DETERMINANTS OF MOTHER TO CHILD TRANSMISSION (MTCT) OF HIV AMONG SEROPOSITIVE MOTHERS AT THIKA LEVEL 5 HOSPITAL, IN KIAMBU COUNTY, KENYA

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DECLARATION

This thesis is my original work and has not been presented for any award or degree in any other university.

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DEDICATION

I dedicate this study to my God for giving me strength, health, and sound mind throughout this course. I also dedicate this study to my family for giving me the necessary moral and financial support to undertake this thesis.

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LIST OF ABBREVIATIONS AND ACRONYMS

ANC	Antenatal Care
AZT	Zidovudine
BMI	Body mass index
CCC	Comprehensive Care Clinic
CD4	A cluster of Differentiation 4
CHEWs	Community health extension workers
CS	Caesarean section
FBOs	Faith-Based Organizations
HAART	Highly Active Antiretroviral Therapy
HIV	Human Immune-deficiency Virus
IUGR	Intrauterine Growth Restriction
KDHS	Kenya Demographic and Health Survey
LBW	Low birth weight
MCH	Mother and child health
MICS	Multiple indicators cluster survey
MMR	Mother mortality ratio
MTCT	Mother to Child Transmission of HIV virus
NGOs	Non-governmental Organizations
NVP	Nevirapine
PLHIV	People living with HIV
PMR	Perinatal mortality rate
PMTCT	Prevention of Mother to child transmission of HIV
SGA	Small for Gestational Age
SPSS	Statistical Package for Social Sciences

SVD	Spontaneous Vertex Delivery
UNAIDS	United Nations Program on HIV/AIDS
VVF	Vesical-vaginal fistula
WHO	World Health Organization

OPERATIONAL DEFINITIONS

Determinants: refers to influencers of mother to child transmission (MTCT)

Gravidity: refers to the number of times the seropositive has been pregnant

Infant mortality: the probability of dying before the first birthday

Intrauterine fetal death: refers to mortality of a newly growing child within the 2nd and 3rd trimesters

Low birth weight: refers to birth weight less than 2500gm

Mother-to-child transmission (MTCT): this is the transmission of HIV to a child from an HIV-infected woman during pregnancy, delivery and or breastfeeding

Preterm delivery: is delivery of the newborn before 37 weeks of gestation

Postnatal mother: refers to a mother who delivers at the hospital facility.

Seropositive mothers: is an HIV infected mother who has seroconverted

Seropositive pregnancy outcome: refer to a newborn who tests HIV positive at 18 months. 18 months is the standard period at which a case of perinatal transmission is confirmed

Stillbirth: refers to the fetus that shows no evidence of life (heartbeat, respiration or independent movement) at any time later than 22 weeks after conception.

ABSTRACT

Background: In Kenya, Human Immune-deficiency Virus (HIV) prevalence is still high (6.9%) compared to national average of 6%. Despite Kenya's prevention of mother to child transmission of HIV (PMTCT) efforts to reduce mother to child transmission (MTCT) of HIV rates to <5% by 2015, the transmission rate is still high, about 14%. The high maternal and MTCT prevalence have been associated with increased fetal and maternal deaths, morbidities and other adverse pregnancy outcomes even globally.

Objective: To establish determinants of MTCT of HIV among seropositive post-natal mothers at Thika Level 5 hospital, in Kiambu County, Kenya. Specifically, the study sought to examine the influence of socio-demographic characteristics of seropositive mothers, maternal factors, and infant related factors on MTCT of HIV.

Materials and Methods: This was a cross-sectional descriptive study of 94 seropositive mothers at Thika level 5 hospital. Interviewer-administered questionnaire and abstracted medical review record were used to collect relevant data. The questionnaire was pretested before being used during the actual data collection exercise. Descriptive statistics were used to describe data. The Chi-square of independence was used to test the association between the study variables and MTCT of HIV. Multiple logistic regression was used to explore relationships between variables while adjusted odds ratios were used to test associations between study variables and establish determinants of MTCT of HIV and thus formed the basis for testing the study hypotheses.

Results: The study found out that mothers' type of residence whether urban or rural influences MTCT of HIV. Mothers whose residences were in rural areas were more than two times likely to transmit HIV to their babies than those whose residences were in urban areas (AOR: 2.36; 95% CI: 1.45-8.52]. In addition, the World Health Organization (WHO) clinical stage was found to influence the MTCT of HIV at Thika Level 5 hospital. As compared to mothers who enrolled for ARV treatment in the first and second trimester, mothers who enrolled for ARV treatment at the third trimester were more than 2 times likely to transmit HIV to their children (AOR: 2.3; 95% CI: 1.9-13.7, $p < 0.05$). In addition, mothers who enrolled to PMTCT care during WHO clinical stage II were more than three times likely to transmit HIV to their children compared to those who enrolled to PMTCT at WHO stage I (AOR: 3.4; 95% CI: 1.5-8.4, $p < 0.05$). Regarding types of ARV prophylaxis given to infants after birth, infants who were provided no ARV prophylaxis and those provided NVP only, were about 7 times and 6 times significantly more likely to contract HIV from their mothers than those infants provided with Nevirapine (NVP) and Zidovudine (AZT) (AOR:7.26; 95%CI:2.84-21.03] and (AOR: 6.12; 95%CI: 2.09-14.23).

Conclusion: Socio-demographic, maternal-related factors and infant related factors should be monitored by health care providers when taking care of seropositive postnatal mothers to prevent occurrences of HIV MTCT.

Dissemination: The results of the study will be presented to the School of Nursing of the University of Nairobi. Two manuscripts based on the study objectives will be prepared and published in a peer-reviewed journal for the wider audience and access.

CHAPTER ONE: INTRODUCTION

1.1 Background Information

Human Immune-deficiency Virus / Acquired Immune-deficiency syndrome (HIV/AIDS) is a major public health problem globally, regionally and also in Kenya. Globally, 17.4 million women aged 15 years and above are living with HIV/AIDs. Out of these, 15% comprise young women15–24 years old, 80% of whom live in sub-Saharan Africa (World Health Organization [WHO], 2016). However, only 15% of young women aged 15-24 years are aware of their HIV status in Sub-Saharan Africa (UNAIDS, 2016). In Kenya, HIV prevalence among pregnant women in Kenya is 6.2% (KAIS, 2016).

The World Health Organization estimates that over 90% of HIV infection among children results from mother-to-child transmission (MTCT) (WHO, 2015). They also indicate that without any intervention, about 30-45% of HIV positive pregnant women can transmit the virus to newborns during pregnancy, delivery and or breastfeeding. Morbidities and pregnancy complications result from HIV infection. Approximately, 5% of pregnancy complications are associated with Mother HIV infection due to associated immune suppression (Makokha, 2015).

United Nations Program on HIV/AIDS (2015) indicated the disproportionately high prevalence of HIV among young women compared to older women. They revealed that over 70% of new HIV infections among adolescents in Africa occurred among adolescent girls; every hour, around 34 young African women are newly infected with HIV. The report showed that young women and adolescents report 3 times HIV prevalence compared with their male counterparts in Africa (UNAIDS, 2015). Many factors have been reported to influence pregnancy outcomes including high viral load

and comorbidities (Gorman, 2013). Ezechi et al. (2013) reported adverse pregnancy outcomes among seropositive mothers (48.3%) compared to 30.3% reported among seronegative mothers. Birungi and Obare (2011), Kumari and Kumar (2017), and WHO 2015) have suggested a relationship between maternal characteristics and adverse pregnancy outcomes. These characteristics include pre-natal care, substance abuse, poverty, maternal age, and parity.

World health organization (WHO) developed global standards for HIV prevention care and treatment for pregnant mothers and their children to help reduce MTCT of HIV and associated adverse outcomes (WHO, 2015). This includes timely diagnosis and treatment of those affected. The guidelines underscore the need for prevention of mother to child transmission (PMTCT) of HIV for pregnant seropositive women. Informed by these guidelines, the health facilities are equipped to provide advice, care, and treatment of seropositive pregnant women to reduce the risk of mother to child transmission. Resultantly, seropositive pregnant women are required to be enrolled in highly active antiretroviral therapy (HAART) in all phases of pregnancy (CDC, 2012).

In Kenya, PMTCT is integrated into the formal health care systems and services which include mother, newborn and child health services to improve prevention and outcomes. However, the rate of MTCT of HIV rate is still high at about 14% (KAIS, 2016). This is in addition to the high cost of hospitalization, comorbidities, and mortality associated with unwanted pregnancies. It is on this basis that the study's aim was to examine determinants of pregnancy outcomes with an aim of informing interventions for achieving improved pregnancy outcomes and MTCT of HIV risks associated with seropositive women.

1.2 Statement of the Problem

According to UNAIDS (2015), women remain disproportionately affected by HIV/AIDS in Sub-Saharan Africa. In Kenya, maternal HIV prevalence is still high (6.9%) compared to national average of 6% (KAIS, 2016). Whereas Kenya targeted to reduce MTCT of HIV rates to <5% by 2015, the transmission rate is still high, about 14% (Sirengo et al., 2016). The high maternal and MTCT of HIV prevalence have been associated with increased fetal and maternal deaths, morbidities and other adverse pregnancy outcomes even globally (Ndege et al., 2016). The effects may be disproportionately higher among young mothers who report more pregnancy complications due to the under-developed reproductive system, inexperience and limited knowledge on pregnancy management and outcomes (MOH, 2016).

To reduce MTCT of HIV rates and improve seropositive pregnancy outcomes, Kenya has increased efforts to enhance antenatal care and ART coverage through PMTCT programs (KDHS, 2014). This has increased the number of HIV-positive women accessing PMTCT services significantly. According to KAIS (2016), antenatal care coverage is over 90%. However, the reports showed that most of the visits, over 70%, are in the third trimester which causes delays in diagnosis and interventions, hence compromising the effectiveness of interventions. Despite this alarming trend, there is limited local evidence on determinants of seropositive MTCT of HIV outcomes among young post-natal mothers aged 15-29 years in Kenya. This study addressed this research gap by assessing the MTCT of HIV rates and their determinants among post-natal seropositive mothers. The results will be used to inform relevant interventions for improving pregnancy outcomes among young seropositive women.

1.3 Justification of the Study

By 2012, PMTCT programs coverage was reported to be available in about 95% of all medical facilities. However, MTCT of HIV rate is still high at about 14%. This is in addition to high maternal HIV prevalence (6.9%). The perinatal transmission has been associated with increased child mortality, ballooning medical bills, social stigma and loss of work productivity. Nevertheless, there is no adequate and conclusive evidence on factors contributing to the persistently high MTCT of HIV. This has a significant implication on the success of PMTCT initiatives aimed at reducing perinatal transmission. The study findings sought to mitigate this research gap and help inform initiatives to reduce the high burden and cost of MTCT of HIV.

Thika Level 5 hospital is preferred as the study site because it is the main referral hospital in Kiambu County which provides comprehensive PMTCT to prenatal, antenatal and postnatal care for women from across the County and surrounding counties, including referrals for advanced management cases. The hospital provides a suitable access to a representative sample of seropositive young women for the study.

1.4 Research Questions

The study was guided by three main research questions:

1. What are the socio-demographic factors influencing MTCT of HIV among seropositive post-natal mothers in Thika level 5 Hospital;
2. What are the infant-related factors influencing MTCT of HIV among seropositive post-natal mothers in Thika level 5 Hospital?
3. What are the maternal factors influencing MTCT of HIV among seropositive post-natal mothers in Thika level 5 Hospital?

1.5 Study Objectives

1.5.1 Broad Objective

To establish determinants of MTCT of HIV among seropositive postnatal mothers at Thika level 5 hospitals, in Kiambu County, Kenya.

1.5.2 Specific Objectives

1. To determine socio-demographic factors influencing MTCT of HIV among seropositive post-natal mothers in Thika level 5 Hospital.
2. To establish infant-related factors influencing MTCT of HIV among seropositive post-natal mothers in Thika level 5 Hospital.
3. To determine maternal factors influencing MTCT of HIV among seropositive post-natal mothers in Thika level 5 Hospital.

1.6 Study Hypotheses

1. H_{01}: There is no significant relationship between socio-demographic characteristics of seropositive mothers and HIV MTCT.
2. H_{02}: There is no significant relationship between infant-related factors and HIV MTCT.
3. H_{03}: There is no significant relationship between maternal factors and HIV MTCT.

1.7 Significance and Scope of the Study

The study results may document determinants of pregnancy outcomes and identify areas of improvement and or interventions for reducing the risk of adverse seropositive pregnancy outcomes among young mothers. The information generated in this study may be shared with relevant stakeholders such as PMTCT service planners, managers, and providers in guiding relevant policy agendas and briefs, initiatives and appropriate

interventions aimed at reducing HIV MTCT. The study will also be documented for future references and research hence available research body of knowledge. The scope of the study comprised of MTCT of HIV and the associated determinants among seropositive post-natal women in Thika Level 5 hospital located in Kiambu County. The study excluded private, non-governmental organizations (NGOs) and faith-based organizations (FBOs). Therefore, the findings of the study can only be generalized to seropositive women attending public health facilities.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter contains a theoretical review where concepts that guide the research study are being discussed. The chapter also discusses other authors works and findings under the empirical review section which is followed by a critique of the existing literature relevant to the study. The chapter ends lastly with the identified study gaps.

2.2 Prevalence of HIV/AIDS and Mother to Child Transmission (MTCT)

Globally, 35 million persons living with HIV/AIDS; about 80% of these people live in Sub-Saharan Africa (UNAIDS, 2015). A total of 15 million young women aged 15years and above in Sub-Saharan Africa are infected with HIV/AIDs. Out of the 250,000 new infections reported in 2013, 64% were among adolescent girls. Resultantly, HIV/AIDS is the leading cause of deaths among young women (UNAIDS, 2015; UNAIDS, 2016). A significant proportion of young women do not have access to ART in Africa (WHO, 2016). Further, only 15% of young women aged 15-24 years know their HIV status which affects their ability and willingness to get tested and initiate appropriate treatment in time (UNAIDS, 2016). In a study by Ezechi et al. (2013), HIV prevalence among pregnant women was estimated to be 10.4% in Nigeria. In Kenya, KAIS (2016) reported that HIV adult prevalence is 5.6% which translated to 106, 000 new infections yearly. Women in Kenya are disproportionately affected by HIV at 6.9% compared to men at 4.4%. Maternal HIV prevalence is 6.5%. The report revealed also that about half of Kenyans (46.5%) are not knowledgeable, and, or aware of mother to child transmission of HIV (KAIS, 2016). This means their knowledge of HIV/AIDs is poor and this puts the population, especially newborn babies to the risk of the infections.

Improvement in HIV treatment has been associated with the reduction in mother and child mortality in Kenya. Mother to child transmission of HIV occurs at any stage during pregnancy, labor, delivery or breastfeeding. Without any intervention vertical transmission of HIV can range from 15-45%. The goal of antiretroviral therapy initiation is to promote the quality of health of both the mother and the infant and to reduce morbidity, mortality and pregnancy complications among seropositive mothers. With effective ART, transmission rates can be lowered to below 5% (WHO, 2016). However, Kenya is struggling to achieve MTCT of HIV targets of below 5% (MoH, 2016). Factors contributing to the high incidence and prevalence of MTCT of HIV remains poorly understood in Kenya.

2.3 Socio-demographic Factors of Seropositive Mothers

Socio-demographic characteristics of a woman play a critical role in influencing pregnancy outcomes among seropositive mothers. They interact to influence their health care and lifestyle behaviors which are important determinants of individual and population health outcomes (Yang & Ni, 2009). A study conducted by Kumari and Kumar in 2017 indicated variations in pregnancy and health care access among women with differing levels of education. Women with a lower level of education and lack of awareness on PMTCT services reported having higher complications and mortality compared to those who had higher education and access to HAART early in pregnancy (Luka, 2014).

There is a close relationship between higher education levels and good knowledge of PMTCT and ART uptake. Higher education is suggested to empower a woman to access relevant information on care which could be reasons for not accessing optimum PMTCT services including HAART among the less educated (Mosha & Philemon,

2010). A study conducted by Muganyizi *et al* (2007) in Tanzania associated rural residence with unknown HIV status and a higher rate of MTCT (Yang & Ni, 2009). This may indicate that improving the capacity to safely administer HAART in health facilities is not the only factor influencing pregnancy outcomes of HIV infected pregnant women, but rather an array of other social and cultural determinants which interact to influence health care and lifestyle choices and decisions for women.

Age has been shown to mediate in explaining utilization of PMTCT, ART and pregnancy outcomes. Older seropositive mothers have been shown to be a potential risk factor for poor pregnancy outcome (Joseph et al., 2011). According to Jebet (2013), mother age below 18 years and above 35 years is associated with low levels of birth weight, anemia, prematurity, perinatal and neonatal mortality and even maternal deaths especially among women living in rural areas and in high levels of poverty.

In addition, adolescent seropositive pregnant mothers tend to be reluctant in attending antenatal clinics compared to the older and more experienced women (Luka, 2014). A young pregnant woman, especially a first-time mother is reported to exhibit self-denial and esteem issues when diagnosed with HIV infection which limits their ability to demand and use appropriate treatment. Birungi and Obare (2011) found limited attendance of antenatal care for young seropositive women whose pregnancies end up in miscarriage, stillbirths, and abortions which exposes them to higher risks of morbidity and mortality. Young women aged between 18 and 35 years are reported to be less likely to start or adhere to ART, while older ones are most likely to start and adhere to treatment.

Human-immune deficiency virus prevalence is higher among young women with low parity (Gibb *et al.,* 2012). According to Tennyson (2014), nulliparous women have a

higher risk of pregnancy-induced hypertension and fetal-pelvic disproportion leading to operative delivery, whereas the grand multiparous are at a higher risk for hemorrhage, mal-presentation, anemia, uterine rupture and complications associated with chronic medical problems such as diabetes and hypertension. High parity is considered a healthcare problem in low and medium income countries which is mainly due to high prevalence of low socio-economic status, poor female literacy, and social deprivation, as well as poor utilization of contraceptive services associated with poor pregnancy outcomes and higher rate of pregnancy complications (Khatoon et al., 2012). The role of parity on seropositive pregnancy outcomes has not been conclusively documented across literature and specifically, in the local context.

2.4 Maternal Knowledge about MTCT of HIV and Pregnancy Outcomes

Knowledge of maternal care and lifestyle choices have a significant contribution to the pregnancy outcomes among both HIV positive and negative mothers (Kumari & Kumar, 2017). For ANC to yield results in preventing adverse pregnancy outcomes, there is a need for good awareness and knowledge of mothers on the perceived benefit of the visits which enhance positive health behavior changes and reproductive health seeking habits in both partners (Eni-olorunda, 2015). According to a study by Lilungulu (2016), many women, including those who had attended the ANC, have inadequate knowledge regarding the importance of coming early for their first antenatal check-up. Young women are reported to have the least knowledge and experience on pregnancy outcomes (Giuseppe et al., 2015). The study attributed this poor maternal knowledge to a late and limited number of ANC visits in which only 12.4% of the women come for their first trimester ANC visits. Reviews indicate that improving knowledge of women on seropositive outcomes requires early screening and administration of a preventive prophylactic therapy. Poor knowledge has been linked to unfavorable pregnancy

outcome including pregnancy complications, premature birth and low birth weight (Anita & Kumar, 2017).

Lack of formal education, poor infrastructure and poverty have been associated with poor knowledge as a risk factor for adverse pregnancy outcomes (Chama et al., 2010). A study by Ezechi et al. (2013) reported the provision of well-integrated PMTCT services, which include patient counseling, to be an effective strategy for preventing HIV MTCT. However, the study reported that 34.8% of mothers are worried about HIV screening outcomes during their pregnancy for fear of testing positive. PMTCT programs aimed at providing counseling, training and social support networks have been reported to address fears associated with positive HIV test outcome (Gorman, 2013). A woman is responsible for a significant proportion of the decisions which can improve her chances of having a normal, healthy child who is seronegative. For instance, Jebet (2013) indicated that lifestyle behaviors, such as cigarette smoking, nutrition and the use of alcohol, play an important role in determining the growth of the fetus. Women who indulge in cigarette smoking, nutrition and the use of alcohol may end up with more adverse pregnancy outcomes than their counterparts.

A study done by Okeh and Hawkins (2015) revealed that only 42% of women correctly knew the main maternal risk factors for seropositive pregnancy, while only 21.7% of the women were very worried about causing harm to the fetus with the risk behaviors. Only 43.7% of the women in the study indicated that during facility visits, they received relevant information about the possible damage associated with risk factors in pregnancy. This point to gaps in maternal knowledge and awareness as a key component of PMTCT. Existing evidence indicates that pregnancy is an appropriate time to identify maternal risk factors and improve knowledge of women regarding pregnancy complications (Giuseppe Esposito et al., 2015). This is perceived to accrue

immediate benefits in improving the short-term and long-term health of the baby and mothers including limiting MTCT of HIV.

2.5 Maternal and Infant Factors influencing HIV MTCT

There are many factors which interact to influence access to quality and appropriate care for seropositive pregnant women and pregnancy outcomes. A key factor is lack of HIV status acceptance and disclosure resulting to delays and poor uptake of HAART and adherence to PMTCT practices (Mosha & Philemon, 2010). Gibb et al. (2012) postulated that lack of ART increases risks of MTCT of HIV and fatal complications including stunted growth and low birth weights. Past studies by Birungi and Obare (2011) and Gorman (2013) have reported many maternal-related barriers which limit the ability of seropositive mothers to access proper PMTCT. These include stigma, fear of side effects, lack of ART, the absence of partner and family support and lack of status disclosure.

Proper interventions such as the use of timely post-natal and ante-natal care have been reported to reduce the risk of HIV MTCT (Kristine, 2015). ART treatment and counseling comprise important components of prenatal transmission. According to WHO (2015), seropositive women who receive comprehensive prenatal care are more likely to have a positive birth outcome. A proper understanding of pregnancy outcomes and their determinants among HIV-infected women is important in the delivery of healthy newborns. Late diagnosis and intervention of HIV expose seropositive pregnant mothers to higher risks of complications including intrapartum and postpartum complications. However, women, who may benefit from antenatal HAART in conformity with current best practice to suppress the viral load below detectable levels in pregnancy, may be unable to access it, despite its being available due to cultural barriers and cost of care (Chama et al., 2010).

Mother viral load suppresses the immune system and increase the risk of co-morbidities, complications, and mortality (Makokha, 2015). Many ART regimens are now available for treating HIV positive women during pregnancy including the use of highly active antiretroviral therapy (HAART) from early pregnancy, short course combination of ART in late pregnancy and a single dose nevirapine in labor. When HAART is started early in pregnancy, evidence shows that it is more effective with associated improvement in infant survival. Late initiation of ART during pregnancy has been linked with risk of MTCT of HIV and early infant mortality (Kumari & Kumar, 2017). Despite the benefits conferred by the ARTs, its use for prophylaxis in pregnancy can be limited by lack of resources, negative attitudes and in access by the women (Esposito et al., 2015).

Due to complications reported during pregnancy such as the inter-uterine rapture, anemia and other conditions which put the life of the mother and baby to risk, cesarean section (CS) has been successfully adapted to manage the complications (Luka, 2014). The elective cesarean section has been shown to reduce mother to child transmission of HIV among seropositive mothers. It has been shown to be an effective delivery mode to reduce perinatal transmission of HIV especially for women with detectable viral load (Yang & Ni, 2009). However, the elective cesarean section may carry a higher risk of postpartum morbidity than vaginal delivery (Newell, 2004; WHO, 2016). The type of HIV virus has also been associated with pregnancy outcomes. According (Gorman, 2013), HIV-1 infection in pregnancy is associated with higher risks of prematurity and low birth weight. Babies born to HIV positive mothers have a higher chance of weighing less than those of HIV negative mothers. This is primarily due to the immunosuppression resulting from the infection (Lilungulu, 2016).

Poor maternal nutrition before and during pregnancy can lead to poor pregnancy outcome and infant survival among seropositive women (Jebet 2013; Okeh & Hawkins 2015). Reviews by Ezechi et al. (2013) and Giuseppe Esposito et al. (2015) indicate that poor nutrition can lead to immune depression, high mother viral load, spontaneous abortion, stillbirth, congenital malformation, IUGR, preterm delivery, and perinatal and neonatal death. It increases the risk of mother infection which can lead to MTCT of HIV, perinatal and neonatal morbidity and mortality. Body mass index (BMI) is also considered a risk factor for preterm birth and intra-uterine growth retardation (Kristine, 2015). Reviews by Cu and Ef (2013) and Makokha (2015) have also established a link between inter-pregnancy intervals and the risk of poor perinatal and maternal outcomes. The reviews show shorter inter-pregnancy interval to be associated with higher incidences in low birth weight, premature delivery, intrauterine fetal death, as well as higher risk of under-five mortality.

Infant feeding choice has a significant effect on MTCT of HIV. Breastfeeding of infants is estimated to contribute 10% of MTCT of HIV virus (Kumari & Kumar, 2017). However, provision of effective PMTCT initiated at birth can reduce the rate by 5% (Mosha & Philemon, 2010). This requires breastfeeding to be combined with infant prophylaxis. However, some studies have reported formulae feeding to be more effective in reducing transmission than exclusive breastfeeding (Ndege et al., 2016). Low birth weight remains a health problem and is associated with lasting disabilities and even deaths (Birungi & Obare, 2011; Heiman & Artiga, 2015). Reviews by Cu and Ef (2013); Makokha, (2015) have also established a link between inter-pregnancy intervals and the risk of poor perinatal and maternal outcomes. This means that more efforts should be aimed to prevent mortality in the early days of life, especially during the first four weeks. The review concludes that the role of maternal and infant factors

on seropositive pregnancy outcomes among young and adolescent women has not been extensively studied and documented, hence a gap for further studies

2.6 Theoretical Framework

This study model was based on the Health Belief Model (HBM) developed by social psychologists at the United States of Health Service in the 1950s and remains one of the best known and most widely used theories in health research. The theory is based on the comprehension that an individual will take an action related to health if he or she feels that a negative health condition such as HIV can be avoided or has a positive anticipation that by engaging into the recommended action, he or she will avoid a negative health condition. In addition, the theory posits that an individual belief of being able to successfully take a recommended health action will lead that person to implement the action. In this study, the HBM model was used to explain the influence of seropositive mothers' demographic characteristics and obstetric characteristics on MTCT of HIV.

2.7 Conceptual Framework

The conceptual model (Figure 2.1) shows the interrelationships between the study variables.

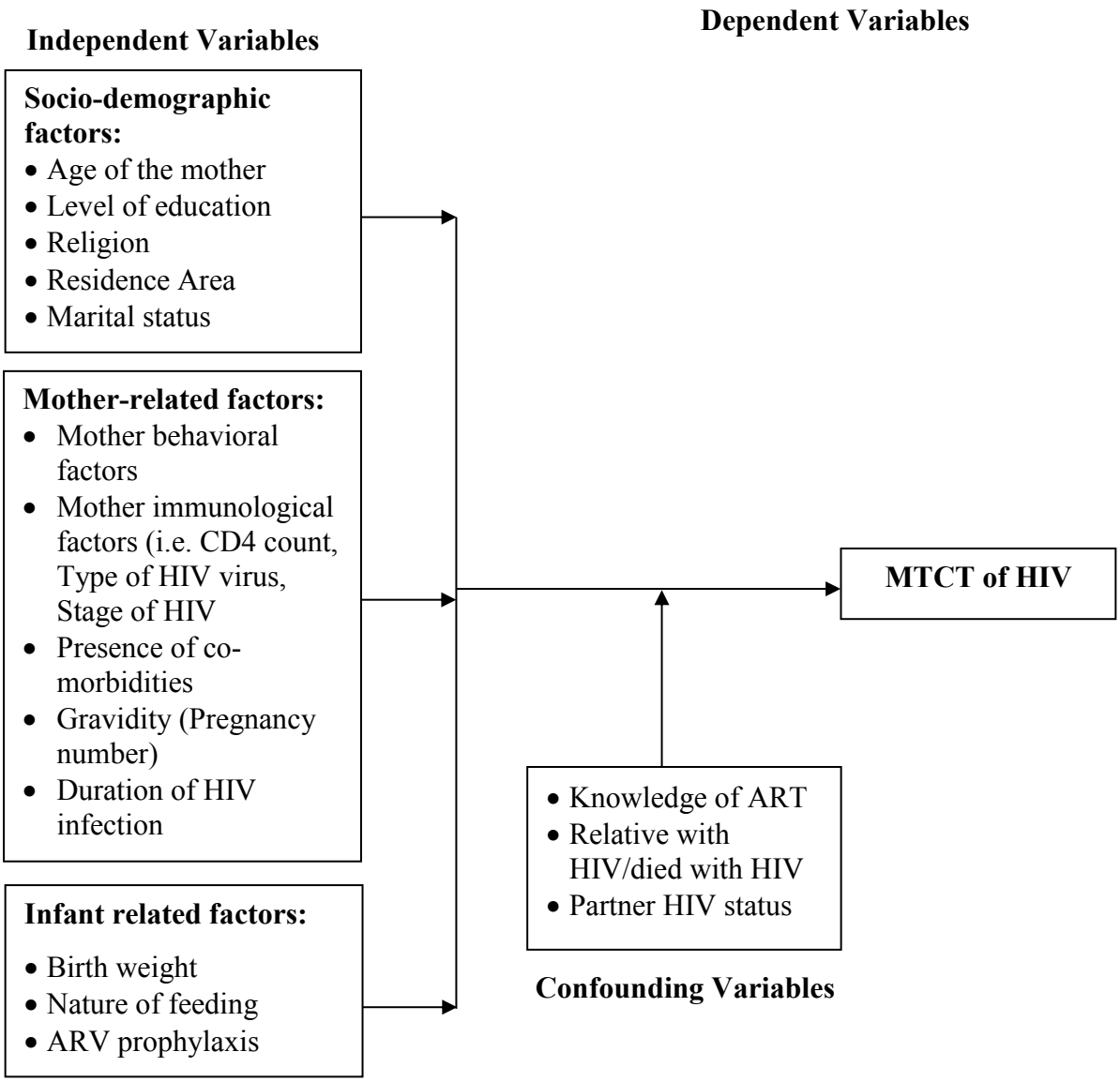

Figure 2. 1: Conceptual Framework
Source: Modified from Schroeder (2007)

CHAPTER THREE: MATERIALS AND METHODS

3.1 Study Design

The study used a descriptive cross-sectional research design in order to establish the determinants of MTCT of HIV outcomes among HIV seropositive mothers attending MCH clinic in Thika level 5 hospitals. The design helped the researcher to establish the participant's experience and views on how socio-demographic, maternal, and infant factors influences the PMTCT outcomes at the hospital.

3.2 Study Area

The study was conducted in Kiambu County and specifically in Thika Level Five Hospital which is the main county referral hospital in Kiambu County, located in Thika Town. It is located in the heart of Thika Town.

There is a total of 364 health facilities spread across the county. Under the public facilities, Thika District Hospital is the only level five hospital. However, there are three level-4 hospitals in Gatundu South, Kiambaa and Kikuyu constituencies, four level-three in Gatundu North, Juja, Kiambaa and Limuru constituencies. In addition, there are 20 level-two health centers and 54 level-ones or dispensaries. Under the private facilities, Kiambu county has 17 mission hospitals, five nursing homes, 36 dispensaries, and 169 private clinics.

The HIV prevalence rate in Kiambu county 3.8% which is relatively lower than the national rate of 6%. The prevalence rate of women stands at 5.6% more than double that of men which accounts for 2% (National AIDs Control Unit, 2017). Kiambu county has a total population of 46, 656 of PLHIV out of which 4,256 are children. There are 228 health facilities providing HIV testing and 190 facilities providing PMTCT. Those providing ART are 48 (NASCOP, 2014).

Thika level-5 hospital provides services to an average of 350,000 outpatients and 20,000 inpatients annually. The hospital is a county referral center that offers comprehensive PMTCT services. The study was conducted in the post-natal clinic which has 800 new post-natal visits monthly. A total of 15 post-natal visits are for seropositive mothers which translate to 180 new seropositive post-natal visits annually (Hospital Service Statistics, 2016).

3.3 Study Population

This study focused on seropositive post-natal mothers in Thika level-5 Hospital. According to Comprehensive Care Clinic (CCC) records (2018) of Thika level 5 hospital, there are 121 cases of seropositive mothers who have been attending the post-natal clinic at the hospital for the last one and half years.

3.3.1 Inclusion Criteria

To participate in the study, the participants had to meet the following conditions:

a) Must be a seropositive pregnant mother attending the antenatal clinic at Thika level 5 hospital and therefore, participating in the hospital PMTCT programme. That is, has been taking counseling sessions and put under HAART programme.
b) The seropositive mother should have delivered and attending the postnatal clinic at Thika level 5 hospital
c) The seropositive mother gave informed consent to participate in the study.

3.3.2 Exclusion Criteria

The following criteria were used to exclude participants:

a) Seropositive mothers who deliver at Thika level 5 hospital but have been attending antenatal clinic elsewhere.

b) Seropositive mothers who had been attending the antenatal clinic in Thika level 5 but opted to deliver elsewhere; and

c) Seropositive mothers who refused to participate in the study.

3.4 Sample Size Determination

The sample size for this study was computed using Fisher et al. (1998) formula. Assuming the proportion of seropositive pregnant mothers at Thika level 5 hospital is 50% and considering a 10% rate of non-response, the required sample was computed as follows:

$$n = \frac{Z^2 pq}{e^2}$$

Where**:**

n = the desired sample size if the sample size is greater than 10,000

Z= the standard normal deviate, which corresponds to 95% confidence level = (1.96)

p= proportion of seropositive pregnant mothers at Thika level 5 hospital

q = 1-p

e= the margin of error at 95% confidence limit = 0.05

$$n = \frac{(1.96)^2(0.5)(1-0.5)}{(0.05)^2} = 384.16$$

Adding 10% non-response rate yields 423 study participants. However, the total population of pregnant seropositive mothers is less than 10,000, therefore the population size was adjusted using the following formula.

$$nf = \frac{ni}{[1 + \frac{ni}{N}]}$$

Where**:**

nf = final sample size after population correction

ni = opening sample size before population correction

N = total population of seropositive mothers attending the post-natal clinic at Thika level 5 hospital

$$nf = \frac{423}{[1 + \frac{423}{121}]} = 94$$

Therefore, the required sample size was 94 seropositive mothers attending the post-natal clinic at Thika level-5 hospital.

3.5 Sampling Technique

Thika Hospital was selected purposively because it is the main referral hospital in the county with a large number of post-natal visits, including referrals (about 700 monthly) drawn from all parts of the county. This enhanced representativeness of the study sample and facilitated generalization of the results to a wider population. To select the 94 seropositive mothers, a list of seropositive mothers who met the inclusion criteria discussed above was obtained from CCC. Convenience sampling of seropositive mothers, with babies who had been on PMTCT, was conducted. A line list of seropositive mothers who had delivered at Thika level 5 hospital and are on PMTCT programme was developed from the antenatal care records, delivery, and PMTCT registers to enable identification of prospective mothers.

3.6 Study Instruments

The study used both data abstraction using participants medical review documents and a pretested questionnaire which was administered to seropositive mothers. Data were collected from mothers at the hospital by the researcher with the help of CCC nurses using a pre-tested structured interviewer-administered questionnaire. The questionnaire

was designed to allow the collection of quantitative data on socio-demographics of respondents and maternal characteristics. Medical review documents were used to provide information on maternal obstetric characteristics and infant related information. Thus, information on the mode of delivery and duration of labor, and maternal factors like CD4 count was obtained from the mother labor records and child health cards using a data abstraction form that was designed for this purpose.

3.7 Pre-Testing of Study Instruments

Pre-testing of study instrument was done at Gatundu Hospital which is a level-4 County referral hospital in Kiambu County. The choice of Gatundu hospital was informed by its operational and functional characteristics which are reflective of Thika level 5 Hospital. The pre-test sample size comprised 10% of the total sample size corresponding to 10 seropositive mothers meeting the earlier mentioned criteria. The results were used to review the study tools such as enhancing the logical flow of questions in the instrument, addition or deletion of questions among others.

3.8 Data Collection Procedure

The process of data collection was done after completion of pretesting the questionnaires. The researcher obtained a letter of authorization to conduct research from KNH-UoN Ethics and Research Committee and the management of Thika Level 5 Hospital. With the help of Comprehensive Care Clinic nurses, questionnaires were administered to selected seropositive mothers in Thika level 5 hospital during clinics and completed at the same time. In addition, data were gathered from the medical health record forms of the selected mothers.

3.9 Data Management, Analysis, and Presentation

Data management for this study comprised various steps. First, data in the collected questionnaires were coded and keyed in the Statistical Package for Social Sciences (SPSS) version 20 for further analysis. Second, keyed in data were cleaned using frequencies. This was done to ensure that all responses in all cases were captured and to help trace those that were wrongly keyed in the SPSS. Third, descriptive statistics (comprising frequencies and percentages) were used to describe the sampled respondents and their social demographic characteristics. The bivariate analysis comprised of chi-square test at 95% confidence level. This statistical test was used to establish the association between the study variables and MTCT of HIV. To test the study hypotheses based on the independent variables (that is, socio-demographic characteristics, maternal-related factors, infant-related factors) and MTCT of HIV, multivariate logistic regression analysis was used. In this study, statistical significance was inferred at a 0.05 percent level ($p<0.05$).

3.10 Ethical Considerations

Ethical approval to conduct the study was sought from UoN-KNH Ethical Review Committee. Study authorization was also sorted from the medical superintendent of Thika Level 5 hospital before data collection. Informed consent was sought from all participants before data collection. To protect respondents' privacy, medical records review was done in a private room within the hospital. No records were taken out of the hospital. Confidentiality was maintained by using unique codes to identify respondents and using lockable cabinets to limit access to data records and documentation. No names were written in the data records. The dataset in the computer was password protected to limit access to study records to the principal researcher.

3.11 Dissemination Plan

The study findings will be presented at the UoN library for publication in the repository. A copy of the report will be presented to the KNH/UoN Ethics Review Committee. The findings of the research will also be published in a recognized peer review journal which will improve its access and use by the relevant audience to inform relevant policies, programs, and interventions. The results will be shared with the hospital management to help them provide improved maternal care services and imitate interventions for addressing identified gaps hence improving the quality of pregnancy outcomes for seropositive mothers.

3.12 Limitations of the Study

The study covered MTCT of HIV outcomes among seropositive women and the factors contributing to these outcomes in Thika Level 5 hospital located in Kiambu County. The study did not include private, NGOs and FBOs. Therefore, the findings of the study can only be generalized to seropositive women attending public health hospitals. Also, selection bias was a limitation in this study. However, the researcher used several CCC nurses to collect data from seropositive mothers who consented to participate in the study.

3.13 Assumptions

1. The participants answered the questions in an honest and candid manner.
2. The inclusion criteria of the sample were appropriate and therefore, assured that the participants had all experienced the same or similar phenomenon of the study.
3. Participants have a sincere interest in participating in the research and did not have any other motives.

CHAPTER FOUR: RESULTS

4.1 Introduction

This chapter presents and interprets the results of the data analysis. The chapter covers response rate, demographic information, institutional information, descriptive statistics and analysis of the determinants of mother to child transmission (MTCT) of HIV outcomes among seropositive postnatal mothers at Thika Level 5 Hospital, Kiambu County, Kenya. Odd ratios and binary logistic regression analysis were performed to statistically test the study hypotheses. Results were presented using tables and figures. All forms and questionnaires used to obtain data from the seropositive mothers had completed data.

4.2 Socio-demographic Characteristics of Seropositive Mothers

4.2.1 Age

Figure 4.1 illustrates the age profile of the respondents. As indicated, the majority (84%) of the women were between 20-29 years of age followed by those who were between 30 to 39 years of age accounting for 11.7%.

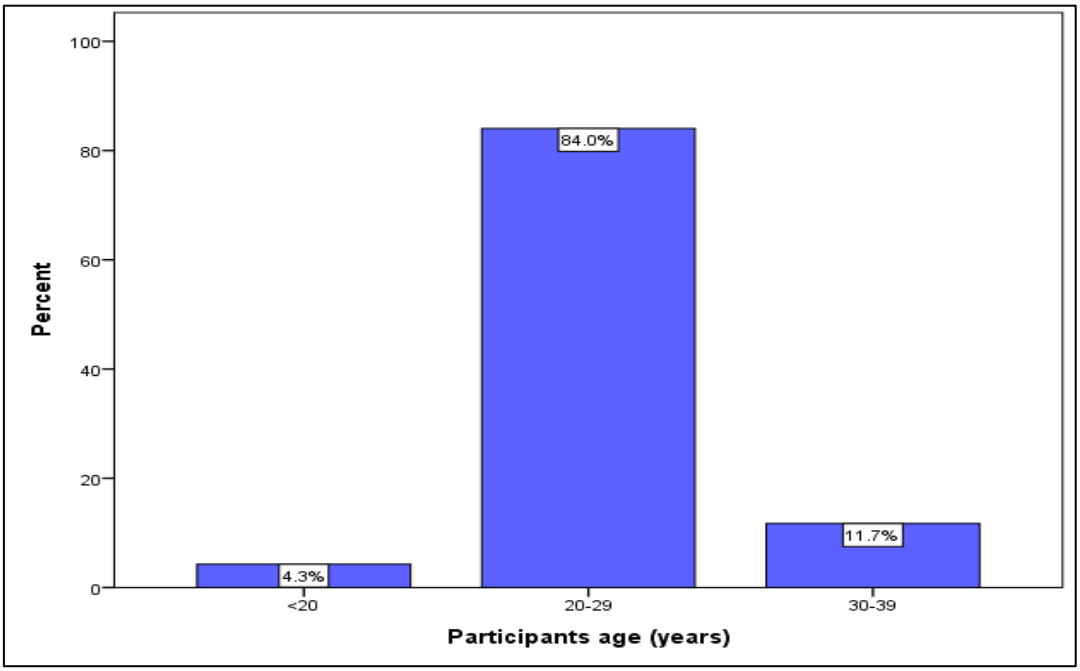

Figure 4. 1. Age in years

4.2.2 Residential area

Figure 4.2 indicates the results of the respondents' residential area. Most (52.1%) of the women were living in urban centers and 46.8% in rural areas at the time of the study.

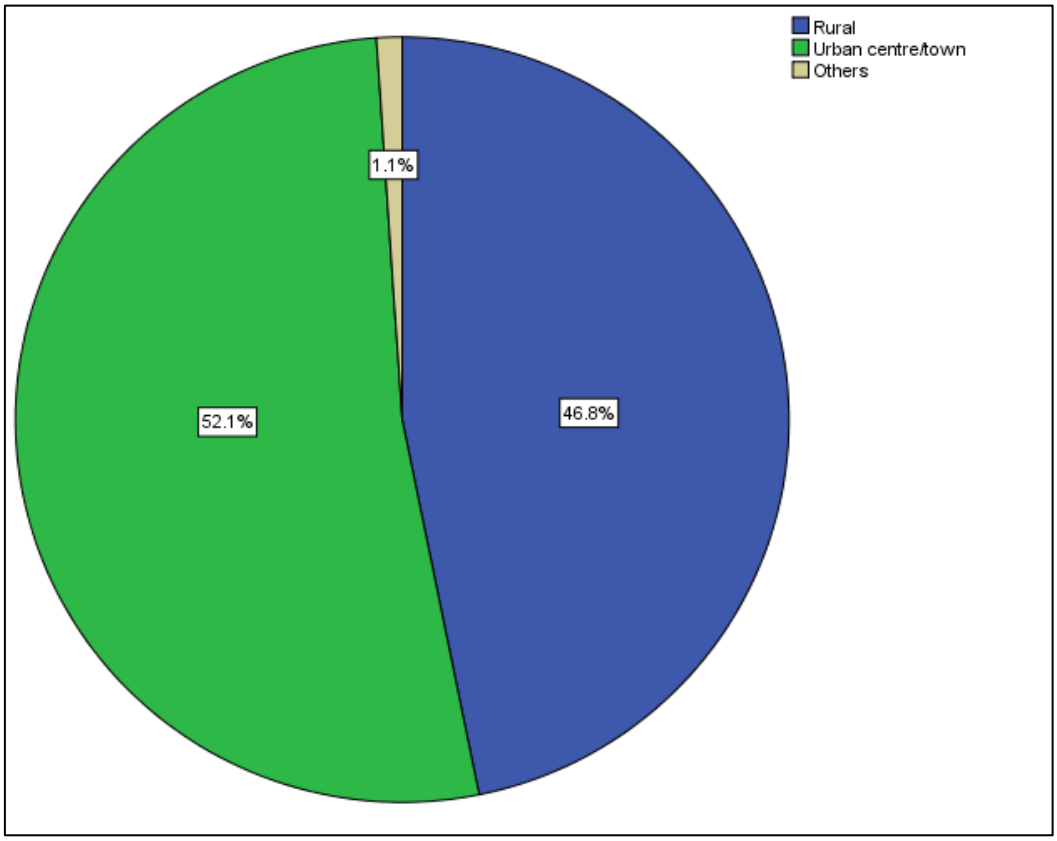

Figure 4. 2. Area of residence

4.2.3 Marital Status

Figure 4.3 indicates the results of the analysis of the respondents' marital status. As indicated, the majority (63.8%) of the women were separated. Only 17.0% of women were married and 19.1% were never married.

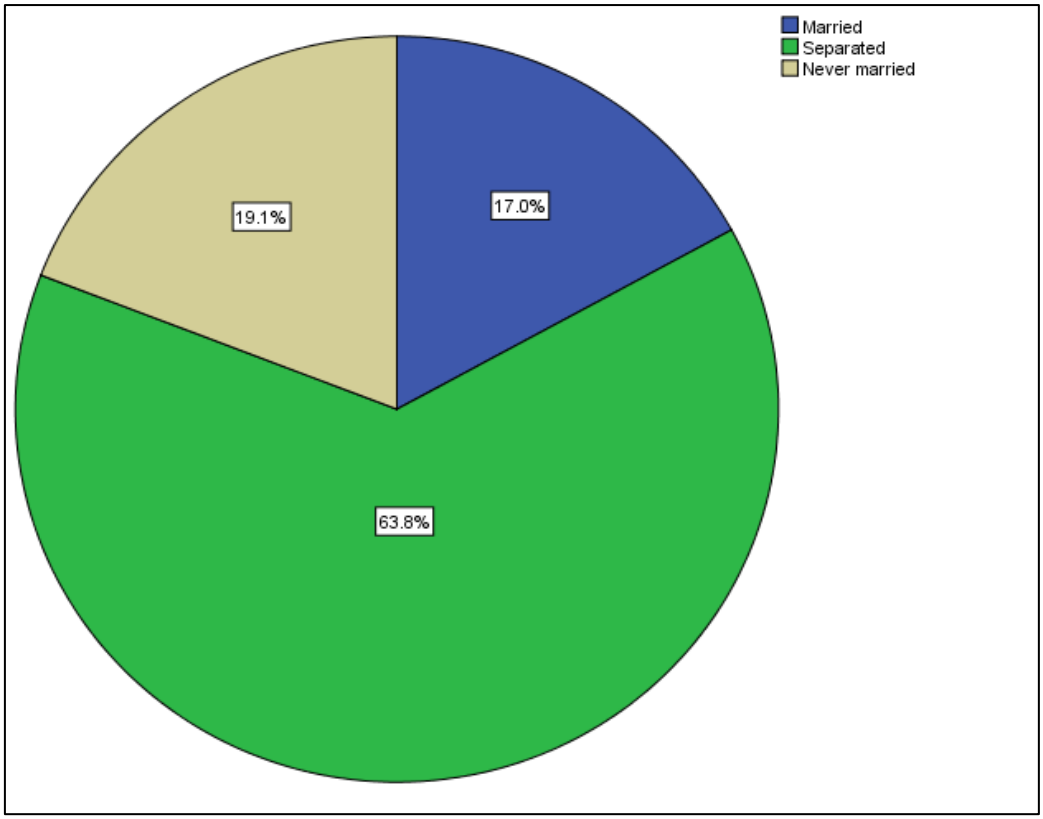

Figure 4. 3. Marital status

4.2.4 Religion

Figure 4.4 indicates the analysis of the respondents' religion profile. As indicated, most (78.7%) of women were protestants (Christians) followed by those who were Catholics (19.1%) and Muslims (2.1%).

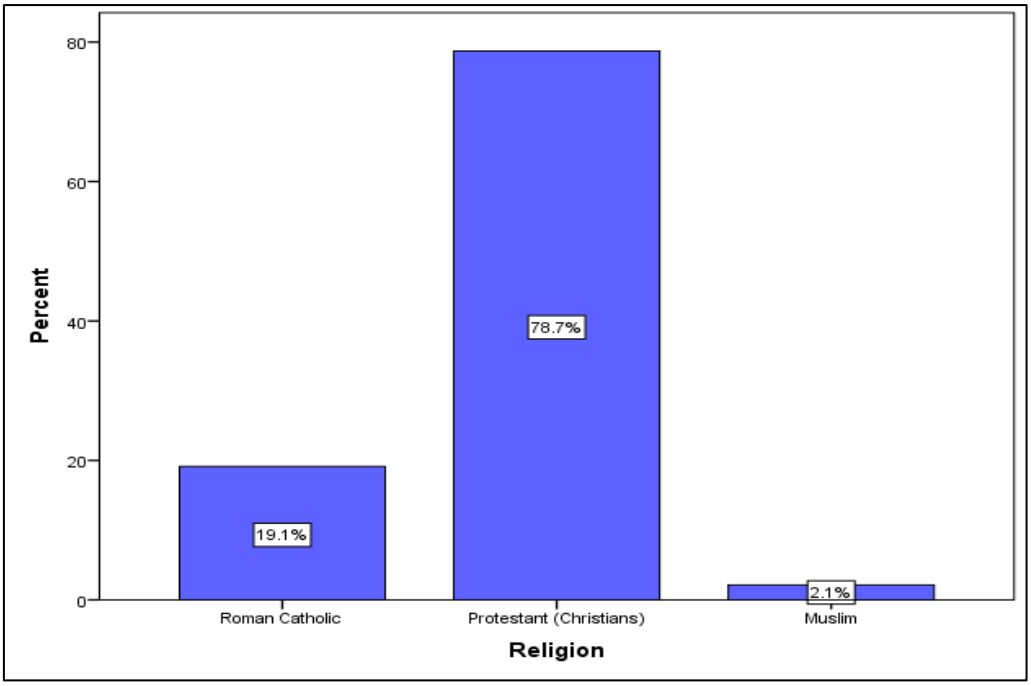

Figure 4. 4. Religion

4.2.5 Education Level

Results of the analysis of the respondents' education profile are illustrated in figure 4.5. Most (55.3%) had secondary education certificate holders. Women with primary school education accounted for 39.4%. Only 5.3% of women had university education qualifications.

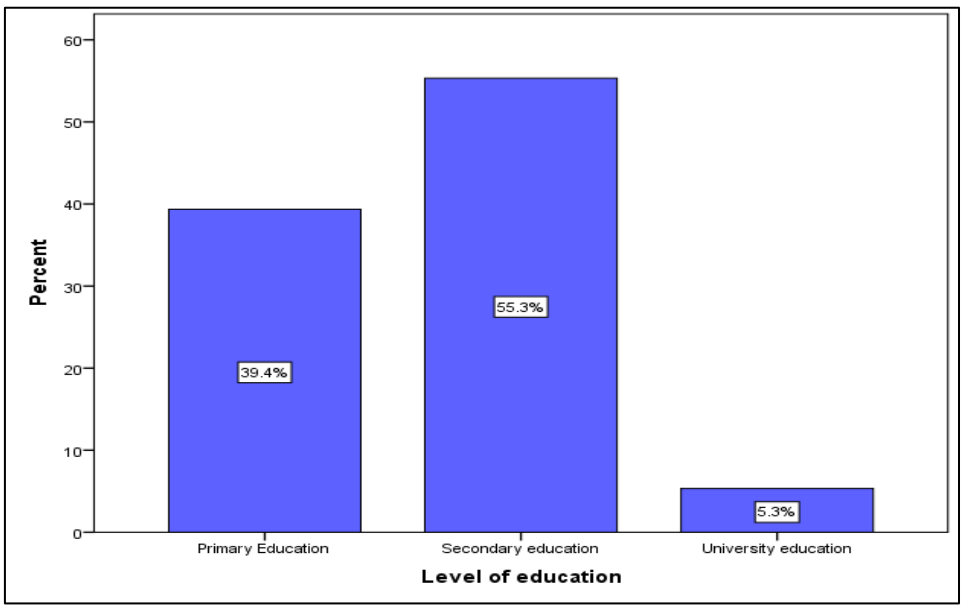

Figure 4. 5. Education Level

4.3 Results of the Bivariate Analysis

4.3.1 Obstetric Characteristics of Mothers

Obstetric characteristics of mothers are shown in table 4.1. Out of 94 participants, most 47 (50.0%) of mothers had a gravidity of 2 pregnancies before the current pregnancy at the time of the study, followed by those with 1 gravidity accounting 37.2%. Only 12 (12.8%) had a gravidity of 3 and more. There was no significant association found between gravidity and MTCT of HIV ($\chi^2 = 14.36$, $df = 2$, $p = 0.072$).

Analysis of the women duration of HIV infection indicates that majority 78 (83.0%) of women had HIV infection for a period ranging between 2 to 4 years. Those who had HIV infection below 2 years accounted for 9.6%. The association between duration of HIV infections and MTCT of HIV was not significant ($\chi^2 = 18.36$, $df = 2$, $p = 0.062$).

All 94 (100.0%) seropositive mothers carried a pregnancy to full gestation. In total, 83 (88.3%) delivered by Spontaneous Vertex Delivery (SVD) while 3 (3.2%) and 8 (8.5%) delivered by elective and emergency caesarian section, respectively. In addition, the mode of delivery was not significantly associated with MTCT of HIV among seropositive mothers ($\chi^2 = 21.32$, $df = 2$, $p = 0.055$).

Overall, all 94 (100.0%) seropositive mothers delivered live babies and were on Antiretroviral (ARV) drugs. Most 54 (57.4%) had enrolled for ARV prophylaxis before pregnancy and 40 (42.6%) during pregnancy.

Likewise, most 51 (54.3%) of mothers had enrolled for ARV prophylaxis within the 1st trimester of the pregnancy. Mothers who enrolled during the 2nd trimester were 42 (44.7%). Only 1 (1.1%) seropositive mother had enrolled for ARV prophylaxis during the third trimester of pregnancy. The association between ARV enrolment pregnancy

trimester and MTCT of HIV was found to be statistically significant ($\chi^2 = 24.16$, $df = 2$, $p = 0.042$).

Table 4. 1. Obstetric Characteristics of Mothers

Characteristics	Frequency (%)	Statistics
Gravidity		
1	35 (37.2%)	$\chi^2 = 14.36$, $df = 2$, $p = 0.072$
2	47 (50.0%)	
3 and more	12 (12.8%)	
Duration of HIV Infections		
Less than 2 years	9 (9.6%)	
2 to 4 years	78 (83.0%)	$\chi^2 = 18.36$, $df = 2$, $p = 0.062$
Greater than 4 years	7 (7.4%)	
Mode of delivery		
Spontaneous vertex delivery (SVD)	83 (88.3%)	
Elective C/S	3 (3.2%)	$\chi^2 = 21.32$, $df = 2$, $p = 0.055$
Emergency C/S	8 (8.5%)	
Fetal outcome after delivery		
Alive	94 (100.0%)	-
Dead	0 (0.0%)	
Use of ARV drugs		
Yes	94 (100.0%)	-
No	0 (0.0%)	
Pregnancy stage at enrollment for ARV treatment		
Before	54 (57.4%)	$\chi^2 = 21.32$, $df = 2$, $p = 0.055$
During	40 (42.6%)	
ARV enrolment pregnancy trimester		
First	51 (54.3%)	$\chi^2 = 24.16$, $df = 2$, $p = 0.042$
Second	42 (44.7%)	
Third	1 (1.1%)	
WHO HIV clinical stage		
1	72 (76.6%)	$\chi^2 = 18.36$, $df = 1$, $p = 0.036$
2	22 (23.4%)	
Type of HIV virus		
HIV-1	93 (98.9%)	$\chi^2 = 10.36$, $df = 1$, $p = 0.061$
HIV-2	1 (1.1%)	
Viral Load		
Below 500	0	-
Between 500 to 1500	94(100.0%)	
Notes: N = 94		

In addition, majority 72 (76.6%) of mothers were in the World Health Organization (WHO) clinical stage 1. There was a significant association between WHO HIV clinical state and MTCT of HIV (χ^2 = 18.36, *df* = 1, *p* = 0.036). The majority 93 (98.9%) of mothers had an HIV-1 virus and just 1.1% had HIV-2 virus. However, the association between type of HIV virus and MTCT of HIV was not statistically significant (χ^2 = 10.36, *df* = 1, *p* = 0.061). All (100.0%) mothers had CD4 count within a normal range of 500 to 1500

4.3.2 Characteristics of the HIV-exposed Infants

Infants with HIV – exposure characteristics were analyzed and results are shown in table 4.2. There were 94 babies delivered to 94 HIV-infected mothers. Out of these babies, 50 (53.2%) were males whereas 44 (46.8%) were females.

All (n=94, 100.0%) babies were of term gestation. The majority (78.7%) were exclusively breastfed with those that were on formula feeding accounting for 21.3%. The HIV status of the babies was negative for the majority (n=91, 96.8%) at the age of 1 to 2 months and 3 (3.2%) were HIV positive. At the age of 4 to 6 months, majority 90 (95.7%) of the babies were still HIV negative. However, 1 baby was infected with HIV during this period of 4 to 6 months resulting in a total of 4 (4.3%) HIV-positive infected babies. Likewise, at the age of 18 months, 5 (5.3%) babies were infected with HIV.

Most 55 (58.5%) of the babies weighed between 3000 to 3500 grams. Those below 3,000grams and above 3500grams accounted for 28.7% and 12.8% respectively. The associations between sex, gestational age at birth (in weeks), birth weight and MTCT of HIV were not statistically significant (*p*-value > 0.05). However, the association

between the choice of feeding and MTCT of HIV was found to be statistically significant ($\chi^2 = 11.76$, $df = 1$, $p = 0.051$).

Table 4. 2. Infant Related Characteristics

Variable	Frequency (%)	Statistic
Sex		
Male	50 (53.2%)	$\chi^2 = 19.56$, $df = 1$, $p = 0.210$
Female	44 (46.8%)	
Gestational age at birth (in weeks)		
< 37	25 (26.6%)	$\chi^2 = 19.76$, $df = 2$, $p = 0.41$
37 – 40	55 (58.5%)	
>40	14 (14.9%)	
Birth weight (grams)		
2500-3000	27 (28.7%)	$\chi^2 = 15.78$, $df = 2$, $p = 0.411$
3000-3500	55 (58.5%)	
3500-4000	12 (12.8%)	
Choice of feeding		
Exclusive Breastfeeding	74 (78.7%)	$\chi^2 = 11.76$, $df = 1$, $p = 0.051$
Formula	20 (21.3%)	
Baby HIV status		
At 1-2 months		
Positive	3 (3.2%)	
Negative	91 (96.8%)	
4-6 months		
Positive	4 (4.3%)	$\chi^2 = 21.13$, $df = 7$, $p = 0.31$
Negative	90 (95.7%)	
18 months		
Positive	5 (5.3%)	
Negative	89 (94.7%)	
N	**94 (100.0%)**	

4.3.3 Maternal Behavioral Factors

Respondents were requested to give information on maternal behavioral factors on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Maternal behavioral characteristics are shown in table 4.3. As indicated, most (50.0%)

of mothers indicated that they were supported by their husbands. However, the majority (46.8%) were indifference about the support they were receiving from their family.

The majority (96.8%) of mothers indicated that they were adhering to ARV drugs and disagreed that they were stigmatized accounting for 83.0%. Also, the majority (47.9%) had not joined support and counseling groups. The majority (48.9%) were neutral about the family pressure to breastfeed. Mothers also expressed disagreement with regard to experiencing financial difficulties accounting for 62.8%. Few mothers (5.3%) agreed to have the desire to breastfeed.

Table 4. 3. Maternal Behavioral Factors

	Disagree	Neutral	Agree
I receive a lot of support from my husband	39(41.5%)	8(8.5%)	47(50.0%)
I receive a lot of support from my family	32(34.0%)	44(46.8%)	18(19.1%)
I adhere to ARV	0(0.0%)	3(3.2%)	91(96.8%)
I experience a lot of stigma	78(83.0%)	12(12.8%)	4(4.3%)
I experience family pressure to breastfeed	15(16.0%)	46(48.9%)	33(35.1%)
I have joined a support group and counseling	45(47.9%)	36(38.3%)	13(13.8%)
I have financial difficulties	14(14.9%)	59(62.8%)	21(22.3%)
I always have the desire to breastfeed	24(25.5%)	65(69.1%)	5(5.3%)

4.4 Results of Multivariate Analysis

This was guided by research objectives and formulated research questions. Logistic regression analysis and odds ratios were computed for interpretation of the key indicators and decision making on research questionnaires. The p-values were also used to explain the significant impact of key indicators on HIV MTCT among seropositive mothers.

4.4.1 Maternal Socio-demographic Factors Associated with HIV MTCT

This was guided by the first objective that was to determine maternal socio-demographic factors influencing HIV MTCT outcomes among seropositive post-natal mothers in Thika Hospital. The analysis was performed using logistic regression and adjusted odds ratios (AOR) were computed as shown in table 4.4. Results of the multivariate logistic regression analysis of mother socio-demographic factors associated with HIV MTCT indicated that age of the mother, marital status, religion and level of education had no significant influence on HIV MTCT outcomes among seropositive post-natal mothers in Thika Hospital ($p > 0.05$). However, the residence of mothers was found to have a significant influence on HIV MTCT outcomes at 0.05 level. This implies that mothers whose residences were in rural areas were more than two times likely to transmit HIV to their babies than those whose residences were in urban areas (AOR: 2.36; 95% CI: 1.45-8.52]. This means that mothers who are close to the hospital can frequently attend in case of any checkup required.

Table 4. 4. Maternal Socio-demographic Factors Associated with HIV MTCT

Variable	Cases	COR [95% CI]	AOR [95% CI]	*P*-value
Age of Mothers				
Less than 20 years	4	1.00	1.00	
20 to 29 years	79	1.23[0.06-2.56]	2.21[1.35-2.81]	0.465
30 to 39 years	11	1.28[0.76-1.98]	2.15[0.72-2.89]	0.421
Residence				
Urban	48	1.00	1.00	
Rural	46	2.75[1.85-4.36]*	2.36[1.45-8.52] *	**<0.001**
Marital status				
Married	16	1.00	1.00	
Separated	60	0.78[0.35-1.81]	1.12[1.35-2.91]	0.219
Never married	18	0.85[0.62-2.89]	2.85[1.72-3.81]	0.231
Religion				
Protestants (Christians)	74	1.00	1.00	
Catholics	18	1.2[0.58-2.12]	1.36[2.31-3.20]	0.366
Muslims	2	0.78[0.35-1.75]	1.87[1.85-2.89]	0.312
Level of education				
Primary school	37	1.00	1.00	
Secondary school	52	2.35[1.18-7.85]	3.20[0.57-1.91]	0.23
University degree	5	2.98[0.51-17.5]	3.18[0.87-2.89]	0.33

Notes: n = 94, AOR = Adjusted Odds Ratio, CI = Confidence Interval

4.4.2 Obstetric Characteristics of Mothers associated with HIV MTCT

This was guided by the second objective that was to determine mother related factors influencing HIV MTCT outcomes among seropositive post-natal mothers in Thika Hospital. The analysis was performed using logistic regression and adjusted odds ratios (AOR) were computed as shown in table 4.5. As shown, results of the relationship between obstetric characteristics of mothers and HIV MTCT were analyzed using logistic regression. Gravidity and mode of delivery were not significantly associated with HIV MTCT (p-value > 0.05). ARV enrolment pregnancy trimester and WHO HIV clinical stage was significantly associated with HIV MTCT (p-value < 0.05). As

compared to mothers who enrolled for ARV treatment in the first and second trimester, mothers who enrolled for ARV treatment at the third trimester were more than 2 times likely to transmit HIV to their children (AOR: 2.3; 95% CI: 1.9-13.7, $p < 0.05$). From findings, mothers enrolled to PMTCT care during WHO clinical stage II were more than three times likely to transmit HIV to their children compared to those who enrolled to PMTCT at WHO stage I (AOR: 3.4; 95% CI: 1.5-8.4, $p < 0.05$).

Table 4. 5. Regression Results for Obstetric Characteristics of Mothers

Characteristics	Frequency (%)	COR [95% CI]	AOR [95%CI]	P value
Gravidity				
1	35	1.00	1.00	
2	47	0.144[8.07-2.56]	1.154[7.17-5.16]	0.257
3 and more	12	0.729[1.63-9.83]	2.103[1.03-6.83]	0.231
Mode of delivery				
SVD	83	1.00	1.00	
Elective C/S	52	0.003[1.55-70.5]	1.164[8.07-2.56]	0.257
Emergency C/S	5	0.080[1.34-4.85]	2.709[2.61-7.13]	0.178
ARV enrolment pregnancy trimester				
First	51	1.00	1.00	
Second	42	1.619[2.11-1.23]	1.02[1.91-13.75]	**0.000**
Third	1	1.405[4.11-3.99]	2.34[2.63-9.83]	**0.000**
WHO HIV clinical stage				
1	72	1.00	1.00	
2	22	2.257[9.88-40.32]	3.452[9.11-15.32]	**0.019**
Notes: n = 94				

4.4.3 Infant Related Factors associated with HIV MTCT

This was guided by the third objective that was to establish infant-related factors influencing HIV MTCT outcomes among seropositive post-natal mothers in Thika Hospital. The analysis was performed using logistic regression and adjusted odds ratios (AOR) were computed as shown in table 4.6. As indicated, sex and gestational age at birth were not significantly associated with HIV MTCT. Regarding types of ARV

prophylaxis given to infants after birth, infants who were provided no ARV prophylaxis and those provided NVP only, were about 7 times and 6 times significantly more likely to contract HIV from their mothers than those infants provided with Nevirapine (NVP) and Zidovudine (AZT) (AOR:7.26; 95%CI:2.84-21.03] and (AOR: 6.12; 95%CI: 2.09-14.23) respectively. This indicates that some infant related characteristics are significantly associated with HIV MTCT. The association between type of infant feeding and HIV MTCT outcome was found to be significant ($p < 0.05$). Infants who were on breastfeeding were more than two times to contract HIV from their mothers than those who were on formula feeding (AOR: 2.32; 95%CI: 2.19-7.23).

Table 4. 6. Infant-related Characteristics Associated with HIV MTCT

Variable	Frequency (%)	COR [95% CI]	AOR [95%CI]	P-value
Sex				
Male	50	1.00	1.00	
Female	44	1.18[0.76-1.86]	2.08[1.76-2.16]	0.47
Gestational age at birth (in weeks)				
< 37	25	1.00	1.00	
37 – 40	55	1.25[0.85-1.98]	2.01[1.23-2.98]	0.24
>40	14	1.32[0.89-2.23]	2.36[2.03-4.23]	0.28
Infant ARV prophylaxis				
NVP+AZT 7/28	11	1.00	1.00	
NVP only	45	1.51[0.77-2.96]	6.12[2.09-14.23]	**<0.001**
None	38	7.11[3.83-13.21]	7.26[2.84-21.03]	**<0.001**
Type of infant feeding				
Formula	20	1.00	1.00	
Breastfeeding	74	1.61[0.87-3.96]	2.32 [2.19-7.23]	**< 0.001**
Notes: N = 94				

CHAPTER FIVE: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings, discussions, conclusions, and recommendations of the study as per the research objectives. These sections were discussed as follows:

5.2 Summary of Major Findings

In this study, 5 babies seroconverted at the age of 18 months. The determinant factors of MTCT of HIV were a place of residence, commencement of ARV prophylaxis, and WHO clinical stage of enrollment to PMTCT.

In this study, infants born to HIV positive mothers from the rural areas were more than two times at higher risk of seroconversion than those born to mothers from urban areas.

Infants born to mothers who enrolled for PMTCT at WHO clinical stage II were two times at risk of HIV infection than those of mothers who enrolled for PMTCT at WHO clinical stage I.

In addition, study results indicated that mothers who enrolled for ARV treatment in the third trimester were more than 2 times likely to transmit HIV to their children than those enrolled earlier. Likewise, mothers who enrolled for PMTCT care during WHO clinical stage II were more than three times likely to transmit HIV to their unborn babies compared to those who enrolled to PMTCT at WHO stage I. With respect to infant related factors, the type of ARV prophylaxis given to infants after birth could determine HIV MTCT. The study results found that infants who were not provided with ARV

prophylaxis and those who were provided NVP only were 7 times and 6 times respectively likely to contract HIV from their mothers.

5.3 Discussion

5.3.1 Influence of Socio-demographic Factors on HIV MTCT

The results indicate that the age of the mother, marital status, religion and level of education had no influence on HIV MTCT outcomes among seropositive post-natal mothers in Thika Level 5 Hospital. This clearly indicates that MTCT of HIV really is not pegged on the marital status of the seropositive mother. The religion of the seropositive mother does not determine MTCT of HIV. However, the residence of mothers had a significant influence on HIV MTCT outcomes. This means that mothers whose residences were in urban centers can frequently visit the hospital for check-ups if required. Also, this could be due to the reason that mothers staying in urban centers are probably more enlightened and have higher knowledge compared to those in rural areas hence, take initiative to seek health services.

These results corroborated with a study by Luka (2014) who found out that seropositive pregnant mothers who in urban centers tend to visit the hospital for antenatal clinics compared to those living in rural areas. Majority of hospitals are located away from rural areas explaining the hassles seropositive mothers living in rural areas go through which really could reduce their likelihood of seeking health services compared to those living in urban centers.

5.3.2 Maternal Factors influencing HIV MTCT

Gravidity and mode of delivery were not significantly associated with HIV MTCT outcome (p-value > 0.05). ARV enrolment pregnancy trimester and WHO HIV clinical

stage were significantly associated with HIV MTCT (p-value > 0.05). As compared to mothers who enrolled for ARV treatment in the first and second trimester, mothers who enrolled for ARV treatment at the third trimester were more than 2 times likely to transmit HIV to their children. This could be due to the reason that at the third trimester, the pregnancy is almost fully developed awaiting delivery and thus, increasing the chances the unborn babies would contract MTCT of HIV due to mothers' late enrollment for ARV treatment. These results supported Makokha (2015) study which found out that mother viral load suppresses the immune system and increase the risk of co-morbidities, complications, and mortality. Also, these results are consistent with the study by Kumari and Kumar (2017) who found out that late initiation of ART during pregnancy has been linked with risk of HIV MTCT and early infant mortality.

Despite the benefits conferred by the ARTs, their use for prophylaxis in pregnancy can be limited by lack of resources, negative attitudes and in access by the women (Esposito et al. 2015). Hence, mothers enrolled to PMTCT care during WHO clinical stage II were more than three times likely to transmit HIV to their children compared to those who enrolled to PMTCT at WHO stage I. Hence, proper interventions such as use of timely post-natal and ante-natal care have been reported to increase seropositive pregnancy outcomes (Kristine, 2015). ART treatment and counseling comprise important components of prenatal transmission. Also, according to WHO (2015), seropositive women who receive comprehensive prenatal care are more likely to have a positive birth outcome. A proper understanding of pregnancy outcomes and their determinants among HIV-infected women is important in the delivery of healthy newborns. Late diagnosis and intervention of HIV expose seropositive pregnant mothers to higher risks of complications including intrapartum and postpartum complications. Thus, WHO clinical stage and pregnancy stage at enrollment to ARV

influence HIV MTCT among seropositive post-natal mothers in Thika level 5 Hospital. These findings are consistent with a study by Ngwende et al. (2013) on factors associated with HIV infection among children born to mothers on the prevention of mother to child transmission program at Chitungwiza Hospital, Zimbabwe.

5.3.3 Infant Factors influencing HIV MTCT

Results indicate that sex and gestational age at birth was not significantly associated with HIV MTCT. Regarding types of ARV prophylaxis given to infants after birth, infants who were provided no ARV prophylaxis and those provided NVP only were about 7 times and 6 times significantly more likely to contract HIV from their mothers than those infants provided with NVP + AZT. This indicates that some infant related characteristics such as infant feeding and ARV prophylaxis are significantly associated with HIV MTCT. This agrees with a study by Kumari and Kumar (2017) who found similar results.

Infant feeding choice has a significant effect on HIV MTCT. Infants who were on breastfeeding were more than two times likely to contract HIV from their mothers than those who were on formula feeding. These results supported Ndege et al. (2016) who reported formulae feeding as a more effective feeding in reducing transmission than exclusive breastfeeding.

5.4 Conclusions

Maternal socio-demographic factors such as the type of residence whether urban or rural have an influence on HIV MTCT at Thika Level 5 hospital. The residence is a key socio-demographic factor which had a significant influence on HIV MTCT. Hence, mothers whose residences are in urban centers near health facilities have more chances to get involved in HIV preventive programs.

Concerning obstetric factors, enrollment for ARV treatment and WHO clinical stage of enrollment was significantly associated with HIV MTCT. A higher probability of HIV MTCT was observed among infants who were not given ARV prophylaxis and those given NVP only. In addition, mode of infant feeding has a significant influence on HIV MTCT among seropositive mothers. Maternal factors such as gravidity are not significantly associated with HIV MTCT.

5.5 Recommendations for Policy and Practice

The findings of this study will provide valuable information for policymakers in the PMTCT scaling-up program to focus on rural settings. Management of hospitals should ensure that seropositive pregnant mothers are reached with AZT prophylaxis before birth in order to substantially reduce HIV MTCT. Hospitals management should also encourage seropositive pregnant mothers to adhere to PMTCT counseling and early preventive measures. Hospitals can work in collaboration with other governmental and non-governmental bodies to spearhead campaigns directing towards achieving this goal.

5.6 Recommendations for further research

This research was a case study and was conducted in one hospital. A similar study can be conducted in the future comprising other hospitals in Kenya. The fact that all potential factors were not included and assessed may affect generalization of predictors in this study.

Also, the more qualitative study can be conducted to determine why other socio-demographic, mother and infant characteristics are not significant with HIV MTCT outcomes among seropositive post-natal mothers in Thika level 5 Hospital.

REFERENCES

Birungi, B. H. & Obare, F., 2011, 'Mother Health Care Utilization Among HIV-Positive Female Adolescents in Kenya',143–149.

Centers for Disease Control and Prevention, 2012, 'HIV Among Youth | Age | HIV by Group | HIV/AIDS | CDC', *Archives of Sexual Behavior*, 825–834.

Chama, C. & Hospital, N., 2015, 'Mother and Fetal Outcomes Among Hiv Positive Pregnant Mothers Attending Antenatal Clinic At', (July 2016).

Chama, C. M. *et al.,* 2010, 'The use of highly active antiretroviral therapy for the prevention of mother-to-child transmission of the human immunodeficiency virus in Nigeria', *Journal of Obstetrics and Gynaecology*, 30(4), 362–366.

Cu, O. & Ef, U., 2013, 'Inter-pregnancy interval and pregnancy outcomes among HIV positive mothers in Nnamdi Azikiwe University Teaching Hospital ', 40(3), 264–269.

Eni-olorunda, T., 2015, 'Knowledge and Attitude of Mothers on Risk Factors Influencing Pregnancy Outcomes in Abeokuta South Local Government Area, Ogun State', *European Scientific Journal*, 11(11), 313–324.

Esposito, G. *et al.*, 2015, 'Women's knowledge, attitudes and behavior about Mother risk factors in pregnancy', *PLoS ONE*, 10(12), 1–12.

Esposito, G. *et al.,* 2015, 'Women's knowledge, attitudes and behavior about Mother risk factors in pregnancy', *PLoS ONE*, 1–9.

Everlyne, S., 2015, 'Pregnancy outcomes among seropositive and seronegative mothers at Pumwani maternity hospital', Kenya (November).

Ezechi, O. C. *et al.,* 2013, 'Pregnancy, Obstetric and Neonatal Outcomes in HIV Positive Nigerian Women', *African Journal of Reproductive Health*, 17(3), 160–168.

G Lilungulu, A., 2016, 'Reported Knowledge, Attitude, and Practice of Antenatal Care

Services among Women in Dodoma Municipal, Tanzania', *Journal of Pediatrics & Neonatal Care*, 4(1), 1–8.

Gibb, D. M. *et al.*, 2012, 'Pregnancy and infant outcomes among HIV-infected women taking long-term art with and without tenofovir in the DART trial', *PLoS Medicine*.

Gorman, S. E., 2013a, 'A new approach to Mother mortality: The role of HIV in pregnancy', *International Journal of Women's Health*, 5(1), 271–274.

Gorman, S. E., 2013b, 'A new approach to Mother mortality: The role of HIV in pregnancy', *International Journal of Women's Health*, 271–274.

Heiman, H. & Artiga, S., 2015, 'Beyond Health Care: The Role of Social Determinants in Promoting Health and Health Equity', *Henry J. Kaiser Family Foundation*.

Jebet, C. J., 2013, 'Factors Contributing to Adverse Pregnancy Outcomes in Public Health Facilities in Keiyo District, Kenya.', (May), p. 109. Available at: http://ir-library.ku.ac.ke/handle/123456789/6867.

Joint United Nations Programme on HIV/AIDS (UNAIDS) and African Union (AU), 2015, 'Empower young women and adolescents girls: Fast-tracking the end of the AIDS epidemic in Africa', p. 32.

Joseph, O., Biodun, O. & Michael, E., 2011, 'Pregnancy outcome among HIV positive women receiving antenatal HAART versus untreated Mother HIV infection', *Journal of the College of Physicians and Surgeons Pakistan*, 21(6), 356–359.

Khatoon, A. *et al.*, 2012, 'Knowledge and need for emergency contraception among women at Abbasi Shaheed Hospital Introduction', 28(3), 204–207.

Kumari, A. & Kumar, R., 2017, 'Fetal Outcome in HIV Positive Women at Tertiary Centre', 5, 2015–2018.

Luka, A. S., 2014, 'Determinants of Pregnancy Outcomes Among Antenatal Care

Attendees in Birnin Gwari Local Government Area of Kaduna State, Nigeria. By a Dissertation Submitted To the Postgraduate School in Partial Fulfilment for the Award of Master of Public Health - Fie.

Ministry of Health, 2016a, 'Kenya Aids progress report 2016', 92. Available at: www.nacc.or.ke.

Ministry of Health, 2016b, 'Kenya HIV County Profiles 2016', 6-24.

Mosha, T. C. E. & Philemon, N., 2010, 'Factors influencing pregnancy outcomes in Morogoro Municipality, Tanzania', *Tanzania journal of health research*, 12(4), 249–260.

Ndege, S. *et al.*, 2016, 'HIV Prevalence and Antenatal Care Attendance among Pregnant Women in a Large Home-Based HIV Counseling and Testing Program in Western Kenya', *PLoS ONE*, 11(1), 1–10.

Newell, M., 2004, 'HIV transmission through breastfeeding: a review of the available evidence', *JAMA: Journal of the American Medical Association*, 11.

Okeh, N. O. & Hawkins, K. C., 2015, 'Knowledge and Perception of Risks and Complications of Mother Obesity during Pregnancy', *Gynecology & Obstetrics*, 5(9).

Sirengo et al., 2016, 2016, 'HHS Public Access', 66(Suppl 1), 1–18.

Kenya Demographic Health Survey, 2014, 'Kenya'.

Tennyson, T. M., 2014, 'Emergency Contraception amongst Female College Students: Knowledge, Attitude and Practice'.

UNAIDS, 2016, 'Putting HIV prevention among adolescent girls and young women on the fast-track and engaging men and boys', *UNAIDS*.

Vold, K., 2015, 'Prevalence, predictors, and outcomes of HIV serostatus disclosure among HIV positive women in Moshi, Tanzania.

WHO, 2015, ‘Guidelines for Prevention of Mother To Child Transmission (PMTCT) of Hiv / Aids in Kenya’, 1–82.

WHO, 2016, ‘WHO | Number of women living with HIV’, *WHO*.

World Health Organization, 2016, ‘Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach’, *World Health Organization*, 155.

Yang, F. & Ni, S., 2009, ‘Prevalence of Adverse Neonatal Outcome and Association With Hiv Infection Among Postnatal Women in Mtwara Regional Hospital-Tanzania’, *Journal of Heterocyclic Chemistry*, 5(May), 1–8.

APPENDICES

Appendix 1: Self-administered Questionnaire for Seropositive Mothers in Thika Level 5 Hospital

Title of Study: Determinants of HIV Mother to Child Transmission (MTCT) among Seropositive Mothers at Thika Level 5 Hospital, In Kiambu County, Kenya

Date: _____

Questionnaire Code No: _____

Instructions

- Do not write your name anywhere in this questionnaire
- Put a tick or circle the appropriate box/response or fill the blank spaces where required

SECTION A: MOTHER RELATED FACTORS

1. *Age in years*: [1] <20 years [2] 20-29 years [3] 30-39years [4] above 40 years

2. *Residential Area:*

[1] Rural [2] Urban centre/town [3] Trading centre

3. *Marital Status:*

[1] Married now [2] Married before [3] Never married

4. *Religion:*

[1] Roman Catholic [2] Protestant (Christians) [3] Muslim

[5] Others [Specify] _____

5. *Level of Education:*

[1] Primary Education [2] Secondary education [3] University education [4] No education at all

6. *Gravidity (pregnancy number):*

[1] 1 [2] 2 [3] 3 [4] 4 [5] ≥5

7. *Any children dead?* [1] Yes [2] No

8. *Duration of HIV infections?* [1] ≤ 2years [2] > 2-4 years [3] > 4 years

SECTION B: MOTHER BEHAVIOURAL FACTORS

Please tick the number that represent how you feel towards the following statements on a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*)

Nº	Statement	1	2	3	4	5
1.	I receive a lot of support from my husband					
2.	I receive a lot of support from my family					
3.	I adhere to ARV					
4.	I experience a lot of stigmas					
5.	I experience family pressure to breastfeed					
6.	I have joined a support group and counseling					
7.	I have financial difficulties and cost					
8.	I always have the desire to breastfeed					

Appendix 2: Informed Consent Information Sheet

Title of Study: Determinants of Mother to Child Transmission (MTCT) among Seropositive Mothers at Thika Level 5 Hospital, In Kiambu County, Kenya

Principal Researcher: Rachael Kimani, School of Nursing, University of Nairobi

Introduction:

I am conducting a study about *Determinants of HIV Mother to Child Transmission (MTCT) among Seropositive Mothers at Thika Level 5 Hospitals, In Kiambu County, Kenya.* There will be no tests to be conducted in this study. The purpose of this consent form is to give you the information you will need to decide whether or not to be a participant in the study. Feel free to ask any questions about the purpose of the research, what happens if you participate in the study, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear.

You should understand the general principles which apply to all participants in a medical research which are:

(i) Your decision to participate is entirely voluntary. However, you may withdraw from the study at any time without necessarily giving a reason for your withdrawal.

(ii) Refusal to participate in the research will not affect the services you are entitled to in this institution.

(iii) We will give you a copy of this form for your records.

This study has been approved by The Kenyatta National Hospital-University of Nairobi

Ethics and Research Committee protocol No. _____

KNH-UoN email: uonknh_erc@uonbi.ac.ke

What will happen if you decide to be in This Research Study?

If you agree to participate in this study, the following things will happen: You will be interviewed by a trained interviewer in a private area where you feel comfortable answering questions. The interview will last approximately 30 minutes.

Are There any Risks, Harms, Discomforts Associated with this Study?

Medical research has the potential to introduce psychological, social, emotional and physical risks. The effort will be put in place to minimize the risks. All information provided by you will be kept confidential and data collection forms will be anonymous.

Are There Any Benefits Being in this Study?

There are no benefits associated with this study. However, your participation will provide useful information which will be used to reduce positive MTCT.

Will Participation in this Study Cost You Anything?

There will be no cost to be incurred in this study.

What If You Have Questions in Future?

If you have further questions or concerns about participating in this study, please call or send a text to the Principal Researcher, Tel No. 0724 207878.

What Are Your Other Choices?

Your decision to participate in research is voluntary. You are free to decline participation in the study and you can withdraw from the study at any time without injustice or loss of any benefits.

I agree to participate in this research study: Yes No

I agree to provide contact information for follow-up: Yes No

Participant signature / Thumb stamp_____

Date _____

Researcher's statement

I, the undersigned, have fully explained the relevant details of this research study to the participant named above and believe that the participant has understood and has willingly and freely given his/her consent.

Researcher's Name: _____Date: _____

Signature_____

Appendix 3: Karatasi ya Maelezo ya Kibali

Kichwa cha Utafiti: Maamuzi ya Uzazi wa Mtoto hadi Utoaji wa Mtoto (MTCT) kati ya Mama wa Seropositive katika Hospitali ya Thika Level 5, Katika Kiambu County, Kenya

Mtafiti Mkuu*:* Rachael Kimani, Shule ya Uuguzi, Chuo Kikuu cha Nairobi

Utangulizi:

Ninafanya utafiti kuhusu *Vigezo vya Uzazi wa Mtoto hadi Utoaji wa Mtoto (MTCT) kati ya Mama wa Seropositve katika Hospitali ya Thika Level 5*, *Katika Kata ya Kiambu, Kenya.* Hakutakuwa na vipimo vyovyote katika utafiti huu. Madhumuni ya fomu hii ya idhini ni kukupa maelezo unayohitaji kuamua ikiwa ni lazima uwe mshiriki katika utafiti. Jisikie huru kuuliza maswali yoyote kuhusu madhumuni ya utafiti, kinachotokea ikiwa unashiriki katika utafiti, hatari na faida iwezekanavyo, haki zako kama kujitolea, na kitu kingine chochote kuhusu utafiti au fomu hii ambayo haijulikani.

Unapaswa kuelewa kanuni za jumla zinazotumika kwa washiriki wote katika utafiti wa matibabu ambao ni:

(i) Uamuzi wako wa kushiriki ni kikamilifu kwa hiari. Hata hivyo, unaweza kujiondoa kwenye utafiti wakati wowote bila ya kutoa sababu ya uondoaji wako.

(ii) Kukataa kushiriki katika utafiti hautaathiri huduma unazostahili katika taasisi hii.

(iii) Tutakupa nakala ya fomu hii kwa rekodi zako.

Utafiti huu umekubaliwa na hospitali Kikuu ya Kenyatta-Chuo Kikuu cha Nairobi Itifaki ya Kamati ya Maadili na Utafiti. Nambari. _____

KNH-UoN email: uonknh_erc@uonbi.ac.ke

Nini kitatokea ikiwa ukiamua kuwa katika Utafiti huu?

Ikiwa unakubali kushiriki katika utafiti huu, mambo yafuatayo yatatokea: Utaulizwa na mhojiwaji mwenye ujuzi katika eneo la kibinafsi ambako unasikia kujibu maswali. Mahojiano yataendelea kwa muda wa dakika 30.

Je, kuna Hatari yoyote inayohusikana na Utafiti huu?

Utafiti wa matibabu una uwezo wa kuanzisha hatari za kisaikolojia, kijamii, kihisia na kimwili. Jitihada zitawekwa ili kupunguza hatari. Taarifa zote zinazotolewa na wewe zitahifadhiwa na data hazitajulikana.

Kuna faida yoyote kuwa katika utafiti huu?

Hakuna faida zinazohusiana na utafiti huu. Hata hivyo, ushiriki wako utatoa taarifa muhimu ambayo itatumika kupunguza MTCT chanya.

Je! Kushiriki katika Utafiti huu Unapoteza Chochote?

Hakutakuwa na gharama yoyote ya kutumiwa katika utafiti huu.

Nini ikiwa Una Maswali Katika Baadaye?

Ikiwa una maswali zaidi au wasiwasi juu ya kushiriki katika utafiti huu, tafadhali piga simu au tuma ujumbe kwa Mtafiti Mkuu, Namba ya 0724 207878.

Je! Chaguzi zingine ambazo unazo ni zipi?

Uamuzi wako wa kushiriki katika utafiti ni wa hiari. Wewe ni huru kupungua kushiriki katika utafiti na unaweza kujiondoa kwenye utafiti wakati wowote bila udhalimu au kupoteza faida yoyote.

Nakubali kushiriki katika utafiti huu: Ndiyo _____Hapana_____

Nakubaliana kutoa maelezo ya mawasiliano kwa kufuatilia: Ndiyo _____Hapana

_____

Saini ya Mshiriki _____

Tarehe:_____

Taarifa ya Mtafiti

Mimi, kama mtafiti mkuu wa huu utafiti, nimeelezea kikamilifu maelezo muhimu ya utafiti huu kwa mshiriki aliyechaguliwa hapo juu na kuamini kwamba mshiriki ameelewa na ametoa kibali chake kwa hiari.

Jina la Mtafiti: _____Tarehe: _____Saini:_____

Appendix 4: Letter to Ethics Review Committee

Rachael Kimani,
University of Nairobi,
School of Nursing Sciences,
P.O Box 5306-00200,
Nairobi, Kenya.

20th February, 2018

The Chairman,
KNH/UON Research and Ethics Committee,
P.O Box 20723,
Nairobi.

Dear sir/ madam,

RE: REQUEST FOR AUTHORITY TO CONDUCT RESEARCH

I am undertaking a study entitled. "Determinants of HIV MTCT among seropositive mothers at Thika Level 5 Hospital, Kiambu County, Kenya" whose purpose is to understand factors associated with HIV MTCT and propose interventions for improving the outcomes, especially reduction of HIV MTCT. This study is a requirement in partial fulfillment of the award of Master's Degree of Science in Nursing. I, therefore, request for an Ethical Review Approval to conduct the study at Thika Level 5 hospital. Attached please find a copy of my research proposal for your review and subsequent approval.

I look forward to a positive response from you.

Thanking you.

Sincerely,

Rachael Kimani

Appendix 5: Permission to Conduct Research Study in Thika Level 5 Hospital

Date

The Medical Superintendent
Thika Level 5 Hospital
P.O Box 227
Thika

Dear Sir/ Madam,

RE: PERMISSION TO CONDUCT RESEARCH STUDY

I am writing to request permission to conduct a research study at your institution. I am undertaking a study entitled. "Determinants of HIV MTCT among seropositive mothers in Thika Level 5 Hospital, Kiambu County, Kenya" whose purpose is to understand factors associated with HIV MTCT and propose interventions for improving the outcomes, especially reduction of HIV MTCT. This study is a requirement in partial fulfillment of the award of Master's Degree of Science in Nursing.

I hope that the hospital administration will allow me to recruit seropositive mothers to anonymously complete a 1 -page questionnaire (*copy enclosed*). Interested seropositive mothers, who volunteer to participate, will be given a consent form to sign (*copy enclosed*) and returned to the primary researcher at the beginning of the survey process.

The survey results will be pooled for the thesis project and individual results of this study will remain absolutely confidential and anonymous. Should this study be published, only pooled results will be documented. No costs will be incurred by either your institution or the individual participants.

Your approval to conduct this study will be greatly appreciated. I will follow up with a telephone call next week and would be happy to answer any questions or concerns that you may have at that time. You may contact me at my email address: rachaelwanjikukimani@gmail.com

If you agree, kindly sign below and return the signed form in the enclosed self-addressed envelope.

Sincerely,

Rachael Kimani
University of Nairobi
School of Nursing Sciences

Approved by:

Name	Title	Signature	Date

Appendix 6: Extract of a Medical Records Review Form

Title of Study: Determinants of HIV Mother to Child Transmission (MTCT) Among Seropositive Mothers at Thika Level 5 Hospital, In Kiambu County, Kenya

Date:_____Participant Unique Code:_____

Instructions: This form should only be filled by the researcher or CTC nurses using information in patient's medical review document. only information indicated in this form should be filled.

EXTRACTED MEDICAL RECORDS REVIEW FORM								
Variables	Observation	Tick or fill	Observation	Tick or fill	Observation	Tick or Fill	Observation	Tick or Fill
Place of delivery	Home		Health facility		Others			
Gestation age at delivery				Comment				
Mode of delivery	SVD		Elective C/S		Emergency C/S		Forceps VD	
	Vacuum VD		Others					
Fetal outcome after delivery	Alive		Stillbirth		Comment			
Sex of baby Male	Male		Female		Comment			
The weight of the baby (Value)								
The weight of the baby (if no value)	<2500 gms		>2500 gms		Comment			
Mode of breastfeeding	Exclusive		Formulae		Comment			
Baby HIV status	At 1-2 months		4-6 months		18 Months		Any other	
Other Mother Clinical Elements								
HIV status	Positive		Negative		Comment			
Time of 1st Test and CD4+ (if HIV positive)	Time (Dates)		Pregnancy Stage		CD4+ Counts		Viral Load	

Time of 2nd Test and CD4+ (if HIV positive)	Time (Dates)		Pregnancy Stage		CD4+ Counts		Viral Load	
Time of 3rd Test and CD4+ (if HIV positive)	Time (Dates)		Pregnancy Stage		CD4+ Counts		Viral Load	
Time of 4th Test and CD4+ (if HIV positive)	Time (Dates)		Pregnancy Stage		CD4+ Counts		Viral Load	
Use of ARV drugs	Yes		Nov		Comment			
Pregnancy stage of enrollment to ARV treatment	Before		During		After		Viral Load	
If ARVs enrollment is during pregnancy, Which trimester	1st		2nd		3rd		Viral Load	
State of HIV according to WHO staging?	I		2		3		4	
Type of HIV Virus	HIV-1		HIV-2		Comment			

Appendix 7: KNH-UoN Ethics & Research Committee Approval

KENYATTA NATIONAL HOSPITAL APPROVED 25 JUL 2018 KNH/UoN-ERC P.O.Box 20723-00202 NRB

UNIVERSITY OF NAIROBI
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KNH-UON ERC
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Website: http://www.erc.uonbi.ac.ke
Facebook: https://www.facebook.com/uonknh.erc
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/A/290

July 25, 2018

Rachel Wanjiku Kimani
Reg. No.H56/81899/2015
School of Nursing Sciences
College of Health Sciences
University of Nairobi

Dear Rachel

RESEARCH PROPOSAL – DETERMINANTS OF MATERNAL TO CHILD TRANSMISSION (MTCT) OUTCOMES AMONG SEROPOSITIVE MOTHERS AT THIKA LEVEL 5 HOSPITAL, IN KIAMBU COUNTY, KENYA (P273/04/2018)

This is to inform you that the KNH- UoN Ethics & Research Committee (KNH- UoN ERC) has reviewed and **approved** your above research proposal. The approval period is from 25th July 2018 – 24th July 2019.

This approval is subject to compliance with the following requirements:

a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
b) All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH-UoN ERC before implementation.
c) Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
e) Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
f) Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

Protect to discover

Appendix 8. County Government of Kiambu Approval to Carry Research

COUNTY GOVERNMENT OF KIAMBU
DEPARTMENT OF HEALTH

Tel.Thika 067 21621/2 fax 21778
All correspondence should be addressed to
MED.SUPT.
When replying please quote

Ref; NO. MOMS/TKA VOL III (488)

THIKA LEVEL 5 HOSPITAL
P.O. BOX 227
THIKA

Date: 17th August, 2018

APPROVAL TO CARRY OF RESEARCH

Principle investigator: RACHEAL KIMANI

RE: DETERMINANTS OF MTCT OUTCOMES AMONG SEROPOSITIVE MOTHERS A THIKA LEVEL 5 HOSPITAL, KIAMBU COUNTY

Following deliberations by Thika Level 5 hospital research committee, your proposal to carry out the above research at this facility has been approved. However, you will need to provide us with licence from NACOSTI before you can commence the data collection.

Take note that you are required to submit a copy of your research findings upon completion of the study to the hospital. It is also expected that the Ethical consideration and the research subjects confidentiality will be maintained as you have outlined in your proposal.

Any patient confidential information that you may access during your research should not be used without consent.

This letter is valid up to 31st January, 2019.

For any queries feel free to contact the committee chair through the Medical Superintendent's office. Thank you and all the best.

MEDICAL SUPERINTENDENT
17 AUG 2018
P.O. BOX 227-01000
THIKA
THIKA LEVEL 5 HOSPITAL

DR. J. WANGECHI
CHAIR TREC
THIKA LEVEL 5 HOSPITAL