lack of laboratory and diagnostics equipment, and the lack of physical infrastructure to facilitate confidential
consultations are some of the structural impediments that contribute to the lack of patient adherence when it comes to antiretroviral therapy.

Kunutsor et al. (2011) carried out a study in Uganda which sought to determine the measures which clinics can implement in order to enhance antiretroviral therapy adherence. The study utilized a sample of 174 persons living with HIV and who attend ART within various clinics in Uganda. The findings from the research process revealed that facilities within Ugandan health clinics significantly influences patient adherence ART. Kunutsor et al. (2011) recommend that health structures should be resourceful in terms of facilities to ensure that patients seeking ART treatment are served effectively.

2.8.1 Access to Health Care Centre’s

Structural factors not directly related to patient or medications can also influence adherence. For instance, limited availability and accessibility of antiretroviral medications and healthcare facilities for diagnosis and treatment of HIV/AIDS is among the leading causes of non-adherence (Kunutsor et al., 2011). Similarly, out-of-pocket payments, high cost of ART and other health services also influence non-adherence. The presence of healthcare providers experienced in ART provision, patient-nurse and other provider relationships, also influence non-adherence (Claude, Brackis-Cott, Dolezal & Abrams, 2004). In some countries, particularly in Africa and Asia, health care providers’ beliefs, waiting time and opening hours (Peltzer & Pengpid, 2013), influence the attitude of patience, and their subsequent adherence. According to Kunutsor et al., (2011), availability of counseling services, and social, economic, or psychological support for people living in both developing as well as developed countries (Ljubicic et al., 2006) can influence adherence positively or negatively.

Ensuring the privacy of ART clinics and waiting areas need to be given special emphasis as authors of this paper and others documented (Peltzer & Pengpid, 2013). For instance, Skovdal and colleagues reported about patients who refused to leave consultation rooms citing to nurses Mr. so and so is outside (Nachega, Mills & Schechter, 2007). Adherence support and clinic policies are also important predictors of adherence (Obirikorang et al., 2013) as well as lack of adherence monitoring mechanisms ((Ljubicic et al., 2006). A recent study from South Africa indicates that improving adherence is cost effective and helps to reduce health care costs especially those of hospital care (Chesney, 2000).
According to Nachega et al., (2007) when clinic and health centers are placed far off from communities, patients are forced to travel long distances for their ART. This makes it difficult to keep a consistent schedule, assuming that every patient needs to make a couple or visits to a clinic every so often. Most clinics also either have prohibitive costs or have long distances, long queues, thus prohibitive to PLHIV. Obirikorang et al., (2013) argues that the structural nature of health clinics presupposes that every person living with HIV will have access, but in reality, this is not usually the case. Governments should start thinking about mobile clinics and investing in mobile health centers as a way of enhancing ART adherence particularly in communities that have fewer clinics, and poor infrastructure that can necessitate easy access.

The feasibility of mobile clinics is a tenable option is governments and development partners can invest their time, and resources to actualize this plan. However, Obirikorang et al., (2013) notes that is as much as this is a noble idea, much consideration should be put in how patience confidentiality will be maintained in the face of having mobile clinics in neighborhoods where everyone knows everyone. If this is not done, them, patience adherence to ART will not be solved, as patience will shy away from exposing their status to members of their communities (Kunutsor et al., 2011).

However, Nachega et al., (2007) argues that if mobile clinics were to form part of health centers offering a wide range of services, including treatment of other diseases, this may help to reduce the stigma associated that is usually associated ART utilization. Thus, transport problems associated with access to ART will have been solved (Kunutsor et al., 2011). To this end and in a galvanized effort to destigmatize HIV, it will be reasonable to recommend and advocate for other patients living with diabetes, hypertension and even asthma to have easy access to treatment (Pokhrel, Regmi & Piedade, 2008).

Peltzer and Pengpid (2013) note that one of the structural challenges that has plagued the administration of ARTs has been integration issues on how parents and children and treated. Thus, integrating care and treatment for women and their children together can circumvent the logistical problems associated with scheduling separate visits for mothers and their children. There are some scholars who are of the view that integration of HIV services with general care might go a long way in enhancing adherence to ART, however, other scholars are opposed to this idea, based on the fact that patient confidentiality will be breached. (Wolfe et al., 2006; Masci, 2011).
A study conducted by Bardeguez et al. (2008) indicated that there existed a significantly higher adherence for women who had initiated ARTs during their pregnancy period compared to women who were initiated post-partum. However, there are no other studies that collaborates this findings. Masci (2011) on the other hand suggested that improving networking between health workers and women and referral mechanisms had shown an increase in number of ART adherence. Similarly, Friedland et al. (2007) study in Malawi and South Africa had indicated that collaboration and integration between clinical services for patients and those with tuberculosis and HIV led to increase in ART adherence. Equally, the data that was collected from the study in Durban, South Africa, indicated that directly observed treatment processes of tuberculosis were noted as good entry point for monitoring of ART adherence. Thus, the study suggested that more concerted efforts should be made towards enhancing health services integration particularly those services that are geared towards PLHIV/AIDS.

According to Peltzer and Pengpid (2013), there is need to develop and establish minor adjustments in the way in which clinics offering ARTs are organized. This may include dispensing ART medications at two or three monthly intervals, to prevent the case of patients having to travel on specific date or risk missing out of ARTs. An example set by this model is demonstrated in Haiti through a study done by Mukherjee et al. (2006) indicated that integrating HIV testing into other primary care health services, rather than waiting for HIV patients to present themselves at VCT, increases HIV cases of testing, treatment, and ARTs. In such cases, for those who were dragonized with HIV, received treatment at no cost, and were educated on the processes of ART adherence, which in the long run proved to be an effective way of soliciting and enhancing ART compliance.

Another way of enhancing ART adherence is by having testing centers and health clinics adjust clinic hours for working patients, while at the same time, providing transport reimbursement as a way of reducing default among the poor communities (Kunutsor et al., 2011). Equally, adopting the use of technology can eliminate the structural challenges associated with health care services. For instance, currently, even the very poor countries do have some spread of mobile cellular telephone technologies. Medication systems reminders can be programmed such that patients receive reminders a week in advance, and subsequent reminders on a daily basis (Bardeguez et al., 2008). In countries that are a
bit advances can use paging system to locate patients and send reminders on ART adherence.

Friedland et al. (2007) argues that HIV prevention and treatment work force, can also be adopted as a way resource mobilization, and also development and dissemination of innovative tools and frameworks that can be adopted and used widely by a broad range of issues by healthcare providers. For instance, multimedia technology and social media can be used as a way of educating and informing members of the public concerning HIV/AIDS awareness, IEC materials can be sent on social media, and also advertisement can also be incorporated in media that has wide usage among different countries populations (Kunutsor et al., 2011). Furthermore, IEC materials that have information concerning HIV care and adherence, infection control, consistency of delivery and intervention content can also be enhanced (Peltzer & Pengpid, 2013).

2.9 Measures of enhancing Adherence to Antiretroviral Therapy

Measurement of ART adherence is often problematic as patients may overestimate their adherence due to recall bias, the demand characteristics of the patient–provider consultation, and the desire to avoid criticism (Gao & Nau, 2000). The most common methods used to measure adherence are pill counts, pharmacy refill records, drug level monitoring, and various self-report instruments (Gill, Hamer, Simon, Thea, & Sabin, 2005). Several studies have shown a mismatch between self-reported adherence and biomedical markers (Omes et al., 2004). In a sample of South Africans only 57% of patients who reported 100% adherence achieved an undetectable viral load, that is <50 copies/ml (Brown, Macintyre, & Trujillo, 2003). Assuming a high negative correlation between reported adherence and viral load, this mismatch suggests that these patients were unable to accurately report adherence levels.

Three types of factors have been identified as barriers to optimal ART adherence, namely, regimen characteristics, patient characteristics, and the relationship between the provider and patient (World Health Organization, 2003). Regimen characteristics include dosage, the requirement of ingestion with specific foods, toxicity, and side effects. This article is concerned primarily with the social and psychological factors relating to patients’ adherence. As the question of providing ART to AIDS patients has been highly politicized in Africa, it is possible that calling attention to the caveats associated with
ART adherence may add to this controversy. However, the purpose of this article is to place on the agenda the question of adherence so as to call attention to the need for research in this area with a view to optimizing health outcomes (Gill, Hamer, Simon, Thea, & Sabin, 2005).

Obirikorang et al., (2013) posits that counseling sessions for patients undergoing ART treatment would significantly enhance ART adherence. In addition, family members of patients need to support the treatment process. Nsimba, Irunde and Comoro (2010) propose that healthcare centers offering antiretroviral therapy should ensure that they have adequate physical infrastructure in order to meet this cause. In addition, they should ensure they have enough qualified and skilled employees. This will ensure that the patients are well taken care of and not discouraged from visiting the healthcare center.

Reynold et al. (2004) carried out a research study whose overall objective was to determine the factors which influence adherence to ART. The study noted that ART treatment was of great significance to persons living with HIV. However, there were a number of factors which adversely influence patient adherence to ART. According to Reynold et al. (2004), the following measures should be implemented to enhance patient adherence to ART: (1) increased social support; (2) individual counseling; (3) education and training.

Simoni, Amico, Pearson and Malow (2008) carried out a research study which sought to determine the strategies which can be implemented to promote patient adherence to ART. Simoni et al. (2008) argue that increased social support and social awareness can be a significant strategy that can be used to promote patient ART adherence. In addition, increased levels of literacy through education can be a viable strategy of increasing patient adherence to ART.

Continuous monitoring of both adherence and correlating it with clinical outcomes will create an interactive feedback mechanism that could lead to optimal clinical states and improved quality of life for patients. There are needs for further research and development in the area of ART adherence, adherence support, and patient behavior.

Diagnosing and treating health problems such as depression, reducing substance abuse, improving patient and provider relationship, counseling and enhancing family, and
community support mechanisms are shown to improve adherence, as well as intervening on modifiable barriers to adherence before starting ART (Reynold et al., 2004). A meta-analysis by Amico and colleagues indicated that adherence interventions may be efficacious when targeted at individuals who are identified or anticipated to have poor adherence (Amico, Pearson and Malow, 2008).

The few investigations of interventions indicate that electronic reminders, pill organizers, medication-event monitoring systems (MEMS) to record dosing behavior, use of internet, educations services, use of phones (Amico, Pearson and Malow, 2008), and so forth can also enhance adherence. However, most of these technologies have not had thorough scientific evaluation and their efficacy and cost effectiveness may not be as high as expectations (Reynold et al., 2004). Cell phone message reminders and web-based interventions require patient resources and literacy which could create obstacles to their applicability in sub-Saharan Africa. A recent systematic review published by the Cochrane Database of Systematic Reviews reached similar conclusions. It cited diverse methodological problems and issues of study quality, among others as problems underlying the scant evidence on adherence improvement interventions and called for standardized and methodologically rigorous trials of interventions to improve and measure adherence to antiretroviral treatment (Amico, Pearson and Malow, 2008).

According to Amico et al., (2008), a high level of adherence to ART is considered as a key parameter in measuring long term management of HIV. However, they acknowledge that there is no clear guidance, or adopted single measure on how to estimate ART adherence among PLHIV. Studies by Nsimba, et al., (2010) and Reynold et al. (2004) indicates that studies done by various researches in 36 countries had evaluated the link between pharmacy-based measures of adherence and clinical outcomes of same. This studies were heterogeneous to best determine ART adherence among divers groups. The findings predicted virologic and nonvirologic HIV outcomes. Meaning, mortality among PLHIV increased at adherence levels below 70%, and reduced at adherence levels above 80%.

According to Amico et al., (2008), the pill counts measuring method is viewed as most intensive method for measuring ART adherence that doesn’t seem create or offer any concrete advantage over other methods. In this method, a measure is done based on the
number of days a patient possessed ARTs, in relation to the days ART were prescribed. When this approach is used, then, measurement becomes feasible. On self-reporting, Nsimba, et al., (2010) argues that patients sometime lie about the number of pills they have used, and the number that is pending, making the method less reliable.

Studies conducted by Nsimba, et al., (2010) and Reynold et al. (2004) indicated that clinicians favored the use of pharmacy-based measures, compared to self-reporting methods. The reasoning behind this preference was that under self-reporting, a pharmacist collects data by asking patients whether how many pills they had, how many they have used, and if they missed any doses of pills per any given day. Thus, information collected can only provide useful indicators if patients’ records were collected more consistently, and if the patients were truthful every time the questions were posed to them.

In most cases, clinicians and pharmacists do ask patience about their adherence, but not for purposes of recording the answers. Also, the most problematic issues concerning adherence id that the period ranging between their adherence might be erroneous, since most patience know they will be asked the question, so they take they pills a day or few days before visiting (Simoni et al., 2008). Gill et al., (2005) notes that adherence under self-reporting can also be measured by looking at the percentage of patients with full adherence to ART; the percentage of ARV doses HIV patients took during the recall period; and the percentage of patients who have maintained more than 95% adherence to ARVs.

Hofstede et al., (2005) notes that in dispensing based adherence measures, the pharmacy dispensing records are used to measure longer term adherence for patterns, by counting the number of medication that has been dispensed to a patience over a period of time. Typically, indicators from dispensing method are used to determine long-term adherences and use, long term achievement of ART targets, and finally the rate of discontinuing ARVs. In most cases, data is collected from databases that capture clients ART usage information, from pharmacies, clinics, insurance agencies among others (Kaaya et al., 2009). Kunutsor et al. (2011) argues that the dispensing-based adherence to ART measures are computed and defines by the average percentage based on number of days a patients received ARVs particularly for utilization within a specified period of time, such as 6 months (180 days).
Beine (2002) notes that patient attendance-based defaulting measures can also be used to measure ART adherence. In patience attendance, a single missed appointment at the health Centre can be used to trigger action to reach out to the patient, and mitigate the risk of having the patient go into default. Equally, Kunutsor et al. (2011) notes that if a patient misses’ medicine within three days of attendance may also trigger an appointment alert. If the health center fails to get in touch with the patient within 30 days following missed appointment, the patient is declared to be in default. Indicators that are related to patient defaulting measures could be classified by analyzing the percentage of patients who didn’t appear for appointments; percentage of patients who did miss their original appointment, and patients came back within 3 days of the missed appointment, and finally the percentage of patients who missed appointments and did not show up to the clinic within 30 days following the missed appointment (Campbell, et al., 2005).

2.10 Chapter Summary

This chapter has examined literature and empirical studies on factors influencing adherence to ART treatment. Social-economic factors have been examined, education factors, poverty influences, infrastructure, health facilities and measurement of ART adherence. The next chapter deals with research methodology for the study.
CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

The research methodology chapter identifies the steps which the researcher followed during the data collection and data analysis process (Kothari, 2008). This chapter is divided into the following subsections: research design, population, sample size and sampling technique, data collection methods, research procedures, data analysis, and the chapter summary.

3.2 Research Design

There are various forms of research designs; however this study employed a descriptive form of research design. Mugenda and Mugenda (2003) define descriptive research design as one which is used to determine the characteristics of a particular element or factor. The researcher furthermore used qualitative and quantitative research approaches.

3.3 Population and Sampling Design

3.3.1 Population

Welman and Kruger (2001) define a population as the total number of elements which a research study seeks to determine or draw inferences from. The population for this study was all the adults who are living with HIV/AIDS in Kirinyaga County. The target population for the study was the adults living with HIV/AIDS within Kirinyaga County and who attend ART treatment in the County. According to statistics provided by the Ministry of Health in Kirinyaga County, there were approximately 5,000 persons who attend ART treatment within Kirinyaga County.

3.3.2 Sampling Design

Sampling is the process of selecting a number of individuals for a study in such a way that the individual selected represents the large group from which they are selected from Mugenda et al., (2003). Sampling procedure may be defined as a systematic process of individuals for a study to represent the larger group from which they are selected (Cooper and Schindler, 2008). They all define sample as method of selecting a portion of the
population for conducting a study in order to represent the population adequately since it is impossible to take the entire population because of time, financial factors and errors which can discourage the researcher and lead him to surrender the study. This study utilized purposive sampling as respondents are targeted based on managerial roles.

3.3.2.1 Sampling Frame

Lewis, Saunders and Thornhill (2003), defines a sampling frame is the list of that constitutes the population that enables a researcher can make a selection. The sampling frame was obtained from Kirinyaga County Director of Health office.

3.3.2.2 Sample size.

According to Welman and Kruger (2001), a sample is a sub-set or proportion of the entire population. A sample should be scientifically selected from the population in order to ascertain its credibility and validity. If it is left to a researcher’s discretion to select a sample, biasness can creep in. The study had a population of 5,000 individuals who seek ART within Kirinyaga County. Based on the Krejcie and Morgan (1970) sample size estimation table, a study with a population of 5,000 individuals can have a sample size 357. This implies that the study had a sample of 357 respondents.

3.3.2.3 Sampling Technique.

Kothari (2008) argues that there are two forms of sampling techniques: probabilistic and non-probabilistic sampling technique. The following are some the probabilistic sampling techniques: stratified random sampling, systematic sampling, simple random sampling, and cluster sampling (Mugenda & Mugenda, 2003). Examples of non-probabilistic sampling technique include: snow balling sampling, convenience sampling, and quota sampling. This study employed stratified random sampling. Stratified random sampling is whereby the target population is subdivided into homogenous strataums and samples selected randomly from each (Mugenda & Mugenda, 2003). The target population in this case was stratified according to the Sub-Counties in Kirinyaga County: Kirinyaga Central, Kirinyaga East, Kirinyaga West, Mwea East, and Mwea West. The Table 3.1 below presents the sampling frame for the study.

Table 3.1: Sampling Frame
Kirinyaga County Sub-Counties | Target Population | Sample |
--- | --- | --- |
Kirinyaga East | 900 | 65 |
Kirinyaga West | 600 | 42 |
Kirinyaga Central | 1,155 | 82 |
Mwea East | 1,900 | 136 |
Mwea West | 445 | 32 |
Total | 5,000 | 357 |

### 3.4 Data Collection Methods

According to Mugenda and Mugenda (2003), there are two data collection techniques: primary and secondary. Francis (1998) argues that primary data is data and information is used for the original purpose it was collected for. Instruments utilized for collecting primary data collection include questionnaires and interviews. Secondary data is data which is used for other purposes other than that for which it was originally collected for (Francis, 1998). This study sourced for primary data. The researcher utilized a semi-structured questionnaires and interviews as the instruments for data collection.

### 3.5 Research Procedures

Research procedures describe the methodology which the researcher will use when collecting data from respondents (Kothari, 2008). The researcher distributed questionnaires to the respondents with the help of two research assistants. The researcher oriented the two research assistants before sending them to the field. By so doing, the two were in a position of handling any challenges that arose during the data collection process.

### 3.6 Data Analysis Methods

Data analysis refers to the technique a researcher will employ to draw inference from the data collected from the respondents (Mugenda & Mugenda, 2003). For this study, qualitative and quantitative data analysis techniques were utilized to analyze the data collected from the respondents. Qualitatively, the responses from the respondents were arranged according to the research questions. In addition, content analysis was carried out. Quantitatively, data collected was coded and entered into the Statistical Package for
Social Science (SPSS) for statistical analysis. Descriptive and inferential statistics was used to draw inference from the data collected. The following statistical measures were used: percentages, cumulative frequencies, Pearson correlation coefficient, and regression.

3.7 Chapter Summary

This chapter highlights the steps in which the researcher undertook when collecting the data. This chapter assisted the researcher remain focused and not disoriented throughout the data collection process. The researcher furthermore upheld research ethics during the data collection process.
CHAPTER FOUR

4.0 RESULTS AND FINDINGS

4.1 Introduction

This chapter presents the findings collected from the respondents. It further analyses and discusses the responses collected from the respondents. This chapter is divided into the following subsections: response rate, background information of the respondents, challenges and socioeconomic factors influencing ART adherence, measures of addressing socioeconomic factors that influence ART adherence, and summary of findings.

4.1.1 Response Rate

The Table 4.1 below presents the response rate of the respondents to the data collection instrument utilized by the study.

Table 4.1: Response Rate

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Response</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responded</td>
<td>265</td>
<td>74.2</td>
</tr>
<tr>
<td>Did not respond</td>
<td>92</td>
<td>25.8</td>
</tr>
<tr>
<td>Total</td>
<td>357</td>
<td>100</td>
</tr>
</tbody>
</table>

According to Table 4.1, 265(74.2%) of the respondents answered and returned the study’s data collection instrument – questionnaire. However, 92(25.8%) of the respondents did not respond to the questionnaire. According to Babbie (1989), a response rate of more than 50% is considered adequate for data analysis and reporting. This implies that the study had an adequate response rate for data analysis.

4.2 Background Information of the Respondents

4.2.1 Gender of Respondents

Figure 4.1 below presents the gender representation of the respondents. From the findings presented in Figure 4.1, 59% of the respondents were of the female gender. However, 41% of the respondents were of the male gender. This suggests that there are more females than male who attend ART in Kirinyaga County.
4.2.2 Age group of respondents

Figure 4.2 below presents the responses of respondents with reference to the age group of the respondents.

From the findings presented above, 28% of the respondents were aged over 40 years. In addition, the findings revealed that 42% and 30% of the respondents were aged between 18-29 years and 30-39 years respectively. This suggests that the most affected group with reference to HIV/AIDS are between the ages of 18 and 30 years.
4.2.3 Employment Status

Figure 4.3 below presents the responses of respondents with respect to their employment status.

According to the findings presented, 67% of the respondents had been employed formally. However, 33% of the respondents had not been formally employed. This suggests that majority of those attending ART treatment in Kirinyaga County are formally employed.

4.2.4 Marital Status

Figure 4.4 below presents the responses of the respondents with reference to their marital status.
According to the findings presented below, 56% of the respondents were married. However, 44% of the respondents were not married.

**4.2.5 ART Center Attendance in Kirinyaga Sub-County**

The Table 4.2 below presents the responses of the respondents with reference to the location of the ART center they visit.

<table>
<thead>
<tr>
<th>Kirinyaga County Sub-Counties</th>
<th>Sample</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kirinyaga East</td>
<td>39</td>
<td>14.7</td>
</tr>
<tr>
<td>Kirinyaga West</td>
<td>31</td>
<td>11.7</td>
</tr>
<tr>
<td>Kirinyaga Central</td>
<td>65</td>
<td>24.5</td>
</tr>
<tr>
<td>Mwea East</td>
<td>104</td>
<td>39.3</td>
</tr>
<tr>
<td>Mwea West</td>
<td>26</td>
<td>9.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>265</td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

From the findings, 39.3% of the respondents attend ART treatment in centers located in Mwea East Sub County. The findings further revealed that 24.5%, 14.7% and 11.7% of the respondents attend ART centers at Kirinyaga Central, Kirinyaga East, and Kirinyaga West respectively. The remainder – 9.8% - of the respondents attends ART therapy at Mwea West.
4.2.6 Knowledge of HIV Status

The findings on respondent’s knowledge of HIV status is shown in Figure 4.5 below.

![Figure 4.5: Knowledge of HIV Status](image)

Figure 4.5 below presents the responses of the respondents with reference to the duration they had known their HIV status. From the findings, 22% and 34% of the respondents had known their HIV status for a duration between 0-3 years and 3-6 years respectively. The findings further revealed that 28% and 16% of the respondents had known their HIV status for a duration of between 6-9 years and over 9 years respectively. This implies that the study had a well representation of the population being studied. As a result, the findings from this research process could be generalized for the entire population being studied.

4.2.7 Distance to ART Center

Figure 4.6 below presents the responses of the respondents with reference to the distance they travel in order to access ART services.
The findings reveal that 14% and 23% of the respondents traveled between 0-20 kilometers and 20-40 kilometers respectively to access ART services. The findings further revealed that 30% and 33% of the respondents traveled between 40-60 kilometers and over 60 kilometers respectively in order to access ART services. The findings revealed majority of the respondents travel over 40 kilometers in order access ART services.

4.3 Influence of Poverty and Financial Distress on ART adherence

Figure 4.7 below presents the responses of the respondents with reference to whether poverty influences ART adherence.
The findings revealed that 72% of the respondents agreed with this view. However, 28% of the respondents disagreed with this view. This suggests that poverty does influence ART adherence. Table 4.3 below presents the responses of the respondents with reference to whether poverty and financial distress influence ART adherence.

**Table 4.3: Influence of Poverty and Financial Distress on ART Adherence**

<table>
<thead>
<tr>
<th>Description</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART treatment is expensive and out of the reach for most persons living with HIV/AIDS.</td>
<td>38(14.3%)</td>
<td>68(25.7%)</td>
<td>21(7.9%)</td>
<td>84(31.7%)</td>
<td>54(20.4%)</td>
</tr>
<tr>
<td>Poverty and financial distress is one of the major factors that hinders adherence to ART.</td>
<td>58(21.9%)</td>
<td>105(39.6%)</td>
<td>16(6%)</td>
<td>51(19.2%)</td>
<td>35(13.2%)</td>
</tr>
<tr>
<td>The lack of funds has significantly contributed to non-adherence to ART.</td>
<td>79(29.8%)</td>
<td>133(50.2%)</td>
<td>12(4.5%)</td>
<td>34(12.8%)</td>
<td>7(2.6%)</td>
</tr>
<tr>
<td>Improved stable employment for persons living with HIV/AIDS will significantly increase ART adherence.</td>
<td>85(32.1%)</td>
<td>136(51.3%)</td>
<td>10(8.3%)</td>
<td>30(11.3%)</td>
<td>4(1.5%)</td>
</tr>
<tr>
<td>Reduce cost on ART treatment will significantly increase patient adherence to ART.</td>
<td>65(24.5%)</td>
<td>117(44.2%)</td>
<td>23(8.7%)</td>
<td>48(18.1%)</td>
<td>12(4.5%)</td>
</tr>
</tbody>
</table>

Table 4.3 above presents the responses of the respondents with reference to whether ART treatment is expensive and out of the reach for most persons living with HIV/AIDS. The findings revealed that 106(40%) respondents agreed with this view. However, 138(52.1%) respondents disagreed with this view. This suggests that to some respondents are of the view that ART treatment is expensive while others are of the view that ART treatment is not expensive.

According to the findings presented, 163(61.5%) respondents agreed with the view that poverty and financial distress is one of the major factors that hinders adherence to ART. However, 86(32.4%) respondents disagreed with this view. This suggests that poverty influences ART adherence. The findings further revealed that 212(80%) respondents agreed with the view that the lack of funds has significantly contributed to non-adherence to ART. However, 41(15.4%) respondents disagreed with this view. This suggests that lack of funds contributes ART non-adherence in Kirinyaga County.
The findings further revealed that 221(83.4%) respondents agreed with the view that improved stable employment for persons living with HIV/AIDS will significantly increase the rate of ART adherence. However, 34(12.8%) respondents disagreed with this view. This suggests that increased employment can result in increased ART adherence in Kirinyaga County. According to the findings presented, 182(68.7%) respondents agreed with the view that reduction in the cost on ART treatment can significantly increase patient adherence to ART. However, 60(22.6%) respondents disagreed with this view. This suggests that reduction in ART cost can increase ART adherence.

4.4 Influence of Transport and Infrastructure on ART adherence

Figure 4.8 below presents the responses of the respondents with reference to whether transport and infrastructure influences ART adherence. According to the findings, 82% of the respondents agreed with the view that transport and infrastructure influences ART adherence in Kirinyaga County. On the contrary, 18% of the respondents disagreed with this view.

![Figure 4.8: Influence of Transport and Infrastructure on ART Adherence](image)

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>82%</td>
<td></td>
<td></td>
<td>18%</td>
<td></td>
</tr>
</tbody>
</table>

The Table 4.4 below presents the responses of the respondents with reference to whether transport and infrastructure influences ART adherence in Kirinyaga County.

Table 4.4: Influence of Transport and Infrastructure on ART Adherence
The availability of transport has significantly contributed to my adherence to ART treatment. Some persons infected with HIV do not adhere to ART treatment because of the lack of transport. Poor infrastructure adversely influences ART adherence. Better infrastructure and availability of transport can significantly increase patient adherence to ART.

| The availability of transport has significantly contributed to my adherence to ART treatment. | 84(31.7%) | 149(56.2%) | 12(4.5%) | 14(5.3%) | 6(2.3%) |
| Some persons infected with HIV do not adhere to ART treatment because of the lack of transport. | 75(28.3%) | 128(48.3%) | 19(7.2%) | 31(11.7%) | 12(4.5%) |
| Poor infrastructure adversely influences ART adherence. | 41(15.5%) | 98(37%) | 24(9.1%) | 77(29.1%) | 25(9.4%) |
| Better infrastructure and availability of transport can significantly increase patient adherence to ART. | 81(30.6%) | 134(50.6%) | 11(4.2%) | 33(12.5%) | 6(2.3%) |

Table 4.4 above presents the responses of the respondents with reference to whether the availability of transport has significantly influences patient adherence to ART treatment. According to the findings presented, 233(87.9%) respondents agreed with this view. However, 20(7.6%) respondents disagreed with this view. This suggests that the availability of transport influences ART adherence. According to the findings presented, 203(76.6%) respondents agreed with the view that patient adherence to ART is affected by the lack of transport. However, 43(16.2%) respondents disagreed with this view. This suggests that the lack of transport adversely influences ART adherence.

The findings further revealed that 139(52.5%) respondents agreed with the view that poor infrastructure adversely influences ART adherence. However, 102(38.5%) respondents disagreed with this view. This suggests that poor infrastructure influences ART adherence. It was further revealed that better infrastructure and availability of transport could significantly influence patient adherence to ART. This was attributed to the fact that 215(81.2%) respondents agreed with this view. However, 39(14.8%) respondents disagreed with this view. This suggests that better transport and infrastructure can enhance ART adherence in Kirinyaga County.

4.5 Influence of Societal Perception and Support on ART Adherence

Figure 4.9 below presents the responses of the respondents with reference to whether societal support influences ART adherence.

48
Figure 4.9: Other Measures of Enhancing ART Adherence

The findings reveal that 58% of the respondents agreed with the view that there were other measures that enhanced ART adherence. However, 42% of the respondents disagreed with this view. Table 4.5 below presents the responses of the respondents with reference to whether societal perception and social support influences ART adherence.

Table 4.5: Influence of Societal Perception and Support on ART Adherence

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Societal stigma adversely influences patient adherence to ART</td>
<td>86(32.5%)</td>
<td>140(52.8%)</td>
<td>13(4.9%)</td>
<td>23(8.7%)</td>
<td>3(1.1%)</td>
</tr>
<tr>
<td>treatment.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of society support adversely influences patient adherence to ART treatment.</td>
<td>75(28.3%)</td>
<td>127(47.9%)</td>
<td>16(6%)</td>
<td>36(13.6%)</td>
<td>11(4.2%)</td>
</tr>
<tr>
<td>Societal training on ART treatment can enhance patient adherence to ART.</td>
<td>54(20.4%)</td>
<td>103(38.9%)</td>
<td>8(3%)</td>
<td>68(25.7%)</td>
<td>32(12.1%)</td>
</tr>
<tr>
<td>Enhanced social support can significantly contribute to enhanced adherence to ART treatment.</td>
<td>58(21.9%)</td>
<td>111(41.9%)</td>
<td>12(4.5%)</td>
<td>61(23%)</td>
<td>23(8.7%)</td>
</tr>
<tr>
<td>The lack of societal stigma can significantly enhance patient adherence to ART.</td>
<td>62(23.4%)</td>
<td>121(45.7%)</td>
<td>14(5.3%)</td>
<td>52(19.6%)</td>
<td>16(6%)</td>
</tr>
</tbody>
</table>
Table 4.5 above presents the responses of the respondents with reference to whether societal stigma adversely influences patient adherence to ART treatment. According to the findings presented, 226(85.3%) respondents agreed with this view. However, 26(9.8%) respondents disagreed with this view. This suggests that societal stigma adversely influences ART adherence.

The findings further revealed that 202(76.2%) respondents agreed with the view that the lack of society support adversely influences patient adherence to ART treatment. However, 47(17.8%) respondents disagreed with this view. This suggests that the lack of societal support adversely influences patient adherence to ART in Kirinyaga County. According to the findings presented, 157(59.3%) respondents agreed with the view that societal training on ART treatment can enhance patient adherence to ART. However, 100(37.8%) respondents disagreed with this view. This suggests that societal training can enhance patient adherence to ART treatment. The findings further revealed that 169(63.8%) respondents agreed with the view that enhanced social support can significantly contribute to enhanced adherence to ART treatment. However, 84(31.7%) respondents disagreed with this view. It was further evident that the lack of societal stigma can significantly enhance patient adherence to ART. This was attributed to the fact that 183(69.1%) respondents agreed with this view. However, 68(25.6%) respondents disagreed with this view. This suggests that the lack of societal stigma can enhance patient ART adherence.

4.6 Influence of Health Centres Structural Impediments on ART Adherence

Figure 4.10 below presents the responses of the respondents with reference to the other measures healthcare centers can adopt to enhance ART adherence.
Findings presented revealed that 80% of the respondents agreed that there are other measures which can be implemented to enhance patient adherence to ART treatment. The findings further revealed that 20% of the respondents were not of this view. The Table 4.6 below presents the responses of the respondents with reference to whether health centers structural impediments influence ART adherence.

Table 4.6: Influencing of Societal Perception and Support on ART Adherence

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of resources in health centers contributes to patient non-adherence.</td>
<td>89(33.6%)</td>
<td>143(54%)</td>
<td>3(1.1%)</td>
<td>22(8.3%)</td>
<td>8(3%)</td>
</tr>
<tr>
<td>Lack of skilled staff results in patient non-adherence to ART</td>
<td>58(21.9%)</td>
<td>71(26.8%)</td>
<td>24(9.1%)</td>
<td>79(29.8%)</td>
<td>33(12.5%)</td>
</tr>
<tr>
<td>Skilled staff can significantly contribute to enhanced patient adherence to ART treatment.</td>
<td>65(24.5%)</td>
<td>101(38.1%)</td>
<td>14(5.3%)</td>
<td>62(23.4%)</td>
<td>23(8.7%)</td>
</tr>
<tr>
<td>Better healthcare facilities in terms of resources can enhance adherence to ART treatment.</td>
<td>95(35.8%)</td>
<td>132(49.8%)</td>
<td>4(1.5%)</td>
<td>24(9.1%)</td>
<td>10(3.8%)</td>
</tr>
</tbody>
</table>

Table 4.6 above presents the responses of the respondents with reference to whether the lack of resources at health centers adversely influences ART adherence. According to the
findings presented, 232(87.6%) respondents agreed with this view. However, 30(11.6%) respondents disagreed with this view. This suggests that the lack of resources at health centers adversely influences ART adherence. The findings further revealed that 129(48.7%) respondents agreed with the view that the lack of skilled staff contributes to ART non adherence. However, 112(42.3%) respondents disagreed with this view. This suggests that the lack of skilled personnel does influence patient adherence to ART treatment. According to the findings, 116 (62.6%) respondents agreed with the view that better healthcare staff can significantly enhance patient adherence to ART treatment. However, 85(32.1%) respondents disagreed with this view. This suggests that more competent staff can enhance and increase patient adherence to ART treatment. The findings further revealed that 227(85.6%) respondents agreed with the view that improved healthcare facilities can enhance ART adherence. However, 34(12.9%) respondents disagreed with this view. This suggests that improved healthcare facilities can enhance patient adherence to ART treatment.

4.7 Correlation of Study Variables

The Table 4.7 below presents the correlation between therapy adherence (measured as respondents pill balance as at the date when he/she participated in the research process) and the following variables: poverty and financial distress hinder ART adherence, poor infrastructure adversely affect ART adherence, lack of social support enhances ART adherence, and the lack of resources at health centers influence ART adherence.
The findings of the correlation analysis indicated that all variables (Poverty and financial distress hinder ART adherence, Poor infrastructure adversely affects adherence, Lack of social support enhances ART adherence, and Lack of resources at Health Centers influences ART adherence) were statistically significant since the p value ≤ 0.05. Therefore, there is strong association between the study’s independent variables and therapy adherence. According to Pallant (2002), it is imperative there should be a correlation of between independent variables and the dependent variable. In this case, all the independent variables – poverty and financial distress, infrastructure, social support,
and health centers resource availability – correlate substantially with therapy adherence (respondents pill count balance). This attributed to the fact that all independent variables have a correlation of above .3 with the study’s dependent variable.

4.8 Multiple Regression Results

The Table 4.8 below presents the regression findings from the responses of the respondents. The dependent variable in the regression equation was adherence to ART therapy measured as patient pill balance as at the date when the study was being conducted. The independent variables for the regression equation were: influence of poverty and financial distress, transport and infrastructure, societal perception and support, and health centers resources on adherence to ART.

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjustment R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.949</td>
<td>.900</td>
<td>.899</td>
<td>.377</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Lack of resources at Health Centers influences ART adherence, Poor infrastructure adversely affects ART adherence, Lack of social support adversely influences ART adherence, Poverty and financial distress hinder ART adherence.

Findings revealed that the relationship for all the variables were significant, R (0.949); p ≤ 0.05. Similarly, the adjusted R Square to be .899(89.9%). This implies that 89.9% of patient pill balance is influenced by the following variables: lack of resources at health centers, poor infrastructure adversely affects ART adherence, lack of social support adversely influences ART adherence, poverty and financial distress hinder ART adherence. The remaining 10.1% is explained by other variables not included in the regression equation. The Table 4.9 below presents the estimated coefficients for the independent variables that were under investigation by the research study process.
Table 4.9: Regression Equation Coefficients

<table>
<thead>
<tr>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty and financial distress hinder ART adherence</td>
</tr>
<tr>
<td>Poor infrastructure adversely affects adherence</td>
</tr>
<tr>
<td>Lack of social support enhances ART adherence</td>
</tr>
<tr>
<td>Lack of resources at Health Centers influences ART adherence</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>95.0% Confidence Interval for B</th>
<th>Correlations</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>t</td>
<td>Sig.</td>
<td>Lower Bound</td>
</tr>
<tr>
<td>(Constant)</td>
<td>3.734</td>
<td>.106</td>
<td>35.106</td>
<td>.000</td>
<td>3.525</td>
</tr>
<tr>
<td>Poverty and financial distress hinder ART adherence</td>
<td>-.611</td>
<td>.059</td>
<td>-.704</td>
<td>10.285</td>
<td>-.728</td>
</tr>
<tr>
<td>Poor infrastructure adversely affects adherence</td>
<td>-.117</td>
<td>.053</td>
<td>-.126</td>
<td>2.187</td>
<td>-.222</td>
</tr>
<tr>
<td>Lack of social support enhances ART adherence</td>
<td>-.291</td>
<td>.055</td>
<td>-.273</td>
<td>5.272</td>
<td>-.399</td>
</tr>
<tr>
<td>Lack of resources at Health Centers influences ART adherence</td>
<td>.181</td>
<td>.050</td>
<td>.149</td>
<td>3.588</td>
<td>.082</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Adherence to therapy (measured as pill balance)

The findings of the regression analysis indicated that all variables (Poverty and financial distress hinder ART adherence, Poor infrastructure adversely affects adherence, Lack of social support enhances ART adherence, and Lack of resources at Health Centers influences ART adherence) are statistically significant since the p value ≤ 0.05. From the coefficient table, the beta coefficient is -.704 with t-value of -10.285 which is for poverty and financial distress hinder ART. This suggests that poverty and financial distress is the one the factor that significantly and negatively influence ART adherence. Poor infrastructure adversely and significantly affects adherence has a beta coefficient of -.126 and t-value of -2.187. Each of the independent variables in this study is statistically significant since the Sig. value for all the independent variables is less than .05. The variables – poverty and financial distress, poor infrastructure, lack of societal support – have significant and negative coefficients which imply that they compromise or reduce patient adherence to ART treatment. On the other hand, the resources availability at health centers has a significant and positive coefficient which implies that it promotes patients adherence to ART treatment.
4.9 Summary

From the findings, the beta coefficient for poverty and financial distress is -.704 with a t-value of -10.285. This suggests that poverty and financial distress is the one of the factors that significantly and negatively influences ART adherence. The negative coefficient further implies that poverty and financial distress reduce patient adherence to ART treatment. The statistical analysis further reveals that poor infrastructure adversely and significantly affects ART adherence. This is attributed to the fact that the beta coefficient was -.126 and the t-value was -2.187. Transport and infrastructure as an independent variable was statistically significant since the Sig. value for it was less than .05. The negative coefficient further implies that transport and infrastructure reduce patient adherence to ART treatment. From the findings, beta coefficient for societal perception and support was -.273 with a t-value of -5.272. This suggests that societal perception and social support is the one of the factors that significantly and negatively influences ART adherence. Societal perception and support as an independent variable was statistically significant since the Sig. value for it was less than .05. The negative coefficient implies that societal perception and support reduce patient adherence to ART treatment. From the findings, beta coefficient for health centers structural impediments was .149 with a t-value of 3.588. This suggests that health centers structural impediments is the one of the factors that significantly and positively influences ART adherence. Health centers structural impediments as an independent variable was statistically significant since the Sig. value for it was less than .05. The positive coefficient further implies that health centers structural impediments can enhance patient adherence to ART treatment.
CHAPTER FIVE

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter outlines the conclusions and recommendations that the researcher arrived at based on the findings of the research process. This chapter is divided into the following subsections: summary, conclusions and discussions, recommendations, and the recommendations for other research studies.

5.2 Summary

The purpose of this study was to investigate the effects of socioeconomic factors on the adherence to antiretroviral therapy. The study was guided by the following research questions: What is the effect of poverty and financial distress on adherence to antiretroviral therapy? What is the effect of transport and infrastructure on adherence to antiretroviral therapy? How does societal perception and support influence adherence to antiretroviral therapy? What is the effect of health centers structures on adherence to antiretroviral therapy?

The population of the study consisted of patients in Kirinyaga County on ART treatment. The sample frame for this study was adopted from Kirinyaga County Director of Health services office. To ensure that every employee had an equal chance of being sampled, a simple random technique was used.

The study utilized a simple random sampling for picking out respondents. Data was collected using structured questionnaires, and analyzed using Statistical Package for Social Sciences (SPSS) software version 21. A total of three hundred and fifty seven (357) questionnaires were dispatched to respondents; two hundred and sixty five (265) were returned back giving the study a response rate of 74.2 %. Descriptive statistics utilized in this study include frequencies, percentages, and mean. For inferential statistics, correlation analysis, regression and multivariate analysis was done to enable easy data interpretation. The presentation of the data was done using Tables, and figures according to each research question.

On the issue of poverty and ART adherence, respondents indicated that lack of and finances, ART drugs that are out of reach, and perpetual family financial distress
contributed to lack of adherence to ART treatment. Other respondents indicated that lack of employment contributed to the lack of resources to access ART treatment.

On the issue of transport and infrastructure, majority of respondents indicated that lack of transport mechanism enhanced lack of adherence to ART while others indicated that lack of fare to travel to health centers, and poor road infrastructure, had significantly contributed to the lack of adherence to ART treatment.

On the issue of societal perception and support, majority of respondents indicated that even though they do receive family support, they still lacked societal support and acceptance. Others indicated that stigma still exists in the society concerning HIV/AIDS which has contributed to lack of adherence by those who fear being stigmatized.

Finally on the issue of health centers and structural impediments, majority of respondents indicated that poor or lack of resources in the health centers had influence their lack of adherence. Other respondents strongly indicated that lack of skilled staff in health centers in dealing with people living with HIV/AIDS had significantly influenced lack of adherence. Equally, lack of ART in health centers and long waiting lines had significantly influence lack of adherence to ART treatment.

Recommendations for the future includes the introduction of income generation activities to alleviate poverty among people living with HIV/AIDS, the enforcement of laws that criminalize discrimination based on HIV status, formation of societal HIV/AIDS support groups and providing adequate resources in terms of health centers, ART, and skilled workers will greatly influence adherence to ART treatment.

5.3 Discussions

5.3.1 Effect of Poverty and Financial Distress on ART Adherence

The findings of this study revealed that 106(40%) respondents agreed with the view that ART treatment is expensive and out of reach of most patients. However, 138(52.1%) respondents disagreed with this view. The findings further revealed that 163(61.5%) respondents agreed with the view that poverty and financial distress is one of the major factors that hinders adherence to ART. However, 86(32.4%) respondents disagreed with this view. According to the findings, 212(80%) respondents agreed with the view that the lack of funds had significantly contributed to non-adherence to ART. However,
41(15.4%) respondents disagreed with this view. The findings further revealed that improved stable employment for persons living with HIV/AIDS will significantly increase the rate of ART adherence. This is according to the findings presented which revealed that 221(83.4%) respondents agreed with this view. However, 34(12.8%) respondents disagreed with this view. The findings further revealed that 182(68.7%) respondents agreed with the view that reduction in the cost on ART treatment can significantly increase patient adherence to ART. However, 60(22.6%) respondents disagreed with this view. According to the findings, 72% of the respondents agreed with the view that poverty influences ART adherence. However, 28% of the respondents disagreed with this view.

This study findings are in agreement with Peltzer and Pengpid (2013) that found out that individuals who may not have adequate revenue streams may have a challenge in adhering to ART treatment because the treatment is costly. This implies that if the government and various nongovernmental agencies do not assist those living in poverty access ART treatment, most of them will not afford it. Berhe, Tegabu and Alemayehu (2013) carried out a research study in Northern Ethiopia whose core objective was to determine how patients’ adherence to antiretroviral therapy was influenced by nutritional factors. According to the study, ART assists in the reduction of CD4 cell destruction, the reduction viral replication, and promotes the reconstruction of the immune system. This implies that ART is an effective technique of slowing the progression of the disease and it is imperative for all those with HIV to enroll and adhere to antiretroviral therapy. According to Berhe, Tegabu and Alemayehu (2013), lack of proper nutrition during ART treatment contributes to ART non-adherence. This presents a real challenge to the developing countries whose majority populations live below the poverty line and may lack access to enough quality food. This implies that the poor may have challenges adhering to ART treatment because they may lack access to enough and quality food.

According to Peltzer and Pengpid, (2013), poverty is likely to affect adherence to care, as financial resources may need to be directed elsewhere, funds for travel to a medical clinic that provides ART may not be available, and child-care may not be readily accessible for parents who attend clinic appointments. The combined stresses associated with poverty, such as inadequate housing, community violence, unemployment and forced migration,
may obviate an acknowledgement of the importance of regular clinic visits, and what may be perceived as rigid treatment regimens.

From the responses of the respondents, it is evident that poverty and financial distress do influence patient adherence to ART treatment. According to the findings of the regression model, poverty and financial distress is the most significant factor – over societal support, resources at health centers, and poor infrastructure – which influences patient adherence to ART treatment. This finding is in line with those in empirical literature: Peltzer and Pengpid (2013), Berhe, Tegabu and Alemayehu (2013), and Berhe, Tegabu and Alemayehu (2013). The finding of this study is in line with those of other studies. For instance, Kagee, Remien, Berkman, Hoffman, Campos and Swartz (2011) conducted a research study in South Africa on structural barriers to can adversely influence ART adherence. The findings from their study revealed poverty as one of the factors that significantly influence patient ART adherence. The recommendations from their study were that stakeholders must partner in order to significantly reduce the costs associated either directly or indirectly with ART treatment. By so doing, ART adherence will be expected to increase considerably. This suggests that poverty is in did a factor which significantly and negatively influences patient adherence to ART treatment in Kirinyaga County.

5.3.2 Influence of Transport on ART Adherence

According to the findings, 87.9% respondents agreed with the view that the availability of transport has significantly influences patient adherence to ART treatment. However, 7.6% respondents disagreed with this view. In addition, 76.6% respondents agreed with the view that patient adherence to ART is affected by the lack of transport. However, 16.2% respondents disagreed with this view. The findings further revealed that 52.5% respondents agreed with the view that poor infrastructure adversely influences ART adherence. However, 38.5% respondents disagreed with this view. In addition, 81.2% respondents agreed with the view that better infrastructure and availability of transport significant influences patient adherence to ART. However, 14.8% respondents disagreed with this view. From the findings, 82% of the respondents agreed with the view that transport and infrastructure influences ART adherence in Kirinyaga County. On the contrary, 18% of the respondents disagreed with this view.
This study findings are in agreement with Kunutsor et al. (2011) research which sought to determine the factors which influence ART adherence. The findings from the research process revealed that one of the factors which influence ART treatment is transport and infrastructure. Similar sentiments are echoed through a study that was carried out by Chesney in 2000. Chesney (2000) carried out a research which sought to determine the factors which influence patient ART adherence. The findings revealed that among the factors that adversely influence patient adherence to ART in developing countries was poor infrastructure. According to Chesney (2000), transport inaccessibility and poor infrastructure significantly influences patient adherence to ART.

Low and middle income countries are characterized by several deficits in environmental infrastructure, notably inadequate transport. As most patients who attend public health clinics do not have private transport they rely chiefly on public means, which are in many cases expensive and unsafe, and in some areas unavailable (Kagee et al. 2007). The limited incomes characteristic of patients in low income countries may in some cases preclude even using public transport. Thus, if clinics are located far from residential townships, patients often have to walk, which may require considerable effort, particularly if they feel unwell.

Mills et al (2006) argue that transport significantly influences patient adherence to ART treatment. According to the findings of the regression model, Poor infrastructure adversely affects patient adherence to ART and has a beta coefficient of -.126. When compared to the other independent variables studied by this research process; poor transport and infrastructure is the least likely to influence patient adherence to ART treatment. However, findings still revealed that transport influence patient adherence to ART treatment. This is in line with the responses of the respondents which revealed that the lack of accessibility of transport, lack of infrastructure and distance from health center negatively influences patient adherence to ART. This suggests that improved infrastructure and transport systems can significantly enhance patient adherence to ART.

5.3.3 Influence of Societal Perception and Support on ART Adherence

From the findings, it was evident that societal stigma adversely influences patient adherence to ART treatment. This is attributed to the fact that 85.3% respondents agreed
with this view. However, 9.8% respondents disagreed with this view. It was further revealed that the lack of society support adversely influences patient adherence to ART treatment. According to the findings presented, 76.2% respondents agreed with this view. However, 17.8% respondents disagreed with this view. The findings further revealed that societal training on ART treatment can enhance patient adherence to ART. This is attributed to the fact that 59.3% respondents agreed with this view. However, 37.8% respondents disagreed with this view.

From the findings, 63.8% respondents agreed with the view that enhanced social support can significantly contribute to enhanced adherence to ART treatment. However, 31.7% respondents disagreed with this view. In addition, the findings revealed that 25.6% respondents disagreed with this view that lack of societal stigma can significantly enhance patient adherence to ART. According to the findings presented, 69.1% respondents agreed with this view.

This study findings also confirms Obirikorang et al (2013) study findings that family support and self-perceived wellness are some of socioeconomic factors that influence ART adherence. Bouhnik, Chesney, Carrieri, Gallais, Moreau, Moatti, Obadia and Spire (1999) conducted a research study whose overall objective was non adherence among individuals living with HIV. The study identified a number of factors which influenced patient adherence to ART one being social support. According to Bouhnik et al (1999), patients who had social support were more likely to adhere to ART treatment when compared to individuals who did not have social support. Claude, Brackis-Cott, Dolezal and Abrams (2004) argue that in order to enhance adherence to ART by children who are infected by HIV, family support is utmost critical. The findings from this study reveal societal support and perception are critical components when it comes to adherence to ART.

Societal cultures and behaviors have been attributed for adherence or lack of adherence to ART treatment (Abrams, 2004). In most African, and alcohol and substance abuse (Claude, Brackis-Cott, Dolezal & Abrams, 2004), have also contributed to lack of adherence. Major barriers to ART adherence in India are economic factors (Nachega, Mills & Schechter, 2007). For instance, not having money for travel to ART center,
hunger and waiting time were identified as barriers to ARV adherence similar to African setting (Claude, Brackis-Cott, Dolezal & Abrams, 2004). Lack of money and livelihood issues result in food insecurity. Growing body of literature (Claude, Brackis-Cott, Dolezal & Abrams, 2004), provides evidence that livelihood is an all-encompassing socio-behavioral barrier that can reduce adherence to ART and increase gastrointestinal diseases due to lack of much needed food to go along with ART (Nsimba, Irunde & Comoro, 2010).

The responses of the respondents revealed that societal perception and support of HIV patients significantly influences patient adherence to ART treatment. According to the responses, enhanced societal support could significantly enhance patient adherence to ART treatment. This finding is in line with that of empirical studies conducted by: Obirikorang et al (2013), Bouhnik et al. (1999), and Claude et al. (2004). This finding is in line with that of Katz et al. Katz, Ryu, Onuegbu, Psaros, Weiser, Bangsberg, and Tsai (2013) conducted a study on the impact of HIV related stigma on ART adherence. Data for the study was sourced from secondary literature. According to Katz et al (2013), HIV related stigma significantly hinders successful patient adherence to ART treatment. Similar findings are presented by Singh et al. Singh et al. (1996) carried out a research study which sought to identify the determinants patient adherence to ATR. The findings of their study revealed that a number of factors influence patient adherence to ATR. One of the factors identified in the study was societal perception and support. This suggests that societal perception and support significantly influences patient ART adherence.

5.3.4 Effect of Health Centre Structures on ART Adherence

From the responses, 87.6% respondents agreed with the view that the lack of resources at health centers adversely influences ART adherence. However, 11.6% respondents disagreed with this view. In addition, 48.7% respondents agreed with the view that the lack of skilled staff contributes to ART non adherence. However, 42.3% respondents disagreed with this view. The findings further revealed that 62.6% respondents agreed with the view that better healthcare staff can significantly enhance patient adherence to ART treatment. However, 32.1% respondents disagreed with this view. The findings presented further revealed that 85.6% respondents agreed with the view that improved healthcare facilities can enhance ART adherence. However, 34(12.9%) respondents
disagreed with this view. In addition, 80% of the respondents agreed that there are other measures which can be implemented to enhance patient adherence to ART treatment.

Nsimba, Irunde and Comoro (2010) had argued that structural impediments or inadequacies in health centers offering ART treatment contribute to patient in-adherence. In particular, lack of skilled personnel in ART, lack of enough personnel, lack of laboratory and diagnostics equipment, and the lack of physical infrastructure to facilitate confidential consultations are some of the structural impediments that contribute to the lack of patient adherence when it comes to antiretroviral therapy.

Kunutsor et al. (2011) had carried out a study in Uganda which sought to determine the measures which clinics can implement in order to enhance antiretroviral therapy adherence. The study utilized a sample of 174 persons living with HIV and who attend ART within various clinics in Uganda. The findings from the research process revealed that facilities within Ugandan health clinics significantly influences patient adherence ART, same as the findings of this study. Kunutsor et al. (2011) recommend that health structures should be resourceful in terms of facilities to ensure that patients seeking ART treatment are served effectively.

Structural factors not directly related to patient or medications can also influence adherence. For instance, limited availability and accessibility of antiretroviral medications and healthcare facilities for diagnosis and treatment of HIV/AIDS is among the leading causes of non-adherence (Kunutsor et al., 2011). Similarly, out-of-pocket payments, high cost of ART and other health services also influence non-adherence. The presence of healthcare providers experienced in ART provision, patient-nurse and other provider relationships, also influence non-adherence (Claude, Brackis-Cott, Dolezal & Abrams, 2004). In some countries, particularly in Africa and Asia, health care providers’ beliefs, waiting time and opening hours (Peltzer & Pengpid, 2013), influence the attitude of patience, and their subsequent adherence. According to Kunutsor et al., (2011), availability of counseling services, and social, economic, or psychological support for people living in both developing as well as developed countries (Ljubicic et al., 2006) can influence adherence positively or negatively.
Tsai and Bangsberg (2011) argue that resources at health center have an influence on patient adherence to treatment. Nsimba, Irunde and Comoro (2010) also argue that structural and resource inadequacies in health centers offering ART treatment can negatively influence patient adherence to ART. These sentiments are in line with the findings of this study which revealed that health center resources significantly influence patient adherence to ART treatment. This suggests that the government should work towards ensuring that its health centers are resourceful when it comes to ART treatment.

5.4 Conclusion

5.4.1 Effect of Poverty and Financial Distress on ART Adherence

This study concludes that the effect of poverty and financial distress on ART adherence was statistically significant. When people living with HIV/AIDS lack financial resources or are bogged down with the burden of poverty, it inhibits their ability to focus on their routine of taking ARTs or visiting health centers, thereby increasing chances that they will not adhere to ART treatment. Therefore the study concludes that poverty has a negatively effects on ART adherence.

5.4.2 Influence of Transport on ART Adherence

This study concludes that transport infrastructure on ART adherence is statistically significant. When people living with HIV/AIDS can’t afford fare to travel to health centers for ART treatment, or when the road infrastructure and transport system in poor, it influences the lack of adherence to ART treatment. Therefore the study concludes that transport negatively effects on ART adherence.

5.4.3 Influence of Societal Perception and Support on ART Adherence

Society places a lot of stigma on people living with HIV/AIDS. As a result, based on this study findings, the influence of societal perception and support on Art adherence is statistically significant. This study equally concludes that stigma that still pervades the society in regards to people living with HIV/AIDS, in as much as family members and social support groups do offer meaningful support to people living with HIV/AIDS. Therefore the study concludes that society perception and support negatively effects on ART adherence.
5.3.4 Effect of Health Centre Infrastructures on ART Adherence

Availability of health facilities and resources are important in the adherence to ART treatment. This study concludes that health facilities infrastructure influences the adherence to ART treatment. This is both in the physical structures, adequate skills available in the health center’s by health workers, and also the availability of ART drugs. Therefore the study concludes that health care centers positively effects on ART adherence.

5.5 Recommendations

The study findings had the following recommendations.

5.5.1 Recommendations For Improvement

5.5.1.1 Effect of Poverty and Financial Distress on ART Adherence

The government should partner with other stakeholders and institutions in an effort of making ART treatment more affordable to patients. In addition, both the National and County government should adopt and implement policies aimed at improving the livelihoods of persons infected with HIV in Kirinyaga County. By so doing, patient adherence to ART can significantly increase.

5.5.1.2 Influence of Transport on ART Adherence

The government should work towards improving the infrastructure within Kirinyaga County and its environs. This is because; it will go a long way in enhancing patient adherence to ART treatment. Both tarmacked roads are all weather roads that have been done well to improve accessibility will equally enhance ART adherence. The County health services directorate should consider giving people living with HIV/AIDS transport vouchers when traveling to ART treatment as a way of enhancing adherence.

5.5.1.3 Influence of Societal Perception and Support on ART Adherence

Governmental and nongovernmental institutions should initiate programs aimed at training and educating the society about HIV. By so doing, the negative perception towards patients receiving ART treatment will significantly reduce. Some of the
mechanisms that should be adopted in educating the society includes public awareness forums, use of community health workers education day, and introduction of HIV/AIDS teaching curriculum for primary, secondary and tertiary school education.

5.5.1.4 Effect of Health Centre Infrastructures on ART Adherence

The government should work towards improving the services offered to ART patients at health centers. This can be achieved by ensuring that ART health centers are well equipped in terms of medication, facilities and skilled personnel. By so doing, the government will increase the number of persons adhering to ART treatment.
REFERENCES


APPENDICES

Appendix One: Questionnaire

The questionnaire is designed to gather general information about you with reference to the socioeconomic factors that influence adherence to antiretroviral therapy (ART). You are assured that your answers will be treated confidential. Hence do not provide your name. Please indicate the correct option as honestly and as correctly as possible by putting a tick on one of the options. For questions that require your own opinion, please fill blanks (....). You are requested to respond to all items.

Section I: Personal Information

1. Please indicate your gender:
   (a) Male [ ]
   (b) Female [ ]

2. Marital status:
   (a) Single [ ]
   (b) Married [ ]

3. Please indicate your age group:
   (a) 18 – 29 Years [ ]
   (b) 30 – 39 Years [ ]
   (c) 40 – 49 Years [ ]
   (d) Over 50 Years [ ]

4. Please indicate how long you have known that you are infected with HIV/AIDS:
   (a) 0 – 3 Years [ ]
   (b) 3 – 6 Years [ ]
   (c) 6 – 9 Years [ ]
   (d) Over 9 Years [ ]

5. Please indicate for how long you have consistently adhered to Antiretroviral Therapy (ART)?
   (a) 0 – 3 Years [ ]
   (b) 3 – 6 Years [ ]
   (c) 6 – 9 Years [ ]
   (d) Over 9 Years [ ]

Section II: Influence of Poverty and Financial Distress on adherence to ART
6. Can reduction in poverty rates in Kirinyaga County positively influence adherence to ART treatment? Yes [ ] No [ ]. Please give reasons for your answer:

…………………………………………………………………………………………
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…………………………………………………………………………………………

You have been provided with statements on whether poverty and financial distress influence adherence to antiretroviral therapy. Please indicate whether you strongly agree, agree, neutral, disagree, or strongly disagree with the given statements: Strongly agree (SA)… 5: Agree (A)… 4 neutral (N)… 3 Disagree (D)… 2 strongly disagree (SD)… 1

<table>
<thead>
<tr>
<th>Poverty and Financial Distress</th>
<th>SA</th>
<th>A</th>
<th>N</th>
<th>D</th>
<th>SD</th>
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<tbody>
<tr>
<td>7. ART treatment is expensive and out of the reach for most persons living with HIV/AIDS.</td>
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<td>8. Poverty and financial distress is one of the major factors that hinder adherence to ART.</td>
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<td>9. The lack of funds has significantly contributed to non adherence to ART.</td>
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<td>10. Improved stable employment for persons living with HIV/AIDS will significantly increase the rate of ART adherence.</td>
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<td>11. Reduce cost on ART treatment will significantly increase patient adherence to ART.</td>
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</table>

Section III: Influence of Transport and Infrastructure on adherence to ART

12. Do you think improvement in transport and infrastructure can positively influence patient adherence to ART? Yes [ ] No [ ]. Please give reasons for your answer:

…………………………………………………………………………………………
…………………………………………………………………………………………

You have been provided with statements on whether transport and infrastructure influence adherence to antiretroviral therapy. Please indicate whether you strongly agree, agree, neutral, disagree, or strongly disagree with the given statements: Strongly agree (SA)… 5: Agree (A)… 4 neutral (N)… 3 Disagree (D)… 2 strongly disagree (SD)… 1
<table>
<thead>
<tr>
<th>Transport and Infrastructure</th>
<th>SA 5</th>
<th>A 4</th>
<th>N 3</th>
<th>D 2</th>
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<tbody>
<tr>
<td>13. The availability of transport has significantly contributed to my adherence to ART treatment.</td>
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<td>14. Some persons infected with HIV do not adhere to ART treatment because of the lack of transport.</td>
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<td>15. Poor infrastructure adversely influences ART adherence.</td>
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<td>16. Better infrastructure and availability of transport can significantly increase patient adherence to ART.</td>
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</table>

Section IV: Influence of Societal Perception and Support on adherence to ART

17. Are there any other measures which can be implemented by the society in order to enhance patient adherence to ART at Kirinyaga County? Yes [ ] No [ ]. If Yes, State what measures are these:

..............................................................
..............................................................
..............................................................

Yes [ ] No [ ]

You have been provided with statements on whether societal perception and support influence adherence to antiretroviral therapy. Please indicate whether you strongly agree, agree, neutral, disagree, or strongly disagree with the given statements: Strongly agree (SA)... 5: Agree (A)... 4 neutral (N)... 3 Disagree (D)... 2 strongly disagree (SD)... 1

<table>
<thead>
<tr>
<th>Societal Perception and Support</th>
<th>SA 5</th>
<th>A 4</th>
<th>N 3</th>
<th>D 2</th>
<th>SD 1</th>
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<tr>
<td>20. Societal training on ART treatment can enhance patient adherence to ART.</td>
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<td>21. Enhanced social support can significantly contribute to enhanced adherence to ART treatment.</td>
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<td>22. The lack of societal stigma can significantly enhance</td>
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</table>
patient adherence to ART.

Section V: Influence of Health centers structural impediments on adherence to ART

23. Are there any other measures which can be implemented by health centers offering ART in order to enhance patient adherence to ART at Kirinyaga County? Yes [ ] No [ ]. If Yes, State what measures are these:

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………………

You have been provided with statements on whether Health centers structural impediments influence adherence to antiretroviral therapy. Please indicate whether you strongly agree, agree, neutral, disagree, or strongly disagree with the given statements:

Strongly agree (SA)... 5: Agree (A)... 4 neutral (N)... 3 Disagree (D)... 2 strongly disagree (SD)... 1

<table>
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<tr>
<th>Health centers structural impediments</th>
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<tr>
<td>24. The lack of resources in health centers offering ART significantly contributes to patient non-adherence.</td>
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<td>25. Lack of skilled staff contributes to patient non-adherence to ART treatment.</td>
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<td>26. Better and more skilled staff can significantly contribute to enhanced patient adherence to ART treatment.</td>
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<td>27. Better healthcare facilities in terms of resources can enhance adherence to ART treatment.</td>
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28. Please indicate the ARVs pill balance today.

(a) 0 – 10 [ ]
(b) 11 – 20[ ]
(c) 21 – 30[ ]
(d) Over 30 pills [ ]

…THANKS…
## Appendix Two: R.V. Krejcie and D. W. Morgan (1970) Sample Size Estimation

### Table

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*N is the population

†S is the sample size