

**CHALLENGES OF ANTIRETROVIRAL THERAPY ADHERENCE AMONG SERO-
POSITIVE PREGNANT WOMEN IN MURANG'A COUNTY REFERRAL HOSPITAL
IN KENYA**

By

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of Masters of Science in Nursing (Midwifery and Obstetric Nursing) degree in the School of
Nursing Sciences, College of Health Sciences of the University of Nairobi.**

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DECLARATION

This research dissertation is my original work and has not been presented for a degree or other awards in any other university.

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DEDICATION

To my parents, Joseph and Leah who, made me what I am today.

To my wife, Joy Wairimu, our two children, Shalom and Melody with deepest love, gratitude and showing understanding during the course of this study. You always inspired me and you are my ignition key.

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LIST OF ABBREVIATIONS AND ACRONYMS

ABZ	Albendazole
AIDS	Acquired immunodeficiency Syndrome
ANC	Antenatal Clinic
ART	Antiretroviral Therapy
ARV	Antiretroviral
AZT	Azidothymidine
BScN	Bachelor of Science in Nursing
CCC	Comprehensive Care Centre
CD4	Cluster of Differentiation
CDC	Center for Disease Control
CHS	Center for Health Solution
CI	Class Interval
CWC	Child Welfare Clinic
EMTCT	Elimination of Mother to Child Transmission
FANC	Focused Antenatal Clinic
FGM	Female Genital Mutilation
HAART	Highly Active Antiretroviral Therapy
HBM	Health Belief Model
HBV	Hepatitis B Virus
HCW	Health Care Worker
HIV	Human Immunodeficiency Virus

KAIS Kenya AIDS Indicator Survey

KDHS Kenya Demographic Health Survey

KHSSP Kenya Health Sector Strategic Program

KHCP Kenya HIV County Profile

KNBS Kenya National Bureau of Statistics

KNH/UoN-ERC Kenyatta National Hospital /University of Nairobi Ethics and Research
Committee

KNH Kenyatta National Hospital

MCH Maternal and Child Health

MScN Master of Science in Nursing

MTC Medical Training College

MTCT Mother to Child Transmission

NACC National AIDS Control Council

NASCOP National AIDS and STI Control Program

OR Odd Ratio

PMTCT Prevention from Mother to Child Transmission

PNC Post Natal Clinic

PrEP Pre-Exposure Prophylaxis

P Probability value

SPSS Statistical Package for Social Sciences

STI Sexually Transmitted Infections

STD Sexually Transmitted Disease

UNAID United Nation Program on HIV/AIDS

UoN University of Nairobi
USA United States of America
WHO World Health Organization

OPERATIONAL DEFINITIONS

Acquired Immunodeficiency Syndrome: A condition in human in which progressive failure of immune system allows life threatening opportunistic infections and cancers to thrive

Adherence: In HIV is defined as the ability of the person living with HIV/AIDS to be involved in choosing, starting, managing and maintaining a particular drug regimen to control viral replication and improve body immune system.

CD4 count: This is an antigen marker of helper/ inducer T-cell that recognizes antigens bound in class II major histocompatibility complex proteins.

Challenges: In this study the term challenges has been used interchangeably with the term factors.

Hepatitis B Virus: An infectious disease caused by hepatitis B virus (HBV) which affects the liver. It's capable of causing both acute and chronic infections.

Human Immunodeficiency Virus: A lentivirus that causes the acquired Immunodeficiency Syndrome (AIDS) in humans.

Opportunistic Infections: An infection that result due to a weakened immune system.

Optimal adherence: Proportion of those who take their medication more 95% of the time.

Pill Count: A tool for medication adherence and diversion reduction

Pill burden: The number of the tablets, capsules or other dosage forms that a person takes on a regular basis

Poor adherence: Adherence rates less than 95% by pharmacy pill counts over the one month period prior to clinic visit or reported adherence of less than 95% in the two weeks prior to clinic date.

Pregnant Woman: A woman expecting to deliver a baby.

Referral Hospital: A hospital in which health care providers at lower level of the health care system, who lack the skills, facilities or both to manage a given clinical condition seek the assistance of providers in a better equipped institution to guide them in the management of a serious clinical condition in a patient.

Satisfactory: Services that fulfils the need of the client.

Sero-positive: The presence of antibodies or other immune markers in the serum that indicate prior exposure to a specific organism or antigen.

Viral-load: Levels of virus found in the blood per 10 milliliters

ABSTRACT

Background: Adherence of or more than 95% to Antiretroviral Therapy (ART) has been highly regarded as a success in HIV treatment. Globally, there are various challenges associated with ART adherence among sero-positive pregnant women especially in sub-Saharan Africa. In Kenya, there is inadequate information on challenges of ART adherence among sero-positive pregnant women.

Objective: To establish the challenges that influence ART adherence among sero-positive pregnant women in Murang'a county referral Hospital's MCH

Methodology: The research design was analytical cross-sectional design with a retrospective review of ANC records. The research study utilized both quantitative and qualitative methods of data collection using interviewer administered questionnaire for the sero-positive pregnant women and in-depth interview for the key informants. The sample size was 57 sero-positive pregnant women who were sampled using census method. Quantitative data cleaning and entry was done manually into MS-Excel spreadsheet and analysis done using Statistical Package for Social Sciences (SPSS) Program. Significance level of 95% was used to determine the strength of the association between variables. Qualitative data was analyzed using NVIVO 8 software.

Results: Viral load results and pill counts results revealed that sero-positive pregnant women adhered to ART regimen until the viral load dropped to less than 50 copies of HIV. Challenges of ART adherence among sero-positive pregnant women were as follows:

The literacy levels' influence on ART adherence among the sero-positive pregnant women was significant in the following aspects; low education level ($p=0.01$), poor knowledge on condom use ($p=0.004$), selective disclosure ($p=0.003$), poor compliance to ART prescription ($p=0.002$)

and clients having a sense of full recovery ($p=0.009$). Cultural related factors that posed as challenges to ART adherence included; faith healing ($p=0.037$) and stigma ($p= 0.0010$). Hospital related factors included; under-staffing ($p=0.001$), drug side effects ($p= 0.031$), lack of enough space in the hospital ($p=0.001$) and unclear instructions to patients ($p=0.009$). The patient related factors found to influence ART adherence were: alcoholism (AOR=5; CI=3.8-7.0; $p=0.004$), forgetfulness AOR=5; CI=5.0-5.1; $p=0.002$), lack of family support (AOR=3; CI=3.0-5.1; $p=0.037$) and depression (AOR=2; CI=1.9-4.1; $p=0.018$).

Conclusion: There exists other clients' related challenges that affect ART adherence in addition to literacy related challenges, cultural related challenges and hospital related challenges.

Recommendations: There is need to strengthen the health education given to sero-positive pregnant women to optimize the adherence level, destigmatize the patient status as well as the medication they are on.

1.0 CHAPTER ONE

1.1 BACKGROUND INFORMATION

Human immunodeficiency virus (HIV) infection is and continues to be the major public health problem in the world (Avert, 2017), with its related infections as the main cause of death especially in women of child bearing age (Avert, 2016). Sero-positive pregnant women receive anti-retroviral Therapy (ART) during pregnancy to prevent mother-to-child-transmission (MTCT) of HIV (AIDS info, 2017) and this therapy is given in a combined regimen known as Highly Active Antiretroviral Therapy (HAART). The combined therapy is composed of Tenofovir (TDF), lamivudine (3TC) Effavirez (EFV) as the recommended first line therapy in pregnant woman (WHO, 2013) with an aim of reducing transmission to the fetus to as low as possible.

Adherence to ART implies firmly observing HIV regimen and this can be achieved by ensuring that lifelong therapy is practiced (AIDS info,2018). Failure to stick firmly to ART will otherwise leads to countless risks among them transmission to the unborn ones in addition to maternal health compromise.

Optimal adherence to ART is a global challenge among sero-positive pregnant women. These women regardless of their resource settings face challenges of ART adherence such as physical, economical, psychological state, drug abuse and pill burden (Paredes et al., 2013). Developing and developed countries equally encounter some challenges in advocacy for ART adherence and only 72% of sero-positive pregnant women adhere adequately to ART, which is lower than expected for viral load suppression and prevention of drug resistance (Nachega et al, 2012).

Without optimal adherence to ARTs Sustainable Development Goals (SDG 3) health indicators on Maternal Mortality Rate (MMR) and Neonatal Mortality Rate (NMR) may not be realized by 2030.

In Ukraine for example, ART adherence among sero-positive pregnant women was found to be poor at 14% mainly because they fear taking ART, drug side effects and health status of the client like depression (Bailey et al., 2014). On the other hand more than 70% of sero-positive pregnant women adhered adequately to ART in Malawi (Haas et al., 2016) projecting a group of 30% who don't meet the optimal adherence mainly due to age, disease stage and presence of pregnancy itself (Wangia, 2012). These factors can lead to further deterioration of the adherence below 30% if they are not addressed promptly.

Similarly in Nigeria, adherence to ART has been described as a major challenge to achieving the goal and expectations of antiretroviral therapy mainly because of stigma and discrimination, social cultural factors and lack of knowledge about ART (Ekama et al., 2012). Other obvious challenges include lack of knowledge among the clients and the inaccessibility to the health facility (Ebuy et al., 2015). At the same instance it has been found that married women are more likely to get infected with HIV compared to other women in the same country with reasons mainly being that, they are more unlikely to use protections unlike the unmarried women (Adeniyi et al., 2016). Many married women rarely use protection in marriage which in some instances can slow the rate of disease detection and enrollment to care and treatment.

In another research study done in Tanzania found that majority of sero-positive pregnant women reside in urban areas and have advancement in education therefore can afford the paid sex. Similarly women with more than one sexual partner are more likely to be infected with disease

than those with one sexual partner (Singh and Patra, 2015), mainly due to increased risks involved with more than one sexual partner.

In Kenya the challenges of ART adherence level among sero-positive pregnant women have been majorly due to a variety of factors which include educational level, poor channels of communication between the care giver and the client, lack of disclosure among partners, fear of stigma and discrimination plus forgetfulness (Adhiambo, 2016). The disparities in the challenges in this country vary from one geographical region to another. One of the counties in this country with high HIV rate is Murang'a County. It has an overall HIV positivity rate of 3.5% in comparison to Kenyan HIV prevalence index of 6%. The MTCT of HIV rate in this county is 9.3% with a hospital delivery among sero-positive pregnant women at 30% (NASCO 2013).

It therefore begs for the question; what challenges do sero-positive pregnant women in Murang'a county referral hospital commonly face that compromise adherence to ART (NASCO, 2016)? This study sought to determine the challenges to ART adherence among sero positive pregnant women at Maternal and Child Health (MCH) clinic in Murang'a County referral hospital.

1.2 PROBLEM STATEMENT

Much of our effort is directed towards maintaining good health of pregnant women through treatment of maternal underlying conditions but, the intended potential benefits to the fetus may not be realized if challenges influencing ART adherence is not addressed. This problem is complex with various factors playing a central role (Matsui, 2012), and these factors once

handled properly can help in boosting adherence among this needy group. Therefore there is need to team up together and increase our efforts in maternal care and treatment.

Caribbean region for example is second in HIV prevalence after sub-Saharan Africa and experiences challenges to ART adherence among sero-positive pregnant women due to side effects of ART and pregnancy related nausea, socio-economic issues, religious and cultural beliefs, disclosure as well as concern for well being of the children (Vitalis and Hill, 2017). Likewise in Nigeria, a problem of low level of adherence at a rate of 21.7 % was noticed among sero-positive pregnant women. This rate is slightly higher than the rate reported from Zambia of 16.3% (Igwegbe et al., 2010). Over a quarter (26.9%) of all cases of MTCT of HIV in the world happen in Nigeria , and in 2016 just 32% of all pregnant women living with HIV received ART to prevent MTCT and only 34% were tested for HIV in ANC clinics (AVERT 2017)

On the other hand, Tsegaye et al (2016) found out that in Ethiopia the adherence level of ART among sero-positive pregnant women is 87.9%, less than optimal target of more than 95%. This is mainly contributed by many challenges faced by pregnant women in addition to those faced by general population which include nausea, vomiting and caring for their family and children.

Despite critical need of ART in pregnancy due to its important role in viral suppression, evidence based trials to enhance ART adherence in pregnancy is lacking as evidenced by supportive interventions not implemented at scale (Shubber et al., 2016). These interventions are very crucial in addressing adherence and all stakeholders must be aware of if the optimal target of more than 95% is to be achieved.

In Kenya 20-45% of babies born to HIV infected mothers will get infected with HIV through mother to child transmission (MTCT) either in pregnancy, delivery or during breast feeding if no prophylaxis is given. It's estimated that 5-10% of these babies acquire infection in pregnancy

(KAIS, 2014), which calls for the willing players to come together and try to bring this figure down before many lives are lost due to MTCT. A report released recently showed that, by the end of 2015, a total of 751 pregnant women were in need of PMTCT services per year with only 465 among them being linked to PMTCT service in Murang'a County (NASCO, 2016). However, there remains a huge burden of HIV among Kenyan women of reproductive age whereby only 60% of HIV infected women reported to have received ART (Sirengo et al., 2014). This means that 40% of the unborn ones are at greater risk of being infected with HIV before they are born or before they celebrate their first birthday.

Poverty and stigma are the major challenges found to affect adherence in people living with HIV/AIDS in Kenya. People are so poor that they can't afford the essential amenities in life which includes; transport to the health facility, food and treatment of opportunistic infections. Stigma on the other hand drive them away from seeking health services on their doorstep promoting huge expenses incurred in transport and finally affecting ART adherence (Odhiambo, 2016). They do so with a hope that stigma will not follow them only to find that it's a common phenomena to most of the care giving centers.

In another research finding, it has been established that poverty among families of adolescents in Thika Level Five hospital has lead to worsening of HIV infection. Many of them miss ART doses despite receiving counseling before and after ART initiation. The report further indicates that long waiting queues and failure to disclose their HIV status are the major challenges of ART adherence (Kariuki, 2016). This is a big concern that really touches on the health care workers which require immediate attention from the hospital administration and other stake holders.

In the neighboring region of Nyeri County, assessment of challenges influencing ART adherence in Nyeri referral hospital found out that many clients reported being busy, travelling a lot,

forgetfulness and ART side effects as the most common challenges. This finding seems to be a bit different from the ones found in Thika Level Five hospital (Muthiani, 2010), even though both scenarios seem to have the same magnitude of altered ART adherence. This alteration of adherence to less than optimal level will continue to drag great efforts applied towards Sustainable Development Goals (SDG 3) of reducing Maternal and Neonatal mortality rate by the year 2030.

Measures for PMTCT can only be implemented if the sero-positive pregnant women are aware of the dangers of a failed ART adherence. In Murang'a county 75.4% of the women of child bearing age are aware that by taking ART during pregnancy will reduce the risk of MTCT but only 58.8% of all pregnant women in the county do seek HIV counseling and testing. These two rates are lower than the figures projected in other neighbouring counties namely; Kiambu, Kirinyaga, Nyeri and Nyandarua (KDHS, 2014) and this put Murang'a County in a category of regions that challenges of ART adherence needs to be investigated.

Various factors are cited as the main reasons behind low levels of ART adherence among sero-positive pregnant women in Kenya namely; late antenatal clinic commencement, long distance to clinics, insufficient commodity security, lack of disclosure and un-integrated health services (KAIS, NASCOP, 2014). Whether these challenges are the true influencers of ART adherence in this region is a question that the study will prove at the end of the study and therefore the purpose of this study is to determine challenges of ART adherence among sero-positive pregnant women in Murang'a county referral hospital and address these challenges accordingly with an aim of reaching the optimal target of ART adherence of more than 95%

1.3 STUDY JUSTIFICATION

Sub-Saharan Africa has the highest number of people infected with HIV AIDS, with one young woman becoming infected with HIV every minute (UNAIDS, 2012). The region is a home of 92% of HIV positive pregnant women in a report released in 2011 by Joint United Nations Programme on HIV/AIDS during World AIDS Day (Ramjee and Daniels, 2013). This report might have changed to the worse in the current situation mainly due to the prevailing hindrances to ART adherence.

Currently, World Health Organization (WHO) guidelines recommend lifelong Antiretroviral Therapy (ART) for all sero-positive people including pregnant women. In Kenya, challenges of ART adherence and retention to care and treatment among sero-positive pregnant women is undermining the expected results towards the fight against HIV infection (Helova et al., 2017). We therefore have to face these challenges head-on and solve them as quickly as possible so as to achieve the set targets in Sustainable Development Goals (SDG 3) of eradicating disease, strengthening treatment and health care, and addressing the new emerging issues. Currently Kenya is among the countries highly hit by maternal mortality rate which stand at 362 deaths in every 100,000 live births. This can be reduced if these challenges facing ART adherence are addressed well through collaboration with relevant stakeholders. The sero-positive pregnant women are required to take drugs for a life-long to avoid viral mutation and treatment failure. This life-long regime has been enhanced by current introduction of triple therapy with lesser side effects, less frequent dose, less food intake restrictions and more tolerable drugs. Great results are expected from the clients to achieve an adherence level of or above 95% through commitment in ensuring the attendance of antenatal clinics, HIV testing as well as enrollment of newly diagnosed HIV positive pregnant women into care and treatment (National AIDS Control

Council of Kenya, 2014). Surprisingly, this has not been the case according to the data released recently on ART enrollment and retention to care and treatment. It is estimated that in 2015, only 59,000 (74%) women were offered PMTCT services out of a targeted figure of 79000 who were eligible (UNAIDS, 2016). This is lower than 86% coverage which was achieved in 2010 indicating a huge gap in adherence level of ART among sero-positive pregnant women (National AIDS Control Council of Kenya, 2014). It's so worrying to see that this trend is heading to the wrong direction as the time goes by depicting worse results ahead.

In another report shared on ART enrollment and retention to care and treatment, it revealed that even though 90.2% of pregnant women attended ANC clinic and identified for ART enrollment before third trimester, 58% of all women went to delivery without retest. This is against the Kenyan policy adopted in 2012 directing that there should be retesting of pregnant women every three months after the initial negative HIV testing. This point out to challenges in ART adherence among sero-positive pregnant women that hinder them from clinic follow-up and later ART adherence (Rogers Anna J et al., 2017). Health institutions should therefore scale-up the exercise of re-testing the mothers before they reach their expected date of deliveries. By so doing will help in identifying sero-positive women who might be HIV negative in their first ANC visit but converted in their last trimesters.

The fight against HIV infection has not stopped there and more efforts are geared towards improving for the better. In 2016, Kenya became the second country in sub-Saharan region to issue full regulatory approval of pre-exposure prophylaxis (PrEP). Clinical trials are being done on women with anticipation of better results and reducing the challenges of ART adherence to as low level as possible (UNAIDS 2016), but this is not clear because there exists little information

on the exact level of ART adherence among sero-positive pregnant women and the challenges influencing ART adherence in poor resource settings. Additionally few research findings are available concerning challenges of ART adherence among sero-positive pregnant women in Murang'a County Referral Hospital in Kenya. It is worth noting also that unless research is done in this county the true picture of challenges to ART adherence will remain in darkness.

The purpose of this study therefore is, to determine challenges of ART adherence among sero-positive pregnant women in Murang'a county referral hospital. Addressing these very challenges may lead to increased linkage, retention to course of treatment and ART adherence among sero-positive pregnant women and further contribute towards elimination of mother-to-child transmission while improving maternal and child health.

1.4 STUDY OBJECTIVES

1.4.1 Broad objective

To determine factors that influence ART adherence among sero-positive pregnant women at Maternal and Child Health (MCH) clinic in Murang'a County Referral Hospital.

1.4.2 Specific objectives

1. To evaluate the literacy level's influence on ART adherence among sero-positive pregnant women at Maternal and Child Health (MCH) clinic in Murang'a County Referral Hospital
2. To establish culture related factors that influence ART adherence among sero-positive pregnant women at Maternal and Child Health (MCH) in Murang'a County Referral Hospital.

3. To determine hospital related factors that influence ART adherence among sero-positive pregnant women at Maternal and Child Health (MCH) clinic in Murang'a County Referral Hospital.

1.5 RESEARCH QUESTIONS

1. How does the literacy level influence ART adherence among sero-positive pregnant women at Maternal and Child Health (MCH) clinic in Murang'a county referral hospital?

3. What are the cultural related factors that influence ART adherence among sero-positive pregnant women at Maternal and Child Health (MCH) clinic in Murang'a county referral hospital?

3. What are the hospital related challenges that influence ART adherence among sero-positive pregnant women at Maternal and Child Health (MCH) clinic in Murang'a county referral hospital?

1.6 SIGNIFICANCE OF THE STUDY

This study will be a significant endeavor in addressing challenges of ART adherence among sero-positive pregnant women and how they can be avoided to promote ART adherence and improving quality of life of pregnant women. The study will also be beneficial to students and their instructors in nursing research when they employ effective learning in their study environment particularly in handling concepts of HIV/AIDS transmission and prevention among antenatal mothers.

Moreover, this research will provide recommendations of how to describe challenges in ART adherence for an appropriate action to be taken. It will also serve as a future reference for researchers on the subject of challenges of ART adherence and more importantly, this research

work will be used by policy makers to formulate new policies in regards to HIV/AIDS transmission and prevention. Finally this study will enable the investigator to venture into more researchable areas and utilize the knowledge and skills gained after a successful research study.

1.7 HYPOTHESIS

There is no relationship between literacy level and ART adherence among sero-positive pregnant women at Maternal and Child Health (MCH) clinic in Murang'a County Referral Hospital.

There is no significant difference between cultural related challenges and ART adherence among sero-positive pregnant women at Maternal and Child Health (MCH) in Murang'a county referral hospital.

1.8 CONCEPTUAL FRAMEWORK

Conceptual framework outlined the patient's related factors as well as the hospital related factors that influence ART adherence among sero positive pregnant women. These factors were assessed by asking the clients the factors that hindered them from attending and taking the ART as directed. Availability of visiting cards was checked with the correct return dates well indicated and confirmation of information with the guardian. Pill count was also done to confirm the pattern of taking the ART in relation to the number of days she has been on ART in that particular period. Additionally the patient file was also checked for viral load results and comparison made with the current patient health status.

To evaluate the literacy related challenges that influence the ART adherence, the researcher assessed the literacy level of sero-positive pregnant women in relation to HIV transmission, treatment, prevention and the importance that comes along with taking ART, additionally those

that were found unable to answer three literacy questions correctly were regarded as having challenges to adherence.

To determine the culture related factors that influence ART adherence the researcher looked at traditions and cultural practices that influence ART adherence. This culture related challenges were mostly explained by the clients and they value them very much.

To determine hospital related factors that influence ART adherence, the researcher sought to know the challenges within the hospital set-up that influence the patterns of ART adherence.

These challenges have a direct impact on ART adherence among sero-positive pregnant women and can be handled by addressing these key points. The study investigated the above variables in order to identify challenges to ART adherence in the Kenyan set-up.

INDEPENDENT VARIABLES

1. Literacy related factors that influence ART adherence

- Literacy level
- HIV transmission ,prevention
- Importance of PMTCT

2. Cultural related factors that influence ART adherence among sero-positive pregnant women

- Faith healing
- Traditional medicine
- Witch crafts

3. Hospital related challenges that influence ART adherence among sero-positive pregnant women

- Long distance to hospitals
- Lack of health facilities
- Prolonged waiting time
- Lack of enough health workers
- Poor inter-personal relationship

INTERVENING VARIABLE

Government policies and guidelines

DEPENDENT VARIABLE

Adherence to ART

OUTCOME

- Reduction in maternal mortality
- Reduction in neonatal mortality
- Increased ART adherence
- Increased clinic attendance
- Improved general health of sero-positive pregnant women

Figure1.1: CONCEPTUAL FRAMEWORK

1.9 THEORETICAL FRAMEWORK

A theory is a set of organized principles that explain and guide an analysis. A theoretical framework was used in guiding the entire process of research study. This study utilized Health Belief Model (HBM) which was developed by social psychologists Hochbaum, Rosenstock and Kegels in 1950s. This is a psychological model that tries to explain and predict the health behaviors by focusing on attitude and belief of people. HBM has been adopted to explore a variety of long-term and short –term health behaviors of people which include sexual risks behaviors and transmission of HIV/AIDS disease.

The HBM is based on the belief that the person will take certain health related action like use of condoms and taking ART if the person feels that a negative health problem like HIV/AIDS can be avoided. The person has a positive expectation that by applying a recommended action he/she avoid negative health problem; in this case use of condom to prevent HIV disease (Glanz et al, 2002).

HBM is used in Public Health Service so that people can understand their failure to adopt disease prevention mechanisms or screening tests for early disease detection and management. It can also be used for peoples' response to signs and symptoms and treatment adherence. This model has six constructs namely; Perceived susceptibility where the person perceives the risk of acquiring a disease and she is vulnerable to that illness, perceived severity which are the person's feelings on the seriousness of the disease that can cause death or suffering to significant others, Perceived benefits which is the person's perception on the effectiveness of numerous available actions to control the disease. The course of action taken by the individual depends on the severity and she accept the health action if perceived to be beneficial. Another construct is perceived barriers which are the personal feelings or hindrances to perform the health action as

recommended. She considers whether the action is expensive, dangerous, time consuming or unpleasant. Cue of action is the force needed to trigger the decision making to take up the recommended health action. The influence can be internal like fever or external like advice from spouse while Self-efficacy is the person's confidence to be able to perform the behavior. It outlines whether the person performs the expected behavior.

An optimal adherence was expected among sero-positive pregnant women. The belief that if one took ART as recommended helped to control the infection, lead to change of behaviors and promote ART adherence among sero-positive pregnant women. By evaluating the expected good results due to ART treatment, the client became motivated and adherence is improved. The patient perceived the element of susceptibility and took necessary measure of seeking HIV testing in the health facility. Upon realizing that she is infected, the patient considered taking the recommended health action to avoid the disease becoming severe.

Regarding the clinic attendance, the sero-positive pregnant woman perceived the benefits of attending the clinic as required and this enabled her reduce the severity of the condition through drug refill and health assessment by the care giver. Factors that hindered clinic attendance like cost and long distance were considered as perceived barriers. Others include the cultural factors like traditional medicine, role of women in the family as well as lack of disclosure to avoid divorce. The patients tried to overcome them by accepting that ART adherence is crucial in disease control.

The force from relatives and friends to attend clinic and to take medication as prescribed helped in promoting adherence. This perceived cue changed the behavior of the patient and improved health status. After establishing ART adherence and realizing the benefits it brings to one's health, the confidence was built and the patient could perform every task by herself.

In this study the researcher adopted the Health Belief Model that enabled the sero-positive pregnant women observe the six concepts and improve on ART adherence which in-turn prevented mother-to-child transmission.

2.0 CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

HIV continues to be the major public health problem in the world. Great developments have been seen in recent years in an effort to control and halt the HIV/AIDS epidemic and advocacy on ART adherence; however many people have lost their lives especially those from sub-Saharan Africa (UNAIDS, 2015), mainly due to the high rate at which this infection is spreading.

East Africa and South Africa experience the greatest challenge of HIV infection among other countries in the sub-Saharan region. Despite political and financial commitment towards fighting HIV/AIDS, many of these countries Kenya being one of them, rely on donor support in the fight against this epidemic (Avert, 2017). Kenya has proven its commitment in HIV prevention though many people living with the disease face challenges of stigma and discrimination which hinder them from seeking HIV health services. Women are among the group of people highly hit by this menace (Kenya National Bureau of Statistics, 2015) and in return they end up infecting their unborn ones or immediately born neonates.

The virus that causes HIV infection attacks and destroys the disease fighting cells well known as CD4 cells that belong to the immune system. After the loss of the CD4 cells it becomes very hard for the body to fight many diseases and cancers. The main mode of transmission is through body fluids from an infected person. The major ones are; blood, semen, vaginal fluids, anal fluids, breast milk and pre-seminal fluids. MTCT remains the main mode of transmission from mother to children either in pregnancy, during birth or breastfeeding. ARVS only helps in prolonging the life and making the lives of patients healthier. The disease presents itself as early as 2-4 weeks with signs of flu-like symptoms which can last for few weeks then complicates to

more severe symptoms of HIV infection (WHO|HIV /AIDS, 2017). At this early period, the disease is highly infectious and undetectable by usual antibody antigen reaction titers till three months elapse.

The risks of transmitting the disease to the unborn ones are reduced if the mother remains as healthy as possible and on ARV drugs. Various factors increases the chances of transmission which include; smoking, substance abuse, vitamin A deficiency, malnutrition, infections like Sexually Transmitted Diseases (STDs), disease progression, labor and childbirth factors like mixed feeding. HIV rarely crosses the placenta though some factors can facilitate its penetration. These include; intra-uterine infections, recent HIV infection, advancement of the disease and malnutrition (American Pregnancy Association, 2012). However it is believed that if a mother is enrolled early for care and treatment these factors are reduced to the lowest level of cross transmission to the fetus.

The first case of HIV in Kenya was reported in 1984 and by 1990s the disease had spread to so many parts becoming one of the major causes of mortality in the country. With the introduction of HIV treatment and care, the prevalence has fallen from 10.5% in 1996 to 5.9% in 2015 (National AIDS Control Council, 2015). Still women between ages 15-64years have higher prevalence than their male counterparts who are 4.4%, though the prevalence of adults aged 50-59years continues to remain high at 8.9% (KAIS, 2014). This ever rising figure is alarming and even though majority of these adults have passed their reproductive age, there is need to ask ourselves the question why this is happening.

2.2 Literacy level's influence on ART adherence among sero-positive pregnant women

Lack of adequate knowledge about HIV infection, transmission and prevention has lead to increased challenges of ART adherence among sero-positive pregnant women in the world. It is

believed that the more educated a person is the more understanding has hence able to see the essence of drug adherence for her or his own good. Various regions in the world have expressed different outcomes when literacy is weighed against ART adherence. In India MTCT will only be controlled if effective awareness is done which in turn lead to increased acceptability and accessibility. It was found that 72% of the study sample didn't have knowledge that HIV transmission occurs during vaginal delivery while half of them were not aware that transmission could occur during pregnancy(Sagili et al., 2015). These finding therefore indicate a knowledge gap in this population which if closed would help in improving ART adherence.

In other parts of the world like western hemisphere many countries in Europe operate on an agreed policies and guidelines. It's evident that health care workers adhere to policies and guidelines. Lack of knowledge, awareness and fear of offending the sero-positive pregnant women will affect health care providers' ability to translate a recommendation to practice. This in turn can lead to increased challenges of ART adherence. In one of the countries; Spain, about 68% of the pregnant women declared having had a HIV test while only a quarter of interviewees thought that they had received enough information about the test(Deblonde et al., 2007). This report was established about a decade ago but is not so different from other parts of the world like Africa in the current trends, whereby adherence to ART in sub-saharan Africa is alarming due to the large group of sero-positive pregnant women found in this region. Research findings have found that poor knowledge of HIV infection, MTCT and ART regimen in addition to lower maternal education are the key factors hindering ART adherence (Gourlay et al., 2013). The comparison between Sub-Saharan Africa and Spain is a sure indication that no region is perfect in matters of ART adherence and therefore there is need for a combined effort in all parts of the world. Back in Africa different countries have almost the same picture but varying statistical

findings. A report from South Africa indicated that there is little knowledge about the need to use condoms by sero-positive pregnant women. Many of them don't see the importance of protected sex simply because there is no need of pregnancy prevention. An alarming number of them seroconvert by 32 weeks of gestational period portraying a gender based power dynamics and limitation in safe sex negotiations (Jones et al., 2013). Additionally in the same country, it has been found that lower educational level is associated with low socio-economic status that can probably contribute to the spread of HIV infection among pregnant women. The study goes further to reveal that binge alcohol consumption and addiction play a bigger role in increased risk of HIV infection among young pregnant women below 25 year of age. This is because the homemade alcohol is a form of economic activity which offer the product at affordable prices (Businge et al., 2016). Further study done in Eastern Cape revealed that smoking, young age, women with unplanned pregnancy, alcohol use in pregnancy, early booking of ANC clinic and non-disclosure of individual sero-status to partners and family members as compromisers of ART adherence. In addition to that, forgetfulness was the most reported reason for poor adherence to ART, though the underlying reasons for forgetting were not investigated (Adeniyi et al., 2018). South Africa just like any other country in Sub-Saharan Africa is facing a huge challenge of ART adherence, irrespective of its bigger economic capability with more resources channeled towards prevention of MTCT. These calls for more commitment to establish whether the factors listed above are the real challenges or there are other existing factors.

In another region of West Africa the knowledge level which include understanding the origin, transmission, prevention and the complications of HIV infection are the challenges of ART adherence among sero-positive pregnant women in Ghana. However, some of these women believe that HIV is transmitted through spiritual means of witchcraft leading them to look for

alternative means of treatment and control. In comparison with the social and cultural factors which both revealed a 50-70% hindrance to ART adherence, the general view found out that knowledge level has lower impact on ART adherence compared to the other two factors(Boateng et al., 2013).This means that irrespective of the educational level of the people of Ghana there is intense awareness in the public of the need to adhere to ART, but the fight must be directed more on cultural beliefs and traditions.

The sense of feeling better by the patients will lead to a failed ART adherence among pregnant women. This is mainly observed when the treatment is started early before any clinical complain is raised or when patients have regained their healthy status after a good spell of drug adherence. This was observed in Malawi in a study trying to identify the bleachers of ART adherence (Haas et al., 2016). This scenario can lead to the answer that the ART is very effective in improving the health status of the people if commenced early and optimally adhered to.

In eastern African region various factors have contributed to failure of the sero-positive mothers to gain knowledge in ART adherence. In a research study done in Kenya found out that, stigma due to HIV/AIDS and gender imbalance are responsible for reduced ART adherence in sero-positive pregnant women (Murithi, 2013). Lack of comprehensive knowledge about HIV/AIDS in 28% of the women in reproductive age in Murang'a County has lead to low adherence to ART. This portion (28%) of women in reproductive age are not aware that, by taking ART in pregnancy will help in reducing HIV transmission to the fetus. Sero-positive pregnant women needs to know the need for taking ART, use of condoms and clinic follow-up which in this case are great challenge in the county (KDHS, 2014). Unless much effort is applied in the fight to combat these challenges influencing ART adherence, the battle might be lost in the future with that figure increasing to more than 28%.

Technology and knowledge go hand in hand. In other instances in Nyanza region of Kenya, the awareness of appreciating the need to have mobile phones and getting connected with proper internet coverage has facilitated communication between the community health workers and sero-positive pregnant women. This has in turn ensured a reduction in vertical transmission of HIV infection to babies. Its worthy noting that those women who are reminded of their clinic dates are more likely to attend the recommended four ANC clinics (Mushamiri et al., 2015). It is by attending these ANC visits that counseling is done and importance of adherence emphasized which finally helps to address the challenges of ART adherence.

2.3 Culture related factors that influence ART adherence among sero-positive pregnant women

People from different races in the world value and preserve numerous myths and cultural beliefs which enable them to stay united and in harmony. Likewise there exist myths related to HIV infection which include: HIV is a death sentence, sero-positive women can't bear children, HIV negative should not use condoms and HIV always leads to AIDS. This is not true because by taking antiretroviral drugs one is able to prolong life, live long with no complications and give birth to HIV free children. Furthermore by using condoms, an individual will protect herself from this infection since is detectable after three months using antigen antibody reaction(Murrell et al., 2018). Different cultural beliefs will influence adherence differently according to the way people concerned perceive it. Some will promote adherence while others will challenge it putting the individuals at a tricky position of following hospital guidelines.

In the world also there exist laws and rights that govern citizens of different countries. In most cases sero-positive pregnant women face stigma, discrimination and violations of their human rights from the community members, and this influence ART adherence (UNAIDS 2014). The

culture of violence against young girls and women increases the dangers of acquiring HIV infection with 45% of girls reporting having been forced to their first sexual debut in South Africa (UNAIDS, 2018). This social, physical and moral violence are not only risky in acquiring HIV infection but also make it hard for the victims to open up and accept strict adherence to ART whenever such incidences happen.

Similarly relationship between sero-positive pregnant women with their significant others and the community as a whole will determine the degree of adherence. In china women have fewer opportunities to openly express their true opinions to their partners and family members leaving a small room for disclosure. Traditional Chinese culture has facilitated lack of positive communication which has negative effect on adherence. About 49% of the women don't disclose their HIV status to their spouses whenever they realize that they are infected with the disease. This hinders ART compliance as well as communication between them (Qiao et al., 2016). This is a violation of one's right to prevent her from self expression which could otherwise help in addressing challenges of ART adherence and finally improve their health status.

In another instances, Sub-saharan Africa has the highest number of sero-positive pregnant women with a wide range of cultural differences. Many of these women fear attending ART clinics to avoid stigma that come along with taking ARVs. They refrain from discussing the issues of HIV transmission and rarely disclose their status to family members and the community (Hodgson et al., 2014a). This vice of stigma can only be wiped off if these women are supported and be helped to overcome it by members of the society. There is obvious fear from the community to associate freely with infected victims due to the pre-existing cultural norms and these norms need to be discouraged for adherence to improve.

In a study done in Zimbabwe Hodgson et al (2014b) found that, by belonging to a religion that encourages the practice of traditional medicine in pregnancy will hinder ANC visits and subsequently ART adherence. This study concurs with one done in United States that showed that alcoholism and tobacco use will affect adherence negatively.

Closer to the United States is the region of South America which is second in HIV incidences behind sub-saharan Africa. Studies have shown that cultural behaviors of selective disclosure among sero-positive pregnant women are the real challenges of ART adherence. Only the individuals close to the client like sexual partner get to know her HIV status but not family members, friends and religious leaders (Tam et al., 2015). This will lock away moral and financial support from other family members which can help to improve ART adherence.

In Nigeria stigma and discrimination are the major deterrents of HIV counseling, testing and ART adherence. They impede disclosure among sero-positive pregnant women leading to ART clinic fall out and compromised ART adherence. There is need to integrate HIV testing with other prenatal tests so as to avoid HIV only test approach among pregnant women (Iwelunmor et al., 2014). According to a medical practitioner who was interviewed in Nigeria on barriers towards seeking HIV services, he outlined harmful cultural practices such as home deliveries by poorly skilled birth attendants, lack of information on HIV transmission and poverty as the main hindrances. This leads to only 13% of all pregnant women seeking HIV testing and enrollment on care and treatment (Avert, 2016). These cultural practices will not only continue to hinder ART adherence but will drastically results to increased infant and maternal mortality in Nigeria.

According to Tsb and Sks (2017) different regions in the world have different cultural beliefs and practices. This culture diversity also has a direct influence on ART adherence. In Swaziland for example, the culture of stigma to sero-positive pregnant women is evident which make them

shy away from seeking HIV care and treatment. Additionally some patients have reported to have opted not to disclose their status leading to hiding of the medications and consequently affecting ART adherence and development of other complications.

Challenges of adherence can also be expressed as fear of negative results which can result in divorce and domestic violence against pregnant women. This is a behavior observed among sero-positive pregnant women and which delays the process of HIV testing and counseling, and access to PMTCT services in Uganda. Sero-positive pregnant women have mastered the behavior of keeping information under cover with the intention that their status will never be known. For those who disclose their status they do so to their partners who assist them to attend clinic as well as reminding them of clinic dates. Close to 83.8% are reported to trust their partners and mothers with this information than to their fathers and brothers. Those who have reminders reported to have good adherence to ART than those without any form of a reminder (Naigino et al., 2017). If fear is addressed well then this practice of selective disclosure will end and adherence improve to the better among sero-status pregnant women.

In the Kenyan set-up couple counseling has been on high alert among sero-positive pregnant women. In an interview done on the same, it revealed that fear of abuse, disharmony in the relationship and the stigma as the cultural hindrances to disclosure among pregnant women. Many participants were not comfortable when their HIV status was disclosed to their partners by the health care giver. In this case couple testing was most preferred mainly because it gave an opportunity to remove the burden of disclosure on any individual so no one was to blame for infecting the other partner (Walcott et al., 2013). Further studies have continued to expose the cultural practices that put women of reproductive age at risk of contracting HIV infection.

These cultures are harmful and a challenge to ART adherence. In the case of Female genital mutilation (FGM), it is known to be one of those outdated practices which are still practiced among the communities in Kenya like, the Maasai and the Meru. Young girls are forced to undergo this culturally accepted practice in their communities and immediately they are healed are forced into early marriages. It is through this early marriage that these girls are exposed to teenage pregnancy and increased risk of HIV infection mainly due to polygamous marriages. Many of these girls don't continue with their studies and may not understand the reason of ART adherence during antenatal clinics(Avert, 2015). At the time of delivery, it becomes even worse for these women to deliver normally due to trauma on their reproductive organs. In another region of central Kenya at Murang'a County there has been a campaign for reduced stigma and discrimination among sero-positive pregnant women. There are reports indicating that only 30% of both men and women are willing to accommodate women with need for PMTCT services. This has reduced the level of adherence to ART among sero-positive women as well as the failure to disclose their HIV status (NASCOP, 2016).If stigma against sero-positive women can be eliminated the chances are, the level of ART adherence will go up, more women will be enrolled to care and treatment and more children will celebrate their first birthday free of HIV infection.

2.4 The hospital related factors that influence ART adherence among sero-positive pregnant women

2.4.1 Viral load and pill count factors

Viral load suppression has been a gold standard in determining the ART adherence levels among sero-positive pregnant women. Virologic suppression rates exceeding 95% indicate an excellent retention in care and treatment and these clients are encouraged to remain adherent. Measuring viral load and sharing the results with the clients helps the pregnant women to observe clinic follow-up as well as improving ART adherence (Jain et al., 2014). By monitoring viral load suppression levels among sero-positive pregnant women, will not only help to determine the adherence levels but also will carry a unique potential benefits for maternal, child and family members. Viral load suppression results to decreased morbidity and mortality among sero-positive individuals. Various factors are pointed out as the challenges of ART adherence like ART side effects and pill burden which latter will be projected by escalating viral load (Myer et al., 2017). These factors can be many and apart from high viral load the individuals will have poor health and reduced productivity.

On the other hand, pill count of ARTs is being used in poor resource settings to determine the adherence levels. In Tanzania the adherence level was determined by counting the pills and measurements taken at four time points in one year follow-up. The mean for the four time points was considered and the subsequent analysis done which in-turn determine the level of adherence. For the patients who were newly recruited into the follow-up it was hard to determine the viral load and so questions regarding missing of pills either one or two consecutively was regarded as compromised ART adherence (Sangeda et al., 2014). Here in Kenya, clinician ART initiated pill count analysis revealed a strong association between the number of pill counts done and ART adherence. Adherence support is done in one of the big hospital in Kenya; Kijabe Mission Hospital which incorporate both home visits, pharmacy counseling and pill count which

subsequently has resulted to ART adherence(Achieng et al., 2013). But there are other undetermined thoughts whether pill count really measure adherence. It is through realizing the challenges of adherence that we can be able to support pill count as a good measure especially when combined with viral load analysis.

2.4. Other hospital related factors that influence ART adherence among sero-positive pregnant women

Sero-positive pregnant women face many setbacks during their clinic attendance; among them is stigma in healthcare settings. In countries like Mexico, women report direct abuse from healthcare workers promoting increase in clinic defaulting (Avert, 2015). Countries with appropriate measures for HIV prevention have noticeable gaps when pregnant women visit health facilities seeking HIV services. In a survey done on barriers towards HIV prevention in western and central Europe and North America it revealed that social barriers like sexual harassment, abuse and rape, language barrier and marginalization especially in female migrants are the main contributors (Avert 2016). Additionally country and clinic resources do play part in promotion of PMTCT services. In countries with poor resource settings, inadequate PMTCT personnel, interruptions in care giving and less resources plus shortfall in counseling procedures will lead to long waiting times hence many women go home without receiving the very important care (UNAIDS 2013). These are challenges that demand for good working systems in the institutions so that a smooth flow of events can be established. Once the systems are in order it becomes easy to use the available resources to address the issue of ART adherence. In other countries like Brazil, great strides on PMTCT have been made with much emphasize in

addressing the prevailing challenges. Despite this notable effort especially in creating awareness and educating sero-positive women, there exists a problem of inaccessibility to health care facilities. This in turn leads to disruption of hospital appointments and finally interruption in ART adherence (Araujo et al., 2014). There is need for the government to be fully concerned with this challenge because many patients are financially hand-capped and cannot afford to pay extra cost to access the health facilities.

Patients who really follow hospital guidelines on ART clinic may at times feel completely healed and end-up skipping the clinic dates. In cape-town South Africa for example, it was found that a sense of feeling healthy due to frequent follow-ups given to the clients, are the major challenges faced by the sero-positive pregnant women that influence ART adherence (Kolelwa, 2013). By skipping the clinic, this will lead to altered medication which in-turn give room for the multiplication of the viruses. Many will eventually find themselves rushing to hospitals when their condition deteriorates to almost dying.

In some instances sero-positive pregnant women are required to travel long distance to seek HIV care and treatment. Gabon in Western Africa released a report that revealed that these women could travel several kilometers to reach a health facility of their choice. This in-turn has negative effects on ART adherence when done repeatedly. Poor citizens have no choice but to travel these long distances especially when the near facilities are not friendly (Janssen et al., 2015). They do so trying to avoid the existing stigma in these health facilities not knowing that they will have to face more challenges whenever they decide to travel to seek medication.

On the other hand many women may not be willing to visit health facilities for ART services as ordered. In Uganda, the sero-positive pregnant women face high levels of discrimination mostly from the health care workers. Stigma is so pronounced that other clients who are not infected

with HIV disease get served first before the infected ones. Additionally they receive negative messages about being pregnant and discouraged from reproducing (Ashaba et al., 2017). If the health facilities can observe good interpersonal relationship with the clients then stigma in this country can reduce and ART adherence can improve remarkably.

In the same note clinic drop-out and reduced ART adherence in the same country has been associated with under stocking of health facilities, longer waiting time and long distances covered by the rural dwellers. These challenges are so evident that they lower ART adherence greatly among sero-positive pregnant women (Muhumuza et al., 2017). It is so demoralizing to find that patients can travel long distances only to find no drugs in the hospital. This challenge is a double blow in the fight against poor adherence which requires combined efforts from all sides of good will.

A comparison study done in Uganda and Malawi, established that long waiting time, lack of support from husbands as advocated by the hospital administration, negative treatment from health care workers and side effects to ART are the major influencers of ART adherence (Flax et al., 2017). This report concurred with another one that reported that long distances to be travelled, low quality HIV services due to stigma and lack of male partner support will lead to defaulting clinic dates and only come back to the clinic when they become very ill (UNICEF, n.d). Consequently there is great challenge of dropping the newly enrolled patients from care and treatment along PMTCT process. This finding in Tanzania went on to reveal that this challenge of ART adherence is witnessed where same day diagnosis and enrollment are done at the same time hence the need for pregnant women to be given enough time to make up their mind on the benefits of ART adherence (Gamell et al., 2017). It's always important to consider that

counseling before treatment is paramount and will help to prepare the patient for a lifelong therapy where adherence counts a lot.

Kenya has been on the forefront in the campaign of free counseling and testing of pregnant women during their ANC visits. However some hospital related challenges have been noticed as the challenges of ART adherence among sero-positive pregnant women.

In western Kenyan region for example, knowledge gaps among health care providers, staff and drug shortage, long queues and space limitations as well as scolding of patients for lack of retention and adherence are the major challenges of ART adherence (Helova et al., 2017). The health care givers have a role to play in ensuring that patients are comfortable whenever they come for treatment and guide them towards drug adherence without malice or prejudice. Otherwise it will be very sad to know that they are failing in their roles as health care workers.

Similarly other factors have been indentified to obstruct ART adherence in other parts of Kenyan region. In Murang'a County, the educational level is low hence the need to educate the pregnant women on HIV care and treatment. Many of the pregnant women lack the literature about PMTCT despite having visited the ANC clinics more than one times. This is mainly due to inadequate health messages given by the health workers. Some of them engage in alcoholism leading to failed clinic dates and in-turn interfere with the patterns of ART adherence (CHS, 2015). Much education is needed among the sero-positive women so as to be informed of the dangers that come alone with failed treatment.

Additionally in a report on major drivers of new HIV infections in this county under the title SWOT (Strength, Weakness, Opportunities and Threats) analysis, revealed countable challenges in ART adherence which include; knowledge gaps, lack of capacity to conduct comprehensive HIV issues, limited financial resources for HIV programming, lack of water tight mechanisms of

linkages and low uptake of ANC services (MCASP, 2015). If the ANC linkages can be improved and proper capacity building done then these challenges can be the thing of the past and good results can be witnessed among sero-positive pregnant women.

3.0 CHAPTER THREE: MATERIALS AND METHODS

3.1 Introduction

This chapter expounds the methodology used in this study which include; the research site, study design, study population, research tools, sampling procedures, pre-testing, data collection, data management, data analysis and presentation. The challenges found in the field and how to avoid them plus ethical considerations are similarly described here.

3.2 Study Design

The study utilized analytical cross-sectional design that collected data at a point and used both qualitative and quantitative methods. It incorporated retrospective review of clients' daily attendance record book, and abstracted patients viral load suppression levels and objectively analyzed ART adherence among sero-positive pregnant women in Murang'a county referral hospital. Additionally any information concerning pill refill was noted and analyzed as well.

3.3 Study Site

In Mt. Kenya region the researcher found seven counties namely; Kiambu, Murang'a, Nyeri, Kirinyaga, Laikipia, Nyandarua and Embu. These Counties do share same geographical and social factors that determine the health status of their residents. Among these counties, Murang'a has the highest HIV prevalence of 4.2% with other counties recording a range between 2.9-3.7% (NASCO, 2016). The study was carried out at Murang'a County Referral Hospital, MCH Clinic. The hospital is located in Township location, Kiharu Constituency, Murang'a County and it is approximately 400m from Murang'a Town just next to Medical Training College (MTC) Murang'a Campus. It is the regional County referral hospital and serves other neighbouring

counties namely; Kirinyaga, Embu and Machakos. It has a bed capacity of 270 and 58 baby cots in New Born Unit. Currently the hospital has 199 clients in need of PMTCT services; those include both pregnant women and those who have given birth and on follow-up. The hospital attends to an average of two sero-positive pregnant women each day and an average of 60 Antenatal clinic (ANC) clients attending the clinic each day irrespective of their HIV status (ANC attendance record book, 2018).

The hospital enjoys the services of 60 doctors both qualified and in internship and 294 nurses. Other cadres are determined by the magnitude of the work and the demands from the patients at a given time. Services offered in the hospital includes; Out Patient Services, medical, surgical, paediatric, maternity, newborn care, family planning, Comprehensive Care Centre (CCC) services for HIV/AIDS cases, Maternal and Child Health (MCH) service, laboratory services, Critical Care Services, rehabilitation and many more. The hospital has a client flow of 600-800 clients per day.

The MCH clinic is run by collaborative work of County Government of Murang'a and HIV Care and Treatment program funded by Center for Health Solutions (CHS). The MCH services are offered from Monday to Friday starting eight in the morning to five in the evening. Various health services are offered in this department which includes immunization, family planning, ANC and Postnatal clinic (PNC) services, child welfare clinic services, treatment of minor illnesses and PMTCT services all under one roof. MCH department is next to casualty department with a good and spacious waiting bay for clients. It has several rooms conducive for learning environment for the students who acquire their clinical experience in this department. Generalized health education is conducted in the morning before other services are offered and then individualized health talk done in respective rooms according to the needs of the clients.

There is recommendable privacy to the clients with one client receiving the service at any given moment.

MCH clinic client flow is 60 on average in each day and is served by two doctors, nine nurses, four clinical officers, three peer educators and three mentor mothers (KHCP, 2016).

3.4 Study population

The study population was all sero-positive pregnant women attending Maternal and Child Health (MCH) clinic and two administrative health care workers with vast clinical experience on PMTCT services and working in MCH department. These included; the doctor and nurse in-charge of the department. They contributed mainly on information touching on hospital related factors that influenced ART adherence among sero-positive pregnant women at MCH department.

3.5 Inclusion criteria

- All consenting sero-positive pregnant women evidenced on the ANC record book.
- All sero-positive pregnant women on ART.
- Doctor and Nurse in-charge of the MCH department purposively selected from the department

3.6. Exclusion criteria

- Non-consenting sero-positive pregnant women

3.6. Sample size Determination

No sampling was done since the investigator employed census method.

In this type, all sero-positive pregnant women formed part of sample population since **the n-value is 59**. The inclusion of all sero-positive pregnant women in the study helped to eliminate sampling error and provide data on all the individuals in the population.

3.7 Sampling Method

No sampling was done since census method was used in this study.

Each clinic day was used as a research day until the study was over, and the clients were selected as they came into the clinic.

The clients were then informed of the research exercise, the main objective of the study, how long it would take as well as its benefits to the clients; and only sero-positive pregnant women who were willing to consent took part in the study.

All those who were willing to take part in the study were allowed to receive the health services they needed then redirected where to sit comfortably and taken through the consent forms, signed them and finally formed the sample population. The MCH unit nurse in-charge and the doctor in-charge were purposively selected for in-depth interview due to the working experience possessed and ability to access more information concerning the whole unit.

3.8 Data collection instruments

The researcher exercised three methods of data collection so as to obtain detailed and richer information. The interviewer-administered questionnaire was used on sero-positive pregnant women who met the inclusion criteria. The interviewer administered questionnaire enabled the researcher to obtain quantitative data first then used qualitative strategies to look deeper into the meaning of the trends identified in the numerical data.

A one-on-one in-depth interview using an interview-guide was utilized to obtain detailed information. In this research study, the participants were the MCH unit nurse in-charge and

doctor in-charge who were probed for ideas about the challenges of ART adherence among seropositive pregnant women. The data was recorded using an audio recorder and in written notes.

A data sheet was incorporated in retrospective review of clients' viral load results and information concerning drug refill report.

3.9 Pre-testing

It involves testing the research tools in conditions as similar in characteristics as possible to the research area. In this case the researcher carried-out the pre-testing process in Kigumo Sub-county Hospital which is in Murang'a County and has the participants with similar characteristics as those in Murang'a County Referral Hospital. The research assistant also assisted in this process and ten percent of the study population took part in pre-test after having been selected using simple random sampling method. In-depth interview was carried out with the MCH unit nurse in-charge and the overall doctor in-charge. The aim of the pre-test was to check for validity and reliability study. At the end of pre-test the tools of data collection were checked one at a time. In the case of a questionnaire, the questions found difficult to answer were rephrased and those found so obvious reconstructed. The voice recorder was assessed if it would capture all the details expected and volume adjusted whenever necessary.

3.10 Research Assistant

A nursing officer who is a degree holder assisted in data collection since the officer had good theoretical knowledge with wide experience in MCH unit and working in Murang'a County. Additionally, she possessed good communication skills, attention to detail, critical thinking and ability to maintain high quality data.

3.11 Data Collection processes

These involved gathering and measuring information on variables concerning sero-positive pregnant women in Murang'a county referral hospital. The process took a maximum of two months and was carried out by the principal researcher with the research assistant. The research assistant ensured that the participants were directed well immediately after arrival into the clinic entrance and assisted the principal researcher to invite all the potential participants to participate in the study. All the willing participants then proceeded to form a sample population. They were identified by noting their names on a piece of paper and coded accordingly. Any additional assurance to them was accorded appropriately. The participants were allowed to first get the services they needed on that particular day with the help of the principal researcher, who guided them accordingly and ensured they were cleared and directed to one of the rooms in the MCH unit where the consent form was read to them, then their permission to participate obtained by signing these forms.

Data collection was done in each clinic day for sero-positive pregnant women. Quantitative data was collected using interviewer administered questionnaire whereby the researcher and the research assistant worked collaboratively in data collection.

Only the data needed for the study was collected. Privacy was observed during data collection and only one participant was served at a given moment. Through explanation, the purpose of the study was explained to participants and questions answered appropriately.

Informed consent was always obtained before any data was collected and questionnaire translated for those who couldn't understand English.

The flow of questions was systematic and clarification was done for easy understanding of the questions. Any additional information that the participant were willing to share was handled with

utmost respect. At the end of data collection in each day all questionnaires were gathered together and kept in a lockable cupboard till the end of the whole process of data collection. Data collection took place in a quiet place within the clinic. Retrospective review of clients' daily attendance record book and patients file was done to retrieve the viral load results and comments concerning the drug refill. Pill count was done at that point to verify the pattern of taking ART in relation to the instructed return dates within a period of nine months (1st October 2017 to 30th June 2018). A data sheet was used in this case whereby each sero-positive pregnant woman had her own row with at least four ANC visits expected in those nine months. Every ANC visit was indicated using a tick in every entry. A column for the viral load results and pill count report to cater for omitted, missing, destroyed or extra pills was also provided.

Qualitative data was obtained through in-depth interviews. In in-depth interviews, the participants were the MCH unit nurse in-charge and doctor in-charge and interview was done in the in-charges' office. Consent was obtained and relevant material for data collection made available which included; audio recorder, paper and pen.

The data from one index interviewee was obtained by the principal researcher, while the assistant obtained qualitative data from the other interviewee. Each interview took place for one hour and both the principal researcher and the research assistant verified the information at the end of the interview.

Once all the data was collected, all the data was re-checked, arranged properly then put in waterproof envelop. The data was re-checked for uniformity, completeness and accuracy. Each questionnaire was numbered before storage and the principal researcher was responsible for storing the data in a safe lockable cupboard. Data was stored on paper work and data coding done before analysis. Electronic storage using a computer was used as a back-up method.

3.11.1. Triangulation

This study used inter-method triangulation by combining survey questionnaire and the in-depth interviews to generate richer and comprehensive information on challenges of ART adherence among sero-positive pregnant women. The researcher brought together data collected quantitatively and qualitatively and allowed one data to elaborate the findings of the other and provide richer and detailed information.

3.12 Data management

3.12.1 Data cleaning and coding

Matching of the data, detection of missing and erroneous data was done, then categorized and coded accordingly. Re-checking for completeness was done before the data was entered in MS-Excel database. It was organized in terms of quantitative or qualitative data and each handled separately and systematically. Any given variable had a specified set of answer choices and codes to match each answer choice. Possible codes for each question were identified before the data was entered and if a number outside of the pre-determined possibilities was entered, an error message would appear.

3.12.2 Data storage

The researcher stored the data in the computer and secured it with a unique password. Audio recorder was used to store the recorded sounds and this information was transferred to the computer for back-up purpose. No data was given to anybody without authorization from the principal researcher. This ensured reliability and validity of the data. All the data was stored

safely and accessed only by the principal researcher and the assistant. After data entry, the best choice of statistical method of data analysis was selected ready for analysis to take place.

3.12.3 Data analysis and Presentation

The data was examined to confirm what was collected from the questionnaire then deductions and inferences made accordingly. The data collected was both qualitative and quantitative in nature. Quantitative data cleaning, entry and analysis employed the Statistical Package for Social Sciences (SPSS) Program version 20 while Chi square test and multivariate logistic regression was used to determine the challenges. Frequencies were used to analyze patient's socio-demographic data, clinic attendance, challenges of ART adherence and social behaviors among sero-positive pregnant women in Murang'a County referral hospital. Bivariate analysis of the association between variables was performed and the variables found to be having significant relationship with the adherence will be used to perform multivariate logistic regression. Significance level of 95% was used to determine the strength of the association between variables therefore a p-value of 0.05 was deemed to have a significant association to ART adherence. The findings were then presented using tabulations, figures and percentages.

Qualitative data was coded to identify the relevant piece of information and themes arranged according to the appropriate part of the thematic framework. The findings were presented in direct quotations and selected comments with all quotes in Kiswahili translated into English and incorporated into the main text. Analysis of qualitative data involved the use of NVIVO 8. All interviews were recorded using a voice recorder and then transcribed. The transcribed interviews were coded by NVIVO 8 and coding done in two phases. First there was development of a code book and secondly development of an additional codes from the transcripts. There was

comparison of the patients' and the MCH unit doctor and nurse in-charge's transcripts for the purpose of common themes. Representatives and verbatim was used to illustrate key findings. Finally the themes were used for discussion and interpretation.

3.13 Study Limitations and delimitations

These were influences that the researcher couldn't control and placed restriction on research methodology and conclusions. In this study the research had anticipated to encounter biases especially in data collection.

A missed opportunity was a limitation that was expected to occur in this study due to high clients' turn-up. The researcher ensured that there was no missed opportunity by making sure that every participant was subjected for selection as far as they had the unique feature that researcher was looking for. The client triage was enhanced for smooth flow of clients.

Due to the sensitivity of the study, i.e. HIV positive status of the pregnant women, they were not forth coming with the cultural related information required for the research. The researcher attempted to reduce the effect of this limitation by being sensitive to the respondent's local culture and HIV status.

3.14 Ethical Considerations

The study was conducted following approval by Joint Kenyatta National Hospital and University of Nairobi Ethics Research Committee (KNH/UoN-ERC). The researcher obtained approval from KNH/UoN-ERC before data collection. Permission was sought from Murang'a County Referral Hospital Administration as well as from the Nurse Manager for Maternal and Child Health (MCH). Written informed consent was obtained from all study participants after explanation and all necessary information provided to them by the principal researcher and research assistant. Confidentiality was highly observed in the study and the HIV status of the

clients as well as other investigation results were not revealed to anybody without consent of study participant. Participation was free and every participant was free to withdraw from the study at any point and no service was denied to such individuals if they chose not to participate. Data base systems were password protected and study findings made public for utilization accordingly. No sharing of documents including the questionnaires to other people, neither were they destroyed. They were kept safely in a lockable cupboard after the data analysis, and will be preserved for at least five years. No participant's name was written on the documents so as to ensure anonymity. Full information concerning the purpose of the study, risks and benefits, compensation or lack of them was given to the participants to ensure voluntary informed consent and participation. No harm to both the mother and her unborn one were anticipated.

3.15 Dissemination plan

This project will form a body of knowledge in the University of Nairobi and at other universities and colleges throughout the country. The results of my evaluation will be shared with a copy of the study to the University of Nairobi College of Health Sciences library, as well as to the main campus library. Other copies will be disseminated to the School of Nursing and the University's repository. Additional dissemination will occur through presentations at the conferences such as Midwifery Conference of Kenya and through articles published in peer-reviewed journals.

4.0 CHAPTER FOUR: RESULTS

4.1 INTRODUCTION

In this chapter, the results of the study are described and the analysis of the data presented. Analysis was done using IBM SPSS 23 statistical software. The results describe information on the subjects under study and how different predictors influence the outcome of interest, which is Challenges of ART adherence among sero-positive pregnant women in Murang'a County Referral Hospital. All sero-positive pregnant women who visited the clinic during the study period were interviewed since the sample population was 57 and data for 56 women analysed. One of the respondents was not able to give the required information due to opportunistic infection that prevailed then and which altered the level of understanding of that client. Data analysis was done according to the demographic data, literacy level challenges, cultural challenges and hospital related challenges with a response rate of (98%, n=56) for the sero-positive pregnant and (100%, n=2) response rate for health care givers having been achieved.

4.2 DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

In this section demographic data which include age, residence, marital status, occupation, terms of employment and educational level were analyzed and findings reported according to each variable.

4.1 Age of the respondents

The researcher sought to determine the age distribution demographic characteristics of the respondents. There were 56 respondents, range was 25, minimum age was 18 and maximum age was 43 years with a mean age of 30 years. The age group that had majority of the respondents was (50%, n=28) and the minimum was (23%, n=13).

The findings are presented in Table 4.1

Table 4.1: Age category of the respondents

Years	Frequency(n)	Percentage (%)
15-25	15	26.8
26-35	28	50.0
36-45	13	23.2
Total	56	100.0

4.2.1 Residence

The study sought to determine the area of residence of the participants. Majority of the residents were living in the rural areas (53.6 %, n=30) compared to urban areas with (46.4 %, n=26). The findings are presented in Figure 4.1

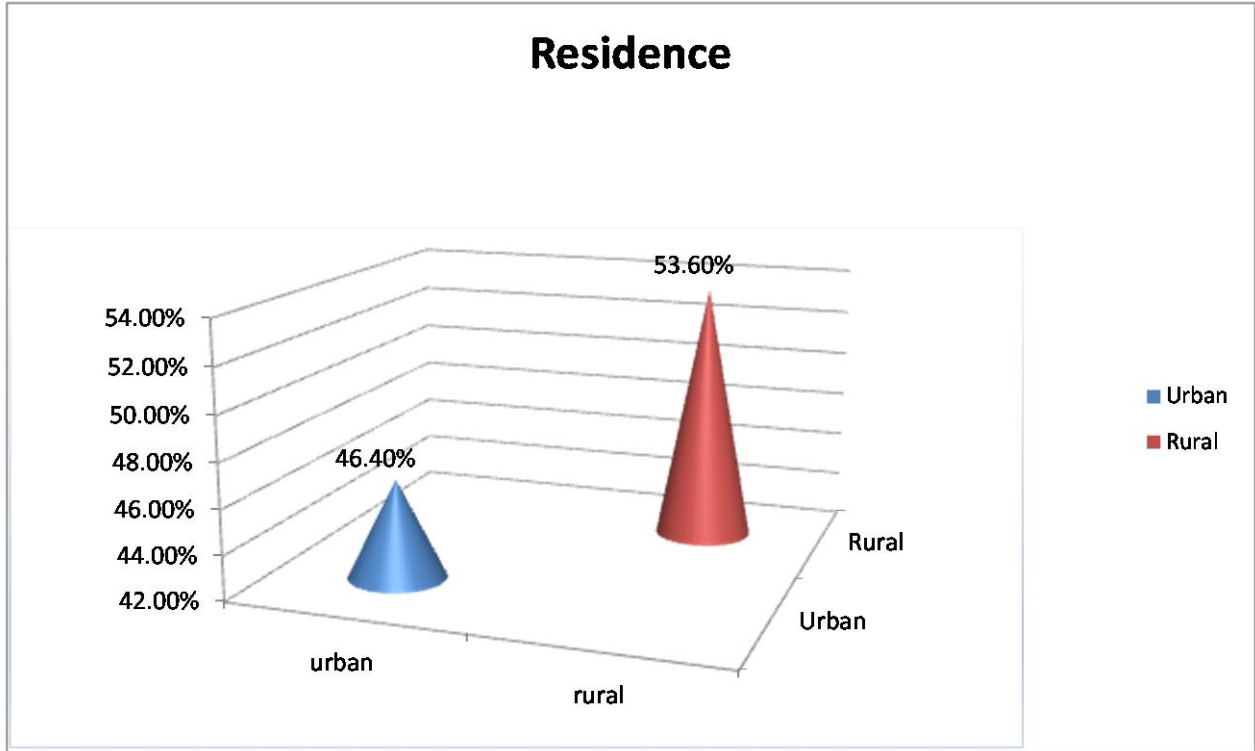


Figure 4.1: Residence of respondents

4.2.2 Marital status

Regarding the marital status majority of the respondents were married (66.1%, n=37), (25% n =14) single, (5.4 % n=3) separated and (3.6 % n=2) widowed. The findings are shown in the Table 2

Table 4.2: Marital status of the respondents

Marital status	Frequency(n)	Percentage (%)
Single	14	25.0

Married	37	66.1
Separated	3	5.4
Widowed	2	3.6
Total	56	100.0

4.2.3 Education level

Most of the respondents had primary level of education (53.6% n=30), (8.9 % n=5) have gone up to college level and (1.8 % n=1) are university graduate. The finding is presented in Figure 4.2

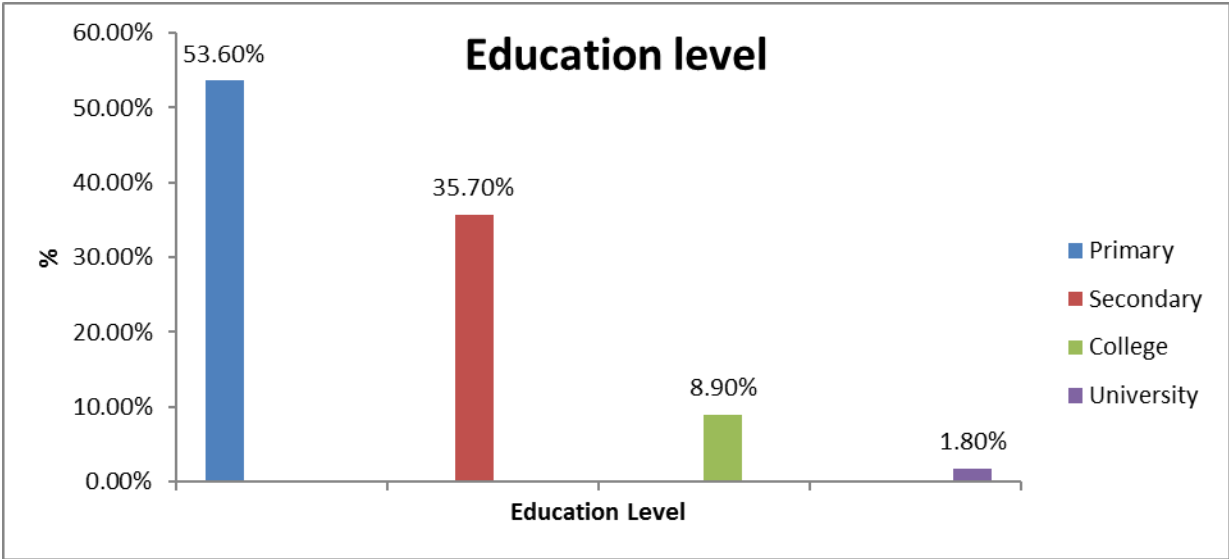


Figure 4.2: Education level of respondents

4.2.4 Religion

Majority of the respondents were Christians at (98.2%, n=55) with only (1.8 %, n=1) being Muslim. The finding is found in Table 4.3

Table 4.3: Religion

Religion	Frequency(n)	Percentage (%)
Christian	55	98.2
Muslim	1	1.8
Total	56	100.0

4.2.5 Terms of Employment

The researcher sought to find out the terms of employment of both the respondent and her spouse.

4.2.5.1 Terms of employment for the respondents

Majority of the respondent were self employed (42.9% n=24) while some of them (21.4% n=12) were house wives, however a smallest group (8.9 % n=5) were employed on permanent terms.

The results are shown in Figure 4.3

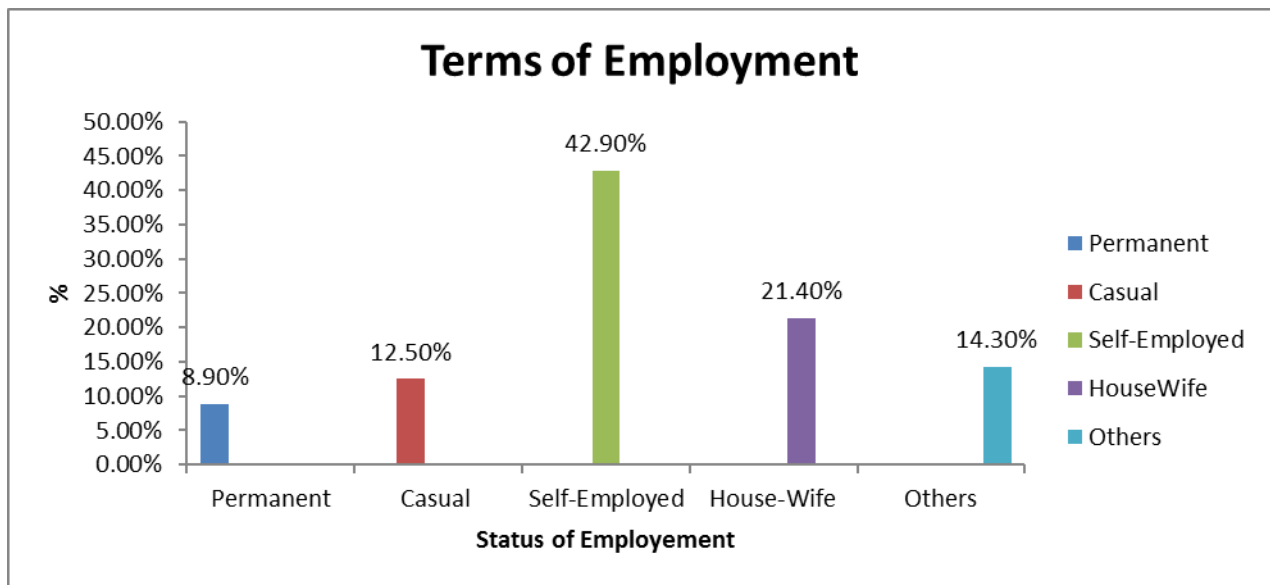


Figure 1.3: Terms of employment for the respondents

4.2.5.2 Terms of employment of the spouse

Majority of the respondent's spouse were self employed (33.9% n=19), (17.9 %, n=10) unemployed, (10.7 %, n=6) have permanent employment while (3.6 %, n=2) have casual jobs.

The results are shown in Figure 4.4

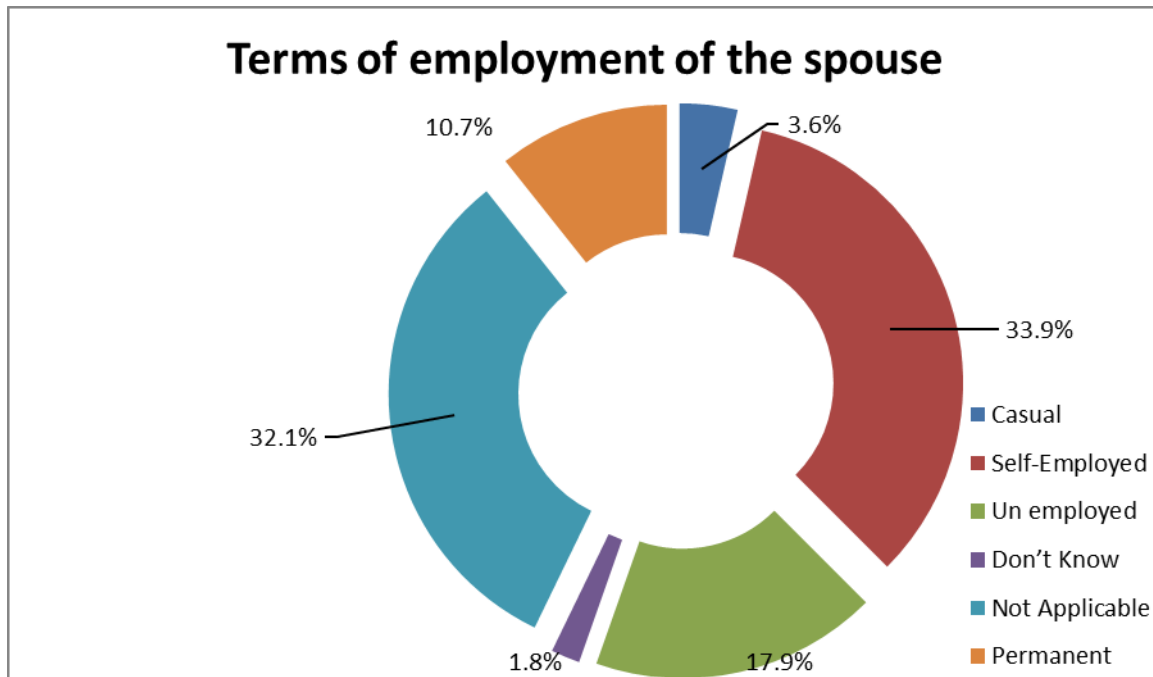


Figure4.4: Terms of employment the respondent's spouse

4.2.6 Monthly income

Both the respondent and spouse's results are as follows.

Of the 56 respondents majority (69.6%, n=39) of them were earning, the minimum monthly income was Ksh. 750 and the maximum was Ksh. 18000 (mean=6796.2, SD=5475.1). The findings are presented by Table 4.4

Table 4.4: Respondents' income

Monthly income	N	Minimum ksh	Maximum ksh	Mean ksh	Std. Deviation
Mother's income	39	750	18000	6796.2	5475.1

Of the 56 respondents majority (64.2%, n=36) of their spouses were earning, the minimum monthly income was Ksh. 1,000 and the maximum was Ksh. 40,000 (mean =14305.56, SD=10822.119). The findings are shown in Table 4.5

Table 4. 5: Spouses' income

Monthly income	N	Minimum ksh	Maximum ksh	Mean ksh	Std. Deviation
Partners income	36	1000	40000	14305.56	10822.119

The researcher sought to determine the challenges that affect the adherence to ART among sero-positive pregnant women at Murang'a county referral hospital by looking at literacy, cultural and institution related factors, patient related factors as well as viral load and pill counts. The results are as follows.

4.3 LITERACY RELATED FACTORS AMONG SERO-POSITIVE MOTHERS

The researcher investigated the literacy level of the 56 respondents and their findings reported on each variable. The researcher used various codes to denote the respective respondents when analyzing the qualitative data. Each of these codes is shown at the end of information obtained from the respondents. For the information obtained from the key informants, they were denoted as (KII 1) for the first health worker and (KII 2) for the second care giver.

4.3.1 Education Level

The findings for the educational level are analyzed under demographic characteristics of the respondents and presented in figure 4.2. In the findings it was found that majority of the respondents had primary level of education (53.6%, n=30), (8.9%, n=5) had college level, and only (1.8%, n=1) were educated upto university.

4.3.2 Duration since diagnosis

For most of the respondents (67.9%, n=38), at least one year had passed since they were diagnosed with HIV, (14.3 %, n=8), 0-6 months since diagnosis and (17.9 %, n=10) 6-12 months old since diagnosis. The results are shown in Table 4.6

Table 4.6 Time period since respondent's sero-positive diagnosis

Duration (months)	Frequency (n)	Percentage (%)
0-6 months	8	14.3
6-12 months	10	17.9

12 months and above	38	67.9
Total	56	100.0

4.3.3 Adhering to ART prescription

Majority of the respondents (75%, n=42) were not adhering to the ART prescription as directed by the doctor. The findings are shown in Figure 4.5

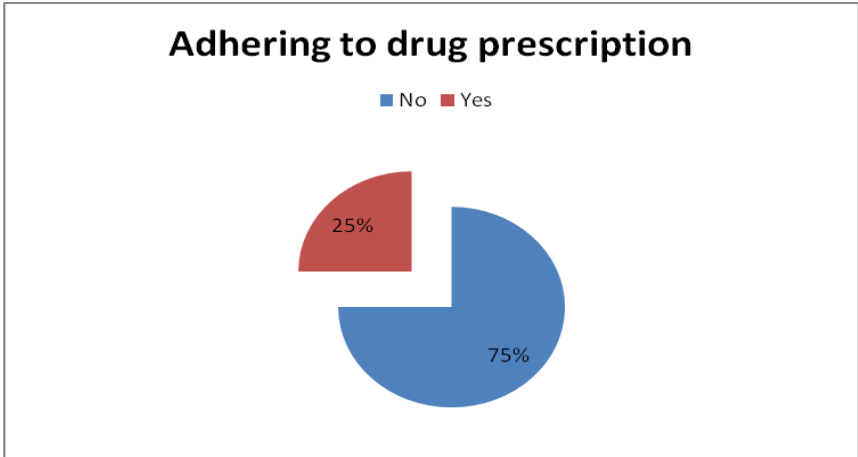


Figure 4.5 Adherence to the drug prescription

4.3.4 Type of memory aid used by respondents to help in drug adherence

Majority of the respondents (83.9 %, n=47) use electronic device, (7.1%, n=4) use calendar dates, (5.4%, n=3) do not use any memory aid and (3.6 %, n=2) use personal diary. These finding are presented in Figure 4.6

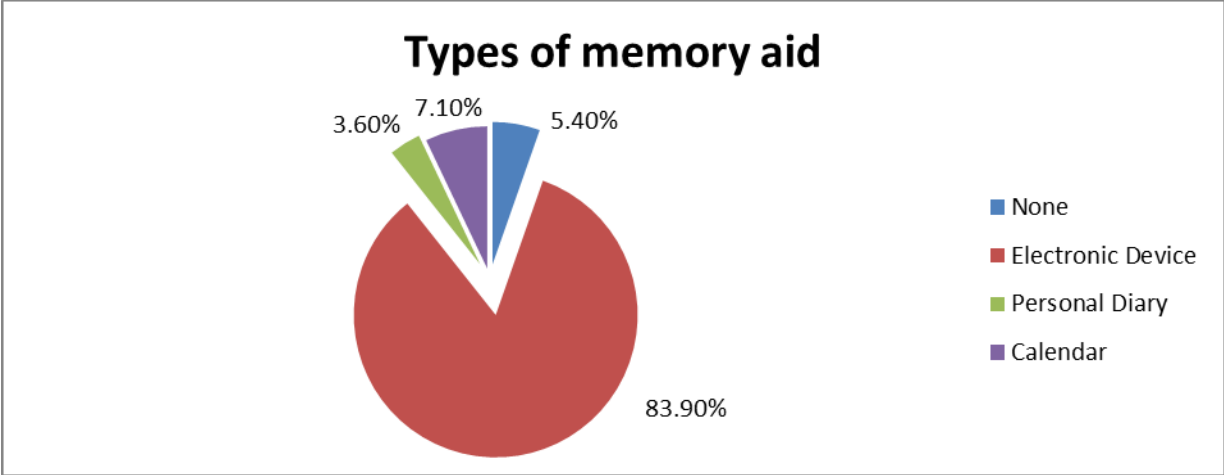


Figure 4.6: Type of memory aid used

4.3.5 Disclosure of HIV Status

Majority of the respondents, (89.3% n=50) had disclosed their status but to specific confidants.

These results are shown in figure 4.7

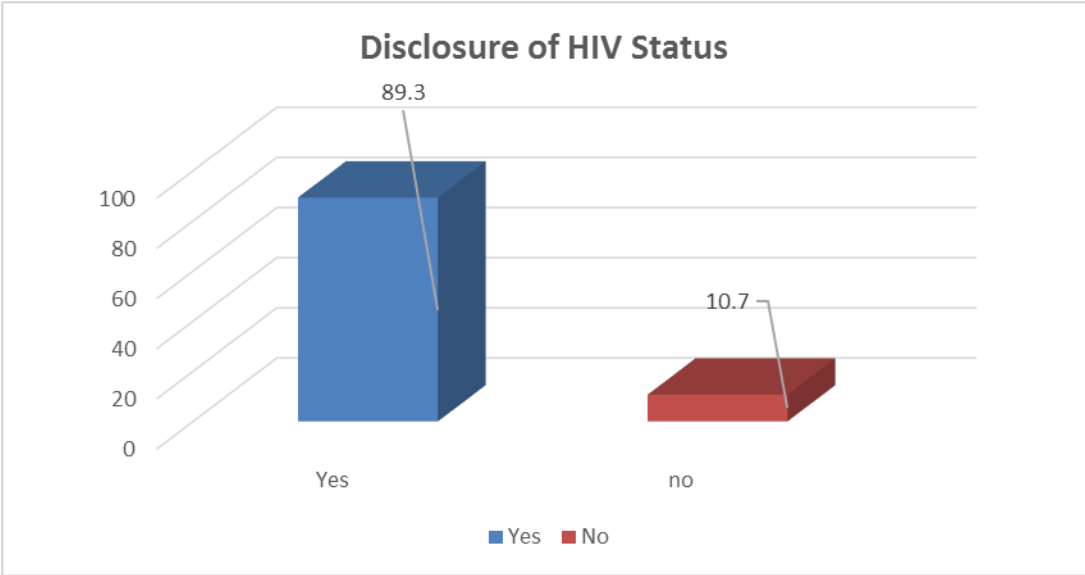


Figure 4.7: Disclosure of HIV Status

4.3.6 Reasons for disclosure

Majority of the clients (52%, n=26) disclosed due to encouragement from their partners, (26%, n=13) said disclosed due to fear of serious illness while (22%, n=11) disclosed due to support from care givers. These findings are presented in Table 4.7

Table 4.7: Reason for disclosure

Themes	Frequency(n)	Percentage (%)
Trust from the partner and relative	26	52
Encouragement from health care giver	11	22
Fear of a serious illness	13	26
Total	50	100.

4.3.7 Sexual engagement

Most of the respondents (82.1%, n=46) had sexual partners and were actively engaging in sex with the remaining having no sexual partner (17.9%, n=10). The results are shown in Table 4.8

Table 4.7: Respondent's with sexual partners

Themes	Frequency(n)	Percentage (%)
No	10	17.9
Yes	46	82.1
Total	56	100.0

4.3.8 Importance of adherence to ART treatment regimen

The participants in this question were asked to explain the importance of taking the ART. Majority of them(70%, n=39) mentioned that they do so to lower viral load but immediately its low they sometimes omit taking them especially when they feel depressed, (19%, n=11) said that they take drugs to reduce drug resistance while (11%, n=6) wanted to avoid drug side effects.

Table 4.9 Importance of Adherence to ARV's treatment regimen

Themes	Frequency (n)	Percentage (%)
To reduce drug resistance	11	19
To lower the viral load	39	70
Avoid side effects	6	11
Total	56	100

The respondents had strong belief that by adhering to ART the viral load would come down and drug resistance would also be reduced. On the other hand a few of them had the opinion that by adhering to ART the drug side effects will no longer be present.

I take ARVs because I know by taking these drugs my virus will be reduced and will not be weak anymore. By having fewer viruses will ensure that I am strong and able to work in the market and sometimes can skip taking without much worry. Respondent 007

The doctor usually tells us that if we don't take drugs as directed, the drugs will not be able to work properly then our bodies will be weak. So for these ARVs to help us we must take them until the viral load comes down. Respondent 014

Their comments were evidenced by the use of standard way of ART initiation by the health care workers. They both concurred with each other on ART initiation procedure guidelines. A

standard way of initiation of treatment is followed to the letter. They emphasized that by adhering to ART the viral load would be reduced and the health status of the patients would improve.

We use guidelines on antiretroviral therapy treatment and prevention of HIV infection in Kenya 2016, an adoption from WHO through MOH Kenya. This is the recommended one but still waiting for the current one to be released. KII 2

The respondents explained further that they experience some side effects whenever they cease to take the medications. So they ensure adhering to ART as much as possible.

These drugs are good but once you interrupt taking them, they start reacting to you. So to avoid experiencing these effects one has to take drugs continuously. Some of these effects are so bad like nausea, vomiting, dizziness and general malaise. But my body is now used to these drugs and I can't complain. Respondent 003

4.3.9 Importance of taking ART

Majority of the respondents (58%, n=32) had the opinion that their chances of survival would increase if they take ART, (18%, n=10) said that morbidity would reduce while (24%, n=13) gave the reason as to prevent sexual transmission and perinatal transmission. This is how they gave their different opinions.

Table 4.10 Importance of taking ART

Themes	Frequency (n)	Percentage (%)
Prevention of perinatal transmission	5	9
Prevention of sexual transmission	8	15
Reduction of HIV related morbidity	10	18

	Increased survival	32	58
	Total	55	100

The need to live for more years while infected with HIV was the driving force towards ART adherence. Many of the respondents suggested this when interviewed on importance of taking ART. Some also would like to have good life which can guarantee them coitus with their partners.

We take ARVs so that we can increase chances of living. Many people who don't adhere to ARVs have already died. There is no way you can live yet you have declined to take these drugs. Every time you take them you add some more years to live in this world. Respondent 027

If somebody doesn't want to take the drugs then she wants others to die because the virus will increase and get transmitted to the partner. Once we were started on ARVs, the germs have gone down and we can even enjoy coitus. Respondent 017

The number of people dying of HIV has decreased because we are taking the drugs. If we didn't make this decision maybe we could be dead by now. We take them to protect our babies from this disease and prevent the virus from getting into them. Respondent 042

4.3.10 Importance of ART to the unborn

Majority of the respondents (98%, n=55) had the same opinion simply because they have been taken through a comprehensive counseling every time they attend the clinic.

Table 4.11 Importance of ART to the unborn

Themes	Frequency (n)	Percentage (%)
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	Lower risk of mother to child transmission	55	98
	To prevent death of the unborn	1	2
	Total	56	100

Almost all the clients agreed that it's important to adhere to ART so that their unborn babies can be free from the virus and be able to live a normal life. However the question whether they would continue with that trend after delivery was not guaranteed.

We don't want to give birth to sick children. These drugs prevent our children from HIV and guarantee them of their survival. Respondent 036

In the case of health care workers they also showed rich knowledge due to vast training they have received. On the specific training they have received on HIV treatment and management, they both portrayed to have adequate training. Sample discussion is stated below for both of them.

I have received training on counseling in PMTCT especially on mothers with higher viral load, undetectable viral load and also current HIV management and treatment to both the mother and the baby. Additionally I have rich knowledge on HAART which includes education on TB and HIV co-infection. KII 1

I have done clinical management in HIV and PMTCT prevention among pregnant mothers in addition to TB & HIV co-infection training. KII2

4.3.11 Person with whom disclosure was made

Majority (78%, n=39) of them seems to trust either their spouses, (10%, n=5) disclosed to either the parents or extended family while (2%, n=1) disclosed to their children

Table 4.12 Person with whom disclosure was done

Themes	Frequency (n)	Percentage (%)
Parents	5	10
Spouse	39	78
extended family member	5	10
Children	1	2
Total	50	100

Selective disclosure was revealed from the respondents by restricting their status to certain people only mainly because they expected certain assistance from them.

I disclosed to my spouse because I know he is the only one who can keep the secret and he will support me at all times. Respondent 033

I only disclosed to my parents since they show love to me and can't tell anybody about my status. Respondent 011

I decided to disclose to the whole family because if I don't tell them might refuse to help me in the time of need. Again they can also know my status and avoid putting me into situations that can lead to spread of disease. Respondent 029

4.3.12 How to ensure safe sex

Slightly more than half (51%, n=23) believed on being faithful to their partners, (41%, n=19) used condoms while (8%, n=4) were abstaining. The findings are illustrated in Table 4.13.

Table 4.13 How to ensure safe sex

Themes	Frequency (n)	Percentage (%)
Use of a condom	19	41
Being faithful	23	51
Abstinence	4	8
Total	46	100

Inadequate knowledge on safe sex was noticed among the majority of the respondents. They seemed not to differentiate safe sex and way of preventing the spread of the disease.

I usually use condoms as we were told by the health workers. Condom doesn't allow the virus to pass through so there is no fear during sexual intercourse. Respondent 040

Since I realized am HIV positive I decided not to spread it to other people but to stick to my husband who is also infected. Respondent 018

Immediately I found myself with HIV infection I decided never again to engage in sex and so I decided to abstain. Respondent 029

On the other hand the health care workers were giving as much information as possible but the knowledge to put these guidelines into proper practice was a problem to the majority of the clients.

We create awareness especially in ANC with the help from the mentor mothers. We emphasize using flip charts, current a logarithm on treatment of STIs, WHO guidelines for staging and categorization and a logarithm for ART for both the mother and infants. To ensure the proper use of condom we literally demonstrate to them using the models of how to wear condoms properly. KII 1

We give health education every morning and teach them using flip charts and demonstrate using models especially for the safe sex. The clients get to understand well how to use condoms by demonstrating to them on how to wear condoms. KII 2

4.3.13 Use of condoms when both partners are HIV positive

Majority of the respondents (54%, n=25) didn't have any reason of using condoms when both partners are infected, while (46%, n=21) felt that it was necessary to use condom in this case.

Table 4.14: Use of condoms when both partners are HIV positive

Condom use	Frequency(n=46)	Percentage (%)
Yes	21	46
No	25	54
Total	46	100

4.3.14 Reasons for condom use when both partners are positive

On the reason for condom use while both partners are HIV positive, majority (63%, n=13) commented the reason as being to prevent re-infection, (21%, n=5) to prevent STIs and a smaller number (16%, n=3) to prevent pregnancy. The findings are shown in Figure 4.8

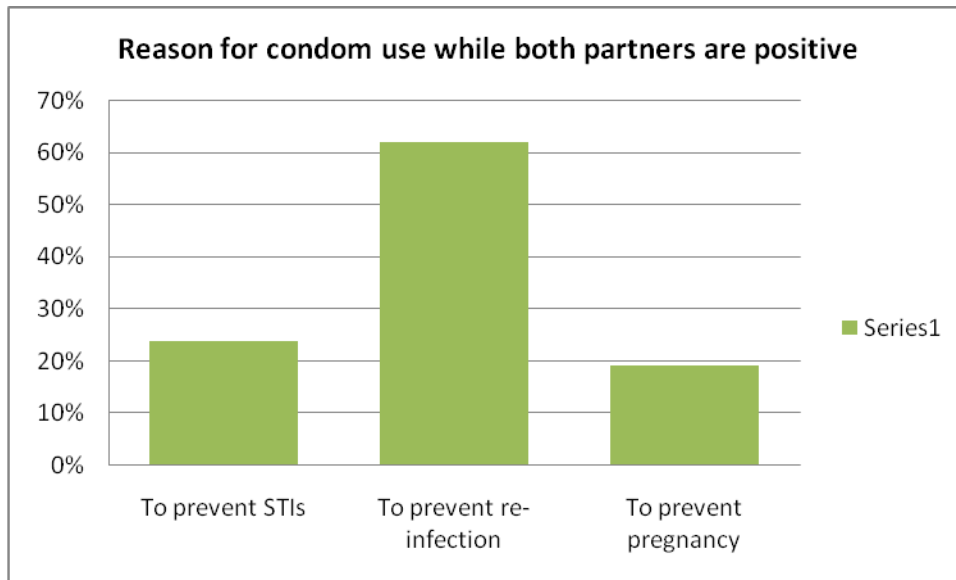


Figure 4.8 Reasons for condom use when both partners are positive

It came out clearly the clients would not at all times risk getting another strain of HIV since this would worsen their health conditions further and even infecting the unborn ones. Additionally some were cautious of other sexually transmitted infections and pregnancy itself.

By using condoms to both of us, helps prevent infections like other types of HIVs. Respondent 016

When we use condoms we protect ourselves from getting diseases like gonorrhoea and syphilis. Respondent 049

Condom will help prevent pregnancy since we don't want other kids. Respondent 050

4.3.15 Reason for not using condoms when both partners are HIV positive

On the reason for not using a condom, majority (80%, n=20) said that their partners were already infected while (20%, n=5) said by using condom they don't get satisfied sexually. The findings are shown in Table 4.14

Table 4.15 Reason for not using condoms when both partners are HIV positive

Themes	Frequency(n)	Percentage (%)
Partner is already infected	20	80
Condom use is not satisfying	5	20
Total	25	100

The respondents gave their suggestion on why they would not use condoms as being that there is no longer fear for HIV infection while a few of them didn't enjoy coitus by using condoms.

There is no need to use if both of us are infected with HIV. No need to fear anymore. Respondent 048

When I use condoms I don't get satisfied enough, therefore I opt not to use it. Respondent 021

4.3.16 Perception of alcohol use while on ART

More than half of the respondents, (59%, n=32) said that alcohol consumption in small amount will not have an effect on adherence, while (26%, n=14) said that it is unhealthy behavior and reduces survival and a smaller number of respondents (15%, n=8) said is contraindicated.

Table 4.16 Perception of alcohol use while on ART

Themes	Frequency(n)	Percentage (%)
Contraindicated	8	15
It is unhealthy and reduces survival	14	26
Has no effect when taken in small amount	32	59
Total	54	100.0

There was no effect of alcohol on ART if only taken in small amount according to the majority of the respondents, though a small group of them believed that it is contraindicated and can reduce survival chances since is unhealthy.

Alcohol is not bad when taken in small amount. Respondent 037

We are always told in the clinic that taking of alcohol is unhealthy behavior. Respondent 016

Drinking of alcohol is totally contraindicated while taking ARVs. No need to go against the guidelines given in the hospital. Respondent 005

The investigator went further to look for cultural related challenges that could be influencing the ART adherence. In this section all the questions were qualitative in nature and their findings were reported using Tables.

4.4 CULTURAL RELATED FACTORS

In this section the investigator sought to find out the cultural related challenges that influence ART adherence. Most of the answers from the patients were reported in their own words and a comparison made with the responses from health care workers. The responses were given respondent code in case of the patients and a different code for the health care giver.

4.4.1 Presence of myths and cultural beliefs in the community

Majority (62%, n=34) of the respondents said that the community viewed the infected people as those who are promiscuous, (29%, n=16) as those who will die soon while (9%, n=5) as those who have been bewitched. The findings are illustrated in Table 4.16.

Table 4.17 Myths and cultural beliefs regarding HIV infection

Themes	Frequency (n)	Percentage (%)
Witchcraft	5	9
Prostitute and promiscuous	34	62
One who will die soon	16	29
Total	55	100

There exist myths and cultural beliefs regarding HIV infection according to the responses given by the clients. They are subjective and can hinder ART adherence.

Some people say that once you get HIV infection you are going to die soon. Respondent 007

Many people say that you move around with many men having sex without protection hence the reason for HIV infection. Respondent 009

Some people believe that HIV infection is due to witchcraft from coast. Respondent 013

4.4.2 Community perception on pregnant women with HIV infection taking ART

A significant number of respondents (46.2%, n=26) said that the community feels that the unborn child will be HIV positive even on ART therapy while (10.3%, n=6) feel that the community stigmatizes HIV infected pregnant women but a remarkable group (43.6%, n=24) feels that the unborn child will be protected from HIV infection due to ART therapy. The findings are shown in Figure 4.9

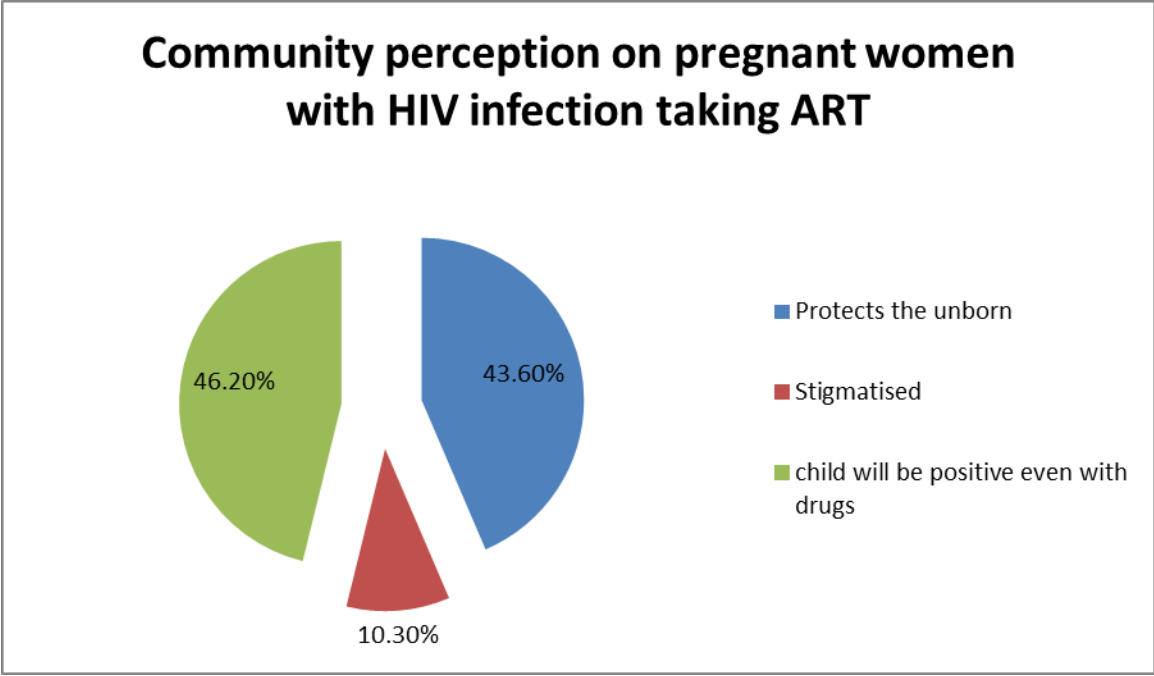


Figure 4.9 Community perception on pregnant women with HIV infection taking ART

The community still has a negative perception toward pregnant women and don't believe that ART can prevent HIV transmission. This is according to the majority of the respondents interviewed.

People say that even if you take medications the child will definitely be HIV positive since the mother is also sick. Respondent 030

But a smaller number do support the idea of prevention of mother to child transmission.

If you take ARVs and you are pregnant your baby will be free of the HIV infection. Respondent 044

However a number of them commented feels that they would be victims of stigma from the community.

When people realize that you can't breastfeed they start isolating you since they know you are sick. Respondent 022

4.4.3 Cultural related factors that influence adherence among sero-positive women

Slightly below half of the respondents (45% n=25) said that the prayers can heal through faith, (29%, n=16) stated stigma and rejection, (13%, n=7) said witchcraft as a hindrance while (9%, n=5) stated lack of male involvement as factors which deter ART adherence. The findings are illustrated in Table 4.17

Table 4.18 Cultural related factors that influence adherence among sero-positive women

Themes	Frequency (n)	Percentage (%)
Prayers can heal through faith	25	45
Lack of male involvement	5	9
Herbal medicine	2	4
Witchcraft	7	13
Stigma and rejection	16	29
Total	55	100.0

Faith healing and stigma towards ser-positive pregnant women are the major hindrances of ART adherence according to the information given during the interview.

Majority of the people contact the pastors for prayers immediately they realize that they are HIV positive. Respondent 055

People normally isolate us whenever they realize that we are HIV infected of rejecting anything we come contribute in the fundraising. Respondent 051

4.4.4 Cultural reason for not disclosing

Majority of the respondents (80%, n=45) feared stigma once they disclosed while (20, n=11) were concerned of divorce. These findings are shown in Table 4.18

Table 4.19 cultural reasons for not disclosing

Themes	Frequency (n)	Percentage (%)
fear of stigma	45	80
fear of divorce	11	20
Total	56	100

Majority of them gave the suggestion that stigma is the community and fear of divorce by their spouse will prevent the process of disclosure.

I don't want to tell them because they will isolate me and think that am promiscuous. Respondent 006

I can't tell my spouse because he will divorce me immediately. Respondent 049

4.4.5 Perception on the influence of FGM on HIV status

Majority of the respondents (98%, n=55) believed that FGM is no longer practiced in this locality while very few immigrants (2%, n=1) said that, is being practiced in their ancestral homes. These findings are illustrated in Table 4.19

Table 4.20 Perception on the influence of FGM on HIV status

Themes	Frequency (n)	Percentage (%)
Yes	1	2
No	55	98
Total	56	100

The practice of FGM is being practiced in other regions but not in that locality. The inhabitants of this place didn't support FGM since people have embraced the theme of modernization and rejecting those practices that can put their health at risk.

In this locality female circumcision is not done because we are being taught that it has no benefits to us. One can bleed and even die or get infected with HIV by sharing of razor blades. It was there before we were born but nowadays is no longer there. Respondent 057

The research also investigated the hospital related challenges that have an effect on the ART adherence. These factors include those suggested by the clients as well as those given by the health care givers.

4.5 HOSPITAL RELATED FACTORS

The researcher sought to find out the hospital related factors that influence ART adherence. The analysis was both qualitatively and quantitatively. Triangulation has been made for comparison of the information given by both the patients and the health care givers.

4.5.1 Frequency of PMTCT clinic visits

Majority of the respondents (96.5% n=54) were attending their PMTCT clinic visits on a monthly basis. The results are shown in Figure 4.10

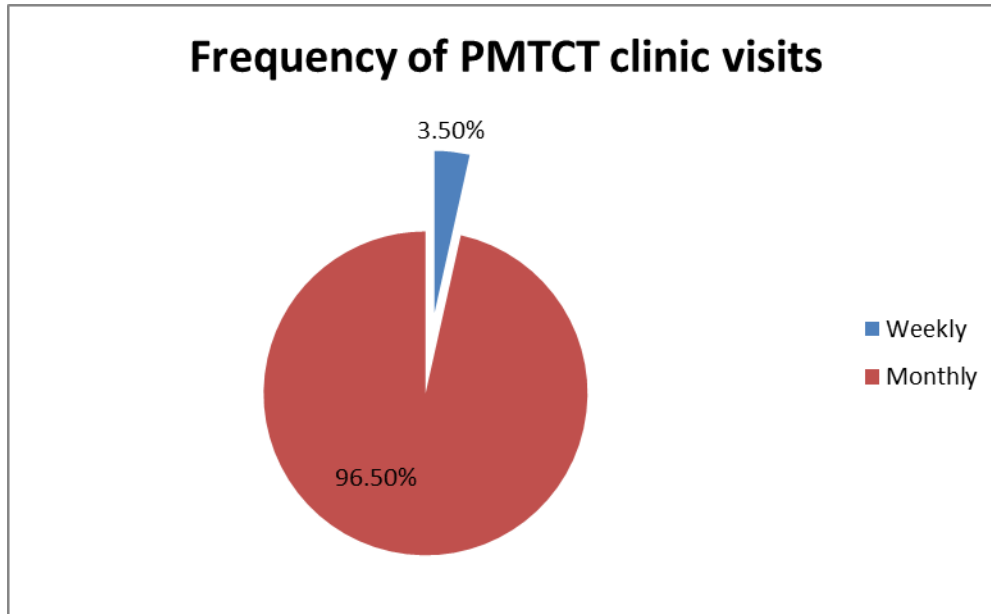


Figure 4.10: Frequency of PMTCT clinic visit

4.5.2 Distance from home to PMTCT clinic

Most of the respondents (66%, n=37) were attending clinics at a distance of less than 20 Km from their home. The findings are shown in Table 4.20

Table 4.21 Distance from home to comprehensive care clinic

Distance (kilometers)	Frequency (n)	Percentage (%)
0-10	20	36.8
10-20	17	29.8
20-50	10	17.5
50-100	4	7.0
100 and above	5	8.8
Total	56	100.0

4.5.3 Drug stock outs in the clinics

A significant majority (96.5%, n=54) had not missed drugs from their clinics. The results are found in figure 4.11

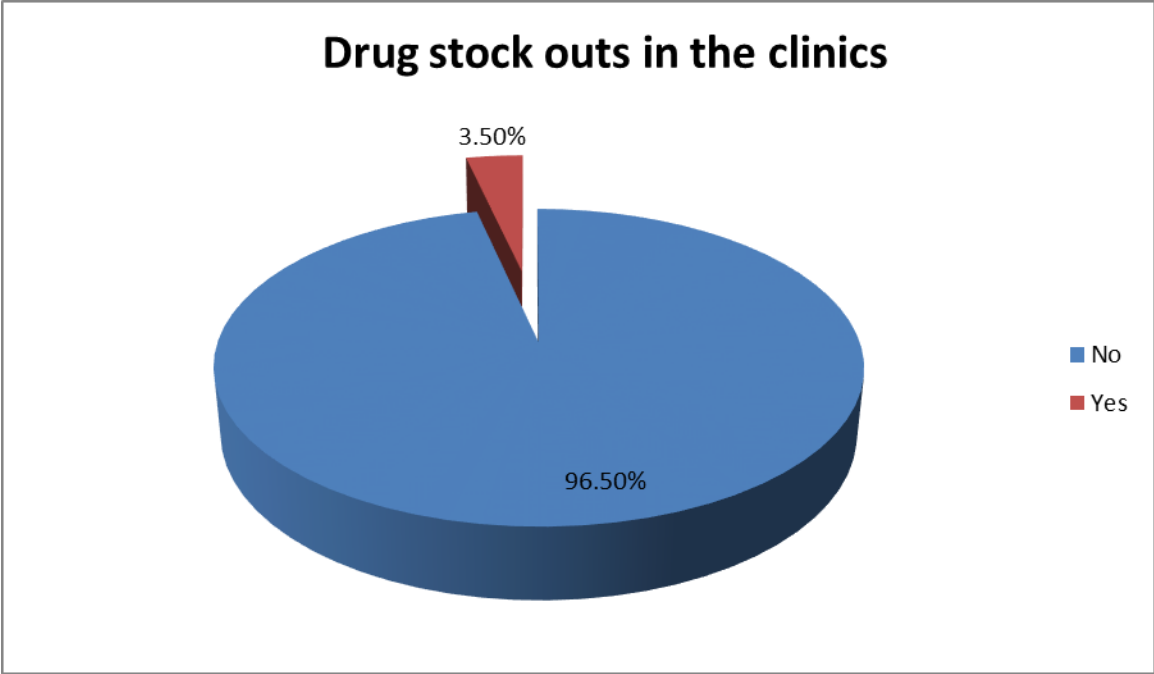


Figure 4.11: Stock outs at the clinic

4.5.4 Number of times of drug stock out in the clinic

Amongst the respondents who had faced stock outs, (50%, n=1) said it occurred once while (50%, n=1) said it had occurred twice. On the other hand, the health care workers have a direct feeling of drug stock-out though they usually ensure that any drug that is missing is stocked just before the patient arrives into the clinic and this saves the client the challenge of experiencing the drug shortage. Therefore this element was not felt by the clients as a challenge towards ART. Health care givers however felt that understaffing and lack of enough space to conduct counseling as the major hospital related challenges to ART adherence.

Sometimes we get understaffed. You find yourself being alone with one nurse and the workload is big, so is a bit overwhelming. Sometimes the laboratory results are not released at the appropriate time, in this case we mean delay in stock supply or failure of CD4 machine to

function properly is sometimes tedious. Also some family planning methods are not timely supplied in good time bearing in mind that we do offer dual methods in this clinic.

Another big challenge is the inadequate room for offering counseling services to our clients. In a way lack of enough space do interfere with confidentiality, so to some extent mothers feels their privacy is compromised. The room in which we offer our services is very small and it becomes very hard to offer counseling to the couples. Additionally some clients do lack alternative drugs especially dapson for those clients who can't use septrin. At one point we have to liaise with neighbouring facility to receive the supplies. KII 1

Understaffing; I see the patients, I dispense drugs and offer family planning methods. High staff turnover is also evident anytime it occurs and once the change-over is out the staff is supposed to move to the new place of work. In some instances CD4 analyzing machine is a problem and we have to liaise with neighbouring facilities to get our results in good time. KII 2

4.5.5 Perception on health care workers

Majority of the respondents (98%, n=54) had a good perception towards health care workers while very few of them (2%, n=1) said that some workers were ignorant. The results are shown in Table 4.21

Table 4. 22 Perception on health care workers

Perception on care workers	Frequency (n)	Percentage (%)
Educative	28	51
Supportive	21	38
Encouraging	5	9

Some were ignorant	1	2
Total	55	100.

The clients had good perception towards health care workers and only a small group felt that they did not get the exact information they needed.

The doctors and nurses are very supportive and they encourage us very much. We find the reason to come to clinic because they are friendly to us. Respondent 013

This is evidenced by comments from the healthcare workers who seemed to be familiar with their roles and offer good services to the clients. Both the health care givers share the roles in the clinic simply because they are usually two in the clinic in most of the time and this compliments their duties.

I offer health education to the sero-positive mothers and setting them to support groups as well as retaining them to these groups. I also enhance investigation like PCR and do home visits to them in addition to treatment of the medical complain they may present with. By doing home visits, it help us to identify the challenges they are facing in their home set-ups. KII 1

I prevent HIV transmission by giving prophylaxis to pregnant mothers and take part in obtaining a DBS for investigations. KII 2

4.5.6 Effects of distance from home to hospital on ART adherence

The distance to hospital didn't seem to affect so much their clinic attendance. Majority (52%, n=29) said that the distance is short and convenient to them, (27%, n=15) were satisfied with the services offered in the hospital while a small group (12%, n=7) said they experienced a challenge of lack of the bus fare. The findings are illustrated in Table 4.22

Table 4. 23 Effects of distance from home to hospital on ART adherence

Themes	Frequency(n)	Percentage (%)
Distance is short and convenient	29	52
It is around home are therefore stigma	5	9
No(respondent motivated by good services)	15	27
Lack of bus fare	7	12
Total	56	100.

Distance didn't have an affect towards ART adherence. Whether short or long they all managed to come to clinic as required.

I don't feel burdened by the distance I cover to clinic since I trust this hospital very much. This distance is short and ok to me. Respondent 052

Even if the distance is a bit far I can't complain since the services I receive from this hospital are satisfactory. Respondent 004

This hospital is just near the home area and would not like to be seen by people who know me. Respondent 036.

The distance is a bit long and I sometimes lack bus fare to hospital. Respondent 027

4.5.7. Waiting time in the hospital

The duration of time they wait before they receive the needy service is short. Majority (80%, n=45) waited for a period less than 30min while (20%, n=11) waited for 30-60min. the findings are shown in Table 4.23

Table 4.24 Waiting time in the hospital

Time	Frequency(n)	Percentage (%)
0-30min	45	80
31-60	11	20
Total	56	100

Almost all the respondents felt comfortable with the time they wait before receiving the crucial services from the hospital.

I normally wait for a short time like less than 30min so that my file can be retrieved. Respondent 046

The time I wait in the clinic is very short unless there is someone inside so I have to wait till she is served. Respondent 031

4.5.8 Services offered at the clinic

Majority of the clients (68%, n=38) were satisfied with the services they were receiving from the hospital while (32%, n=18) felt that the services were modern. These findings are shown in Table 4.24.

Table 4.25 Services offered at the clinic

Themes	Frequency(n)	Percentage (%)
Services are satisfactory	38	68
Modern	18	32
Total	56	100.0

Services offered in the hospital met the desire of the patients and they expressed their contentment with these services.

The services we receive from this hospital are satisfying and would wish if they can continue with that trend. Respondent 053

In the case of health care workers on how they ensure ART adherence is optimal they suggested that, there are mechanisms to ensure keeping of appointment dates. This makes the services satisfactory and patient friendly. Great concern was portrayed by health care workers by calling the patients to remind them of the clinic date.

We remind them of the clinic dates by calling them, giving out the clinic cards as well as doing the pill count. Pill count help to ensure clinic date as well as ART adherence. Immediately we realize the pills are more we inquire about it and counsel appropriately. Some are being reminded by their spouse or the children. Pill count really helps to assess whether the clients are taking drugs as required hence a measure of ART adherence in the same note. KII 1

We give them clinic cards to remind them and by calling them via phone just before the clinic date. KII 2

An assessment of adherence was determined by obtaining information on various variables that alter adherence process. A list of these various were ticked for Yes or No according to whether the client has ever experienced ART challenge due to the effect of these variable in antenatal period. Finally their influence is determined and conclusion made.

4.5.5 Assessment of Adherence

Slightly above half of the respondents (53.6 %, n=30) were not adhering to ART, while (46.4%, n=26) were adhering to ART treatment. These results are shown in Figure 4.12

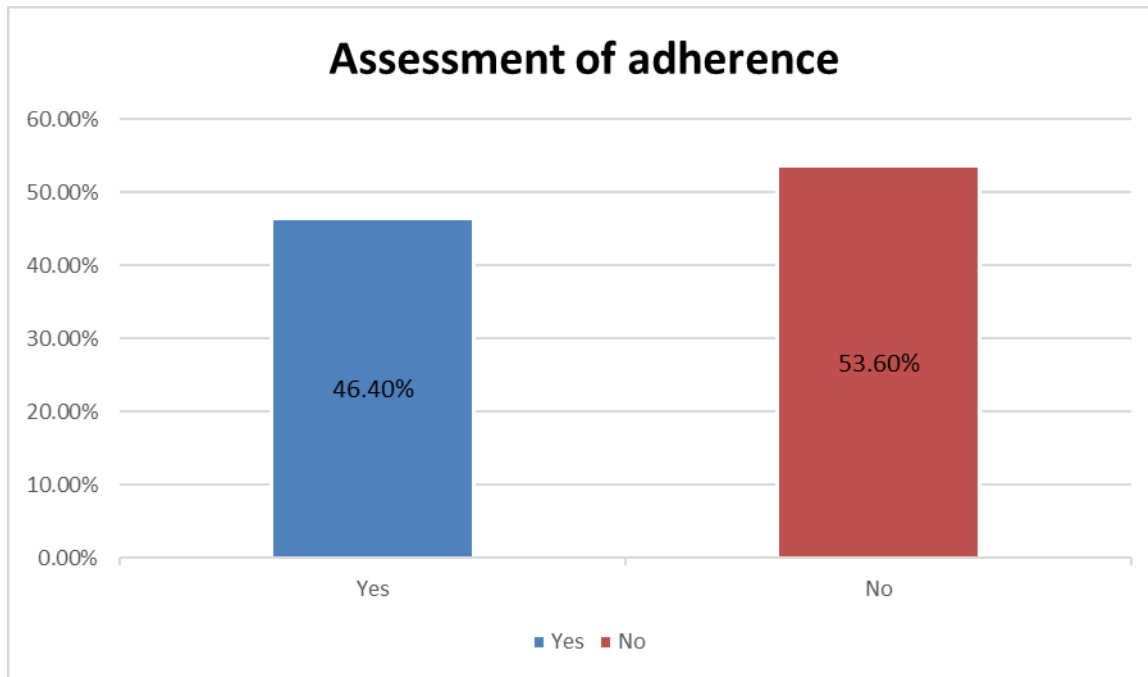


Figure 4.12: Assessment of adherence

4.5.6 Factors affecting ART adherence

There are several factors that had made the respondents skip taking medication. These include: alcoholism (86%, n=48), fear of others (77%, n=43), forgetfulness (84%, n=47), depression (89%, n=50), unclear instructions (87%, n=49), feeling better (88%, n=49), faith healing (92%, n=51), lack of support from relative (91%, n=51) and drug side effects (93%, n=52) cited fear of been seen by others (n=56). The findings are shown in Table 4.25

Table 4.26: Factors affecting ART adherence

Factor	Skipped medication due to the factor	Frequency(n)	Percentage (%)
Alcohol	Yes	48	86
	No	8	14
Fear of been seen by others	Yes	43	77
	No	13	23
Forgetting to take the pills	Yes	47	84
	No	9	16
Depression	Yes	50	89
	No	6	11
Run out of pills	Yes	3	5
	No	53	95
Unclear instructions	Yes	49	87
	No	7	13
Sense of recovery	Yes	49	88

	No	7	12
Hospitalization	Yes	3	5
	No	53	95
Faith healing	Yes	51	92
	No	5	8
Lack of support from relatives	Yes	51	91
	No	5	9
Herbal medicine	Yes	4	7
	No	52	93
Pill burden	Yes	3	5
	No	53	95
Illness	Yes	1	2
	No	55	98
Lack of food	Yes	2	4
	No	54	96
Side-effects	Yes	52	93
	No	4	7
Sharing the pills with friends	Yes	4	7.1
	No	52	92.9
High cost of transport	Yes	2	7.1
	No	54	96.4

Losing pills	Yes	3	5.4
	No	53	94.6
Travelled away from home	Yes	4	7.1
	No	52	92.9

4.5.7 Chi Square Test of Association between Different Factors and Adherence

The chi square test of association was done to find the association between adherence and the different factors that challenge ART adherence. The results are as presented in Table 4.26

Table4. 27 Chi Square Test of Association between Different Factors and Adherence

Factor	Chi Square Value	P Value
Alcohol	8.1	0.004
Fear of being seen by others	14.7	0.001
Forgetting to take pills	9.3	0.002
Depression	5.9	0.018
Running out of pills	2.8	0.146
Unclear instruction	6.9	0.009
Sense of recovery	6.9	0.009
Hospitalization	2.8	0.146
Faith Healing	4.8	0.037
Lack of support from relatives	4.8	0.037
Herbal medicine	3.7	0.053

Pill burden	2.7	0.146
Illness	0.9	0.536
Lack of food	1.8	0.282
Side effects	4.9	0.031
Sharing pills with friends	3.7	0.075
High cost of transport	1.8	0.282
Losing pills	2.7	0.146
Travelled away from home	3.7	0.075

The chi-square test for independence, also called Pearson's chi-square test or the chi-square test of association, was used to discover if there was a relationship between two categorical variables. These results illustrated either statistically significant or non-significant association between various variables on adherence. Those that were revealing a statistical significance to ART adherence were: alcohol $\chi(1) = 8.089$, $p = 0.004$, Fear of being seen by others $\chi(1) = 14.673$, $p = 0.001$, Forgetting to take pills $\chi(1) = 9.294$, $p = 0.002$, unclear instruction $\chi(1) = 6.933a$, $p=0.009$, recovery $\chi(1) = 6.933a$, $p = 0.009$, drug side effects $\chi(1) = 4.90$, $p = 0.031$, depression $\chi(1) = 5.824a$, $p = 0.016$, faith healing $\chi(1) = 4.758a$, $p = 0.037$ and Lack of support from relatives $\chi(1) = 4.758a$, $p = 0.037$

Others variables tested showed no statistical association between them and ART adherence. These variables were: Running out of pills $\chi(1) = 2.747$, $p = 0.146$, Herbal medicine $\chi(1) = 3.733a$, $p = 0.075$, Pill burden $\chi(1) = 2.747a$, $p = 0.146$, hospitalization $\chi(1) = 2.747$, $p = 0.097$, sharing pills with friends $\chi(1) = 3.68$, $p = 0.075$, high cost of transport $\chi(1) = 1.789$, $p = 0.282$,

losing pills $\chi(1) = 2.69$, $p = 0.146$, travelling away from home $\chi(1) = 3.6$, $p = 0.075$, lack of food $\chi(1) = 1.76$, $p = 0.282$ and illness $\chi(1) = 0.87$, $p = 0.536$

4.5.8 Pill Count Results

Regarding the results on pill count since they started ANC clinic, close to half of the respondents(47%, n=26) were found to have complied but more than half of them (53%, n=30) had reports on either having missed some pills on clinic date or omitted to take some when counting was done. These findings are presented in Table 4.27

Table 4.28 Results on Pill counts

Pill count report	Frequency (n)	Percentage (%)
Complied	26	47
Omitted	23	41
Missing	7	12
Total	56	100

4.5.9 Results on Viral load

Majority of the respondents (985, n=55) had their viral load less than 50 copies according to the data collected from patients file at the time of data collection. These results are shown in Table 4.28

Table 4.29: Results on Viral load

Levels of virus	Frequency (n)	Percentage (%)
<50 copies	55	98
>50 copies	1	2
Total	56	100

5.0: CHAPTER FIVE: DISCUSSION

This chapter involves a discussion of the major study findings based on the problem statement and study objectives.

5.1: SOCIO-DEMOGRAPHIC VARIABLES AND ART ADHERENCE AMONG SERO-POSITIVE PREGNANT WOMEN

Age, residence, religion, occupation, income, educational level, marital status and employment were the identified social demographic variables in this study.

5.1.1 Age and ART adherence among sero-positive women.

The study revealed that there was no relationship between age of the patients and the adherence to ART. This did not concur with Adeniyi et al (2018) that pointed that young age leads to poor ART adherence.

5.1.2 Residence and ART adherence

The research findings on area of residence and ART adherence revealed no significant association mainly because the clients indicated that the choice on where to get the health services depended upon individual decision. Some clients traveled from very far to get the services hence the necessity to advocate for good interpersonal relationship between the care giver and the patient. However, these findings were inconsistent with findings in Tanzania (Sigh

and Patra, 2015) which found out that majority of the sero-positive pregnant women were urban dwellers who were thought to adhere more to ART than rural dwellers.

5.1.3 Marital status and ART adherence

In this study there was no direct association between the marital status of the patients and their ART adherence. Even though clients that are married expressed higher degree of disclosure to their partners who accompany them to clinic, this did not really guarantee their adherence to ART. This was only determined by other inter-related factors between the husband and the wife. These findings do not concur with research findings in South America (Tam et al., 2015) that stated that the notion of selective disclosure among the married couples determined clinic attendance and ART adherence since they got support from their close individuals especially the sexual partners. Similarly, the outcomes of divorce and separation was demonstrated to hinder women from disclosure and finally ART adherence and this delayed the process of HIV testing and counseling (Naigino et al., 2017).

5.1.4. Level of education and ART adherence

Findings in this study were that majority of the patients had primary education as their highest level of education. These results found an association between level of education and ART adherence. Clients with low level of education had lesser understanding than highly educated ones. The degree of argument on why and how to ensure adherence did not prevail correctly to the lowly educated patents. The research outcome therefore revealed that majority of lowly educated people attended clinic in large numbers which is recommendable, but portrayed remarkable gaps in adherence. Gourlay et al, (2013) reported that poor knowledge of HIV

infection; MTCT and ART regimen in addition to lower maternal education are the key factors that hindered ART adherence. Therefore this study does tally with the findings. In keeping with other study results that have demonstrated that the knowledge level which includes understanding the origin, transmission, prevention and the complications of HIV infection determines ART adherence among sero-positive pregnant women in Ghana (Boateng et al., 2013).

5.1.5 Religion and ART adherence among sero-positive pregnant women

Majority of the clients were Christians indicating that the study area was mostly inhabited by Christians. The research finding did not find direct association between religion and ART adherence. Great support was witnessed from the churches that encouraged the clients to adhere to the ART in addition to giving them social and spiritual support, but this was only useful if the clients disclosed their sero-status to family, partners and friends who on the other-hand should accommodate her. The study findings differed from a study done in Tanzania (Rakotoniana et al., 2014) which revealed that, prayer give the sero-positive pregnant women hope in life and for some individual women the same prayer supported their adherence to ART medication.

5.1.6 Occupation status among sero-positive pregnant women in relation to ART adherence

Regarding the occupation of the clients in relation to ART adherence this study found that, there was no association between the amount of income earned in every month and ART adherence. It is true to state that a noticeable group of clients depended on less than one dollar a day which translated to hard economic times but this scenario does not hinder them from going to clinic every month. This outcome therefore differ from what was reported by Odhiambo (2016), who

stated that clients in Murang'a Kenya were so poor that they could not afford the essential amenities in life which includes; transport to the health facility, food and treatment of opportunistic infections. Stigma on the other hand drove them away from seeking health services on their doorstep promoting huge expenses incurred in transport and finally affecting ART adherence

5.1.7 Occupation status of sero-positive pregnant women partners in relation to ART adherence.

Just like their female counterparts, this study did not find an association between the amount of income earned by their partners and ART adherence. It is worth noting that a certain group of bread winners depends on less than one dollar a day to sustain their families. In our interactions with the clients the amount of income did not feature as a hindrance of ART adherence, simply because there was proper arrangement and a scheduled timetable for the clinic date. Many clients prepared themselves properly prior to the set date and they normally got an extra dose or two to cater for uneventful date in every clinic date. This was different from the report by Kariuki (2016) in Thika Kenya that documented poverty among families of adolescents in Thika Level Five hospital had lead to worsening of HIV infection. He went further to explain that many of them omitted ART doses despite receiving counseling before and after ART initiation.

5.2 LITERACY LEVEL ON CHALLENGES INFLUENCING ART ADHERENCE AMONG SERO-POSITIVE PREGNANT WOMEN.

5.2.1 Literacy level among sero-positive pregnant women in relation to importance of taking ART to both the mother and the fetus.

The level of education was important in understanding the need for ART adherence and the dangers that come along with failure to take medications as advised. In this study majority of the clients were educated upto primary levels. Clients with advanced knowledge seemed to understand better the reason for ART adherence compared to those with lower level of education. In our research findings clients expressed some knowledge of HIV transmission and prevention due to health messages they receive before they get relevant service. However there exists a gap in knowledge among these clients when critical decisions are needed to ensure that ART adherence is observed at all times irrespective of the clients' health status at a particular time. Additionally the clients did not portray enough knowledge when deciding on certain key decisions like when to use condoms among themselves. This therefore means that despite disparities in the level of education there was an association between level of education and ART adherence. These findings are similar to the study findings in Kenya (KDHS, 2014) that found that 28% of the women in reproductive age were not aware that by taking ART in pregnancy would help in reducing HIV transmission to the fetus, and in India (Sagili et al., 2015) found that 72% of sero-positive women did not have knowledge that HIV transmission occurs during vaginal delivery while half of them were not aware that transmission could occur during pregnancy. In another research findings in Spain (Deblonde et al., 2007) found the same results whereby 75% of the sero-positive pregnant women had inadequate information about HIV.

5.2.2 Duration since diagnosis with HIV infection among sero-positive pregnant women

Majority of the patients were diagnosed with HIV more than 12months ago while few of them were newly diagnosed at 0-6months. This indicates that by the time these women were becoming pregnant majority of them knew their HIV status, counseling and enrollment to care and treatment had already been established and monitoring of the viral load upto less than 50 copies. Therefore these finding did not reveal an association between time of diagnosis and ART adherence. It was proven that the decision to adhere to ART did not majorly depend on the time of diagnosis rather by the counseling these patients received which enabled them to accept their status and finally adhere to drugs. However by remaining adherent, these clients pointed out the benefits that follow especially protection of the fetus. These results concur with the report (American Pregnancy Association, 2012) that indicate that the risks of transmitting the disease to the unborn ones are reduced if the mother remains as healthy as possible and on ARV drugs.

But there is a contrary research finding on the aspect of ART adherence in Kenya (KAIS, 2014) which commented that an estimated 5-10% out of 20-45% of all the babies who get infected with HIV acquires it in pregnancy. If detection of the infection was realized early and treatment commenced at an appropriate time then the patient would be able to adjust to the guidelines and consequently adhering to ART regimes. On the other hand the findings were not congruent with the report in Murang'a, Kenya (Sirengo et al., 2014) which concluded that, there remains a huge burden of HIV among Kenyan women of reproductive age whereby only 60% of HIV infected women reported to have received ART.

5.2.3 Following hospital guidelines on ART adherence

Findings on whether the patients took ARVs as prescribed by the doctor found out that majority of the clients were not following the guidelines as prescribed. The decision on why they should keep tight schedule on ART guidelines was not observed among majority of the clients. These decisions include the specific time they were supposed to take medication, how to take it and how many times in one day. This therefore means that, even though they were receiving the counseling in the hospital the level of education was affecting their adherence.

This research study found an association between following hospital guidelines and ART adherence simply because adherence means strict observation of prescription as indicated by the care giver. These findings were consistent with results found in Thika Kenya (Kariuki, 2016) which found out that many of sero-positive pregnant women missed ART doses despite receiving counseling before and after ART initiation.

5.2.4 Use of memory aid in ART adherence

This study found out that majority of the clients was using memory aids to remind them of clinic date as well as time to take medication. Significant proportions were capable of using electronic device for this purpose. The study findings in regard to memory aids as a reminder to take ARV drugs and ease of communication, was consistent with a study in Nyanza Kenya which found out that, many sero-positive pregnant women had embraced the use of mobile phones with good internet coverage. They used it as an alarm to remind them of clinic date, or to communicate with community health workers during clinic days (Mushamiri et al., 2015). The results were also similar to the study in Uganda which found out that all those with any form of reminders

had good ART adherence than those without any reminder (Naigino et al., 2017). However this research did not find a direct association between using a reminder and ART influence since there existed other interrelated factors between these two variables which were not investigated.

5.2.5 Disclosure among sero-positive pregnant women

Majority of the patients reported to have disclosed their HIV status to specific confidants. These findings were incongruent with a study in china (Qiao et al., 2016) which found out that less than half of the women do not disclose their HIV status to their spouses whenever they realize that they are infected with the disease. In another research findings in Swaziland (Tsb and Sks, 2017), found that some clients opted not to disclose their status leading to hiding of the medications and consequently affecting ART adherence and development of depression. In this study an element of selective disclosure was identified which latter affected ART adherence just as what was reported by Tam et al (2015).

5.2.6 Safe sex in ART adherence among sero-positive pregnant women

The study established that majority of the patients had sexual partners and were actively engaging in sex. These finding correlates with a study done in South Africa (Jones et al., 2013) which explains that there is little knowledge about the need to use condoms at all times by sero-positive pregnant women. Many of them do not see the importance of protected sex mostly because both partners were infected. There was an indirect association between condom use and ART adherence mainly because knowledge level will determined when to use condoms which later affect the need to adhere to treatment guidelines.

5.2.7 Importance of adherence to ART treatment regimen, importance of taking the ART to sero-positive women and the importance to the unborn ones.

In this study finding, it was realized that the clients had some knowledge on taking the ART to themselves as well to the unborn child. This was due to adequate knowledge they get in the hospital from the health care workers. They knew that by taking the drugs the viral load would be reduced drastically and they would live longer and healthy. Again they had information that a reduced viral load meant that one could get pregnant and the chances of transmitting the virus to the unborn was very minimal. However the clients were found not to consistently adhere to treatment immediately they realized that the viral load was below 50 copies. They were found to skip medications on some days since they either felt better or they no longer feared becoming very sick. In this case the researcher found an association between the knowledge on importance of HIV transmission, prevention and treatment among sero-positive women and the challenge of ART adherence. The pattern of having this knowledge led to increased adherence. This concurs with other findings by Gourlay et al (2013) who reported that poor knowledge of HIV, MTCT and ART among sero-positive results to interruption in adherence. Similar results were documented by Sagili et al (2015) who revealed that lack of knowledge on HIV transmission during pregnancy and delivery would lead to poor adherence.

5.2.8 The need for disclosure and ART adherence

The investigator found out that the clients had the information of the need to disclose their sero-status though to specific individuals. The main reasons being that, they would like to be supported in the time of need as well as to be open to the significant others about their health so that protection from transmission could be enhanced. In this study, an element of selective

disclosure by the clients could indirectly affect the adherence of ART treatment. The need for disclosure to more than one person was more of an individual decision which was probably determined by other factors that were not explored in this study. However by disclosing their sero-status means they got encouraged and supported psychologically, emotionally and given the resources that they needed to attend the clinic. In another finding Adhiambo (2016) found that lack of disclosure among sero-positive women was a major hindrance to ART adherence similar to what was reported by Deborah Vitalis and Zelee Hill (2017) that failure to disclose impedes ART adherence which can depict to poor prognosis. Also Adeniyi et al (2018) had the same observation that lack of disclosure would lead to challenges of ART adherence.

5.2.9 Safe sex and condom use in relation to ART adherence.

They reported that safe sex can be achieved by being faithful, abstaining as well as use of condoms. They believed that by being faithful and abstaining from unprotected sex was safer to them which was not true. They did not reveal for how long to abstain which put into question if it's a safer method. There was an association between safe sex and condom use in relation to ART adherence. Having a safe sex and always using condoms means adhering to the hospital guidelines which determine the whole concept of ART adherence. This finding concur with Jones et al (2013) that there was little knowledge about the need for condom use and limitation to safe sex in South Africa, likewise according to KDHS (2014), people in Murang'a needed to be informed of the importance of using condoms as a way of protecting themselves from perinatal transmission.

5.2.10 Alcohol use while taking ARVs

The researcher sought find-out if the clients had information that alcoholism will alter the patterns of taking the medication. They were unfamiliar with the knowledge about pitfalls that come along with alcoholism. These research findings revealed that there was an association between knowledge on effects of alcohol to ART adherence. Some of them seemed to be alcoholics and lacked information that, even small amount of alcohol would affect adherence when this trend is repeated for some time. This study concurs with Hodgson et al (2014) that realized that alcoholism interferes with ART adherence in USA in the same way reported by Businge et al (2016) that in South Africa alcohol consumption and addiction play a bigger role in increased risk of HIV infection and a challenge to ART adherence among young pregnant women below 25 years of age.

5.2.11 Reason for disclosure and why they fear disclosing

There was enough evidence why they should disclose their HIV status though not in the right way. On the other hand they pointed out the reason why they selectively disclosed their status was to avoid stigma. This revealed that even though they would wish to disclose their status for support and encouragement the element of stigma was still a hindrance to ART adherence. This study therefore found an association between stigma and ART adherence. This report agrees with another report in Uganda (Ashaba et al., 2017) that indicated that stigma was the major challenge to ART adherence among sero-positive pregnant women. Similarly Murithi (2013) pointed out stigma and gender imbalance as the two main obstacles to ART adherence.

5.3. CULTURAL RELATED FACTORS THAT INFLUENCE ART ADHERENCE

5.3.1 Myths and cultural beliefs on HIV infection, perception on pregnant women with HIV infection, FGM practice and cultural barriers to ART adherence.

Patients expressed various cultural beliefs that existed among them and which were related to HIV infection. The practise of FGM was a very rare occasion among them and people in that locality did not embrace it, but for those individual who come from other region due to marriage said that it was still practised in their native land and women were obliged to under-go the practice as rites of passage. However there prevailed other cultural factors that seemed to hinder ART adherence, mainly the faith healing and stigma towards sero-positive pregnant women. This information concur with UNAIDS (2018) that culture of violence against women hinders ART adherence while Qiao et al (2016) revealed that Chinese culture lock out communication which in turn affect negatively the ART adherence. This research findings therefore revealed an association between culture and ART adherence.

5.4. HOSPITAL RELATED CHALLENGES ON ART ADHERENCE.

Findings from this study showed that majority of the patients were attending their clinics on monthly basis while a small portion attended the clinic on weekly basis. This indicated that a bigger number were able to observe clinic guidelines of attending ART clinic once in every month if the client did not have any complain and was adhering to the ART as required. For the newly enrolled clients they were normally given short return dates so as to assess their drug taking patterns and intervene appropriately. These findings were different from CHS (2015) in that, many women in Murang'a Kenya usually visit ART clinic more than once and still portray

inadequate knowledge on ART adherence. Similarly Gamell et al (2017) who did a research in Tanzania concurred with this findings that, it was important to give sero-positive pregnant women enough time to adjust to the new HIV management standards which would in-turn help to improve ART adherence.

5.4.1 Distance travelled in relation to ART adherence

Majority of the respondents travelled between 0-10km to reach the clinic, while a small group travelled 500-100km to reach the clinic. This study finding did not point out distance from home to clinic as a factor that determined ART adherence. The clients were comfortable traveling any distance to get the medications since the clinic dates were well communicated early enough and personal preparedness done prior to clinic date. This was in disagreement with Araujo et al (2014) who found that, despite those notable efforts especially in creating awareness and educating sero-positive women, there existed certain challenges such as inaccessibility to health care facilities leading to disruption of hospital appointments and finally interruption of ART adherence. In the same note contrary to these findings, clinic drop-out and reduced ART adherence in Uganda had been associated with long distances covered by the rural dwellers. These challenges were so evident that they lowered ART adherence greatly among sero-positive pregnant women (Muhumuza et al., 2017).

5.4.2 Drug stock-out in relation to ART adherence

The study further established that majority of the clients were able to get the medications in the clinic at any appointment date while a smaller percentage missed drugs at some point in the clinic. For those who missed the drugs, they were two in number, one patient missed once while

the other patient missed twice. This study finding established that it was on those rare occasions that these drugs missed in the clinic and only happened to those with certain reaction to specific drugs hence the need for alternative choice that would be harmless to them. This finding meant that drug stock-out did not interfere with ART adherence. Likewise the finding did not concur with research outcomes in Uganda by Muhumuza et al (2017) that revealed a substantial level of under stocking as a factor that compromised ART adherence, and in Western Kenya, Helova et al (2017) also noted that drug shortage majorly influenced ART adherence in addition to other hospital related factors.

5.4.3 Health care workers perception, waiting time at the hospital and quality of services offered in the hospital in relation to ART adherence.

This study established that these factors did not have any impact to the patterns of taking medication. The clients pointed out that they had the will and passions to attend the clinic since the health care workers were supportive and encouraging; no wastage of time before receiving the services and the quality of services they received was satisfactory. In the way health care workers perceived them, the finding was different from Avert (2015) which revealed that, health care worker projected bad perception which could lead to stigma while UNAIDS (2013) found waiting time as a cause of poor adherence. Apart from travelling long distance to seek medication Janssen et al (2015) found unfriendly hospitals due to poor perception and unsatisfactory services as an obstacle to adherence. We therefore did not find an association between the above factors and ART adherence.

5.5. ASSESSMENT OF ADHERENCE AND FACTORS AFFECTING ART ADHERENCE

This research finding assessed the ART adherence in accordance with the factors believed to either interfere with taking of ARVs or those leading to cessation of taking the medication altogether. In this study various factors were identified and posed to the sero-positive pregnant women and their response noted and scored in a check list. Adherence to ART implies firmly observing HIV regimen and this can be achieved by ensuring that lifelong therapy is practiced without cessation (AIDS info, 2018). In respect to this any factor realized to have an effect in ART adherence could lead to sub-optimal adherence to ART. An optimal level of or more than 95% % has been highly regarded as a success in HIV treatment. A lower level than this would indicate a challenge in adherence to ART which in turn would lead to poor immunological and virological results. It was therefore important to appreciate that great results were expected from the clients to achieve an adherence level of or above 95% through commitment in ensuring the attendance of antenatal clinics, HIV testing as well as enrollment of newly diagnosed HIV positive pregnant women into care and treatment (National AIDS Control Council of Kenya, 2014). After assessing the factors given out by the clients this research finding found that slightly above half of the clients were found not to be adhering to the ART treatment. This tallies with various factors that were thought to hinder ART adherence.

Amongst many factors that had made the respondents skip the medications, majority cited fear of being seen by other, forgetfulness, alcoholism, unclear instructions, feeling better, depression, faith healing, lack of support from relative and drug side effects.

In this research finding the chi-square test for independence for, also called Pearson's chi-square test or the chi-square test of association, was used to discover if there was a relationship between two categorical variables. The discussion below outlines how the association between the two variables was achieved.

5.5.1 Association between alcohol and adherence

The findings revealed that there was significant association between alcohol and ART adherence. This means that alcohol consumption had a negative effect in ART adherence among seropositive pregnant women. Like-wise as reported by Center for Health Solution (2015) also cited that, alcoholism was another major factor reported in Murang'a Kenya just as what was revealed by Businge et al (2016) in South Africa that, binge alcohol consumption and addiction played a bigger role in increased risk of HIV infection and a challenge to ART adherence among young pregnant women below 25year of age. These findings were deeply supported by Hodgson et al (2014) in a study done in USA which indicated that alcoholism would affect adherence negatively. Alcohol was believed to interfere with drug mechanisms in the body hence the need for thorough counseling before initiation of ART.

5.5.2 Association between fear of being seen by others and adherence

The study came up with a conclusion that there was an association between fear of being seen by others and ART adherence. This happened due to stigma that followed immediately after these patients were noticed taking ARVs. This report agreed with another report in Uganda (Ashaba et al., 2017) which indicated stigma as the major challenge to ART adherence among sero-positive pregnant women. In a comparison report between Uganda and Malawi on pregnant women, Flax

et al. (2017) also noted stigma as one of the major challenges of ART adherence. Another study done by Adhiambo (2016) in Kenya established that stigma and discrimination were among the major ART challenges witnessed in pregnant women.

5.5.3 Association between forgetting to take pills and adherence

This study showed that there was an association between forgetting to take pills and ART adherence. The same results were reported by Adhiambo (2016) that forgetfulness was among the major challenges in ART adherence in addition to other two factors discussed above. Similar results were reported by Adeniyi et al (2018) in Eastern Cape that, forgetfulness was the most reported reason of poor ART adherence among sero-positive pregnant women.

5.5.4 Association between depression and ART adherence

The study further established that there was a statistically significant association between depression and ART adherence. The findings were similar to the results got from Swaziland by Tsb and Sks (2017) that the clients became shy and mentally disturbed every time they went for treatment due to failure to disclose their status, and this finally ended up in worsening the psychological state of these clients. Moreover, similarly to our finding were the results revealed by Paredes et al (2013) which described that, psychological state of the clients deterred them from optimal adherence to anti-retroviral drugs.

5.5.5 Association between running out of pills and ART adherence.

In this study two variables were categorically analysed and the finding concluded that there was no statistically significant association between running out of pills and ART adherence. This

finding was different from what was revealed in Uganda by Ashaba et al (2017) that, running out of pills due to under-stocking of drugs in the hospitals was one of the major challenge of ART adherence in that country. In western Kenya, Helova et al (2017) also pointed out that, drug shortage in the hospitals among other factors led to running out of pills for the clients and this would influence ART adherence among sero-positive pregnant women.

5.5.6 Association between unclear instructions and ART adherence

The study also established that there was a statistical significant association between unclear instructions and ART adherence. According to CHS (2015) in Murang'a Kenya, found similar results that indicated that majority of the clients were found to lack enough literature on PMTCT due to inadequate information given by the health care givers. It was through those health messages that the clients were taken through all the guidelines pertaining to drug instructions.

5.5.7 Association between recovery and ART adherence

The result revealed that there was an association between recovery and adherence. The clients expressed that the sense of wellness hindered them from taking ARVs as required. This was due to the fact that there was an improvement in their health status which arrested any fear they had. In a similar study done in Malawi by Haas et al (2016) found that a sense of feeling better contributed to pregnant women omitting or skipping their medications. More emphasis should be applied in encouraging the clients to take drugs irrespective of their healthy feelings, to avoid rebound of viral load. In a similar case Kolelwa (2013) also found that, sense of feeling better due to many clinic follow-up lured the patient to drop taking ARVs.

5.5.8 Association between hospitalization and ART adherence

Our study reviewed an association between hospitalization and ART adherence among seropositive pregnant women. The finding revealed that there was no statistically significant association between hospitalization and adherence. The clients explained that whenever they became hospitalized they carried the medications and notified the care givers who later ensured that they adhered to the guidelines. When compared with other research studies this finding did not concur with Haas et al (2016) that hospitalization either in district hospitals or health centres led to inadequate ART adherence among the clients. Additionally Bailey et al (2014) revealed that health status of the clients which could lead to hospitalization led to poor adherence of antiretroviral drugs.

5.5.9. Other factors that revealed an association with ART adherence.

This study revealed an association between faith healing, lack of support from relative and drug side effects and ART adherence. These factors were found to have a direct effect to the adherence. This concurred with Hodgson et al (2014) who explained that faith healing in Zimbabwe hindered ART adherence just like what Tam et al (2015) found in south America that, lack of support from relatives altered ART adherence while Muthiani (2010) pointed out drug side effects and forgetfulness as the factors that impeded ART adherence in the Kenyan set-up.

5.5.10. Other factors that did not reveal any association with ART adherence

This study also found these factors to have no relationship at all with ART adherence. These factors include: use of herbal medicine, pill burden, lack of food, sharing of pills with friends, high cost of transport, losing of pills and travelling away from home. These factors were

subjected to p-value of or less than 0.05 and first degree of freedom to arrive at that conclusion. Various research findings did not concur with our results, like results released by Hodgson et al (2014) explained that, use of herbal medicine in Zimbabwe hindered ART adherence while Adhiambo (2016) revealed that, lack of food and high cost of transport were major deterrents of ART adherence. Unlike in our study finding, pill burden among other factors was found to interrupt ART adherence as reported by Paredes et al (2013)

5.5.11 Pill count and viral load results

Pill count and viral load assessment are the gold standard in measuring adherence in the Kenyan set-up. In this study finding majority of the respondent were found to be having less than 50 copies of viral load at the time of data collection but these results were subject to change immediately the clients recorded a remarkable drop in adherence. Majority of the clients confirmed that they mostly adhered well to ART so that they could avoid MTCT. After reaching a target of less than 50 copies, they either skipped taking the medication or they shared with whoever borrowed from them. This information was evidenced by low viral load results reported from majority of clients just before they got pregnant. Additionally for those clients who were on follow-up in the clinic before they got pregnant had higher copies until the decision to become pregnant came into their mind, but this was not analysed in this research study since it occurred before pregnancy. These low levels were maintained during antenatal clinic and many questions were being asked whether they would continue with the same trend after delivery or a viral rebound would be witnessed. Viral load results were reported to take time before they were released and this made pill count as an alternative way to determine ART adherence. After retrospective review of the clients' files since when they became pregnant, it was found that at

some time majority of them either omitted taking the medications or they forgot to take them because they presented more than expected pills in the clinic. It is the custom of CCC clinic to give the exact drugs plus one pill according to the calendar days so as to observe the trends of adherence. This is according to the Kenyan guidelines of adopting pill count method as a way of monitoring ART adherence in poor resource settings in addition to viral load analysis. Other clients were also found to have missing pills meaning they either shared with their friends or the pills got destroyed. This research finding therefore showed that assessment of adherence could be achieved well by combining those two methods together which in this case revealed that majority of the clients were not adhering to ART. This finding concurred with Achieng et al (2013) who revealed that clinician initiated pill count exercise would help to determine the adherence level of the clients as well as the report by Sangeda et al (2014) that missing of pills either one or two consecutively was regarded as compromised ART adherence.

6.0 CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 SUMMARY OF THE RESULTS:

The study found out that the following results:

Use of viral load results and pill counts directed the investigator to the findings that at some point during the ANC clinic the patients either omitted (47%, n=26) drugs and therefore came to the clinic with extra pills than expected, or attended the clinic earlier than set return dates due to missing pills (41%, n=23). This finding summarizes the findings that even though majority of the clients had lower viral load they were not adhering to ART regimen.

There was literacy level influence on ART adherence among sero-positive pregnant women mainly contributed by low level of education (p=0.01), poor knowledge on condom use (p=0.004), selective disclosure (p=0.003), poor compliance of ART prescription (p=0.002) and a sense of full recovery (p=0.009)

There existed cultural related factors that influenced ART adherence which were faith healing (p=0.037) and stigma towards sero-positive pregnant women (p=0.001)

The hospital related factors that influenced ART adherence include; under-staffing (p=0.005), drug side effects (p=0.031) lack of enough space in the hospital (p=0.005) and unclear instructions to the patients (p=0.009)

Other clients related factors that were found to influence ART adherence are: alcoholism (p=0.004), forgetfulness (p=0.002), lack of family support (p=0.037) and depression (p=0.018).

6.2. CONCLUSION

- The two gold standards of measuring adherence i.e. pill count and viral load analysis would give better results when used together. It was found that large group of clients

were not adhering to ART guidelines when pill counts was done during ANC clinics. This calls for more counseling to scale up the level of ART adherence.

Majority of the respondents were educated upto primary level and had inadequate knowledge on HIV transmission, prevention and treatment portraying that literacy level factor have a negative effect on ART adherence.

- The researcher also concluded that apart from literacy related challenges, cultural related challenges and hospital related factors there existed other clients related factors that influenced ART adherence, these factors were; alcoholism forgetfulness and lack of family support.
- Faith healing and stigma among the sero-positive women were the major cultural related factors that influenced ART adherence.
- Lack of enough space in the hospital had an effect in promoting stigma which later affected ART adherence.

6.3. RECOMENDATIONS

The investigator recommends that:

- Viral load and pill counts are effective ways of measuring ART adherence and especially when used together hence the need to employ them while determining ART adherence.
- To the pregnant women:
Majority of them were educated upto primary level hence the need to counsel them more on ART strategies with an aim of achieving an optimal level of ART adherence.
- To the policy makers;

There is need for the hospital administration to address the elements of hospital related factors that are hindering ART adherence.

- To the health care providers;

There is need to continue counseling the clients on ART adherence so as to maintain it at optimal level at all times.

6.4 Further research recommendations

Clients related challenges that hinder ART adherence needs to be investigated further to find their source and possible solutions so as to avoid their influence on ART.

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APPENDICES

APPENDIX I: RESEARCH PERIOD


RESEARCH ACTIVITY DESCRIPTION	MONTH/ YEAR											
	Dec	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov
Proposal development	X	X	X									
Submission and review by ethics and research committee for approval				X								
Pre-testing and training research assistant.					X							
Data collection						X	X					
Data entry and analysis								X				
Report writing									X	X		
Presentation, defense of the study and final report writing											X	X
Results dissemination												

APPENDIX II: RESEARCH BUDGET

COMPONENT	ACTIVITY DESCRIPTION	ITEM	UNIT OF MEASURE	UNIT COST(KSH)	TOTAL(K SH)
Research proposal/stationary	Stationary	Foolscap	One ream	@750	750
		Photocopy papers	3 reams	@800	2400
		Photocopy charges	300 pages	@5	1500
	Printing charges	First, second and third draft	@70 pages	@700	2100
Research tool pre- testing	Research assistant	Responsibility allowance	5 days	@1000	5000
	Questionnaires	Typing and printing questionnaires	20 copies	@10	2000
		Photocopy of questionnaires	2000 pages	@5	10,000
	Data collection	Research assistance(1) sustenance	60 days	@1000	60000
Reports/Thesis	Draft reports(3)	Printing and Photocopy	90 pages(3)	2700+10,800	13,500
	Final reports	Correction and printing, photocopy and binding	90 pages for 8 copies	3600+900+4000	8500
		Miscellaneous			9250
Grand total					115000


APPENDIX III: REQUEST LETTER FOR ETHICAL APPROVAL

Resub P183/03/2018



UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
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Website: <http://www.erc.uonbi.ac.ke>
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Twitter: @UONKNH_ERC https://twitter.com/UONKNH_ERC



KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/RR/475

John Mwaniki Kiama
Reg. No. H56/87043/2016
School of Nursing Sciences
College of Health Sciences
University of Nairobi

Dear John,

Research Proposal: Challenges of antiretroviral therapy adherence among sero-positive pregnant women in Murang'a County Referral Hospital in Kenya (P183/03/2018)

This is to acknowledge receipt of your revised research proposal and to inform you that upon review the KNH- UoN Ethics and Research Committee made the following observations and suggestions:

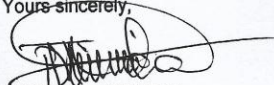
Most of the issues raised in our previous letter (Ref: KNH-ERC/RR/354 dated 15th May, 2018) have been addressed. However, please recheck the following:

- Sample size: It is advisable to interview all women if n=59.

Recommendations

Revise and resubmit two (2) copies of the full proposal within a period of two (2) weeks with effect from the date of this letter. Include a cover letter that summarizes how you have addressed the comments and note the page number(s) where the changes have been made.


Yours sincerely,



PROF. M.L. CHINDIA
SECRETARY, KNH- UoN ERC

c.c. The Principal, College of Health Sciences, UoN
The Director, CS, KNH
The Chair, KNH- UoN ERC
The Director, School of Nursing Sciences, UoN
Supervisors: Ms. Hannah Inyama, Ms. Joyce Jebet

21st June, 2018



Protect to discover

APPENDIX IV: REQUEST LETTER PERMISSION TO CONDUCT A RESEARCH STUDY

APPENDIX 2: REQUEST LETTER PERMISSION TO CONDUCT A RESEARCH STUDY

John M. Kiama,
School of Nursing Sciences,
University of Nairobi,
P.O BOX 19676,
Nairobi.
The Medical Superintendent,
Murang'a County Referral Hospital,
P.O BOX 52-10200,
Murang'a.

Dear Sir/Madam,

RE: REQUEST FOR PERMISSION TO CARRY OUT RESEARCH

I am a second year post graduate student pursuing Master of Science in Nursing (Obstetrics/Midwifery) at the school of Nursing Sciences, University of Nairobi. I humbly request for permission to conduct a study on challenges on antiretroviral therapy adherence among sero-positive pregnant women in Murang'a County referral hospital. At the end of this study all the challenges that will be identified will be addressed well for action to be taken.

Your kind consideration will be highly appreciated as it will go a long way to facilitate completion of study and subsequent award of the degree. Thank you in advance.

Yours Faithfully,

John M. Kiama. Contact- 0721974375.

*Permission granted on
condition that informed
consent will be
obtained from all the
participants*

THE MEDICAL SUPERINTENDENT
MURANG'A LEVEL 5 HOSPITAL
10 JUL 2018
P.O. Box 52-10200
MURANG'A

APPENDIX V: INFORMED CONSENT FOR QUANTITATIVE RESEARCH WITH SERO-POSITIVE PREGNANT WOMEN

Study sub titles

1. Knowledge related factors that influence antiretroviral therapy adherence among sero-positive pregnant women in Murang'a County Referral Hospital.
2. Cultural related factors that influence antiretroviral therapy adherence among sero-positive pregnant women in Murang'a County Referral Hospital.
3. Hospital related challenges that influence antiretroviral therapy adherence among sero-positive pregnant women in Murang'a County Referral Hospital

This informed sheet will be read to you by the principal researcher or research assistant, please feel free to ask any question for further clarification in any issue you may not understand. Your participation in this study is voluntary; you can withdraw from the study at any time of you wish to and failure to participate in this study will not affect the services you receive from this clinic.

Part 1: information sheet

Introduction

I am John Kiama, a student undertaking a Master's degree program at the University of Nairobi seeking to explore the challenges of antiretroviral therapy adherence among sero-positive pregnant women in Murang'a County Referral Hospital and recommend the possible action to be taken.

You are requested to participate in this study because you are pregnant woman on follow-up in Maternal and Child Health clinic in Murang'a County Referral Hospital which has been selected

as study site. We are providing the information to you about this study and would like to invite you to be part of this survey.

What to expect during the interview.

If you accept to participate, this interview will take one hour. The questionnaire will evaluate knowledge level on Anti retroviral therapy adherence, determine cultural related factors that influence antiretroviral therapy adherence among sero-positive pregnant women and finally determine the hospital related challenges that influence antiretroviral therapy adherence among sero-positive pregnant women in Maternal and Child Health Clinic.

Voluntary participation

Your participation is entirely voluntary and your decision to participate or not to participate will not affect the services you receive in this clinic.

Benefits of participating in the study

There may be no direct benefits for your participation in this research study. Though you will be able to discuss with the researcher any arising issue that you may be having and the researcher will assist you with the necessary counseling needed.

Risks involved in the study

No known risk in participating in this research study but you may feel that your time has been inconvenienced.

Confidentiality

Every effort will be made to protect your privacy and confidentiality in the research study. The interview will take place in private and the information collected from you will be kept in a lockable cupboard and only accessed by the researcher. The questionnaire will not contain your name rather will have a unique number which you will be given upon consenting. At the end of data collection a report will be prepared which will be shared in forums and publications but this report will not reveal your name in any way. We reassure you that we will stick to our words.

Study cost

There will be no compensation to you for taking part in this research studies neither are you required to pay anything for participation.

Research related injury.

No form of injury or harm that could happen to you due to participation in this study. However some questions may be sensitive and it's advisable to inform the study staff if you feel annoyed or irritated by taking part in the study.

Contacts and questions

In case of any question that might arise after you have been interviewed you may contact John Kiama on 0721974375

Or

The Director,

KNH-UoN Ethics and Research Committee,

Email:uonknh-erc@uonbi.ac.ke

Website:<http://www.erc.uonbi.ac.ke>

Or

Ms Hannah Inyama

Contact-0723065246

[Email-hannainyama@gmail.com](mailto:hannainyama@gmail.com)

Or

Dr Joyce Jebet

Contact-0721475165

[Email-jjcheptum@mail.com](mailto:jjcheptum@mail.com)

Part 2: Certificate of Consent

I have read the informed consent or it has been read to me. I have had the opportunity to ask question about it and every question was answered to my satisfaction. I hereby consent voluntarily to participate as a participant in this research.

Name of participant	Date	Signature
---------------------	------	-----------

If illiterate

I have witnessed the accurate reading of the consent sheet to the potential participant and the individual given opportunity to ask questions. I hereby confirm that the individual has given her consent freely.

Name of participant	Date	Thumb print
---------------------	------	-------------

Name of witness

Date

Signature

Statement of taking consent

I herby confirm that the participant was given enough opportunity to ask questions about the research study. All questions have been answered to the level of my satisfaction. No coercion in giving consent was witnessed and the consent has been given voluntarily and freely.

Name of consenting person

Date

signature

APPENDIX VI: INFORMED CONSENT FOR SEMI -STRUCTURED INTERVIEW WITH HEALTH CARE WORKERS.

Study Title: Challenges of ART adherence among sero-positive pregnant women in Murang'a County Referral I Hospital

Introduction

I am John Kiama, undertaking a Master's degree program at the University of Nairobi seeking to explore the challenges of antiretroviral therapy adherence among sero-positive pregnant women in Murang'a County Referral Hospital and recommend the possible actions to be taken.

You are requested to participate in this study because you have a working experience at Maternal and Child Health clinic in Murang'a County Referral Hospital which has been selected as study site. We are providing the information to you about this study and would like to invite you to be part of this survey.

What to expect during the interview.

If you accept to participate, this interview will take one hour. The questions will evaluate knowledge related challenges that influence antiretroviral therapy adherence, determine the culture related challenges that influence antiretroviral therapy adherence among sero-positive pregnant women and finally determine hospital related challenges that influence antiretroviral therapy adherence among sero-positive pregnant women in Maternal and Child Health Clinic.

Study Procedure

If you agree to participate in research, I will conduct an interview with you on Friday in your office or any other location of your choice. The interview will involve questions about literacy related challenges that influence antiretroviral therapy adherence, culture related factors that

influence antiretroviral therapy adherence and finally the hospital related factors that influence antiretroviral therapy adherence. It should last about one hour. With your permission, I will audiotape and take notes during the interview. The recording is to accurately record the information you provide, and will be used for transcription purposes only. If you choose not to be audio taped, I will take notes instead. If you agree to be audio taped but feel uncomfortable or change your mind for any reason during the interview, I can turn off the recorder at your request. Or if you don't wish to continue, you can stop the interview at any time.

Voluntary participation

Your participation is entirely voluntary and your decision to participate or not to participate will not affect the services you receive in this clinic.

Benefits of participating in the study

There may be no direct benefits for your participation in this research study. Though you will be able to discuss with the researcher any arising issue that you may be having and the researcher will assist you with the necessary counseling needed.

Risks involved in the study

No known risk in participating in this research study but you may feel that your time has been little been inconvenienced.

Confidentiality

Every effort will be made to protect your privacy and confidentiality in the research study. The interview will take place in private and the information collected from you will be kept in a lockable cupboard and only accessed by the researcher. The questionnaire will not contain your

name rather will have a unique number which you will be given upon consenting. At the end of data collection a report will be prepared which will be shared in forums and publications but this report will not reveal your name in any way. We reassure that we will stick to our words.

Study cost

There will be no compensation to you for taking part in this research studies neither are you required to pay anything for participation.

Research related injury.

No form of injury or harm that could happen to you due to participation in this study. However some questions may be sensitive and it’s advisable to inform the study staff if you feel annoyed or irritated by taking part in the study.

Contacts and questions

In case of any question that might arise after you have been interviewed you may contact John Kiama on 0721974375.

Part 2: Certificate of Consent

I have read the informed consent or it has been read to me. I have had the opportunity to ask question about it and every question was answered to my satisfaction. I hereby consent voluntarily to participate as a participant in this research.

-----	-----	-----
Name of participant	Date	Signature

If assisted

I have witnessed the accurate reading of the consent sheet to the potential participant and the individual given opportunity to ask questions. I hereby confirm that the individual has given her/his consent freely.

Name of participant	Date	Thumb print
---------------------	------	-------------

Name of witness	Date	Signature
-----------------	------	-----------

Statement of taking consent

I hereby confirm that the participant was given enough opportunity to ask questions about the research study. All questions have been answered to the level of my satisfaction. No coercion in giving consent was witnessed and the consent has been given voluntarily and freely.

Name of consenting person	Date	signature
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APPENDIX VII: STUDY QUESTIONNAIRE

Title: Challenges of ART adherence among sero-positive pregnant women in Murang'a County referral hospital

Serial number..... Date.....

Instructions to the respondents

Please respond to the following questions without fear or intimidation. All information will be kept private and confidential. You are free to seek any clarification during the process of data collection and the process will take one hour.

Part A: Demographic Data

Please put a tick (√) in the space provided to indicate your response.

1. How old are you? (Please indicate your age in years in the space provided)

.....

2. Where do you live?

1=Urban area-----

2=Rural area-----

3. What is your marital status? 1=Single 2=married 3= separated 4= divorced
5=widowed

4. What is your highest level of educational? 1=Primary 2=secondary
3=college 4=university

5. What is your religion? 1= Christian

2=Muslim 3=Hindu 4=Buddhist

5=others (specify).....

6. What is your occupation? 1= Permanent Employed 2=Casual Employment

3=Self Employment 4=Housewife 5= others(specify)

7. What is the occupation of your spouse?

1= Permanent Employed 3=Casual Employment

4=Self employment 5= Unemployed 6=don't know 7=N/A (no spouse)

8. What is your average monthly income? (kenya shillings)-----

9. What is your spouse's/partner's monthly income? (Kenya shillings).-----

Part B: Literacy level related factors that influence ART adherence among sero-positive pregnant women

10. When were you diagnosed with HIV infection?

1=0-6months 2=6-12months 3=12months and above

11. What is the importance of taking ART to you?

I-----

ii-----

iii-----

12. What is the importance of taking ARVs to the unborn babies?

13. Do you take ARVS as prescribed by the doctor? 1=Yes 2=No

14. If yes, why do you think is important to take ARVs as prescribed? -----

15. Do you have treatment assistance (someone to remind you to take your ARV medications)?

1=yes 2= No

16. Do you use any memory aid to remind you to take ARV drugs?

1=yes 2= No

17. If yes above, which type of memory aid do you use?

1=electronic device (alarm, beeper,)

2=personal diary

3=calendar dates

4=others (specify).....

18. Have you disclosed your HIV status to someone else other than health care giver?

1=yes 2=No

19. If yes above, whom did you disclose your HIV status to.....

20. If YES to question 39 above give reason for your disclosure

1=trust from the partner and relatives

2=encouragement from health care giver

3=fear of serious illness

4=others (specify).....

21. Do you have a sexual partner? 1=yes 2= No

22. If yes above, how do you ensure is a safe sex?

.....

23. Is it necessary to use condoms if both partners are HIV positive?

1=yes

2=No

24. Give reason/reasons for your answer

above.....

.....

.....

25. What do you know about taking alcohol while using ARVs?

PART C: Culture related factors that influence ART adherence

26. In your community, what are the myths and cultural beliefs regarding HIV infection?

27. How does your community perceive a pregnant woman with HIV infection taking

ART? -----

28. Are there any cultural beliefs that deter/hinder a pregnant woman from taking ARTs consistently? If so please explain-----

29. Have you been able to disclose your HIV status to family and or community member?-----

i. If YES why and how they took it especially on ART regimen and compliance-----

ii. If NO why not? Any cultural barrier?-----

30. In your community do cultural practices (rites of passage) such as female genital mutilation (FGM) being practiced? -----

30. i. If YES in your opinion do these practices influence HIV status and subsequently ART adherence? please explain-----

Part D: hospital related challenges on ART adherence

31. How often do you go for your PMTCT clinic appointments?
 1=weekly 2=monthly 3=every 3 months 4=whenever needed be 5=others
 (specify)-----
32. What is the distance from your home to the HIV comprehensive care clinic? 1=0-10km 2=10-20km 3=20-50km 4=50-100 km 5=100km and above
33. Does the distance from home to hospital affect your clinic attendance in any way?
 Explain-----

34. Have you ever failed to get medication (ART) from the hospital?
35. 1=Yes 2=No
36. If Yes above, how many times? 1=Once 2=twice 3=others, (specify)-----

37. How do you perceive the health care workers from this hospital? -----

38. How long do you wait before being attended to? -----
39. Tell us about the services you receive from this hospital every time you attend the clinic (*probe if the services are satisfactory, enough, necessary and modern*)-----

40. Have any of the following factors made you skip/stop taking ART? Tick on the space provided for each factor.

Factors affecting ART adherence

	FACTOR	YES	NO
1	Alcohol/substance use		
2	Didn't want others to see		
3	Forgot/busy		
4	Depressed		
5	Ran out of stock pills		
6	Didn't understand instructions		
7	Felt better		
8	Hospitalized		
9	Faith healing		
10	Lack of support from relatives		
11	Herbal medicine		
12	Pill burden (many pills)		
13	Felt ill		
14	Lack of food		
15	Side effects		
16	Pills shared with friends		
17	High cost of transport		

18	Pills got lost		
19	Travelled away from home		

APPENDIX VIII: INTERVIEW GUIDE FOR KEY INFORMANT INTERVIEW

Study Title: Challenges of ART adherence among sero-positive pregnant women in Murang'a County Referral Hospital

Introduction of the study and consenting

1. What specific training have you received in relation to HIV management and treatment?
2. Describe your role in Maternal and Child Health clinic unit?
3. What is the Anti Retroviral Therapy initiation procedure in your institution? Which guidelines do you use for this therapy?
4. What do you think are the hospital related challenges that influence ART adherence among sero-positive pregnant women in Murang'a county referral hospital? (*Probe for: lack of hospital facilities, waiting time, under staffing, quality of services, high staff turnover, poor interpersonal relationship*).
5. What mechanisms do you apply to ensure clients keep appointment dates? (*Probe for: clinic guardian, phone call, clinic cards and reminders*).
6. How do you ensure that sero-positive pregnant women in Murang'a county referral hospital have adequate knowledge on HIV transmission, treatment and prevention? (*Probe for: flip charts, health education sessions, proper use of condoms, safe sex*).
7. What do you think are the cultural related factors that influence Anti Retroviral Therapy adherence among sero-positive pregnant women? (*Probe for: traditional medicine, faith healing, witchcrafts and roles of men in antenatal clinic, stigma and discrimination*).

Do you have any question you feel that I have not asked and you would like us to talk about?

Thank you for your participation.

APPENDIX IX: DATA ABSTRACTION FORM

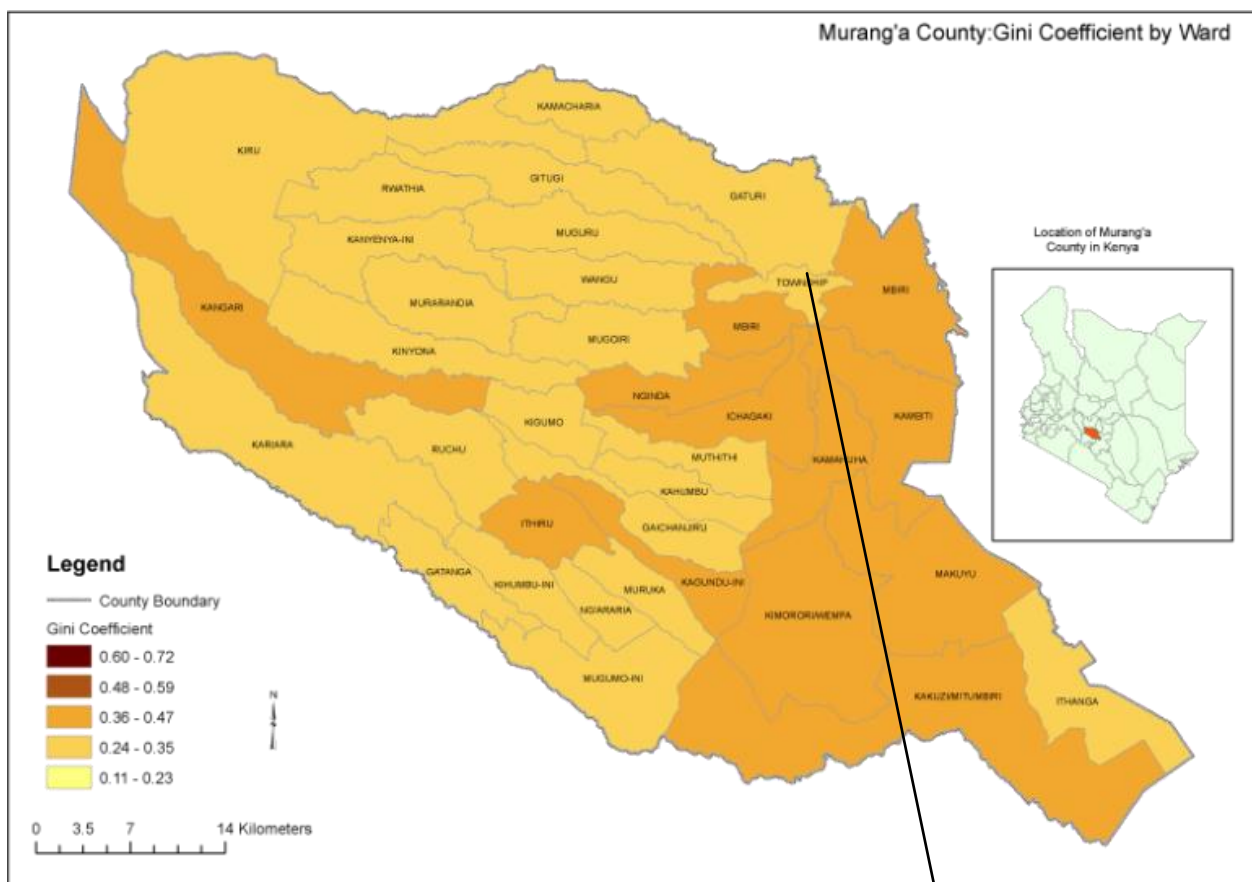
Study Title: Challenges of ART adherence among sero-positive pregnant women in Murang’a County Referral Hospital

NB: This form will be filled by the researcher to evaluate the level of adherence to ARTs by the sero-positive pregnant women. This information will help to address the hospital related factors.

	BIODATA			DATE AND ANC VISIT PROFILE						
COD E	AGE	PAR A	HOM E	1st ANC VISIT (DATE, TICK ATTENDANC E)	2nd ANC VISIT (DATE, TIC K ATTENDAN CE)	3rd ANC VISIT (DATE, TIC K ATTENDAN CE)	4TH ANC VISIT (DATE, TIC K ATTENDA NCE)	PILL COUNT REPORT (MI SSING/OMM ITTED/COM PLIED) INDI CATE THE NUMBER	VIRA LL LOAD RESU LTS	
001										
002										
003										

004									
005									
006									

APPENDIX X: MAP OF MURANGA COUNTY



Murang'a town

Figure 2: Map of Murang'a County

Source: Google maps, (2018)