DETERMINANTS OF MOTHER-TO-CHILD TRANSMISSION OF HIV INFECTION IN RACHUONYO EAST SUBCOUNTY, HOMABAY COUNTY, KENYA

NICHOLAS ODIEMO OGONE

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DECLARATION

This thesis is my original work and has not been presented for an award of a diploma or conferment of a degree in any other university or institution.

Signature Date: …….

Nicholas Odiemo Ogone

H153/4197/2017

SUPERVISORS' APPROVAL

This thesis has been submitted for examination with our approval as university supervisors;

Signature: Date ……

Dr. Daniel Onguru, PhD

School of Health Sciences

Jaramogi Oginga Odinga University of Science and Technology

P.O. Box 210-40601 Bondo, Kenya.

Signature Date ……..

Dr. David Otieno, PhD

In-Depth Research Institute,

Department of Health and Social Work.

P.O Box 104289-0010 Nairobi, Kenya.

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DEDICATION

I wish to dedicate this thesis to my supervisors, Dr. Daniel Onguru, Dr. David Otieno and my mentor Mr. Joshua Mutanyi for their guidance, moral support and encouragement to pursue this course to completion.

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ABBREVIATIONS AND ACRONYMS

ABC	Abacavir
ANC	Antenatal Care
AOR	Adjusted Odds Ratio
ART	Anti-Retroviral Therapy
ARV	Antiretroviral
AZT	Zidovudine
CD4 Cells	Cluster of Differentiation 4 Cells
CHS	Centers for Health Solution
CME	Continuous Medical Education
COR	Crude Odds Ratio
EFV	Efavirenz
EID	Early Infant Diagnosis
EMTCT	Elimination of Mother to Transmission of HIV
ERC	Ethics and Research Committee
HAART	Highly Active Antiretroviral Therapy
HAM	Health Action Model
HBM	Health Behavioral Model
HEI	HIV Exposed Infant
HIV	Human Immunodeficiency Syndrome
HIV	Human Immunodeficiency Virus
KAIS	Kenya Aids Indicator Survey
LPV/R	Lopinavir/Ritonavir
MCH	Maternal Child Health
MOH	Ministry Of Health
MTCT	Mother to Child Transmissions
NACC	National AIDS Control Council
NASCOP	National AIDS and STI Control Program
NVP	Nevirapine
MTCT	Prevention of Mother to Child Transmissions
SPSS	Statistical Package for Social Sciences
TDF	Tenofovir

UNAIDS	United Nations program on HIV/AIDS
UNICEF	United Nations International Children's Emergency Fund
VL	Viral Load
WHO	World Health Organisation

DEFINITION OF TERMS

Acquired immunodeficiency syndrome:	Active pathological condition that follows the earlier non-symptomatic state of being HIV positive.
ARV prophylaxis:	Refers to short-term use of antiretroviral drugs to reduce HIV transmission from mother to infant.
Attitude:	Is a hypothetical construct that represents an individual's like or dislike for an item. It's a complex mental state involving beliefs, feelings, values, experiences and dispositions to act in certain ways.
Exclusive breast feeding:	Feeding only on breast milk for 6 months without introducing any feeds.
Exclusive formula feeding:	Giving the infant only commercial infant formula milk for the first six months of life
Guidelines:	A detailed plan or explanation to guide one in setting standards or determining a course of action during the provision of health services
Health care facility factors:	This refers to factors within the health facility that affects the uptake of ARV prophylaxis amongst HIV positive pregnant women.
Health care provider:	A person involved in the identification, prevention or treatment of an illness or disability.
Health care worker:	Health care provider working at the MCH clinic is within the healthcare profession and this will include the nurses, clinical officers, nutritionist and counselors.

HIV exposed infant:	Infant born to a known HIV positive mother having a negative HIV DNA PCR.
HIV infected infant:	An HIV exposed infant having a positive HIV DNA PCR
HIV positive mother:	These are mothers who are found to be positive during antenatal period and during delivery
Implementation:	The act of providing a practical means for accomplishing health care service provision as per the available guidelines. Intervention Health care measures that are put in place so as to improve a situation or prevent further damages.
Infant:	A newborn born until 18 months of life
Mother-to- transmission of HIV:	Refers this transmission to from HIV-infected woman which can occur during pregnancy, delivery or breastfeeding period.

ABSTRACT

Vertical transmission is the commonest mode of Human Immunodeficiency Virus (HIV) infection in children aged below 5 years. It remains one of the HIV pandemic's most important challenges. Without preventive measures, chances of the unborn child acquiring HIV in the uterus or during delivery are 15-30%, increasing to 20-45% with breastfeeding. Preventionof mother-to-child transmission (MTCT) strategies can reduce HIV infections to below 1% in developed countries though little success is being realized in developing countries.This study investigated factors influencing MTCT of HIV among children under 5 years in Rachuonyo East Sub County, Homabay County, Kenya. A cross sectional study was conducted in Rachuonyo East Sub County between November 2020 and April 2022. A validated semi structured questionnaire was used to obtain data from 120 randomly sampled HIV positive mothers paired with their children. Data analysis was performed using Chi square tests, Fishers Exact tests and binary logistic regression. The study showed that HIV positive mothers' pregnancy willingness was significantly associated with prevention of MTCT of HIV. Women who were willing to get pregnant were 49.7 times more likely to achieve prevention of MTCT of HIV compared to those who were unwilling (AOR=49.71; 95% CI 2.20-1125.54). Themean age of the participants was 27.8 (SD = 6.4). There was significant association between number of live births and prevention of MTCT of HIV (p <0.05). In addition, women with at least four MTCT visits during pregnancy were 8.6 times more likely to achieve prevention of MTCT of HIV than those who had less than four visits (AOR=8.60; 95% CI 0.45-163.72). Women who never migrated from health care facilities initially enrolled in for HIV care and treatment were 34.4 times more likely to achieve prevention of MTCT of HIV as compared to those who ever migrated (AOR = 34.47; 95% CI 4.84-245.34).Majority of the women 78 (65.0%) possessed above average knowledge on when mother to child transmission of HIV can occur. Women who had average knowledge (AOR = 5.83; 95% CI 0.29-118.26) and excellent knowledge (AOR = 5.62; 95% CI 0.23-138.25) of MTCT during pregnancy were 5.6 and 5.8 times respectively more likely to achieve prevention of mother-to-child transmission of HIV than those who had below average knowledge. Pregnancy willingness and migration between health facilities predicted MTCT in this study area. Social support to HIV infected mothers, policy adjustments regarding transfer of patients on HIV care between health facilities and intensive health messaging are key to achieving MTCT.

CHAPTER ONE: INTRODUCTION

1.1 Background

Several factors are believed to predict Mother to child Transmisssion(MTCT) of HIV, among these are socio demographic which include myths about HIV, cultural beliefs and practices, lack of perceived need for prevention, stigma and discrimination. Economic factors include cost of transport and competing obligations. In addition, health care facility factors such as MTCT intervention, health facility migration and satisfaction with health facility services tends to determine MTCT. Knowledge related factors equally affect MTCT. Lack of information, low levels of knowledge of these factors and misconceptions about MTCT interventions.

Mother to Child Transmission (MTCT) is still considered one of the HIV pandemic's most important challenges. Without preventive measures, chances of the unborn child acquiring HIV in the uterus or during delivery is 15 to 30 %, increasing to 20 to 45 % with breastfeeding. Prevention of MTCT (MTCT) strategies can reduce HIV infections to below 1 % in developed countries(WHO, 2010a). Despite positive trends, little success is being realized developing countries. Prior to the introduction of readily accessible and affordable antiretroviral therapy (ART), traditional medical wisdom generally did not recommend giving birth by HIV infected women due to the risk of HIV transmission (both to uninfected partners and from mother to child) and the reduced survival of infected parents and children (Bekker *et al.*, 2015).

Introduction of ART HIV/AIDS has witnessed HIV infection being treated as a manageable chronic illness, leading to dramatic reductions in hospitalizations and deaths of HIV infected patients. Furthermore majority of HIV infected adults are sexually active and even though in advanced HIV infection fertility is reduced, pregnancy rates still increases with ART initiation as a result of increased sexual activity and attitudinal changes in hopes and desires for the future(Bekker *et al.*, 2015).

Nevertheless, among the HIV prevention measures undertaken by the government, MTCT proven to be the most effective preventive intervention. Despite the gains in the MTCT of HIV in sub-Saharan Africa, MTCT rates are still high. Mother-to-child transmission is treated as the leading health challenge In Kenya, and scaling up MTCT services is critical towards achievement of 0% MTCT rates by 2021(Musalia *et al.*, 2010).

In 2017 Homabay County was ranked number two in HIV prevalence among the 47 counties in Kenya with a prevalence rate of 20.7% having recorded 4,558. Out of 7,978 new HIV infections among children aged 0-14 years in Kenya. This was about 15% of all total new HIV infections, Homabay County contributed the highest new HIV infections at 700(MOH, 2018). According to Ministry of Health, Homabay County had a MTCT rate of 1.3%, Rachuonyo East Sub County was ranked number two with MTCT rate of 2.7% among the 8 sub counties in Homabay County(NASCOP, 2020a).

New recommendations are hence necessary to enable provision of routine point of care and testing which still remain a challenge that need to be addressed to dramatically reduce time to treatment initiation for HIV-infected infants. Most importantly, there is need to provide new knowledge for developing new guidance towards efforts to continue reaching patients that are not adhering to MTCT programs.

1.2 Statement of the problem

In Kenya, seven out of the forty seven counties have achieved the 2020 target of less than 5% mother-to-child HIV transmission rate. Furthermore, 24 counties have recorded a reduction of HIV infections among children. However, Homabay County was among the counties which recorded an increase in HIV infection among children. Homabay County hence had a negative trend on MTCT services compared to other HIV high burden areas such as Siaya, Migori, Kisumu and Nyamira counties within the period 2013 to 2015(NACC, 2016). This has seen several interventions being put in place through research and changes to the MTCT guidelines in order to reduce MTCT in Homabay County.

However, despite all the interventions in place for MTCT, still a significant number of infants thus, 2.7 % were -infected with HIV in Rachuonyo East Sub County, Homabay County resulting to higher rates being recorded in the sub county as compared to county as a whole which recorded 1.3 % in 2018 (NASCOP, 2020b). This implies that more knowledge is still needed through research in order to accelerate elimination of MTCT (eMTCT) of HIV especially in this region.

1.3 Objectives

1.3.1 General objective

To investigate factors influencing prevention of mother-to-child transmission of HIV

among children in Rachuonyo East Sub County, Homabay County.

1.3.2 Specific objectives

1. To determine the socio-demographic and economic factors influencing prevention MTCT of HIV in Rachuonyo East Sub County, Homabay County.
2. To identify health care facility factors influencing prevention MTCT of HIV in Rachuonyo East Sub County, Homabay County.
3. To evaluate how mothers' knowledge contributes to the prevention MTCT of HIV in Rachuonyo East Sub County, Homabay County.

1.3.3 Research questions

1. What are the socio-demographic and economic factors influencing achievement of 0%MTCT of HIV in Rachuonyo East Sub County?
2. What is the health care facility factors influencing achievement of 0% MTCT in Rachuonyo East Sub County?
3. How is the mothers' knowledge contributing to prevention of MTCT of HIV in Rachuonyo East Sub County?

1.4 Justification of the study

Up to 6200 children were born with HIV in Kenya in 2017, a reduction of 58.67 % from a high of 15000 recorded in 2012.This was a momentum projected to eliminate MTCT in Kenya by 2021(Muchangi, 2017). Narrowing down to the county level, Homabay County recorded the highest HIV incidence rate of 0.82% among the 47 counties in Kenya in 2017(MOH, 2018). In 2020, among the 8 sub counties of Homabay, Rachuonyo East had the second highest MTCT rates at 2.7% after Mbita Sub County (NASCOP, 2020a). This means that with all the interventions in place for MTCT ,still a significant number of infants turn out HIV-infected in health facilities situated in Mbita and Rachuonyo East sub counties. Despite the high MTCT of HIV rate in Rachuonyo East Sub County, the factors contributing to this rate remained scientifically unclear and unknown. Thus, this study was designed so as to investigate factors influencing prevention of mother-to-child transmission of HIV among infants in the sub county. It was expected that this cross sectional study would aid in investigating the past and pointing out to several critical gaps in the MTCT cascade in Rachuonyo East Sub County that may hinder Homabay as a county from achieving eMTCT by the year 2021.

1.5 Study significance

This study was timely as there was need to provide evidence for decision making so as to enable HIV positive women give birth and raise HIV negative children as a result of elimination of HIV vertical transmission. Effective achievement of this eMTCT through
real insights and data analysis from MTCT mothers on mistakes and gaps that existed
made this study necessary. Understanding the socio demographic factors associated with MTCT of HIV was important for improvement and strengthening of MTCT interventions at personal level. Further, this information may be shared with community health workers to enable them contribute to MTCT right from the grassroots levels. The findings of the study were shared with the relevant stakeholders who manage health care facilities. This included Ministry of Health at the county and national level to provide a guide to partners supporting HIV care and treatment in Rachuonyo East Sub County. Further, the study findings were critical to informing health care providers and policy makers on policy adjustments in order to improve MTCT of HIV services at the health facility level in Rachuonyo East Sub County, Homabay County.

The findings of this study may aid in the identification of the existing knowledge gap pertaining to MTCT of HIV among mothers at the community level. This was key to informing the health care service providers on how to strengthen and deliver better behavior change communication for MTCT.

Finally, this study may provide baseline data for future monitoring of the progress of MTCT in Rachuonyo East Sub County.

1.6 Study Limitations

This study used a cross sectional study design whose inherent weakness is that it cannot infer causation. As this study was based only in rural facilities of Rachuonyo East Sub County, there could be a possibility of variation between factors affecting MTCT program in rural facilities and those in urban settings. In this study responses were reported by the study participants thus there could be a possibility of recall bias because the responses given largely relied on the memory of the mother.

CHAPTER TWO: LITERATURE REVIEW

2.1 Mother to Child Transmission of HIV

Globaly, about 160,000 new HIV infections among children fewer than 5 years of age occurred in 2020 which was a 52 % decline from a high of 320,000 cases in 2010. However, it was not fast enough to reach the 2020 targets set by Joint United Nations Program on HIV/AIDS (UNAIDS) and partners as part of the super-fast-track-framework to end HIV/AIDS. Accelerating MTCT measures to achieve elimination of new HIV infections is still needed(UNAIDS, 2021).

Sub-Saharan Africa contributed the majority of over 2 million children who were living with HIV globally in 2015. Furthermore, sub-Saharan Africa recorded approximately 400,000 vertical transmission of HIV infection(WHO, 2010b). In addition, a study by (Besser, 2010) still recorded an acceptably high rate of pediatric HIV infection in sub-Saharan Africa with over 1000 newborns infected with HIV per day.

In Kenya, estimated overall MTCT rate remained unacceptably high at 11 % as of April 2019. Among the 47 counties in Kenya, seven high burden counties contributed 50 % of the reported infant HIV infections. However, Early Infant Diagnosis (EID) coverage improved in the areas of identification, testing and linkage of infants to treatment(COP, 2020).

In countries like Kenya, there is a 30-40% chance that an HIV-positive breastfeeding mother will pass HIV to her infant in the absence of these services. In Kenya, an estimated 37,000 to 42,000 infants are infected with HIV annually due to mother-to- transmission(NASCOP, 2012).

Therefore, a lot of work has been done on MTCT of HIV, but there still remains a big challenge in the war against HIV. Complex and varied social, structural and economic dynamics within countries account for the uneven geographical distribution of HIV infection. Increased efforts to collect and analyze sub national data reveal where HIV infections are occurring and where gaps exist in the provision of HIV services. In Kenya, for example, an analysis in 2014 found that 65% of new HIV infections occurred in just nine of the country's forty seven counties. This analysis contributed to a national HIV prevention "road map" that defines evidence-informed biomedical and structural interventions and targets them to specific populations and geographical zones(UNAIDS, 2016).

Successful prevention of mother to child transmission of HIV entails a number of interventions including uptake of PMTCT services, HIV status identification during pregnancy, use of ART by seropositive pregnant women, appropriate infant
feeding options, safe child birth practices, uptake of infant HIV testing and infant prophylaxis (Doherty *et al.*, 2005).

The study literature will majorly focus on reduction and consequently elimination of mother to child transmission as all the key intervention strategies cannot be covered adequately within the scope of the study. In order to realize reduction of MTCT of HIV, prevention of new infections is key among infants and this call for a better understanding of MTCT guidelines used in Kenya.

2.2 Prevention of Mother to Child Transmission of HIV

Scaling up PMTCT services in the country is crucial for Kenya to eliminate MTCT, as recently called for by the Joint United Nations Program on HIV/AIDS. The implementation of current PMTCT guidelines, however, faces certain barriers that would also challenge scale-up. A recent review of the implementation of Kenya's PMTCT guidelines found that although certain aspects of PMTCT services, such as counseling and ART, had achieved reasonable coverage, other aspects such as disease staging had more limited coverage (Musalia *et al.*, 2010).

Prevention of mother to child transmission (PMTCT) is offered as part of a comprehensive package of fully integrated, routine antenatal care interventions. Pregnant and breastfeeding women living with HIV is be started on ART irrespective of pregnancy trimester, WHO clinical stage and at any CD4 count. ART is started, ideally, on the same day HIV diagnosis is made with ongoing enhanced adherence support. The recommended first line ART regimen for pregnant and breastfeeding women is TDF + 3TC + EFV (NASCOP, 2018).

Pregnant and breastfeeding women with a viral load less than 1000 copies and on a different first-line regimen should continue their current regimen until complete cessation of breastfeeding, after which they can be considered for regimen optimization. For pregnant and breastfeeding women newly enrolled on ART, perform a

viral load test three months after enrolment, and then every 6 months until the mother stop breastfeeding her child. For HIV positive women already on ART at the time of confirming pregnancy or breastfeeding, perform a viral load test irrespective of the last date viral load test , and then every 6 months until the mother stop breastfeeding her child. For pregnant or breastfeeding women with a detectable viral load (any value above LDL): investigate and address reasons leading to high viral load, including strengthening counseling and adherence support. Repeat the viral load test after three months of excellent adherence. If the repeat viral load is less than or equal to 1,000 copies/ml, change to an effective regimen. If the repeat viral load is detectable but less than 1,000 copies/ml consults the Regional or National HIV Clinical TWG. If the repeat viral load is undetectable then continue routine monitoring. All HIV exposed children should be given child ARV prophylaxis consisting of 6 weeks of Zidovudine + Nevirapine and thereafter Nevirapine should be continued until six weeks after complete cessation of breastfeeding. All children regardless of HIV status should be exclusively breastfed for the first six months of life, with timely introduction of recommended complementary foods after six months, and continued breastfeeding up to twenty-four months or beyond (NASCOP, 2018).

Ministry of Health report shows that, the development of national guidelines is one strategy to increase the effectiveness of Prevention of mother-to-child transmission (PMTCT) services by healthcare providers. However, inconsistent implementation of the guidelines in developing countries is a set back to PMTCT services (NASCOP, 2012).

In order to achieve eMTCT by 2021, Kenya has developed a framework through national and county consultative process for the period 2016-2021. The framework covers key intervention areas namely; decreasing of mother to child transmission rates, decrease of number of new HIV infections, decreasing of HIV related deaths among children 0-14yrs, decreasing of HIV incidence in women of reproductive age, eradication of unmet family planning gaps among all women (especially HIV positive women), identification of HIV positive pregnant women for PMTCT services, boosting provision of ARVs to expectant women living with HIV, boosting of skilled birth deliveries, increase of the coverage for early child diagnosis for HIV and increase of access to pediatric ART.

2.3 Socio-demographic factors influencing MTCT

When study participants that is cases and controls were compared on basis of their socio-demographic characteristics, independent sample T-test supported that there was no statistically significant difference among cases and controls with respect to their demographic characteristics such as age at delivery , weight at delivery and height of the mother according to a study in Ethiopia on determinants of HIV infection among children born to mothers on MTCT program (Beyene *et al.*, 2018).

Similar findings were also noted in a study conducted in Kakamega Kenya on socio-demographic factors influencing prevention of mother to child transmission of HIV. Findings from this study discovered that a good of number socio-demographic characteristics did not influence the use of either mother or infant ARV prophylaxis. The only socio-demographic characteristics that were significantly associated with either mother or infant ARV prophylaxis use were district, facility, type of health facility and age (Omondi, 2010).

However, a study conducted in Nairobi, Kenya on prevalence, gender and implication for prevention of mother-to-child transmission observed that female infants are at higher risk of mother-to-child transmission of HIV than male infants(Khobondo *et al.*, 2015).

A study conducted in Nigeria, perceptions of stigma and the fear regarding spread of sero-positive status were found to influence non-disclosure of HIV sero-positive status and non-adherence to ARV's among HIV positive pregnant women. It was further suggested that if MTCT of HIV was to be successfully reduced in Nigeria, it was necessary to continuously scrutinize the broader socio-cultural contexts in which stigma and discrimination occurs so as to come up with effective interventions based on culture and aimed at reducing stigma in MTCT programs (Iwelunmor *et al.*, 2014).

According to findings from a study on socio-demographic factors influencing MTCT outcomes in the Rundu District of Namibia, lack of male involvement was an obstacle faced by the program and the health facility were to come up with some ideas on how to include more men on prevention of mother-to-child transmission of HIV program. Study participants further explained that men participation in the MTCT services resulted in better

results of such program. Men were not willing to participate in MTCT programs for various reasons including much older men feeling ashamed to escort the younger partner to a clinic or hospital, working long distances from home and being very busy at work (Said, 2014).

A study conducted in northern Tanzania noted that methods that were traditionally used in clinics to provide ANC services and MTCT programs reaches few men and did not consider male involvement in voluntary counseling and testing. Male partner involvement was also difficult due to the fact that culturally, ANC in many African cultures was perceived solely as a woman's responsibility, an activity concerning the mother and her child, with no need for male participation until birth and naming ceremony. Therefore, any attempt to design interventions to promote male partner participation may be unsuccessful unless attempts are made to deal with the socio cultural factors governing the responsibility of men in African cultures particularly as related to cultural norms pertaining to pregnancy, delivery and post-delivery care (Msuya *et al.*, 2008).

2.4 Socio economic factors influencing MTCT.

Negative enablers such as long distance to clinics, requiring transport to and from the facility and cost of MTCT related services at the hospital significantly decrease uptake of MTCT services. This affects the capability of expectant women to meet the expense of accessing and utilizing MTCT related services. (Otieno, 2020).

According to a study in the rural Malawi, an outreach was conducted in the community to offer infant feeding counseling to HIV positive and negative women at home by volunteers. Despite the outreach, service users who were HIV positive still found the practice not cost-effective since they still required to reach the hospital in order to get other health services. The study hence suggested that it was important for projects to consider the needs of HIV positive women as well while designing community-based interventions practices to equally counter HIV transmission and deaths among infants. Integration of services was desired given that some women with low income could not afford the means to reach distant health facilities (Bula *et al.*, 2013).

According to a study in western Kenya on applying the socio-ecological model to Understanding Barriers to MTCT Service Utilization, despite women's personal characteristics, the social environment also played a

fundamental part in HIV infected women's utilization of MTCT services. HIV-infected infants were reported among women in unfavorable social environments as compared to women who were in accommodative social environments. This implied that program developers should consider social environment in which the mother reside when coming up with the interventions to be used in achieving MTCT. Achievable strategies to prevent MTCT may need to widely address several factors within the social environment of the mother. Further studies is hence recommended to investigate multifaceted interventions merging together a number of strategies across diverse ecological levels (Onono *et al.*, 2015).

A study on community-based evaluation of MTCT uptake in Nyanza Province, Kenya, association was observed between socio-economic factors and utilization of MTCT interventions throughout the MTCT flow. Mother's level of education was related to PMTCT attendance and maternal ART adherence and uptake. Higher HIV testing rates among mothers and ART uptake was equally associated with higher socioeconomic status. Possible explanation for these relations was enhanced understanding of the benefit of HIV testing or ARVs and easier access to care among women with higher socioeconomic status. Among the women considered to be of higher socio-economic status approximately 70% were reported to be owning a mobile phone, the majority of which were shared within the household. Mobile phones were being considered as a means (mHealth) to improve MTCT(Kohler *et al.*, 2014).

2.5 Health care facility factors influencing MTCT

2.5.1 Obstetric interventions

Mode of delivery has been proven to be a determinant of MTCT of HIV. Based on a study in Nigeria on determinants of MTCT of HIV despite MTCT interventions, out of 177 infants delivered vaginally, two contracted HIV while none of those delivered by elective or emergency caesarian section contacted HIV. With a suppressed viral load less than 400copies/ml infants delivered through the vaginal route had a higher chance of acquiring HIV infection as compared to those delivered through elective or emergency caesarian section (Iloh *et al.*, 2015).

Similarly, a study conducted in Europe on mode of delivery on pediatric HIV-1 infection noted that elective caesarian delivery halved the risk of transmission of HIV during delivery compared to other modes of delivery such as vaginal. When caesarian delivery was compared with other modes of delivery without ART, elective caesarean delivery and Zidovudine regimen collectively lowered chances transmission by more than 85% (Burns & Mofenson, 1999).

However, in a study conducted in Cameroon on MTCT of HIV and its determinants among HIV-exposed infants, higher chances of HIV vertical transmission was observed in caesarean section deliveries as opposed to vaginal deliveries. Chances of infection from delivery by caesarian section in the study was 2.34 times higher than delivery through vaginal route. The study further found that some of the caesarean sections were elective and some were as a result of complication during delivery, but all were treated as as caesarean section. This might have accounted for the high risk of MTCT of HIV through caesarean section deliveries as some deliveries were as a result of complications during labor, including membrane rupture before the caesarean section was done and subsequent blood contact with HIV-contaminated blood (Fondoh & Mom, 2017).

2.5.2 MTCT interventions

Stage of enrolment into HIV treatment which is a MTCT intervention measure by pregnant women is critical in determining MTCT. Mothers who were initiated for HIV treatment in their first and second pregnancy trimester were less likely to transmit HIV to their children as opposed to their counterparts who were initiated at the third trimester (Kimani, 2018).

Study conducted in Eastern Cameroon established a positive relationship between HIV infection and age at testing of the infant for HIV using PCR method. HIV infection was significantly associated with an age at testing more than six months (p=0.014) and mixed feeding (p=0.009), indicating that prolonged infant breastfeeding and particularly mixed feeding is likely to have increased chances of HIV transmission to infants

taking the DNA PCR test at a later date compared with those who were tested before six months (Noubiap *et al.*, 2013).

A related study conducted in Kenya revealed that feeding option of the infant was a major determinant in the prevention of mother-to-child HIV transmission. Study outcome revealed that there existed a significant relationship between infant HIV infections and mixed feeding practice ($\chi 2=48.149$, $p<0.001$). Study results further noted that breastfeeding for six months decreased the chances of HIV infections. Infants who were given exclusive formula milk were found to posses higher chances of MTCT and consequently elimination of new infections (Abere *et al.*, 2018).

Another study in Kenya found that mothers who were initiated on single drug therapy (either Zidovudine during pregnancy or Nevirapine during labor) were more likely to infect their children with virus as opposed to those who were initiated on multiple drug therapy though the association was not statistically significant. This could be as a result of improved efficiency in the reduction of viral load levels in serum and breast milk. The study further observed that nonadhearance in uptake of the prophylaxis in conjunction with Nevirapine was 9 times associated with transmission of HIV infection to the infant This association was significant (Ingabo, 2014).

2.6 Mothers knowledge of MTCT

In order to achieve the goal of eliminating new HIV infection of children, successful intervention towards MTCT will be required. This requires women of reproductive age to have up to date and precise knowledge on HIV transmission, risk of transmission to babies and possible prevention approaches. It has been clearly shown that HIV comprehensive knowledge is positively associated with knowledge of MTCT. Women with comprehensive knowledge of HIV have been found to be more likely to have sufficient knowledge on MTCT (Desta, 2019).

According to a study in antenatal clinic in Durban, South Africa 75.2 % of HIV positive pregnant mothers were aware that HIV could be transmitted from mother to child during three stages including pregnancy, delivery and breastfeeding (Haghdoost, 2015). Findings by a study on Knowledge, attitudes and practices associated with MTCT among breastfeeding mothers living with HIV in Swaziland revealed that 77.8 percent of respondents had high knowledge of MTCT compared to 22.2 percent who showed low levels of MTCT knowledge. Further assessment by the study observed that levels of knowledge of MTCT of HIV by respondents on the three stages of transmission; that is pregnancy, delivery and breastfeeding was 61.1%, 90%, and 87.8% respectively(Dlamini, 2015). A study conducted in Ethiopia on knowledge of prevention of MTCT of HIV among women of reproductive age group demonstrated that women who were knowledgeable on MTCT of HIV were 2.2 times more knowledgeable on MTCT of HIV than those who did not have the knowledge (Liyeh *et al.*, 2020). According to a study on whether women enrolled on MTCT understood the recommendations of MTCT, mothers demonstrated varying levels of knowledge pertaining to different components of MTCT. The study observed that 20% of the participants were aware that transmission can occur during breastfeeding period despite being enrolled into MTCT. A bigger percentage thus 65.6 % and 57.4 % were not even aware that MTCT can occur during pregnancy and delivery respectively (Philemon *et al.*, 2021).

2.7 Conceptual framework

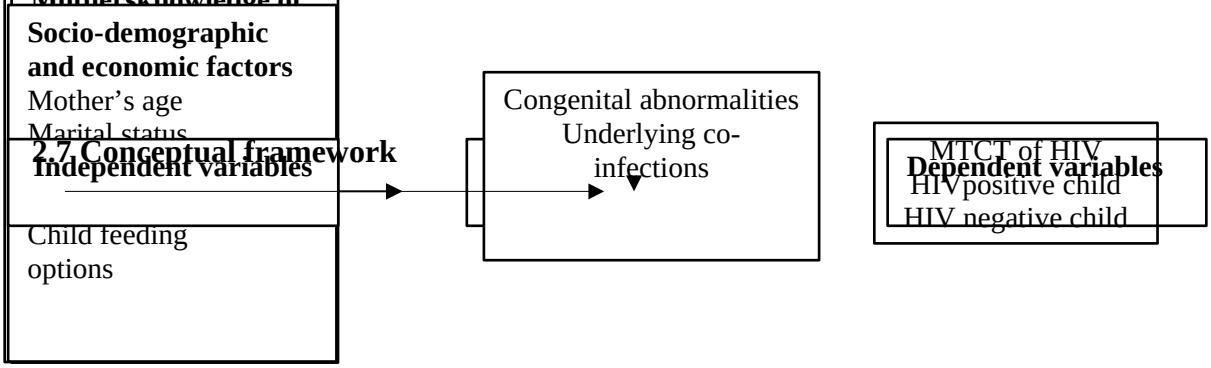

Figure 2.1 : Conceptual fracmework modified from the Health Belief Model.

CHAPTER THREE: METHODOLOGY

3.1 Study design

A health facility based cross sectional study design was employed in this study. The study design was chosen as it enabled data collection on PMTCT mothers at a particular point in time and examination of factors associated with a particular characteristic, which in our case was MTCT of HIV. This was carried out in 10 health care facilities using quantitative method to determine factors associated with MTCT of HIV infection among infants in Rachuonyo East Sub County, Homabay County. This was conducted among HIV positive mothers attending MTCT clinics and were captured in the HIV Exposed Infants (HEI) registers with their infants as a pair from January 2018 through to June 2019. This time frame was considered as it enabled data collection from infants who had completed the recommended 2 years period of MTCT program by December 2020 when data was collected. The outcome measure of the study was if the child turned HIV positive.

3.2 Study area

The study was conducted in Rachuonyo East Sub County, Homabay county, Kenya. According to national AIDS and STI control program, Homabay county HIV prevalence rate stands at 19.6%(NASCOP, 2022) The sub county lies between longitudes 34^0 44′E and 34^0 85E and latitudes 0^0 20′S and 0^0 50′S. It is bordered by seven (7) sub counties namely; Sigowet/Soin to the East, North Mugirango and West Mugirango to the South East, KitutuChache North to the South, Kasipul to the West, Karachuonyo to North West, and Nyakach to the North. The Constituency covers a total area of 249.80 km^2. Rachuonyo East is made up of four wards which form the political representation units, namely: Kokwanyo-Kakelo, Kojwach, Kabondo East, and Kabondo West. Health facilities within the sub county are distributed all over the four wards. Kokwanyo-Kakelo ward have 5 health facilities namely; Ober level 4 hospital, Nyawango health center, Kokwanyo health center, Godber dispensary and Atemo dispensary. Kabondo East has 5 health facilities namely; Othoro level 4 hospital, Atela health center, Jawabu medical center, Okitta nursing home and Got Kaonde dispensary. Kojwach ward has three health facilities namely; Ring health center, Ring mission hospital and Tale health center. Kabondo West has 4 health facilities namely; Kabondo sub county hospital, Kauma dispensary, Kasewe dispensary and Integrated Development Fund (IDF) medical center.

The sub county has two main relief regions namely the lowlands towards the Lake Victoria basin and the highlands bordering Kisii and Nyamira Counties. The constituency lies between 1,160-1,220m above sea level. It is characterized by hills including; Adega, Gangre, Nyabondo, Olak, Dudi, Kimori, Rateng, Okombo, Oogo, Kaonde, Komala, Ongoro, and Atela. It has a number of rivers which originate mainly from Kisii and Nyamira highlands namely; Miriu, Nyamwaga, Awach Pala, Awach Othoro, Anyona, Awach Kadongo, Opilu, Awach Ogera and Orue. Kabondo Kasipul has 2 waterfalls namely; Odino and Atemo Falls.

The main wetlands in the sub county include; Nyamwaga, Luanda, Pundo Lando and Tala. The sub county has the following gazetted forests; Kasewe, Kamondi, Kawuor and Anuoyo in Kakang'utu west. It also has dams which include; Kokise in Kodhoch, Kagero in Ramula, and Anuoyo in Kakang'utu west. The sub county also has a man-made lake called Odino-Nyandolo. It has got mineral-rich soils, especially of red-clay to loamy types thus making it suitable for variety of agricultural activities. The sub county lies in agro-ecological zones described as Upper Midland where tea and coffee are grown. Other crops including sweet potato, maize, horticultural crops among other agricultural productions also do well in this soil. The other zone is found in Lower Midland. This zone supports beans, pineapples, green grams, millet, sorghum, sugarcane, sisal and groundnuts.

3.3 Study Variables

The research studied one dependent variable, two intervening variables and several independent variables. These are explained in the subsequent sub sections.

3.3.1 Dependent Variable

The dependent variable was prevention of MTCT. This was a category variable with two outcomes as HIV positive infants (MTCT of HIV) and HIV negative infants (zero MTCT of HIV).

3.3.2 Intervening Variables

Table 3.1: Definition of intervening Variables

Variable	Definition
Congenital abnormalities	Structural and functional anomalies that occur during intrauterine life and are associated with increased risk of MTCT.
Underlying co infections	Pre existing pathogen in a child which affect immunological responses hence modulating disease severity and clinical outcome

3.3.3 Independent Variables

The list of independent variables with respective explanations is provided in Table 3.2 below.

Table 3.2: Definition of Independent Variables

Variable	Definition
Socio demographic	
Maternal age	Age of a woman in years, further grouped 15-24, 25-34 and 35-44 years
Marital status	Marital status of a woman classified as single, widow, divorced/separated and married
Educational level	Highest education level attained by a woman, classified as none, primary, secondary and tertiary

Occupation	Employment status of a woman, further categorized as unemployed, informal employment or formal employment
Income level	A woman's monthly income, either< Ksh 7000 or ≥ Ksh 7000
Transport means	Means of transport commonly used by a woman to the health facility, categorized as walking, bodaboda/bicycle and public service vehicle
Family planning use	Whether a woman used any family planning method or not
Frequency of PMTCT visits	Total number of PMTCT visits made by a woman, further classified as < 4 and ≥ 4 weeks
Parity	Number of a woman's live births, further categorized as 0, 1, 2 and 3+
Maternal duration of HIV infection	Total years a woman has been infected with HIV, grouped as 0-4, 5-9, 10-14, 15-19, 20-24
Maternal ARV enrolment	Stage at which a woman was enrolled into HIV care and treatment, either before pregnancy or during pregnancy

	Whether a woman conceived willingly or not
Pregnancy willingness	
	Whether a woman had a plan for the pregnancy or not
Pregnancy plan	
	A woman's adherence level to ART as reported by health care worker as poor, good or excellent
Adherence level	
	Infant feeding options practiced by HIV infected woman, classified as exclusive breastfeeding, formulae feeding, mixed feeding or exclusive replacement
Infant feeding options	
	HIV status of the woman's partner, either discordant or concordant
Couple status	
	Whether a woman delivered through vaginal or caesarian section
Health facility factors	
Obstetric intervention	ARV regimen administered to a woman, either TDF+3TC+EFV or TDF+3TC+DTG
ARV regimen	

	A woman's satisfaction level with PMTCT services, grouped as not satisfied, satisfied and very satisfied, as reported by the woman
Satisfaction level with PMTCT services	Whether a woman ever migrated from the health facility initially enrolled in or never
Health facility migration	Time in hours spent queuing before being attended to at the health facility, further grouped as ≤ 1 hour and > 1 hour
Time taken	Measured on likert scale, score of 1 indicated below average knowledge, score of 2 indicated average knowledge, score of 3 indicated above average knowledge and score of 4 indicated excellent knowledge
Knowledge factors	Measured on likert scale, score of 1 indicated below average knowledge, score of 2 indicated average knowledge, score of 3 indicated excellent knowledge
Knowledge of HIV transmission	Measured on likert scale, score of 1 indicated below average knowledge, score of 2 indicated average knowledge, score of 3 indicated above average knowledge and score of 4 indicated excellent knowledge
Knowledge of when MTCT occurs	
Knowledge of MTCT	

during pregnancy	
Knowledge of MTCT during delivery	Measured on likert scale, score of 1 indicated below average knowledge, score of 2 indicated average knowledge, score of 3 indicated above average knowledge and score of 4 indicated excellent knowledge
Knowledge of MTCT during breastfeeding	Measured on likert scale, score of 1 indicated below average knowledge, score of 2 indicated average knowledge, score of 3 indicated above average knowledge and score of 4 indicated excellent knowledge

3.4 Target population

The target population included HIV positive mothers with their infants as pairs, who were enrolled on care in public facilities from January 2018 through to June 2019, and were on care at the time of the study. The sampling frame was drawn from HIV positive mothers who attended the clinics in the sub-county within the study period.

3.4.1 Inclusion criteria

Included in the study were HIV positive mothers, with an HIV exposed infant as a pair, infant having to be less than 18 months of age at the time status was determined, infant found in the HEI and DNA-PCR register, the mother was on care and consented to participate.

3.4.2 Exclusion criteria

Excluded from the study were infants whose care giver were guardians of the infants and not real parent.

3.5 Sample size determination

Among the 20 health care facilities in Rachuonyo East Sub County,10 facilities which account for half the total number were selected for conducting this study to achieve fair representation and ensure non bias.

The sample size was calculated using the formula described by Cochran's formula:

$n = Z^2pq/d^2$

n = desired sample size

Z = standard normal deviation at 95% confidence interval (1.96)

p = (8.7%) proportion of HIV positive mothers who were enrolled on MTCT in Rachuonyo East between January 2018 and June 2019(NASCOP, 2020b)

q = 1-p = (0.913)

d = margin of error (0.05%)

Substituting:

$n = (1.96)^2 \times (0.087) \times 0.913 / (0.05)^2$

= 120

Therefore the required sample size was 120 seropositive mothers who attended the postnatal clinic in Rachuonyo East Sub County.

3.6 Sampling procedure

A multi-stage technique was used; the first stage involves the selection of health care facilities. The choice of the facilities was based on the number of MTCT mothers attended, availability of well documented participant's information, location in terms of ward, level of hospital and type of management. The second stage involved developing a line list of all seropositive mothers who were enrolled on MTCT from January 2018 through to June 2019 in all the selected facilities. Random sampling of the mother with their child as a pair was carried out in all selected facilities. Random sampling was accomplished using random number tables from the sampling frame work of 462 HIV positive mothers.

3.6.1 Sampling of health facilities

A multi stage sampling technique was employed. Out of 20 public health care facilities in Rachuonyo East Sub County, there was one sub county hospital, two level 4 hospitals, 9 health centers and 6 dispensaries. Kabondo sub county hospital and the two level 4 hospitals were included due to their high client volume in order to achieve a representative sample. This was followed by a systematic sampling with the remaining 17 health facilities as the sampling frame. This was achieved by line listing the 17 health care facilities and choosing individual facilities at regular intervals up to a total of 7 facilities.

3.6.2 Sampling of participants

The second sampling stage was simple random sampling of participants from the sampled health facilities in stage one. All mothers whose infants were exposed to HIV enrolled since January 2018 to June 2019 from among the 10 sampled health facilities were traced from the HEI register then populated followed by line-listing to form the sampling frame. Random number generators technique was employed to sample 120 participants from the

sampling frame.

3.7 Data collection and quality control

Data collection was carried out during the participants' clinic days. The investigator and a trained research assistant evaluated the eligibility. This was achieved by taking each participant through exclusion and inclusion criteria and upon meeting the inclusion criteria, quantitative data was reviewed and data was collected using a structured questionnaire. The questionnaire was filled by the research assistants, with the help of a nurse who works at the Mother and Child Health (MCH) clinic of the respective health care facilities through face to face interviews and reviewing information on the mother's hospital file and those from the MTCT and HEI registers of the selected participants. Information on socio demographic and economic factors and vital statistics concerning the mother and her infant was collected first followed by data on interventions to be studied. The interventions to be studied were those aimed at prevention of mother-to- child transmission of HIV. These included the time of enrolment into care of the mother and the HEI, the type of regimen given to the mother and the infant and the mode of feeding of the infant.

3.8 Pilot study

A pretest was carried out in Rachuonyo North Sub County hospital, which has common characteristics as the study site. The hospital was chosen due to its high workload and being a referral facility it serve people from all over the sub county. The pretest was conducted to determine whether the questionnaire was appropriate for the study. The questionnaire was pretested on 12 HIV positive mothers enrolled into HIV care and treatment at the hospital. This represented 10% of the study sample size. They were purposively sampled for the pre-test. The pretest informed the researcher to improve on the questionnaire.

3.9 Reliability

Reliability is the consistency with which a data collection tool produces results. This was achieved by designing the questionnaire to allow for similar steps to be carried out in the same way for each question. Additionally, reliability was enhanced through training of research assistants in standard data collection techniques and research ethics so as to ensure uniformity throughout the entire process. This is because divergences between observers lead to lack of reliability (Bolarinwa, 2015) . Test retest of the questionnaire was performed and then

the results correlated. There was a strong correlation between the results of the test and retest of the questionnaire (r = 0.806), indicating a high degree of reliability. This is because, correlation coefficient (r) values are considered good if $r \geq 0.70$ (Bolarinwa, 2015).

3.10 Validity

Validity is the degree to which a tool measures what it's intended to measure. This was realized through face validity where the subjective judgment was done to determine whether the questionnaire was reasonable. Content validity refers to the extent to which all aspects of the concept being measured are covered. During the pretest, content validity was achieved through rational analysis and review of the questionnaire by three raters i.e. MTCT Program Officers in Homabay County who were experts in the constructs of interest. The level of agreement among the three raters was 96%. Additionally, content validity was enhanced through extensive consultation with the academic supervisors who were familiar and had expertise in the research subject.

3.11 Data management, analysis and presentation

Data was cleaned, coded and entered into the computer for analysis using Statistical Package for Social Sciences (SPSS) version 23 software. Descriptive statistics were used to summarize the participant characteristics. Analysis of numerical data was done using measures of central tendency and measures of dispersion while analysis of categorical data was carried out by calculating frequencies and proportions. Measures of association were used to explain the association between independent variables (socio demographic, economic, health facility factors and maternal knowledge of MTCT) and dependent variable (prevention of MTCT). This was done using Chi-square and Fisher's exact test when more than 20% of the cells had expected frequencies of less than 5. Further, bivariate and multivariate binary logistic regression were carried out to understand the influence of independent variables on the dependent variable. Bivariate binary logistic regression was used to identify the independent variables associated with dependent variable by generating crude odds ratios (CORs). Multivariate binary logistic regression was carried out to further analyze statistically significant independent variables while controlling for others by calculating adjusted odds ratios (AORs). All the analyses were done at a 5% significance level, two tailed at a 95% confidence interval. The results of this study are presented in text, tables and graphs.

The following logistic regression model was used during multivariate analysis in this study:

$$\ln [p/(1-p)] = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \ldots\ldots\ldots\ldots\ldots + \beta_n x_n + \varepsilon$$

where, ln = Natural logarithm

p = Probability of optimal zero MTCT

β_0 =Constant

β_1 through β_n=Coefficients of logistic regression

x_1 through x_n= Distinct independent variables

ε = Error

3.12 Ethical considerations

The study was approved by the Board of Postgraduate Studies, Jaramogi Oginga Odinga University of Science and Technology (JOOUST), before being submitted to Jaramogi Oginga Odinga Teaching and Referral Hospital Institutional Review and Ethics Committee for ethical approval. A written informed consent was obtained from each participant before enrolment into the study. Authority to conduct the study was obtained from the Director of Health, Homabay County. Confidentiality of participant data was maintained as no personal identifiers were collected and the researcher ensured that sharing of participant's information was restricted. To further protect respondents' privacy, medical records reviewed were done in a private room within the hospital.

CHAPTER FOUR: RESULTS

4.1 Socio demographic characteristics of the Respondents

The study enrolled a total of 120 participants; their characteristics are presented in Table 4.1. The average age of the participants was 27.8 (SD = 6.4) years, with the most 52 (43.3%) falling within the 25-34 years age group. Two thirds 80 (66.7%) of the participants were married. Two thirds 81 (67.5%) of the women were using family planning and over a half 63 (52.5%) visited antenatal care less than four times. The median number of live births by the women was 3 (IQR = 2) and most women 71 (59.2%) had at least three live births. The median maternal duration of HIV infection was 4 (IQR = 6) years. Two thirds 80 (66.7%) of the participants enrolled for HIV care and treatment before pregnancy, majority 82 (68.3%) conceived their latest pregnancy willingly, most 75 (62.5%) planned for their latest pregnancy and the highest number 70 (58.3%) had good antiretroviral therapy adherence levels. (Table 4.1).

Table 4.3: Socio-demographic characteristics of participants

Characteristics	n (%)
Maternal age (years),mean(±SD)	27.8±6.4
Age category (years)	
15-24	45 (37.5)
25-34	52 (43.3)
35-44	23 (19.42)
Marital status	
Single	22 (18.3)

Widow	12 (10.0)
Divorced/Separated	6 (5.0)
Married	80 (66.7)
Education level	
Primary	56 (46.7)
Secondary	55 (45.8)
Tertiary	9 (7.5)
Family planning use	
No	39 (32.5)
Yes	81 (67.5)
Frequency of ANC visits	
< 4 visits	63 (52.5)
≥ 4 visits	56 (46.7
Missing data	1 (0.8)
Parity, median (IQR)	3 (2)
Parity	
0	6 (5.0)
1	19 (15.8)
2	24 (20.0)

3+	71 (59.2)
Maternal duration of HIV infection (years), median (IQR)	4 (6)
Maternal ARV enrolment stage	
Before pregnancy	80 (66.7)
During pregnancy	40 (33.3)
Pregnancy willingness	
No	38 (31.7)
Yes	82 (68.3)
Pregnancy plan	
No	45 (37.5)
Yes	75 (62.5)
Adherence level	
Poor	18 (15.0)
Good	70 (58.3)
Excellent	32 (26.7)

With regard to child feeding options, majority of the respondents (84.2%) practiced exclusive breast feeding (Figure 4.1).

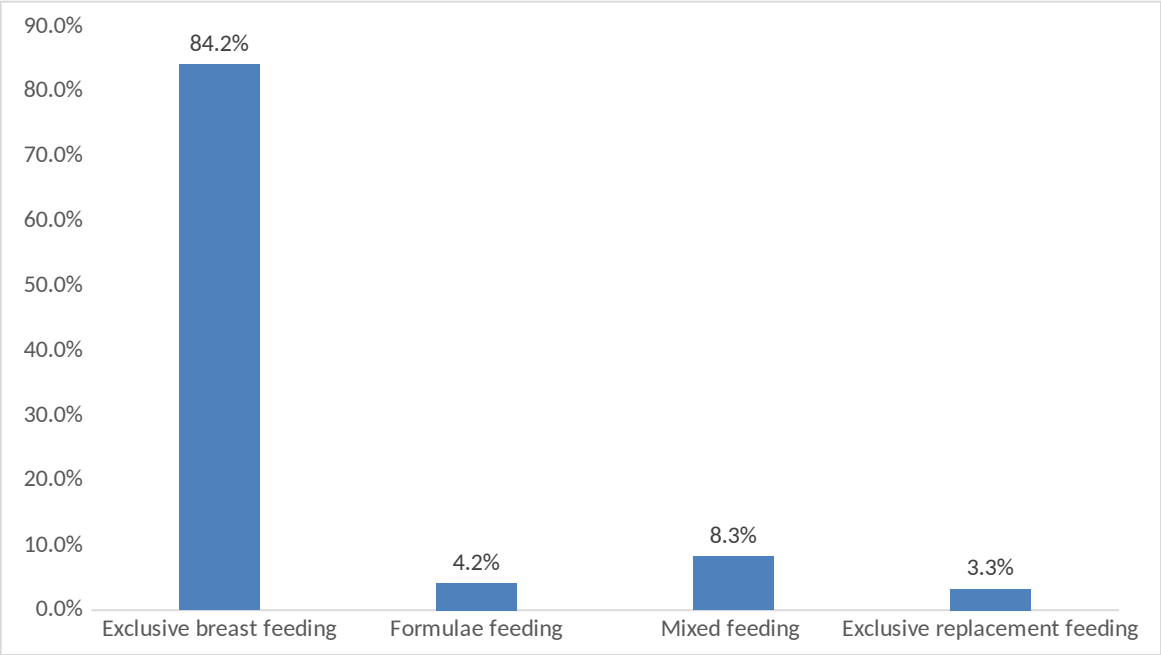

Figure 4.2: Child feeding options practiced by seropositive women

A considerable number of women (22.5%) reported that their partners were disconcordant. (Figure 4.2)

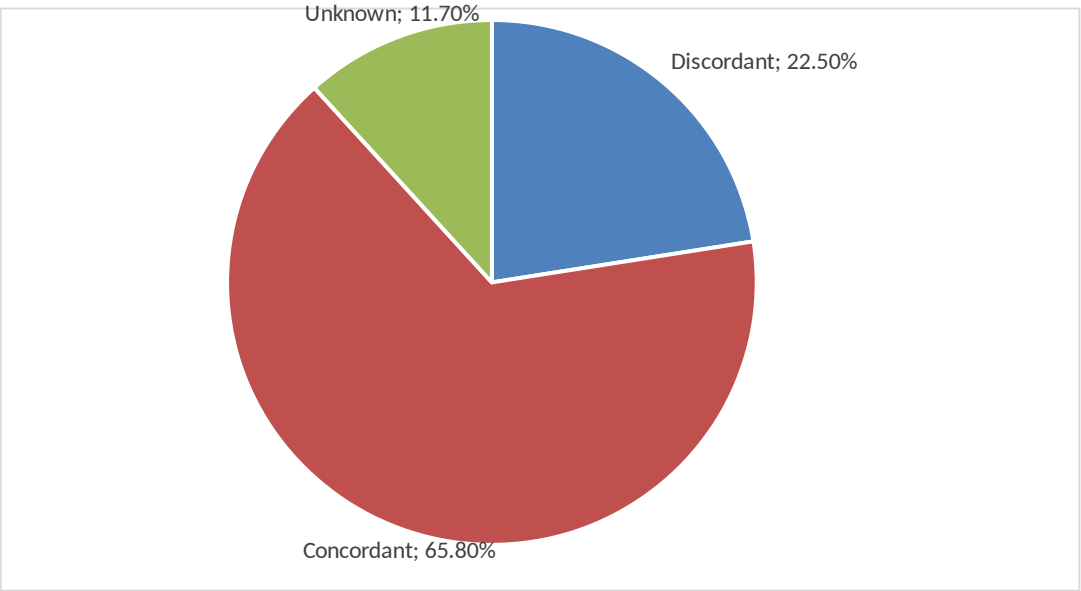

Figure 4.3: Status of the women's partners

Regarding other characteristics of the respondents, the mean maternal age at delivery of the latest child was 25.8 (SD = 6.3) years while the mean gestational age at delivery of the latest child was 38.0 (SD = 1.4) weeks. In relation to the respondents' other children, 145 (54.1%) were females while 123 (45.9%) were males. The mean birth weight of the women's children was 3.2 (SD = 0.5) kg. A total of 7 (6.0%) of the 117 who had records of child birth weight were low birth weight (< 2.5kg)

4.2 Socio-economic characteristics of the respondents

On Socio-economic characteristics of participants, the study showed that about 56 (46.7%) of the women attained primary education. More than a half 67 (55.8%) of the women were informally employed. The median monthly income was Ksh4000 (IQR = 10,000) and majority 79 (65.8%) of the participants earned a monthly income of less than Ksh 7,000 which is the international poverty level (US $ 1.90 per day). The highest number 57 (47.5%) of women walked to health facilities (Table 4.2).

Table 4.4: Socio-economic characteristics of participants

Characteristics	n (%)
Occupation	
Unemployed	40 (33.3)
Informal employment	67 (55.8)
Formal employment	13 (10.8)
Monthly income (Ksh), mean (±SD)	7463.3 (10276.1)
Income level (per month)	
<Ksh 7000	79 (65.8)
≥ Ksh 7000	41 (34.2)
Transport means	
Walking	57 (47.5)
Bodaboda/Bicycle	31 (25.8)
Public service vehicle	32 (26.7)
Education level	
Primary	56 (46.7)
Secondary	55 (45.8)
Tertiary	9 (7.5)

Majority of the women (55.5%) were in informal employment. (Figure 4.3)

Figure 4.4: Nature of women's occupation

With regard to mode of transport to the health facility, majority of the respondents (47.5%) walked to the health facility (Figure 4.4).

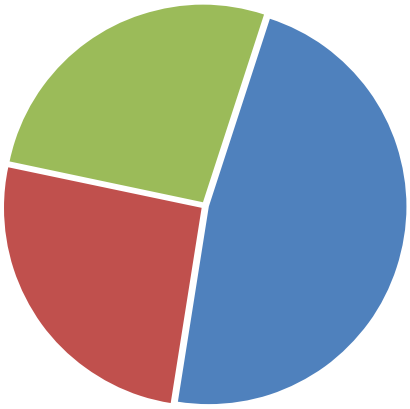

Figure 4.5: Mode of transport to the health facility

4.3 Socio-demographic factors associated with MTCT of HIV.

In this study, the characteristics of women whose children were HIV positive were compared with those whose children were HIV negative. The distribution of MTCT prevention against women's socio-demographic

characteristics is as per Table 4.3. Women with at least three live births were significantly associated with prevention of MTCT of HIV (^{2}=16.607, p <0.005). Frequency of ANC visits (^{2}=6.018, p =0.014) and women's stage of ARV enrolment into HIV care and treatment (^{2}=6.600, p =0.015) were significantly important in determining prevention of MTCT of HIV. Also, pregnancy willingness (^{2}=17.155, p <0.005), pregnancy plan (^{2}=18.182, p <0.005) and adherence to HIV medication (^{2}=13.306, p <0.005) were significantly associated with prevention of MTCT of HIV among the women studied (Table 4.3).Factors such as age (^{2}=0.812, p =0.755), marital status (^{2}=1.319, p =0.801), among others did not report significant association with prevention of mother to child transmission of HIV (Table 4.3).

Table 4.5 Socio demographic factors associated with MTCT of HIV

Independent variables	All N=120 n (%)	MTCT Prevention HIV+VE Children N=10 n (%)	HIV–VE Children N=110 n (%)	^{2}	*p* value
Age category (years)				0.812	0.755
15-24	45 (37.5)	5 (50.0)	40 (36.4)		
25-34	52 (43.3)	4 (40.0)	48 (43.6)		
35-44	23 (19.2)	1(10.0)	22 (20.0)		
Marital status				1.319	0.801
Single	22 (18.3)	3 (30.0)	19 (17.3)		
Widow	12 (10.0)	1 (10.0)	11 (10.0)		
Divorced/Separated	6 (5.0)	0 (0.0)	6 (5.5)		
Married	80 (66.7)	6 (60.0)	74 (67.2)		
Family planning use				0.280	0.417
No	39 (32.5)	4 (40.0)	35 (31.8)		
Yes	81 (67.5)	6 (60.0)	75 (68.2)		
Parity				16.607	<0.001
0	6 (5.0)	4 (40.0)	2 (1.8)		
1	19 (15.8)	0 (0.0)	19 (17.3)		
2	24 (20.0)	0 (0.0)	24 (21.8)		
3+	71 (59.2)	6 (60.0)	65 (59.1)		
Frequency of ANC				6.018	0.014

4.4 Socio-economic factors associated with MTCT of HIV

To identify the association between socio-economic characteristics and achievement of prevention of MTCT, this study compared the participants' socio-economic characteristics with the outcome of MTCT prevention. Table 4.4 summarizes the association between the socio-economic characteristics and achievement of MTCT. Socio -economic characteristics including occupation (^{2}=1.004, p =0.636), income level, (^{2}=0.973, p =0.269), maternal education level (^{2}=0.360, p >0.999), and transport means (^{2}=3.833, p =0.160) did not report significant association with prevention of mother to child transmission of HIV.

Table 4.6 Socio economic factors associated with MTCT of HIV

Independent variables	All N=120 n (%)	MTCT Prevention HIV+VE Children N=10 n (%)	HIV–VE Children N=110 n (%)	^{2}	p value
Occupation				1.004	0.636
Unemployed	40 (33.4)	3 (30.0)	37 (33.7)		
Informal employment	67 (55.8)	7 (70.0)	60 (54.5)		
Formal employment	13 (10.8)	0 (0.0)	13 (11.8)		
Income level (per month)				0.973	0.269
<Ksh 7000	79 (65.8)	8 (80.0)	71 (64.5)		
≥ Ksh 7000	41 (34.2)	2 (20.0)	39 (35.5)		
Transport means				3.833	0.160
Walking	57 (47.5)	8 (80.0)	49 (44.5)		
Bodaboda/bicycle	31 (25.8)	1 (10.0)	30 (27.3)		
Public service vehicle	32 (26.7)	1 (10.0)	31 (28.2)		

4.5 Socio-demographic factors influencing MTCT of HIV

Table 4.5 presents the results from the bivariate and multivariate logistic regressions. Women aged between 25-34 years (COR = 1.50; 95% CI 0.38-5.96) and those in the age bracket 35-44 years (COR = 2.75; 95% CI 0.30-25.05) had increased odds of prevention of MTCT of HIV, though the effect was not statistically significant (Table 4.5). Marital status was not a significant factor for prevention of MTCT of HIV. However, widows (COR = 1.74; 95% CI 0.16-18.80) and married women (COR = 1.95; 95% CI 0.45-8.51) were more likely to prevent MTCT of HIV compared to the single women. In terms of occupation, women who were in the informal employment were less likely to prevent MTCT of HIV than the unemployed (COR = 0.70; 95% CI 0.17-2.86). However, this study found higher odds of prevention of MTCT of HIV among women who used family planning methods (COR = 1.43; 95% CI 0.38-5.39). Parity was significantly associated with prevention of transmission of HIV from the mother to the child such that women who had at least three live births (COR = 21.67; 95% CI 3.27-143.74) were 21 times more likely to achieve prevention of MTCT of HIV. Frequency of ANC visits was also a significant factor associated with prevention of MTCT of HIV. Women who made at least four ANC visits were 9 times more likely to prevent MTCT of HIV than those who made less than four ANC visits (COR = 9.17; 95% CI 1.12-74.84). Other factors significantly associated with prevention of MTCT of HIV at bivariate level were maternal stage of enrolment for ARVs, woman's willingness to get pregnant and maternal adherence to ARVs. Women who enrolled for HIV care and treatment in the course of their pregnancies were 72% less likely to achieve zero MTCT compared to those who enrolled before getting pregnant (COR = 0.18; 95% CI 0.05-0.75). Odds of achieving prevention of MTCT of HIV were higher among women who conceived willingly (COR = 25.14; 95% CI 3.05-207.15). Women who had good adherence level to HIV medication were about 8 times more likely to prevent MTCT than those who exhibited poor adherence levels (COR = 8.25; 95% CI 2.02-33.68). Further, this study established that women who had been infected with HIV for 5-9 years (COR = 1.05; 95% CI 0.20-5.58) were slightly more likely to achieve prevention of MTCT while those infected for 10-14 years (COR = 0.52; 95% CI 0.09-2.94) were about 48% less likely to achieve prevention of MTCT though the association was not significant. Despite there being no significant association, women who practiced mixed feeding had fewer odds of prevention of MTCT of HIV compared to those who practiced exclusive breast feeding for the first six months (COR = 0.34; 95% CI 0.06-1.90). Women whose partners were concordant (COR = 7.09; 95% CI 0.66-75.89) or were of unknown HIV status (COR = 3.32; 95% CI 0.72-15.23) had increased odds of prevention of MTCT of HIV compared to those whose partners were discordant (Table 4.5).When this study controlled for potential confounders such as parity, frequency of ANC visit, maternal ARV enrolment stage, pregnancy willingness and maternal adherence levels of HIV medication in the multivariable model, achievement of prevention of MTCT of HIV was more likely among women with at

least three live births compared to those with none (AOR = 1.83; 95% CI 0.09- 36.66), but the effect was not statistically significant (p = 0.694). In relation to frequency of ANC visits, women with at least four ANC visits during pregnancy were 8.6 times more likely to prevent MTCT of HIV (AOR=8.60; 95% CI 0.45-163.72). As was observed in the bivariate analysis, women who enrolled for HIV care and treatment during their pregnancies were less likely to achieve MTCT of HIV than those who enrolled before their pregnancies (AOR=0.63; 95% CI 0.07-5.77). Women with good adherence levels of HIV medication remained more likely to achieve prevention of MTCT of HIV than those with poor adherence levels (AOR=11.28; 95% CI 0.79-161.14). Pregnancy willingness remained a significant predictor of achieving prevention of MTCT of HIV when other factors were held constant (p = 0.014). HIV infected women who were willing to get pregnant were 49.7 times more likely to achieve prevention of MTCT of HIV compared to those who were unwilling (AOR=49.71; 95% CI 2.20-1125.54) (Table 4.5).

Table 4.7: Socio-demographic factors influencing MTCT of HIV

4.6

Predictors	MTCT Prevention				
	HIV+VE Children n (%)	HIV−VE Children n (%)	Crude Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)	*p*-value
Age category (years)					
15-24	5 (50.0)	40 (36.4)	Reference		
25-34	4 (40.0)	48 (43.6)	1.50 (0.38-5.96)		
35-44	1(10.0)	22 (20.0)	2.75 (0.30-25.05)		
Marital status					
Single	3 (30.0)	19 (17.3)	Reference		
Widow	1 (10.0)	11 (10.0)	1.74 (0.16-18.80)		
Divorced/Separated	0 (0.0)	6 (5.5)	N/A		
Married	6 (60.0)	74 (67.2)	1.95 (0.45-8.51)		
Family planning use					
No	4 (40.0)	35 (31.8)	Reference		
Yes	6 (60.0)	75 (68.2)	1.43 (0.38-5.39)		
Parity					
0	4 (40.0)	2 (1.8)	Reference		
1	0 (0.0)	19 (17.3)	N/A		
2	0 (0.0)	24 (21.8)	N/A		
3+	6 (60.0)	65 (59.1)	21.67 (3.27-143.74)	1.83 (0.09-36.66)	0.694
Frequency of ANC visits					
<4 visits	9(90.0)	54 (49.5)	Reference		

Socio-economic factors influencing MTCT of HIV

From the bivariate and multivariate analyses, women whose monthly income was at least Ksh 7000 were found to be twice more likely to achieve prevention of MTCT of HIV (COR = 2.20; 95% CI 0.45-10.86) though not significant. In comparison to women who had primary education, those who attained secondary education had reduced odds of prevention of MTCT of HIV (COR = 0.98; 95% CI 0.27-3.60). Women who used bodaboda/bicycle and public service vehicles as transport means to the health care facilities were nearly 5 times more likely to attain prevention of MTCT of HIV compared to those who walked to the health facilities (COR = 4.90; 95% CI 0.58-41.13, COR = 5.06; 95% CI 0.60-42.46) respectively (Table 4.6).

Table 4.8: Socio-economic factors influencing MTCT of HIV

Predictors	MTCT Prevention		Crude Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)	*p*-value
	HIV +VE Infants n (%)	HIV –VE Infants n (%)			
Education level					
Primary	5 (50.0)	51 (46.3)	Reference		
Secondary	5 (50.0)	50(45.5)	0.98 (0.27-3.60)		
Tertiary	0 (0.0)	9 (8.2)	N/A		
Occupation					
Unemployed	3 (30.0)	37 (33.7)	Reference		
Informal employment	7 (70.0)	60 (54.5)	0.70 (0.17-2.86)		
Formal employment	0 (0.0)	13 (11.8)	N/A		
Income level (per month)					
<Ksh 7000	8 (80.0)	71 (64.5)	Reference		
≥ Ksh 7000	2 (20.0)	39 (35.5)	2.20 (0.45-10.86)		
Transport means					
Walking	8 (80.0)	49 (44.5)	Reference		
Bodaboda/bicycle	1 (10.0)	30 (27.3)	4.90 (0.58-41.13)		
Public service vehicle	1 (10.0)	31 (28.2)	5.06 (0.60-42.46)		

4.7 Health care facility factors associated with MTCT of HIV

To identify health care facility factors associated with the achievement of prevention of MTCT of HIV, this study compared the participants' health service characteristics with the outcome of MTCT prevention. Table 4.7 summarizes the association between the health care facility characteristics and achievement of MTCT. Achievement of prevention of MTCT of HIV and lack of was higher among women who underwent vaginal or caesarean delivery (91.8% vs. 90.0%), though the association was not significant (^{2}=0.040, p = 0.596). Similar results were found for ARV regimen prescribed (59.1% vs. 60.0%, ^{2}=0.003, p = 0.616) and time taken at the health facility (94.5% vs. 100.0%, ^{2}=0.574, p = 0.586) (Table 4). Achievement of prevention of MTCT of HIV was associated with women's satisfaction of the ANC services (^{2}=10.364, p = 0.005) and migration from health facility initially enrolled in (^{2}=33.855, $p < 0.005$) (Table 4.7).

Table 4.9:Health care facility factors associated with MTCT of HIV

Independent variables	All N=120 n (%)	MTCT Prevention HIV +VE Infants N=10 n (%)	HIV –VE Infants N=110 n (%)	^{2}	*p* value

Obstetric intervention				0.040	0.596
Vaginal	110 (91.7)	9 (90.0)	101 (91.8)		
Caesarean	10 (8.3)	1 (10.0)	9 (8.2)		
ARV regimen				0.003	0.616
TDF+3TC+EFV	71 (59.2)	6 (60.0)	65 (59.1)		
TDF+3TC+DTG	49 (40.8)	4 (40.0)	45 (40.9)		
ANC service satisfaction level				10.364	0.005
Not satisfied	6 (5.0)	3 (30.0)	3 (2.8)		
Satisfied	88 (73.3)	7 (70.0)	81(73.6)		
Very satisfied	26 (21.7)	0 (0.0)	26 (23.6)		
Health facility migration				33.855	<0.001
Ever migrated	11 (9.2)	6 (60.0)	5 (4.5)		
Never migrated	109 (90.8)	4 (40.0)	105 (95.5)		
Time taken				0.574	0.586
≤ 1 hour	114 (95.0)	10 (100.0)	104 (94.5)		
> 1 hour	6 (5.0)	0 (0.0)	6 (5.5)		

Bivariate analysis of health facility predictors of prevention of MTCT of HIV achievement showed that women who were prescribed TDF+3TC+DTG (COR = 1.04; 95% CI 0.28-3.89), women who were satisfied with ANC services (COR = 11.57; 95% CI 1.96-68.40) and those who never migrated from their initial health care facilities (COR = 31.50; 95% CI 6.68-148.55) had increased odds of achieving prevention of MTCT of HIV (Table 4.8).

4.8 Health service factors influencing MTCT of HIV

At multivariate analysis level, only women who never migrated from health care facilities initially enrolled in for HIV care and treatment (AOR = 34.47; 95% CI 4.84-245.34) significantly achieved prevention of MTCT of HIV after adjusting for other covariates ($p<0.005$). As was observed in the bivariate analysis, women who were satisfied with ANC services remained more likely to achieve prevention of MTCT of HIV in the multivariate model (AOR = 1.50; 95% CI 0.12-18.71), though not statistically significant ($p = 0.754$) (Table 4.8).

Table 4.10: Health service factors influencing MTCT of HIV

4.9 Maternal knowledge levels of MTCT of HIV

This study used

Predictors	MTCT Prevention		Crude Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)	*p*-value
	HIV+VE Children n (%)	HIV−VE Children n (%)			
Obstetric intervention					
Vaginal	9 (90.0)	101 (91.8)	Reference		
Caesarean	1 (10.0)	9 (8.2)	0.84 (0.09-7.06)		
ARV regimen					
TDF+3TC+EFV	6 (60.0)	65 (59.1)	Reference		
TDF+3TC+DTG	4 (40.0)	45 (40.9)	1.04 (0.28-3.89)		
ANC service satisfaction level					
Not satisfied	3 (30.0)	3 (2.8)	Reference		
Satisfied	7 (70.0)	81(73.6)	11.57 (1.96-68.40)	1.50 (0.12-18.71)	0.754
Very satisfied	0 (0.0)	26 (23.6)	N/A		
Healthfacility migration					
Ever migrated	6 (60.0)	5 (4.5)	Reference		
Never migrated	4 (40.0)	105 (95.5)	31.50 (6.68-148.55)	34.47 (4.84-245.34)	<0.001
Time taken					
≤ 1 hour	10 (100.0)	104 (94.5)	Reference		
> 1 hour	0 (0.0)	6 (5.5)	N/A		

proportions to assess the knowledge levels of pregnant women on PMTCT. Results indicate that most women 55 (45.8%) had above average knowledge on HIV transmission. Majority of the women 78 (65.0%) possessed above average knowledge on when mother to child transmission of HIV can occur. Half of the study participants 60 (50.0%) possessed average knowledge on how to prevent MTCT of HIV during pregnancy. Regarding prevention of MTCT of HIV during delivery, slightly over half of the women 63 (52.5%) had above average understanding. Most of the women 57 (47.5%) possessed above average information on prevention of MTCT of HIV during breast feeding (Table 4.9).

Table 4.11: Knowledge levels of MTCT of HIV

Knowledge factors	n (%)
Knowledge of HIV transmission	
Below average	2 (1.7)
Average	17 (14.2)
Above average	55 (45.8)
Excellent	46 (38.3)
Knowledge of MTCT occurrence	
Below average	2 (1.7)

Average	9 (7.5)
Above average	78 (65.0)
Excellent	31(25.8)
Knowledge of MTCT during pregnancy	
Below average	11 (9.2)
Average	60 (50.0)
Excellent	49 (40.8)
Knowledge of MTCT during delivery	
Below average	7 (5.8)
Average	49 (40.8)
Above average	63 (52.5)
Excellent	1 (0.8)
Knowledge of MTCT during breast feeding	
Below average	6 (5.0)
Average	14 (11.7)
Above average	57 (47.5)
Excellent	43 (35.8)

4.10 Maternal knowledge related factors associated with MTCT of HIV

This study confirmed that achievement of prevention of mother to child transmission of HIV is associated with maternal knowledge of HIV transmission (^{2}=16.841, $p < 0.005$), maternal knowledge of when MTCT can occur (^{2}=10.808, $p = 0.010$), maternal knowledge of MTCT during pregnancy (^{2}=13.350,$p = 0.001$), maternal knowledge of MTCT during delivery (^{2}=8.962,$p = 0.030$) and maternal MTCT during breast feeding (^{2}=8.871, $p = 0.018$) (Table 8). The highest proportions of prevented MTCT of HIV were among women who had above average knowledge of HIV transmission (52, 47.3%), above average knowledge of when MTCT can occur (73, 66.4%), average knowledge of MTCT during pregnancy (57, 51.8%), above average knowledge of MTCT during delivery (60, 54.6%) and above average knowledge of MTCT during breast feeding (53, 48.2%) (Table 4.10)

Bivariate analysis of the maternal knowledge related factors indicate that having average(COR = 0.07; 95% CI 0.01-0.70) or above average (COR = 0.39; 95% CI 0.04-3.84) knowledge of HIV transmission were associated with fewer odds of achieving prevention of MTCT of HIV compared to having excellent knowledge respectively. Similarly, women who possessed average and above average knowledge of when MTCT can occur were less likely to achieve prevention of MTCT of HIV than those who possessed excellent knowledge (COR = 0.04; 95% CI 0.01-0.45, COR = 0.49; 95% CI 0.06-4.34) respectively. Women who had average (COR = 15.83; 95% CI 3.01-83.29) and excellent (COR = 19.58; 95% CI 3.09-124.16) knowledge of MTCT during pregnancy were 15.8 and 19.6 times more likely to achieve prevention of mother to child transmission of HIV than those who had below average knowledge. Further, women who had average (COR = 8.44; 95% CI 1.38-51.71) and above average (COR = 15.00; 95% CI 2.26-99.64) knowledge of MTCT during delivery increased their odds of achieving prevention of MTCT of HIV compared to those whose knowledge was below average. Finally, the bivariate analysis found that odds of achieving prevention of MTCT of HIV were more among women with average (COR = 13.00; 95% CI 0.98-172.95), above average (COR = 13.25; 95% CI 1.99-88.21) and excellent (COR = 20.50; 95% CI 2.41-174.07) knowledge of MTCT during breast feeding than those with below average knowledge (Table 4.10)

Table 4.12: Maternal knowledge related factors associated with MTCT of HIV

Independent variables	All N=120 n (%)	MTCT Prevention HIV+VE Children N=10 n (%)	HIV−VE Children N=110 n (%)	χ^2	*p* value
Knowledge of HIV transmission				16.841	<0.001
Below average	2 (1.7)	2 (20.0)	0 (0.0)		
Average	17 (14.2)	4 (40.0)	13 (11.8)		

Above average	55 (45.8)	3 (30.0)	52 (47.3)		
Excellent	46 (38.3)	1 (10.0)	45 (40.9)		
Knowledge of MTCT occurrence				10.808	0.010
Below average	2 (1.7)	0 (0.0)	2 (1.8)		
Average	9 (7.5)	4 (40.0)	5 (4.5)		
Above average	78 (65.0)	5 (50.0)	73 (66.4)		
Excellent	31 (25.8)	1 (10.0)	30 (27.3)		
Knowledge of MTCT during pregnancy				13.350	0.001
Below average	11 (9.2)	5 (50.0)	6 (5.5)		
Average	60 (50.0)	3(30.0)	57 (51.8)		
Excellent	49 (40.8)	2 (20.0)	47 (42.7)		
Knowledge of MTCT during delivery				8.962	0.030
Below average	7 (5.8)	3 (30.0)	4 (3.6)		
Average	49 (40.8)	4 (40.0)	45 (40.9)		
Above average	63 (52.6)	3 (30.0)	60 (54.6)		
Excellent	1 (0.8)	0 (0.0)	1 (0.9)		
Knowledge of MTCT during breast feeding				8.871	0.018

Below average	6 (5.0)	3 (30.0)	3 (2.7)
Average	14 (11.7)	1 (10.0)	13 (11.8)
Above average	57 (47.5)	4 (40.0)	53 (48.2)
Excellent	43 (35.8)	2(20.0)	41 (37.3)

4.11 Maternal knowledge related factors contributing to MTCT of HIV

After controlling for confounding, maternal knowledge related factors did not significantly contribute to prevention of MTCT of HIV (Table 4.8). However, women with below average (AOR = 0.38; 95% CI 0.01-12.66) and above average knowledge of HIV transmission remained less likely to achieve prevention of MTCT of HIV than those with excellent knowledge when other factors were constant. In the multivariate analysis, the odds of achieving prevention of MTCT of HIV reduced among women with average knowledge of when MTCT can occur (AOR = 0.14; 95% CI 0.01-7.44) and increased among women with above average knowledge (AOR = 1.24; 95% CI 0.09-16.67) compared to those with excellent knowledge when other factors were controlled. After adjusting for other covariates, women who had average (AOR = 5.83; 95% CI 0.29-118.26) and excellent (AOR = 5.62; 95% CI 0.23-138.25) knowledge of MTCT during pregnancy remained more likely to achieve prevention of MTCT of HIV than those with below average knowledge. Similarly, odds of prevention of MTCT of HIV achievement were higher among women with average (AOR = 15.00; 95% CI 0.56-405.43) and above average (AOR = 7.54; 95% CI 0.31-183.16) knowledge of MTCT during delivery compared to those with below average knowledge when other factors remained constant. Unlike in the bivariate analysis, maternal knowledge of MTCT during breast feeding was associated with lower odds of prevention of MTCT of HIV. Women who possessed average, above average and excellent knowledge of MTCT during breast feeding were 53%, 64% and 40% respectively less likely to achieve prevention of MTCT of HIV after controlling for confounding (AOR = 0.47; 95% CI 0.01-49.37, AOR = 0.36; 95% CI 0.01-21.70 and AOR = 0.60; 95% CI 0.01-40.68) respectively (Table 4.8)

Table 4.13: Maternal knowledge factors influencing MTCT of HIV

Predictors	MTCT Prevention		Crude Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)	*p*-value
	HIV +VE Children n (%)	HIV –VE Children n (%)			
Knowledge of HIV transmission					
Below average	2 (20.0)	0 (0.0)	N/A		
Average	4 (40.0)	13 (11.8)	0.07 (0.01-0.70)	0.38 (0.01-12.66)	0.591
Above average	3 (30.0)	52 (47.3)	0.39 (0.04-3.84)	0.44 (0.03-5.97)	0.534
Excellent	1 (10.0)	45 (40.9)	Reference		
Knowledge of MTCT occurrence					
Below average	0 (0.0)	2 (1.8)	N/A		
Average	4 (40.0)	5 (4.5)	0.04 (0.01-0.45)	0.14 (0.01-7.44)	0.330
Above average	5 (50.0)	73 (66.4)	0.49 (0.06-4.34)	1.24 (0.09-16.67)	0.869
Excellent	1 (10.0)	30 (27.3)	Reference		
Knowledge of MTCT during pregnancy					
Below average	5 (50.0)	6 (5.5)	Reference		
Average	3(30.0)	57 (51.8)	15.83 (3.01-83.29)	5.83 (0.29-118.26)	0.251
Excellent	2 (20.0)	47 (42.7)	19.58 (3.09-124.16)	5.62 (0.23-138.25)	0.291

Knowledge of MTCT during delivery					
Below average	3 (30.0)	4 (3.6)	Reference		
Average	4 (40.0)	45 (40.9)	8.44 (1.38-51.71)	15.00 (0.56-405.43)	0.107
Above average	3 (30.0)	60 (54.6)	15.00 (2.26-99.64)	7.54 (0.31-183.16)	0.214
Excellent	0 (0.0)	1 (0.9)			
Knowledge of MTCT during breast feeding					
Below average	3 (30.0)	3 (2.7)	Reference		
Average	1 (10.0)	13 (11.8)	13.00 (0.98-172.95)	0.47 (0.01-49.37)	0.749
Above average	4 (40.0)	53 (48.2)	13.25 (1.99-88.21)	0.36 (0.01-21.70)	0.622
Excellent	2(20.0)	41 (37.3)	20.50 (2.41-174.07)	0.60 (0.01-40.68)	0.810

CHAPTER FIVE: DISCUSSION

5.1 Summary of major findings

Pregnancy willingness is a key socio demographic factor which had a significant influence on MTCT of HIV. Additional social support is necessary for the adolescent girlswho are HIV positive in accessingfamily planning servicesand health talk. Unplanned pregnancy remains a major challenge towards achieving prevention of MTCT of HIV.

Prevalence of MTCT of HIV still stands at 8.3 % in Rachuonyo East Sub County according to the current study.

Among the health facility factors influencing MTCT of HIV, cases of migration by MTCT mothers among health facilities providing MTCT services remains a challenge that end up in loss to follow up and treatment interruption.

The majority of MTCT mothers with infants turning HIV positive possess inadequate knowledge on MTCT of HIV during pregnancy but knowledge during delivery and breastfeeding is adequate.

5.2 Discusion

Mother to child transmission of HIV is still considered one of the HIV pandemic's most important challenges. This study investigated socio-demographic, economic, health facility factors and maternal knowledge factors influencing elimination of MTCT of HIV infection among infants in Rachuonyo East sub county, Homabay County.

5.2.1 Socio demographic factors influencing MTCT of HIV

Majority of the respondents were aged between 15-34 years. This was in line with a similar study conducted in Rachuonyo North Sub County Homabay County which stated that majority of antenatal attendees were between15-34 years(Otieno, 2020). This calls for strengthening MTCT of HIV control measures among MTCT mothers below age 34 as majority of women deliver from the age of 15 years to 34 years. Based on this study, number of live births was found to be significantly associated with zero MTCT of HIV. Women with at least three live births were more likely to achieve zero MTCT compared to those with none. This finding was in agreement with a previous related study in South Africa (Darteh *et al.*, 2021) which documented that MTCT mothers with zero births had lower odds of knowledge compared to mothers with at least one child. This could be as a result of more experienced women who have undergone through the MTCT program either successfully or unsuccessfully bearing more knowledge from past experiences which enable them to achieve MTCT in subsequent pregnancies as compared to mothers bearing children for the first time and have never accessed MTCT services. This calls for placing more emphasis on primiparous mothers by health care providers during MTCT program to achieve zero MTCT.

Study results indicate that pregnancy willingness was significantly associated with zero MTCT of HIV ($p < 0.05$). Mothers who were willing to carry pregnancy were more likely to achieve zero MTCT of HIV compared to those who were unwilling. This may majorly be as a result of unplanned pregnancy which according to the current study was significantly associated with zero MTCT of HIV. This is consistent with a related study (Beyene *et al.*, 2018) in which unplanned pregnancy increased risk of MTCT of HIV. According to a study by (Ramraj *et al.*, 2018) women with unplanned pregnancy were more likely to have their first antenatal booking as late as second trimester. This lowered MTCT coverage and subsequently led to higher MTCT risk as time for protection against MTCT during pregnancy was reduced. Unplanned pregnancy can be forced or accidental due to unmet needs of family planning among HIV seropositive women of child bearing age. The current study having shown that a third of MTCT mothers were not on family planning, there is hence need to strengthening integration of family planning services into HIV services and further actively engage mothers on MTCT program in family planning services in order to avoid future unplanned pregnancies.

The current study further showed that women with good adherence levels of HIV medication were 8 times more likely to achieve zero MTCT of HIV than those with poor adherence levels. This finding is consistent with a finding in Ethiopia which showed association between poor adherence and MTCT of HIV(Beyene *et al.*, 2018). This finding further agreed with the finding by(Kang'oma, 2011) in which failure of MTCT adherence was a major hindrance in reducing vertical transmission of HIV and associated mortality and morbidity. Possible justification might be that poor MTCT adherence less than 95% may lead to viral resistance as well as non-suppression of viral load. Therefore strengthening adherence counseling of pregnant and breastfeeding mothers in MTCT programs can positively impact on achievement of zero MTCT of HIV.

In this study, there was zero MTCT of HIV among infants who received exclusive replacement feeding as the feeding option, which agreed with a study in Enugu, Nigeria (Iloh *et al.*, 2015) which stated that there was no HIV positive result among infants who had exclusive replacement feeding . This further agreed with another related study in Jos University Teaching Hospital (Achonga, 2006). Despite another related study (Ejara *et al.*, 2018) having shown that exclusive breastfeeding is the most preferred and appropriate feeding practice, few mothers had no option but to practice exclusive replacement feeding. This could be as a result of mother having breast problems or illness. The current study recorded minimal cases of replacement feeding compared to the other three feeding options studied. Possible explanation for this could be that this practice is unaffordable as majority of MTCT mothers in our setting were of low economic status.

5.2.2 Socio economic factors influencing MTCT of HIV

The current study indicates that majority of women that is 65.8% of the participants earned a monthly income of less than Ksh. 7,000 which is the international poverty level (US $ 1.90 per day). Women whose monthly income was at least Ksh. 7000 were found to be twice more likely to achieve zero MTCT of HIV. This observation is related to another observation in a previous study in Kenya where women who were earning income lower than the wage indicator, thus less than 4.9 dollars per hour according to the 2010 Kenya National Bureau of Statistics (KNBS) affected their ability to afford, access and utilize MTCT services due to cost (Otieno, 2020). Income level dictates the ability of MTCT mothers to achieve MTCT. It is an enabler in meeting cost of various high quality services during pregnancy, delivery and breastfeeding. Furthermore, costs including

transport to the facility determine the ability of a mother to attend clinic appointments regularly and arrive on time in case of emergency. Further subsidies and introduction of incentives to needy mothers based on assessment of a social worker is necessary to provide a level ground on cost of MTCT.

maternal education and occupation were not significantly associated with zero MTCT of HIV. This indicates that among other factors, level of education has no influence when it comes to adhering to laid down measures of curbing MTCT of HIV among seropositive women.

5.2.3 Health care facility factors influencing MTCT of HIV

The study results found that women's stage of ARV enrolment and HIV care and treatment was significantly important in determining zero MTCT of HIV. Women who enrolled for HIV care and treatment during their pregnancies were 72% less likely to achieve MTCT of HIV than those who enrolled before their pregnancies. This finding is consistent with the finding by (Kimani, 2018) which showed that late initiation of ARVs during pregnancy has been linked with high risk of MTCT of HIV and early infant mortality. Possible justification might be that treatment could be started but end up not being effective in preventing vertical HIV transmission due to delayed commencement (Yadav *et al.*, 2017). It is hence necessary to provide extended support to HIV positive women in child bearing age by community health volunteers (CHVs) as a means of early identification and enrolment into HIV care as opposed to the usual provider initiated counseling and testing (PITC) done when mother reaches health facility.

The current study noted that, women who were satisfied with MTCT services offered at the PMTCT clinic were more likely to achieve zero MTCT of HIV as compared to those who were dissatisfied although this did not reach significance level. Possible explanation might be that client satisfaction with MTCT services is an indicator of quality of service. Service quality influences attitude towards utilization of MTCT services and consequently desired health outcome, which in our case was MTCT of HIV. Therefore there is need by the MTCT service providers to prioritize on assessing levels of satisfaction during counseling sessions in order to address all factors that can probably affect client satisfaction with MTCT services.

This study revealed that there was no association between MTCT mother's regimen and MTCT of HIV. This finding was consistent with findings by (Davey *et al.*, 2020) which documented that no significant MTCT differences were observed between Delutegravir (DTG) based and Efavirenz (EFV) based ART, MTCT risk appeared similar in both cases. Being that there is no much studies yet for DTG in relation to MTCT and the fact that DTG had been introduced in the study setting three years prior to the study, it remains unknown whether DTG may reduce MTCT in other settings where seropositive mothers were introduced to DTG optimization much earlier than the current study setting.

A striking observation from this study was that women who never migrated from health care facilities initially enrolled in for HIV care and treatment significantly achieved zero MTCT of HIV ($p<0.05$) as opposed to those who migrated at least once during their MTCT program. A possible justification could be due to the fact that during migration, MTCT mother will either notify the clinic or move without notification as a lost to follow up client. Those who move without immediate intention of starting care in a different clinic may only reengage when they feel unwell. Related studies have documented that the timing of reengagement into care will determine effectiveness of HIV treatment (Hickey *et al.*, 2016). This will consequently increase chances of treatment failure due to drug resistance leading to elevated viral load and consequently MTCT of HIV. There is hence need to improve communication and follow-up of MTCT mothers who transfer between facilities. Strengthening active tracing of lost to follow up MTCT mothers is equally necessary.

Measuring knowledge of MTCT of HIV is crucial to plan and implement MTCT care and support of women who are at risk of HIV infection due to inadequate knowledge. Mothers knowledge in this study was assessed under two categories namely, knowledge of HIV transmission and knowledge of MTCT. Knowledge was further assessed in three stages of vertical transmission namely knowledge of MTCT during pregnancy, knowledge of MTCT during delivery and knowledge of MTCT during breastfeeding. Results of the current study indicate that 84.1% of participants had above average knowledge on HIV transmission with 90.8. % having above average knowledge on when mother to child transmission of HIV can occur. Possible

interpretation for this positive association could be that comprehensive knowledge on HIV is critical determinant on levels of knowledge on MTCT of HIV. This explanation is in line with a similar study which documented that women who had comprehensive knowledge on HIV were 1.69 times more likely to possess high knowledge on MTCT of HIV (Desta, 2019).

Having shown that 90.8 % possessed above average knowledge on when mother to child transmission of HIV can occur, the percentage from this finding was higher than the percentage from a related study by (Haghdoost, 2015) which found out that 75.2% of seropositive mothers possessed high knowledge on MTCT of HIV. This variation could be as a result of difference in study settings and sample size between the current study and the previous study. According to another related previous study (Dlamini, 2015), 77.8% of the respondents showed high levels of knowledge on MTCT of HIV with only 22.2 % showing low knowledge on MTCT. With this high level of knowledge on MTCT of HIV shown by the current study, one would have expected a near achievement of zero MTCT of HIV, however the remaining 9.2% of women possessing below average knowledge is equally a significant number and is impacting negatively on the success of achievement of zero MTCT of HIV. This also informs that knowledge is not the only factor influencing MTCT hence other factors to be equally considered by health care workers and community at large.

This study confirmed that achievement of zero mother to child transmission of HIV was associated with maternal knowledge of HIV transmission ($p < 0.05$). This observation is in line with a study in Ethiopia (Liyeh *et al.*, 2020) which found that women who were knowledgeable on MTCT of HIV were 2.2 times more knowledgeable on MTCT of HIV than those who did not have the knowledge. Possible explanation for this could be that knowledge of mothers about MTCT could affect their attitude and perception towards importance of adherence to ART and by extension the outcome of infant HIV status. Therefore maternal knowledge on MTCT remains a corner stone for effective and successful implementation of MTCT program.

Based on this study, women who had average and excellent knowledge of MTCT during pregnancy were 15.8 and 19.6 times more likely to achieve zero mother to child transmission of HIV than those who had below average knowledge. This finding informs that there exist a strong positive association between mother's knowledge of MTCT during pregnancy and achievement of zero MTCT of HIV. This study further observed that in the second and third stages of MTCT of HIV transmission which are delivery and breastfeeding respectively, possibility of achieving zero MTCT of HIV were higher among participants who possessed above average knowledge on this two stages as compared to participants who had below average knowledge of MTCT of HIV in the same two stages. This finding was in line with a previous finding (Philemon *et al.*, 2021)which demonstrated varying levels of knowledge pertaining to different components of MTCT. The study observed that only 20 percent of the participants were aware that transmission can occur during breastfeeding period despite being enrolled into MTCT. A bigger percentage thus 65.6 % and 57.4 % were not even aware that MTCT can occur during pregnancy and delivery respectively. This observation further explains the existence of a positive relationship between MTCT of HIV and MTCT.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Several social demographic factors appeared to determine outcome of MTCT of HIV in this study. Among them pregnancy willingness remained a significant predictor of achieving zero MTCT of HIV when other factors were held constant.

Migration by the mother from health care facility initially enrolled in for HIV care and treatment also proven to significantly influence achievement of zero MTCT of HIV.

A total of 91(84.1%) participants had above average knowledge on HIV transmission while majority of the women 90.8. % possessed above average knowledge on when mother to child transmission of HIV can occur. Although all the three stages of MTCT of HIV demonstrated a positive association with achievement of zero MTCT of HIV, mother's knowledge of MTCT of HIV during pregnancy showed a stronger association compared to delivery and breastfeeding stages.

6.2 Recommendations.

Implementation of findings from this study should provide social support by aiding in averting unplanned pregnancies resulting from unmet need for family planning, the Ministry of Health through the County Government of Homabay should strongly partner with HIV/AIDS care and treatment NGOs to direct more resources in strengthening all aspects of family planning including knowledge, access, and positive attitude towards use of family planning options. The highly targeted group should be but not limited to adolescent. This will counter early and unintended teenage pregnancies.

There is need for health facility policy adjustments by the ministry pertaining to transfer of patients on care from one health facility to another in order to counter lost to follow up clients. This can be attained by health care providers through introduction of physical follow up to the next facility and strengthening communication on patients transferring in and out. This is meant to counter the weak link in poor adherence of ART arising from the transfers.

To address the wider knowledge gap observed in terms of MTCT of HIV during pregnancy as opposed to delivery and breastfeeding, MTCT service providers should strategically consider strengthening health talks on MTCT to all HIV positive mothers of child bearing age prior to conception and enrolment into MTCT program.

6.3 Recommendations for future studies

This study recommends a longitudinal study to determine why social and economic factors such as level of income and maternal education level which is assumed to relate to level of understanding of knowledge of MTCT did not show a significant association with MTCT of HIV.

This study further recommends a detailed study on the determinants of satisfaction with MTCT services and relationship between satisfaction and migration from one facility to another since the two health facility variables had significant association with MTCT of HIV.

In addition, this study recommends a study on the existing gap on the MTCT knowledge level among the three studied stages of MTCT of HIV in order to ascertain the reasons for the inadequate knowledge level demonstrated by the mothers during pregnancy as compared to delivery and breastfeeding stages.

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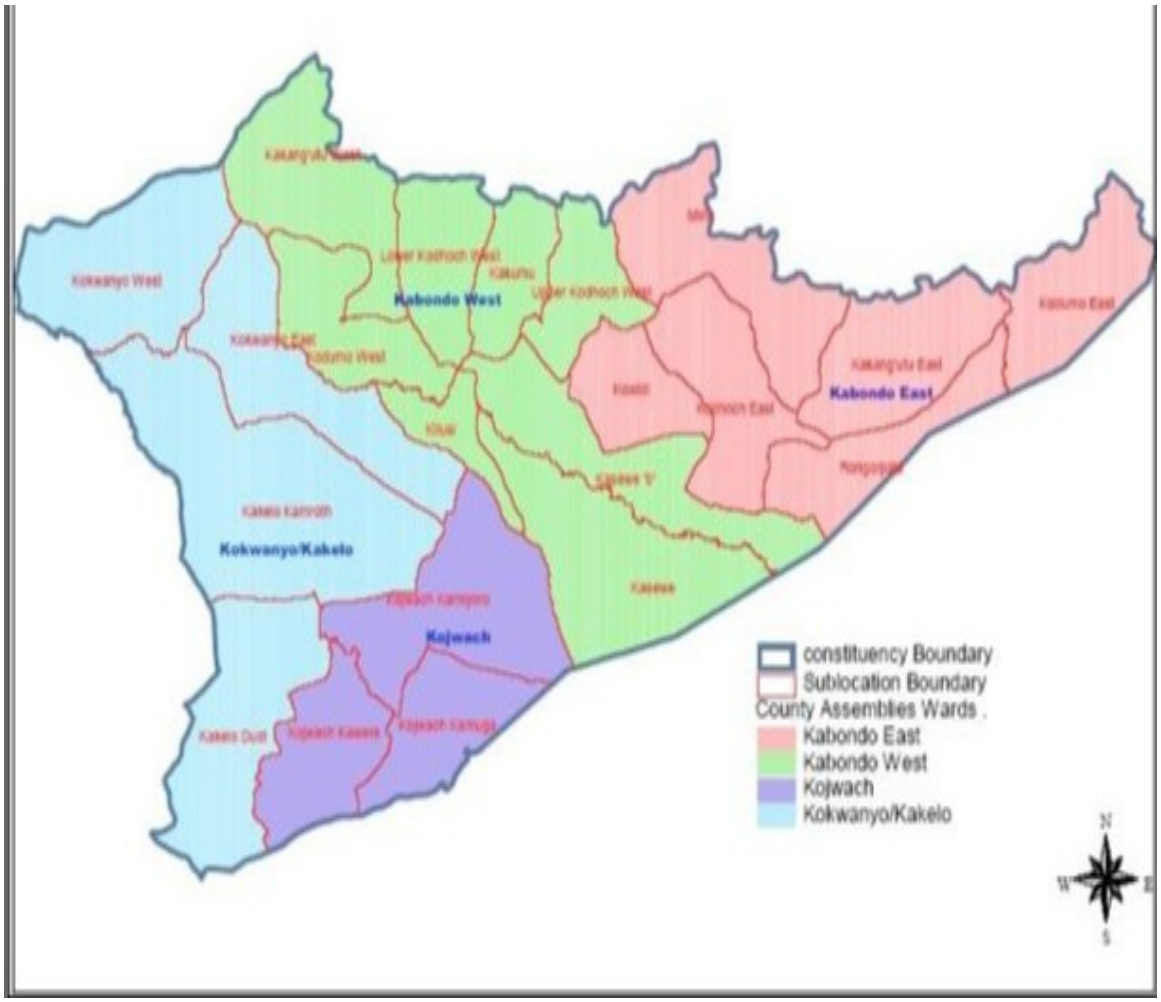
APPENDICES

Appendix1: Map of Rachuonyo East Sub County



Appendix 2: Board of post graduate studies authorization letter

JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE & TECHNOLOGY

BOARD OF POSTGRADUATE STUDIES

Office of the Director

Tel. 057-2501804
Email: bps@jooust.ac.ke

P.O. BOX 210 - 40601
BONDO

Our Ref: H153/4497/2017

Date: 19th July 2021

TO WHOM IT MAY CONCERN

RE: NICHOLAS ODIEMO OGONE – H153/4497/2017

The above person is a bonafide postgraduate student of Jaramogi Oginga Odinga University of Science and Technology in the School of Health Sciences pursuing Master of Science in Epidemiology and Biostatistics. He has been authorized by the University to undertake research on the topic: ***"Determinants of Mother-to-Child Transmission of HIV Infection in Rachuonyo East Sub County, Homabay County".***

Any assistance accorded him shall be appreciated.

Thank you.

JARAMOGI OGINGA ODINGA
DIRECTOR BOARD OF
POST GRADUATE STUDIES
DATE

Prof. Dennis Ochuodho
DIRECTOR, BOARD OF POSTGRADUATE STUDIES

Appendix 3: IERC approval letter



COUNTY GOVERNMENT OF KISUMU
DEPARTMENT OF HEALTH

Telephone: 057-2020801/2020803/2020321
Fax: 057-2024337
E-mail: medsuptnpgh@yahoo.com
ceo@jaramogireferral.go.ke
Website: www.jaramogireferral.go.ke
When replying please quote

JARAMOGI OGINGA ODINGA TEACHING & REFERRAL HOSPITAL
P.O. BOX 849
KISUMU

Ref. No. IERC/JOOTRH/539/21

Date 26th October, 2021

RE: APPROVAL: STUDY TITLE:
DETERMINANTS OF MOTHER- TO- CHILD TRANSMISSION OF HIV INFECTION IN
RACHUONYO EAST SUBCOUNTY, HOMABAY COUNTY

REF: IERC/JOOTRH/539/21

TO: Principal Investigators: – Nicholas Odieno Ogone

Dear Sir,

RE: STUDY TITLE

This is to inform you that JOOTRH IERC has reviewed and approved your above research proposal. Your application approval number is ***IERC/JOOTRH/539/21*** .The approval period is ***26th October, 2021 – 26th October, 2022.***

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by JOOTRH IERC.
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to JOOTRH IERC within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to JOOTRH IERC within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. 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.
vii. Submission of an executive summary report within 90 days upon completion of the study to JOOTRH IERC.

1

viii. In case the study site is JOOTRH, kindly report to Chief Executive Officer before commencement of data collection.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.keand also obtain other clearances needed.

Yours sincerely

INSTITUTIONAL ETHICS & REVIEW COMMITTEE
26 OCT 2021
JOOTRH

NANCY MAKUNDA – SECRETARY
JOOTRH – IERC
KISUMU

Appendix 4: NACOSTI letter

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **607134**

Date of Issue: **19/November/2021**

RESEARCH LICENSE

This is to Certify that Mr.. Nicholas Odiemo Ogone of Jaramogi Oginga Odinga University of Science and Technology, has been licensed to conduct research in Homabay on the topic: DETERMINANTS OF MOTHER-TO -CHILD TRANSMISSION OF HIV INFECTION IN RACHUONYO EAST SUB COUNTY, HOMABAY COUNTY. for the period ending : 19/November/2022.

License No: **NACOSTI/P/21/14355**

607134

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

Appendix 5: Permission to conduct research

DEPARTMENT OF HEALTH

Telegrams: "MOH" Homa Bay
Telephone: 21039
When replying please quote

OFFICE OF THE DIRECTOR,
HOMA BAY COUNTY,
P.O. BOX 52,
HOMABAY.

REF:MOH/RA/VOL.VI.(9)

22nd November 2021

Nicholas Odiemo Ogone
Principal Investigator

Dear Sir

RE: AUTHORITY TO CONDUCT RESEARCH.

This is to inform you that permission to collect data on your research entitled; **" Determinants of Mother to Child Transmission of HIV infection in Rachuonyo East Sub County"** has been approved for the period ending 19 November 2022.

You will be required to adhere to the hospital's norms and regulations, and involve both the County Health Management Team and hospital's staff during the research period, and we expect to get communication on your findings at the hospital level and the office of the undersigned at the end of the research period.

Wish you all the best in your research.

Thank you

DEPARTMENT OF HEALTH SERVICES,
COUNTY DIRECTOR OF HEALTH
22 NOV 2021
P.O. BOX 52 - 4300, HOMA BAY - KENYA

for Dr. Vincent Waringa
Deputy Director Medical Services
HOMABAY COUNTY.

Appendix 6: Budget

Activities	Quantity	Rate	Total
Proposal preparation			
Notebooks	5 reams	300	1500
Pens	1 dozen	500	500
Flash disks	4 gb	1000	1000
Spring files	20	70	1400
Printing	5 copies	200	1000
Sub total			40500
Pilot study			
Producing documents	4 copies	50	200
Transport	5 days	300	1500
Sub total			1700
Data collection			
Producing documents	15 copies	30	450
Transport	15 days	500	7500
subsistence	15 days	200	3000
Sub total			10950
Thesis preparation			
Producing documents	5 copies	250	1250
Binding	5 copies	70	350
Sub total			1600
Total			65250
Contingencies (10%)			6525
Grand total			71775

Appendix 7: Research Participant Form

Determinants of Mother-to-child Transmission of HIV Infection in Rachuonyo East Sub County, Homabay County.

Introduction

I am Nicholas Odiemo. I am pursuing a Master of Science degree in epidemiology and biostatistics, School of health Sciences at Jaramogi Oginga Odinga University of Science And Technology. I am the researcher in this study that aims to investigate factors influencing mother to transmission (MTCT) of HIV Infection in Rachuonyo East Sub County.

Purpose of study

The purpose of this study is get information about you and your infant to investigate factors influencing mother to transmission (MTCT) of HIV Infection in Rachuonyo East Sub County. This interview will take between 45 minutes to one hour of your time. The information you provide will be treated with strict confidentiality in the study. I will ensure that any information included in the study does not identify you as the respondent. Please keep in mind that there is no direct benefit in participating except that the information you provide will be useful to policy makers and feedback concerning the study results will be given to you at the end of the study compilation, if you are interested. There are no risks involved in the study as I will not require any samples or blood from you. I may also need to interview you again if need be, in order to clarify some comments. Do you agree to participate in the discussion? You are free to leave at any time during the discussion.

Study procedures

If you and your infant accept to participate in this study, you will be asked questions regarding your background information which include age, marital status and education. Socio-economic information will include income per month, occupation, feeding options, disclosure of HIV status and MTCT intervention. In regard to your infant, you will give information on the age, gender, delivery place and mode of delivery, feeding options, use of ARV prophylaxis and any admissions. You will also be asked to provide information regarding your personal knowledge on MTCT program and lastly information pertaining to health care facility services.

Benefits

The findings of this study will aid in pointing out to several critical gaps in the MTCT cascade in the fisher folk setting consequently guiding health care providers and policy makers on policy adjustments in order to improve prevention of mother to transmissions (MTCT) of HIV in Rachuonyo East Sub County.

Risks

This study does not carry any significant direct risks, although some questions may be a little personal. These have however been drafted in a manner to reduce any discomfort. Still, should you find any such question and

you feel uncomfortable answering, you are advised to skip such question. However, you are encouraged to try and answer all questions in order to help fully understand the research question.

Compensation

Once you agree to participate in this study, there will be no payment or gift for the purpose of participating as the study will be completely voluntary.

Confidentiality and privacy

Information obtained about you and your infant for this study will be kept confidential and will be used only for the purposes of the study. The interviews will be conducted in a private room. Names not will be used in the questionnaire; instead a unique code for each informant will be used. The research reports and publications will only discuss large groups of participants and will not reveal individual names. The questionnaires will be kept under lock and key with restricted access.

Right to withdrawal or refusal to participate.

A subject' participation in the study is entirely voluntary. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind or penalty. You may also decline to answer any questions you don't wish to answer and still remain in the study

Questions

If you have any questions or concerns about the research, please feel free to contact Mr. Nicholas Odiemo, 0703940455 email address ogonenicholas@yahoo.com and Dr.DavidOtieno0729939023 email dvdotieno@gmail.comaddress?

Consent

I have been explained to all the above and fully understand. I therefore agree/disagree to

Participate in the study. I was accorded the opportunity these questions were answered to my satisfaction. I am aware that the results of the study will anonymously be processed into a study report and that at any stage I can withdraw my consent and participation in the study. I hereby consent voluntarily to participate in this study. I have been given a copy of this form.

Investigator …….

Signature……..... Date……

Participant……

Signature…….. Date……

Appendix 8: Questionnaire

Title: Determinants of Mother to Child Transmission of HIV Infection among Infants in Rachuonyo East sub County.

Questionnaire no……. Date of interview: ……

Part A: Socio-demographic characteristics

1. What is your age in years? …….

2. Marital status

☐ Single ☐ Widow ☐ Married ☐ Divorced/separated

☐ Cohabiting ☐ others (specify) …….

3. Level of education

☐None ☐ Primary ☐ Secondary

☐Tertiary ☐ other (s) specify……

4. Occupation

☐House wife ☐ Self-employed ☐Formal employment

☐Informal/casual employment ☐Others' specify ……..

5. How much is your estimated income per month ….. ……Kenya shillings

6. How do you come to this facility?

☐Walking ☐Bodaboda / Bicycle

☐Public Service Vehicle ☐ Private vehicle

7. Who do you live with?

☐ Husband ☐ parents ☐ Alone

☐ Children ☐ relative

8. What is the gender of your current child?

9. What is the gender of your other children?

☐Number of male children ☐

☐Number of female children ☐

Obstetric characteristics

Parity +++ + ☐

Did you attend ANC clinic?

☐Yes ☐No

How many times did you attend ANC clinic?

☐Once

☐Twice

☐Three Times

☐Four Times

Obstetric intervention

Vaginal Caesarian

MTCT interventions

Infant age at 1st PCR test

6weeks >6 weeks

6 months >6 months

12 months >12 months

Infant feeding options

Exclusive breast feeding Formulae feeding

Mixed feeding exclusive replacement feeding

Infant ARV intervention (prophylaxis)

AZT for 6weeks+NVP for 12weeks AZT for 6 weeks+NVP for > 12 weeks

None NVP+CTX

Maternal ARV Regimen

AZT+3TC+NVP

AZT+3TC+EFV

AZT + 3TC +LPV/r

AZT + 3TC+AZT/r

TDF+3TC+NVP

TDF+3TC+LPV/r

TDF+3TC+EFV

TDF + 3TC+ATV/r

TDF + 3TC+DTG

Single dose NVP in labor

None

Knowledge of Mothers on Mother to child Transmission of HIV

HIV can be transmitted through? *Select all that apply*

Unprotected sexual intercourse with an infected partner

Blood transfusion

Use of infected sharp skin piercing instruments Infected mother to

Have you heard about mother-to-child transmission of HIV?

Yes No don‘t know

Where did you first heard about mother-to- transmission of HIV?

Newspaper and magazines Radio Television

Billboards Printed materials Health workers

Family friends' Religious leaders Others' specify

When can HIV be transmitted from the mother to her infant?

during pregnancy during delivery during breast feeding

During pregnancy and delivery During delivery and breastfeeding

In your opinion,

What can a positive HIV mother do to reduce the risk of transmission of HIV to her child during pregnancy?

Take medication (specify) Abstain from sex Use of condom

Use/safer sex Better nutrition I don't know

ii) What can a positive HIV mother do to reduce the risk of HIV transmission to her baby during delivery?

Take medication, specify Caesarean section at delivery

Seek management during labor with skilled worker I don't know

What can a breastfeeding mother do to reduce risk of baby becoming infected with HIV during breastfeeding?

☐Give breast milk only up to 6 months ☐Get tested if HIV to confirm

☐Get early treatment ☐early weaning, give formula milk

Social and economic factors

1. Do you feel that your community set up affects the way you utilize MTCT services?

☐ yes ☐ no

If yes, explain…….

……

……

2. How do you think the economic activity you are involved in limits your contact time with your infant?

☐ yes ☐ no

Explain briefly

……

……

……

……

3. Do you think that the stigma in the community can make you or some mothers not come for HIV counseling and testing, as well as attending regular clinic visit

☐ yes ☐ no

In your opinion what do you think is the best way to overcome the stigma?

……

……

……

……

4. Did you formulae feed your baby?

▒ yes ▒ no

If yes how did you feel when you formula-feed your baby. Is there any form of stigma or discrimination you experienced from close family members and friends?

……

……

……

From your experience what do mothers do to prevent stigma from formula feeding?

……

……

……

5. Are you married

▒ yes ▒ no

If yes, do you feel your partner provide the much needed social support?

▒ yes ▒ no

6. In your opinion what else could be done to counteract stigma?

……

……

……

7. Are you and your partner living as discordant or concordant couples?

▒ yes ▒ no

8. If discordant, does it affect the way your partner treats you or provide for your social support?

▒ yes ▒ no

If yes explain

……

……

……

If concordant, how is the adherence of your partner to ARVs?

▒Very adherent

▒adherent

▒not adherent

9. Were you willing to carry a pregnancy?

▒ yes ▒ no

If no what were the driving forces that led to conception?

▒ yes ▒ no

10. Did you plan for the pregnancy?

▒ yes ▒ no

11. Are you currently using any family planning method?

☐ yes ☐ no

12. Does your husband escort you to the health care facility for the MTCT services especially during HIV counseling and testing?

☐ yes ☐ no

If not what are the reasons?

……
……
……

Health care facility factors

13. Have you ever migrated from the health care facility you were previously taking care from to another?

☐ yes ☐ no

If yes how many times have you moved and what was the root cause?

……
……
……

As a mother who is receiving antiretroviral (ARV) prophylaxis or highly active antiretroviral therapy (HAART) for MTCT, do you attend the health care facility regularly for your appointments?

☐ yes ☐ no

If not what are the reasons?

……

……

……

14. As a mother receiving ARV prophylaxis or HAART for MTCT are you taking your medicines as prescribed?

☐ yes ☐ no

If not what might be the reasons?

……

……

……

15. What was the health care provider comment concerning your adherence to ARVS.

☐ Excellent

☐ Very good

☐ Good

☐ Poor

16. If not good, is it due to poor adherence?

☐ yes ☐ no

17. If yes what are the main contributing factors?

……

……

……

18. What do you think can be done to eliminate the above mentioned factors in order to improve the situation?

……
……
……

1. Approximately how long do you stay at the health care facility during clinic visits?

☐ 30 min to 1 hr.

☐ 1hr to 1h 30 min

☐ 1hr 30 min to 2 hours

☐ >2hrs

2. Do you think that this stay at the health facility during clinic days is too long?

☐ yes ☐ no

3. Does this duration of stay affect your intention to attend future clinics?

☐ yes ☐ no

Why?

……
……

4. What is your general satisfaction with services received during the MTCT visits to the health facility?

☐ Very satisfied

☐ satisfied

☐ not satisfied

Why?

……

……

5. Is there any available support from the clinic which helps protect you from the stigma?

▒ yes ▒ no

If there is, which one?

……

……

6. Are ARV medicines always available at your facility?

▒ yes ▒ no

Closing questions.

1. Are there, any other matters regarding the MTCT services you wish to emphasize?

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……

……

……

2. If you have a chance of recommending changes on how MTCT program is being carried out, what would you recommend to be changed?

……

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……

……