FACTORS INFLUENCING UTILIZATION OF PREVENTION OF MOTHER TO CHILD TRANSMISSION OF HIV AMONG WOMEN ATTENDING ANTENATAL CARE CLINICS IN RACHUONYO NORTH SUB-COUNTY-HOMA-BAY COUNTY, KENYA

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Factors Influencing Utilization of Prevention of Mother to Child Transmission of HIV among Women Attending Antenatal Care Clinics in Rachuonyo North Sub-County-Homa-Bay County, Kenya

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DECLARATION

This thesis is my original work and has never been presented for a degree or any award in any other University.

Signature…… Date…….

Allan James W. Otieno

This Thesis has been submitted for Examination with our approval as the University supervisors.

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DEDICATION

I wish to dedicate this thesis report to my family, wife madam Pamela and sons- Roonie, Daryl and Bravin for their willing overwhelming support while taking my study and determined not to settle for anything less than the full accomplishment of their dreams

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LIST OF ABREVIATIONS

ANC	Antenatal care
AIDS	Acquired Immune Deficiency Syndrome
ART	Antiretroviral therapy
ARV	Antiretroviral
AZT	Zidovudine
BF	Breast feeding
CDC	Centre for Disease Control- Kenya
CCMT	Comprehensive Care Management and Treatment for HIV and AIDS
EBF	Exclusive breast feeding
EGPAF	Elizabeth Glazer Pediatric Aids Foundation
EID	Early Infant Diagnosis
ERF	Exclusive replacement feeding
HAART	Highly active antiretroviral therapy
IMCI	Integrated Management of Child Illness
KCFS	Kenya county fact Sheets
KHPRM	Kenya HIV Prevention Road Map
MTCT	Mother to Child Transmission
NVP	Nevirapine
PCR	Polymerase Chain Reaction
PMTCT	Prevention of Mother to Child Transmission
SDNVP	Single Dose Nevirapine
SDP	Service Delivery point
UNAIDS	Joint United Nation Program on HIV and Aids
UNGASS	United Nation General Assembly Special Session
WHO	World Health Organization

OPERATIONAL DEFINITIONS

Access: This is defined as how much a population can reach health services- some domain of "access" that can be measured are availability, affordability and/ or acceptability.

Accessibility: This is ability to reach health services.

Discrimination: This is consideration of an individual or group based as in HIV infected, restricting them from privileges available leading to irrational decision making.

Exclusive Breast feeding: This is where an infant only receives breast milk without any additional food, drink, not even water for growth and development for the first 6 months of life.

Exclusive Replacement feeding: This is giving an infant who is not receiving any breast milk a nutritionally adequate diet until the age at which the child can be fully fed on family food. It's only advocated for HIV infected when it's AFASS.

Efficacy: This is the degree to which an intervention accomplishes the desired or projected outcome.

Efficiency: This is the measurable ability in manpower and time taken in producing a desired result.

Early infant diagnosis: This can be defined" as a virological test for highly exposed infant as a critical opportunity to strengthen their follow ups. This is usually done at 4-6 weeks of age or first contact thereafter.

Integration:	This is described as an act of bringing activities with similar components into a single system that functions as one.
Stigmatization:	This refers to setting some mark of negative perception to an individual or group of individuals from others, for example**,** on the basis of HIV infection.
Utilization:	This can be defined as making use of. It can also be used interchangeably with the word "use" and taken to mean the same.

ABSTRACT

The prevention of mother–to –child transmission of HIV uptake in Homa-Bay County and particularly Rachuonyo North sub-county remains sub–optimal despite the HIV prevalence being four times that of average population in Kenya. Information and utilization of services is an important determinant for prevention of transmission of HIV from mother to child. The objectives of the study were to assess the socio-demographic, socio-cultural characteristics, determinants of the appropriate infant feeding options and therapies and to establish the knowledge, attitude and practices of HIV infected women on PMTCT services. Facility based cross sectional study was conducted through simple random sampling technique to select 337 HIV infected pregnant women and 48 HEI mothers attending antenatal clinics from 20 health facilities in Rachuonyo North. Data was entered into MS Excel® (Microsoft, USA) and then exported to SPSS version 17® for analysis which were then analyzed. Results showed that the majority of respondents, had a mean age of 25.7+/-5.23 years (SD = 5.23) with range of 31, whereby 259 (67.3%) were married women. There was significant association between utilization of PMTCT and age (p value < 0.04) marital status (p value < 0.003) and education (P< 0.02). Majority (50.4%, 95% CI: 45.4 – 55.4) of the respondents had their HIV status disclosed to their partners. However, reason for non-disclosure were stigma(37%, 95% CI: 29.7 – 45.0), physical violence (35.1%, 95% CI: 27.9 – 45.0) and divorce/ separation (14%, 95% CI: 9.6 – 20.8).Results further showed that the preferred Infant feeding option was mixed feeding (28%, 95% CI: 24.3 – 33.3) and exclusive breast feeding (26%, 95% CI: 21.8 – 30.6).There was significant association between mixed feeding and attendance of ANC for PMTCT services (P <0.021). Majority of women (66%, 95% CI: 61.3 – 70. 7) were knowledgeable of mother to child HIV transmission and (72.2%, 95% CI: 67.7 – 76.7) attending ANC clinics in government health facilities. Significantly, willingness to test for HIV had association with attitude (P< 0.001). The main barriers impeding women participation on PMTCT awareness programs included cultural practices such as wife inheritance (26.8%, 95% CI: 22.6-31.4), stigma and discrimination (24.7%, 95% CI: 20.6 – 29.2), Care-free sexual rituals (17.1%, 95% CI: 13.7 -21.3). In conclusion, socio-cultural and demographic factors, health system and knowledge are important barriers to utilization of PMTCT services in Rachuonyo North. Therefore, it requires raising more community awareness about PMTCT and HIV. Further research to identify cost effectiveness and clinical impact of PMTCT should be carried out. Finally, advocacy to focused PMTCT services in all facilities to provide full range of comprehensive PMTCT service with a goal towards free pediatric HIV generation.

CHAPTER ONE

INTRODUCTION

1.1 Background

Globally, an estimated 36.9 million people are living with Human Immunodeficiency Virus (HIV), this includes 2.6 million children (<15 years). Approximately over 2.0 million adults and 220,000 children (<15 years) contract new HIV infections annually and there are 1.6 million deaths as a result of HIV/AIDs (UNAIDs, 2015). The HIV infections have reversed gains realized in child health and survival, and the infection has contributed significantly to the common complications of pregnancy. Most of these children are infected by HIV positive mothers during pregnancy, child birth and breast feeding. The vast majority (69%) of people infected with HIV live in low to middle-income countries particularly in sub-Saharan Africa where women are 30% more likely than men to be living with HIV/AIDS (Gill *et al.,* 2015). Kenya has the fourth largest HIV epidemics in the sub-Saharan region with a prevalence of 5.6% among adults aged 15-64 and 6.3% among pregnant women (KAIS, 2012). The risk of an HIV infected mother passing the virus to her infant is 5-8% during pregnancy, 10-20% during labor and delivery while 10-15% can be infected during breast feeding (Wilmoth *et al.,* 2010).

In Kenya, HIV/AIDS transmission from mother to child in Homa-Bay County, especially in North Rachuonyo sub-county, is one of the biggest health and development challenges in the county. According to Kenya County Fact sheet report (2015), the prevalence of HIV among antenatal care mothers in North Rachuonyo sub-county had highest HIV prevalence in the country, where the HIV prevalence in adults was 22.2% and 19.1% women of reproductive age and 12.5% infants are infected. In the sub county, approximately 45,000 people live with HIV (USAID 2014). Prevention of mother to child transmission of HIV services and its scale up in the sub-county has also improved from 23 sites in 2012 to 30 operational sites in 2015, and this has also cascaded the access and utilization of ANC / PMTCT, thus increasing the number in enrolment of children in the program (EGPAF 2015) .

Prevention of mother to child transmission of HIV provides an opportunity of preventing new pediatric HIV infections as well as identifying HIV infected family members. New infections and high viral loads during pregnancy pose the greatest risk of maternal to child transmission of HIV to the unborn baby, thus primary prevention, ARV prophylaxis as well as treatment at this time is critical (NASCOP, 2012). The situation is compounded by the fact that 25% of women in Kenya have an unplanned pregnancy and there is 60% unmet needs for family planning among HIV infected women (Awiti *et al.*, 2012).

Breast feeding also exposes infants to HIV, although exclusive breast feeding is recommended in HIV positive mother for the first six months of life with appropriate complimentary foods thereafter and access to clean water sanitation, and health services. It has been noted that HIV neutralizing antibodies, Tenascin –C or TNC protein are present in breast milk and these inhibits HIV (NAS, 2013). The occurrence of these antibodies could explain why mother to child transmission of HIV does not occur more often than projected. Anti-retroviral treatment is recommended for all pregnant and breastfeeding women living with HIV until one week after cessation of breastfeeding as this significantly reduces mother to child transmission of HIV (Permar *et al.,* 2012).

Caring for HIV infected children has major economic and social impact on families and health systems. Thus, preventing mother to child transmission of HIV has the potential to increase the understanding and acceptance of the HIV/AIDS epidemics. If the targets for PMTCT are to be met, then it is essential to prevent new infections among couples and improve access to family planning services among women living with HIV, improve equitable access to skilled attendants at delivery and increase accessibility of PMTCT services within antenatal clinics (UNAIDS, 2013). Early infants' diagnosis gives an opportunity for early identification for HIV exposed and infected infants and early linkage for care and treatment (WHO, 2010). Progression of the disease in HIV infected infants is fast, with a high mortality rate of more than 50% by second year of age (Betton *et al*., 2012). The median age of death in these infants in the first 2 years of life is 6 months (Betton *et al.*, 2012). Infants who are HIV positive by PCR should be started on Highly Active Antiretroviral Therapy

(HAART) regardless of their WHO clinical stage and CD4 count/ CD4%. Breast feeding should be encouraged for a minimum of 1 year (Wegner, *et al* 2013).

1.2 Statement of the Problem

In Kenya, HIV has emerged as the most important health risk for mothers and their children with great impact on the long-term outcome of pregnancy and child survival. Although the HIV prevalence rate in Kenya among women of reproductive age is 6.9%, for North Rachuonyo sub-county it is 19.1%, with infant's HIV prevalence of 12.5% (KDHS2, 2015). There has been stabilization of the prevalence nationally majorly attributed by the scale up on HIV care and treatment (CDC, 2013). With global target of reducing mother to child transmission rate to below 5% and HIV related maternal mortality by 50%, PMTCT provides an opportunity for preventing new pediatric HIV infection (WHO, 2012). Some of the key strategies geared towards preventing the mother to child transmission of HIV include efforts to increase knowledge of PMTCT in maternal child health clinics, greater male involvement in PMTCT, universal attendance of ANC clinics by pregnant women, universal uptake of HIV testing among pregnant women, as well as the provision of antiretroviral drugs (De Cock *et al.,* 2005). The impact of these strategies in HIV prevention in North Rachuonyo has not been well studied.

Rachuonyo North Sub-County is in Homa-Bay County, Nyanza Province, Kenya. There are 30 health facilities providing ANC services reaching 88% through HIV testing, 69% receiving maternal ARV prophylaxis and 58% infants receiving infant's prophylaxis (DHIS2, 2014). Despite these efforts, 12.5% of infants still acquire HIV through exposure during pregnancy, delivery and breast feeding (KDHS2, 2014). The factors leading to such a high level of transmission to infants has not been ascertained. Therefore, the current study assumed that there were barriers towards elimination of mother to child transmission of HIV in the sub-County. As shown by studies done in Nigeria (Manna, 2012), and Ethiopia (Adama, 2013), these barriers could be emanating from culture, practices and attitude of the local community. The current study aimed at understanding the contribution of socio-cultural, socio – demographic and socio-economic practices in increased mother to child transmission of HIV in the Sub-county. This information is critical to the efforts and knowledge

creation on HIV infection to mother and child health and can be used in devising strategies that could be used to control the disease in the area.

1.3 Justification

Mother to child transmission of HIV is by far the common way children become infected with HIV (Adeneye *et al.,* 2006). Ensuring that no baby is born with HIV is an essential step towards achieving a pediatric generation free from HIV and targeted three Millennium development goals which were to be met by 2015. These MDGs were MDG 4 which called for reduction by two thirds the mortality rate among children under five, MDG 5, which targeted reduction by three quarters maternal mortality ratio and MDG 6 which addressed halting and reversing the spread of HIV/ AIDS (UNICEF, 2010). These MDGs have been replaced by SDGs (2016) and the objectives of the current study was geared toward sustainable development goal 3 (SDG-3), on ensuring healthy lives and promotes well- being for all at all ages, through preventing deaths of newborns and children > 5 years of age and curtailing the epidemics of AIDS and achieving universal health coverage by the year 2030.

Worldwide, about 900 children are newly born infected with HIV per day and over 90% of these occur in sub Saharan Africa. Rachuonyo North with a HIV prevalence of 22.2% (KNASP, 2015) in women of reproductive age makes the sub-county to have one of the highest HIV prevalence in Kenya. The county targets prevention of mother to child transmission of HIV as a key public health priority and plans to scale up evidence-based interventions with new ideas to benefit the vulnerable such as women and children.

This study aimed at determining the link between social and economic factors that influenced access to appropriate treatment and care for pregnant women and their unborn infants. Such information is expected to contribute to laying down strategies for changing to focused PMTCT

1.4 Research Questions

1. What are the socio-demographic, socio-cultural and socio-economic characteristics of HIV positive women attending antenatal care clinics in North Rachuonyo Sub- County?

2. What are the infant feeding options and therapies adopted by pregnant women antenatal care clinics in North Rachuonyo Sub-County?

3. What is the level of knowledge, attitude and practices of HIV infected women on prevention of mother to child transmission in antenatal care clinics in North Rachuonyo Sub- County?

1.4.1 Broad objective

To determine factors influencing utilization of prevention of mother to child transmission of HIV services among women attending antenatal clinics in North Rachuonyo Sub-County, Homa-Bay County, Kenya.

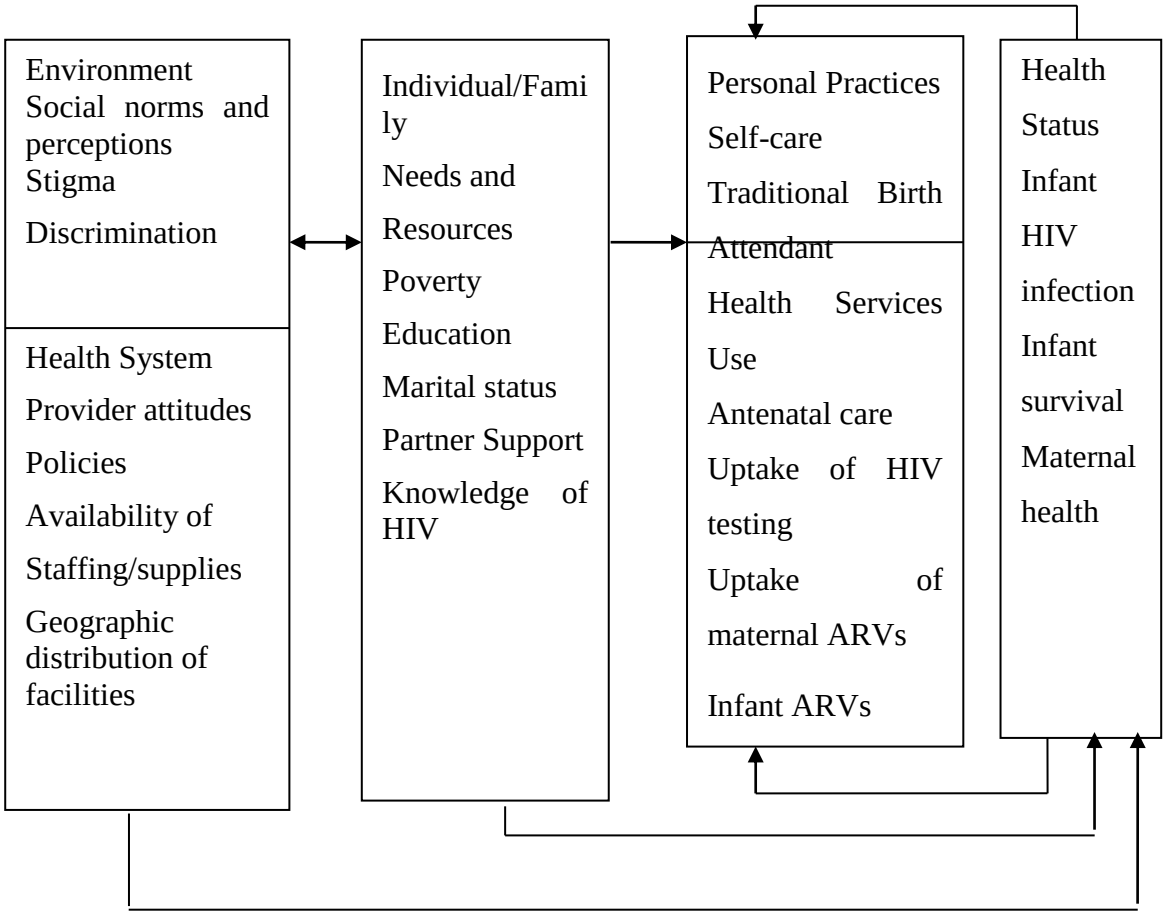
1.4.2 Specific Objectives

1. To determine the socio-demographic, socio-cultural and socio-economic characteristics of HIV positive women attending antenatal care clinics in North Rachuonyo Sub- County.
2. To determine the infant feeding options with a proportion of HIV infected mothers complying with choice of feeding and therapies initiated in attending antenatal care clinics in Rachuonyo North Sub – County.
3. To determine the knowledge, attitude and practices of HIV infected women on prevention of mother to child transmission in antenatal care clinics in North Rachuonyo Sub- County

1.5 Conceptual Framework

The study used an analytical frame work, modified from Andersen's health services utilization model phase four to determine factors influencing utilization of PMTCT of HIV among women attending ANC Clinics in North Rachuonyo.

Figure 1 Andersen Framework for health seeking behavior



The Andersen framework for health services utilization was developed to provide measures of utilization of medical care (Anderson, 1960). The framework aimed to study the interaction between the external environments as proximal variables, predisposing as independent variables, enabling and need factors as dependent variables in utilization of health services, and besides health outcomes.

This include predisposing factors such as socio-cultural features of individuals that present before illness which includes: demographic, education, gender, age, occupation, ethnicity, social networks, social interactions and cultural health beliefs. Enabling factors include ability to pay for the services, knowledge of services and the availability of the services. Needs factors include perceived and evaluated needs, while environmental factors represent the context within which the utilization occurs and comprise of both healthcare systems and the external environment. Health

behavior includes personal health practice and use of health service (Andersen Ronald 1995; Andersen and Newman, 2005).

1.5.1 Modified framework

This study modified Anderson's health service utilization model (Anderson, 1995) to be able determine factors influencing utilization of PMTCT services by the pregnant women and HEI mothers in Rachuonyo North sub county. The modified model includes the following: -

a) Predisposing factors: Age, education, urban/ rural residents of the pregnant women, gender inequality, decision on pregnant women health, knowledge and attitude towards PMTCT services, HIV related stigma at an individual level. The ethnicity and social interaction, occupation and social support at a community level.
b) Enabling factors: Availability acceptability, affordability, accommodation, stigma and discrimination at community level.
c) Needs factor: the researcher take the perceived need for PMTCT services, the evaluated need which is about the health care providers (HCP) and evaluation of the client need for health which is to be explained by the health system factors.
d) Environmental factors: PMTCT policies, strategies, guidelines, human and financial resources, PMTCT supplies, stigma and discrimination in health care settings; PMTCT sites infrastructures and quality of PMTCT services.

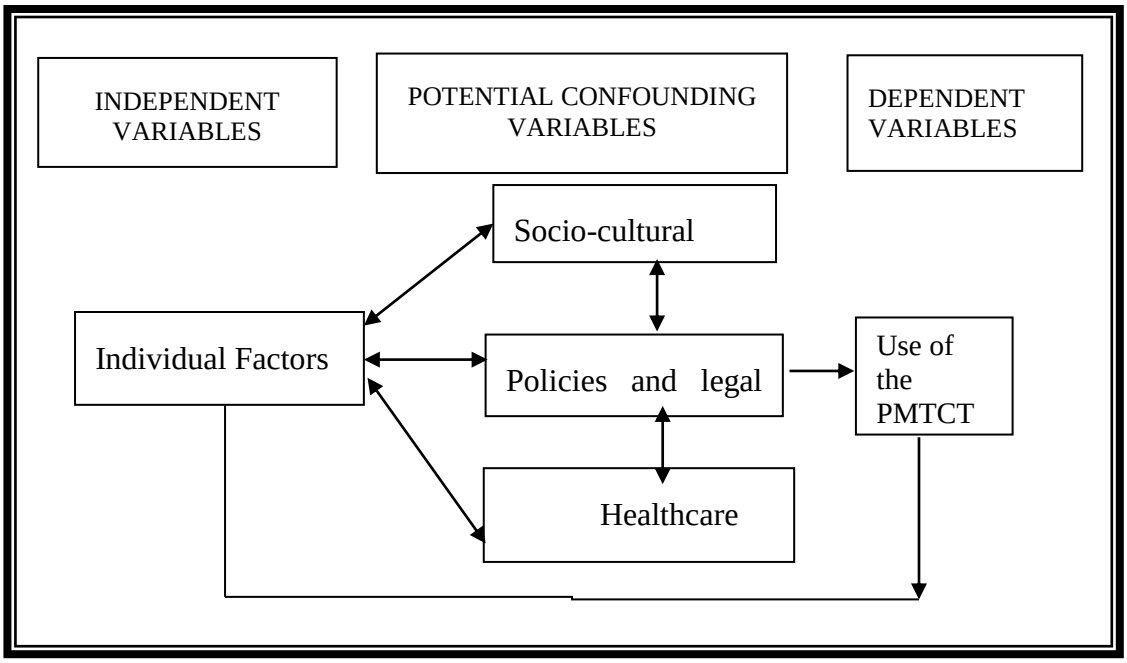


Figure 2: Modified framework

Individual factors- Marital status, level of education, fear of knowing status, disclosure, attitude of clients, knowledge, and perceived benefits.

Socio-cultural factors- Gender, stigma and discrimination, social roles, cultural constrains, socio-economic, decision-making, and accessibility.

Healthcare system factors- Structural/ level of facilities, workforce, health worker motivation and fears, and package of PMTCT.

Policies and legal issues- Related policies and guidelines for PMTCT.

Use of PMTCT services: Clinic attendance for PMTCT for HIV infection, use of ARV prophylaxis and infant feeding Compliance and adherence

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter explores literature as guided by the study's objectives. It highlights the following variables as viewed by various scholars: HIV/AIDS disease in PMTCT context, magnitude of HIV in pregnancy, risk factors, benefits of PMTCT of HIV, use of ARVs in pregnancy for treatment and PMTCT of HIV infection, HIV diagnosis in children, feeding infants and young children born to HIV infected mothers, ANC/PNC and family planning and follow up of children of HIV- infected mothers.

2.1.1Etiology and epidemiology of HIV

HIV is a virus that destroys the immune system that protects the body from illness leading to opportunistic infections. There are two types of HIV: HIV-1 and HIV-2. Both are transmitted by heterosexual, blood contacts and from mother to child when infected (Burke *et al.,* 2004). The two types of HIV appear to cause clinically indistinguishable AIDS, although HIV-2 is less transmitted and relatively rare in causing mother to child transmission. The strains of HIV-1 can be classified into 4 groups, the major group M, the "outlier" group O and two new groups N and P (PACTG, 2009).

Human immunodeficiency Virus transmission is intracellular, where it mostly require HIV infected cells such as macrophages, lymphocytes or attach to the surface of spermatozoa to enter the body through micro-abrasions of the mucus membranes or through penetration of the skin. The HIV infected fluids or blood can be transmitted through heterosexual contacts, mother to child in utero, during delivery and breast feeding and blood transfusion with HIV contaminated blood.

HIV is a global pandemic and the number of people living with HIV worldwide continues to increase. The epidemic is especially severe in many resource constrained countries (Schoulen *et al.,* 2012). Globally an estimated 35.3 million people are living with HIV with approximately 2.3 million new HIV infections and

1.6 million deaths occurring as a result of HIV/AIDs (UNAIDs, 2012). This shows a decline by 33% from 3.4 million new infections and 2.3 million deaths in 2001 (Kulzer *et al.*, 2012).

Sub-Saharan Africa is the region mostly affected by HIV occurrence. In 2012, an estimated 68% (22.9 million) of all HIV cases and 66% of all deaths (1.2 million) occurred in this region. In contrast to other regions, women compose nearly 60% of cases (GARPR, 2012). There are 13 women infected for every 10 infected men and more women are infected at early ages than men (WHO, 2013).

In Kenya, the national HIV prevalence is estimated to be 5.6% with women aged 15-64 years having higher HIV prevalence rate (6.9%) than men (4.4%) of the same age group. Young women aged 20-24 years were at least 3 times more (4.6%) infected than men (1.3%) of the same age group (KAIS, 2012). HIV incidence in Kenya is 0.5 new infections per 100 persons, representing an estimated 106,000 new infections per year, with highest number of new infections occurring in persons aged 25-34 years (KNASP, 2013). Significant differences in HIV prevalence are found across regions with highest levels observed in Nyanza region (15.1%), with Homa-Bay County ranked one among the counties hardest hit by HIV, 25.15% (KCAFS, 2015). The rates are far above national prevalence with some regions such as North Eastern recording as low as 2.1%.

2.2 Socio-demographic characteristics of HIV positive women attending ANC

Identifying the social cultural factors that influences pregnancy, labour, delivery or breast feeding is important for the success of PMTCT efforts. Moreover, since culture plays a vital role in determining the level of health of individuals, family and community, it is plausible that knowledge of socio-cultural factors may facilitate efforts aimed at effective PMTCT in Homa bay county and Kenya at large. This may in turn reduce missed opportunities including late initiation of prenatal care, low perception of risks, failure to disclose knowledge of sero-positive status and lack of knowledge of the effective of interventions for PMTCT (UNAIDS, 2012). With reference to cultural model, Nigeria has focused on elimination of mother to child transmission of HIV through addressing the socio-economic, cultural and health

factors that compel HIV positive pregnant women to stay away from health facilities when they are due to give birth (Adeneye *et al.*,2010). In Ethiopia, HIV related stigma inhibits the effectiveness of PMTCT services as women who test positive want to keep such information from close relatives and significant others who play an active role during child birth (Juliet *et al.*, 2014).

Stigmatizing attitude also manifests within hospital setting. Health workers are not enthusiastic about handling deliveries for women who are known to be HIV positive for fear of accidental infections (Chigevenga, 2013). Thus, there is an important need for training of health facility staffs in safety precautions and procedures to develop their knowledge and insight on HIV prevention precaution without compromising quality services on PMTCT (Muyinda and Seeley, 2007). HIV positive women struggle with sero status disclosure to their close relatives. These women has magnificent stigma that makes it difficult for them to participate in PMTCT programs and this make them prefer opt-out approach to HIV testing in antenatal clinics across Ethiopia (Penguine and Jerene 2006). There is evidence suggesting wider coverage in HIV testing and concealing the status where stigma is still pervasive. This contributes to an increase in the number of HV positive women not linked to care and failure to prevent MTCT (Chigevenga, 2013).

Health system factors including the shortage of skilled manpower, inadequate physical infrastructure, and poor quality of pre/post-test counseling hinder effectiveness of PMTCT services. Communities need to understand the importance of PMTCT to develop innovative and sustainable strategies for removing the barriers that women face in accessing and utilizing PMTCT services as it is critically important if not crucial.

2.3 HIV infected mothers complying with feeding and therapies initiated in ANC

Mother to child transmission (MTCT) of HIV refers to the transmission of the virus from infected woman to her child during pregnancy, labour and delivery or breast feeding. MTCT is by far the common (90%) way that children become infected with HIV (NASCOP, 2012). The risk of HIV infected mother passing the virus to the

infant is 1 in 3 if no intervention is done (UNAIDS, 2013). This risk of infection is 5-10% during pregnancy, 10-15% during delivery and labor and 5-15% during breast feeding (Miotti, *et al*, 2013).

Effective PMTCT services require women and their infants to receive a cascade of interventions including uptake of ANC services, HIV testing during pregnancy, use of ART by pregnant living with HIV, safe child birth practices, appropriate infant feeding, uptake of infant HIV testing and other post-natal health services (Doherty *et al*., 2007). These strategies promote comprehensive prevention of new HIV among women of child bearing age, prevent unintended pregnancies among women living with HIV, prevent HIV transmission from a woman living with HIV to her baby and provides appropriate treatment, care and support to mother living with HIV, their children and families (Olive and Lilani, 2009). Male parents' involvement in PMTCT has been found to reduce the vertical transmission of HIV from pregnant women to their infants (WHO/UNAIDS, 2012).

Breast feeding is the most acceptable feeding option for infants within the first few months of life as it's readily available with all nutrients that an infant need. It also contains agents that can protect against childhood diseases (Penguin *et al.,* 2006). For HIV infected mothers, breast milk contains HIV but it is worth noting that HIV neutralizing antibodies and TNC protein in breast milk is known to inhibit HIV (NAS, 2013). This explains why mother to child transmission of HIV does not occur more often as predicted (Permar *et al.,* 2013*).* Where ARVs is provided to pregnant and breast-feeding women living with HIV, exclusive breast feeding is recommended for the first 6 months of life (NHA and WHO, 2013).

New infections and high viral loads during pregnancy pose the greatest risk of transmission of HIV from mother to the unborn baby and thus primary prevention, ARVs prophylaxis as well as treatment is highly recommended. In Kenya, 25% of women have unplanned pregnancy and there are 60% unmet needs for family planning among HIV positive women (Ochieng-Okoth *et al.,* 2012). This calls for strengthening of family planning services in counties with high HIV prevalence as this can offer a chance to further prevent MTCT of HIV.

HIV- infected pregnant women are eligible for ART and should be initiated as soon as possible. The early initiation of ART and sustained virological suppression are key to reduction of HIV reservoir (Panayiduo, *et al.*, 2015). Option A considers CD4 cell count to decide whether to give a prophylaxis or treatment, with CD4 cell count below 350 cell/mm, as for treatment triple therapy ARV starting as soon as diagnosed and continue for life but with prophylaxis. For CD4 above 350cells/mm, Zidovudin (AZT) prophylaxis should be started as early as 14 weeks of gestation until onset of labor when single dose Nevirapine, sdNVP and first dose of Zidovudin and Lamivudine, AZT/3TCs administered, then postnatal AZT/3TC for seven days. With option A, an infant receives daily Nevirapine, NVP from birth till cessation of all breast feeding or 4-6 weeks if the mother is on treatment (WHO/NASCOP 2010).

In option B, patients with CD4 count below 350cells/mm, triple ARV is started as soon as diagnosed and continue for life. In this option, where patients have CD4 cell count above 350 cells/mm^3, triple ARV is started as early as 14 weeks of gestation and continued intra-partum; through child birth if not breast feeding or until 1 week after cessation of breast feeding. With Option B, an infant should receive NVP or AZT from birth through 4-6 weeks regardless of infant feeding method. With option B plus, regardless of CD4 count triple ARVs treatment is started as soon as diagnosed and continued for life with daily NVP or AZT from birth until one week after cessation of breast feeding (Van der merwe *et al*,. 2009*).* The recommended regimen in PMTCT triple ARV are Zidovudin, Lamivudine and Nevirapine (AZT+3TC+NVP) or Zidovudin, Lamivudine and Efavirenz(AZT+3TC+EFV) or Tenofovir, Lamivudine (emtricitabine) and Nevirapine(TDF+3TC(or FTC)+NVP) or Tenofovir, Lamivudine or emtricitabine and Efavirenz (TDF+3TC(or FTC)+ EFV) (WHO 2012). Women receiving HAART will have a lower viral load, and this presents the best way to prevent babies from acquiring HIV (Gray *et al., 2012).*

Improved infant feeding practices, use of lifelong ARVs can significantly help reduce both child mortality and new HIV infections so PMTCT bolster progress towards achieving the health related Millennium development goal of reducing under five mortality rate by 2/3 (68%) , decreasing maternal mortality rate by 75% , halting and reversing the spread of HIV by 2015 (UNAIDS 2012). All HIV exposed infants

are recommended for breast feeding and cotrimoxazole prophylaxis with good adherence to drug regimens unless replacement feeding is feasible and safe (WHO, 2013).

2.4 Knowledge on prevention of mother to child transmission in ANC

Early infant diagnosis of HIV provides critical opportunity to strengthen follow up of HIV exposed children (UNICEF, 2012). Serology assays suitable for HIV antibody detection in adults cannot be reliably used for confirmatory diagnosis of HIV in infants as the interpretation of positive HIV antibody testing is complicated by the fact that maternal HIV antibody can persist for 18 months, although it usually clears by 9-12 months (Chatterjee *et al*., 2011). Antibody negative results suggests that infants are unexposed and or uninfected, however if the infant is breast feeding the risk of acquiring HIV continues throughout the entire breastfeeding period (Newell *et al*., 2004). However, it is recommended that if the infant is diagnosed at 9-12 months, a confirmatory test must be done after 18 months of age and infant should have stopped breast feeding for more than 6 weeks (WHO, 2012).

PCR testing is the current precise option recommended method for Early Infant Diagnosis, (EID), because it is able to detect HIV-1 pro-viral DNA integrated to human genome (Stevens *et al*., 2008). There are two methods of PCR tests, which include whole blood sample which is sophisticated and not economical in resource limited areas and dried blood spot (DBS) which is more reliable, easy to handle, effective and economical in all HIV settings (UNAIDS2012). Dry blood spot PCR for all infants known to be exposed should be undertaken at 4- 6 weeks or at first contact (Stevens *et al.*, 2008). During pregnancy there is trans-placental transfer of HIV antibodies to the unborn baby from the mother and this can cause false positives where antibodies are measured in such babies. Confirmatory PCR test for all HIV exposed sick infants with positive antibody test should be done before 18 months of age (NASCOP, 2012).

CHAPTER THREE

MATERIALS AND METHODS

3.1 Study Area

The study was conducted in health facilities providing ANC services in Rachuonyo North sub-county, Homa bay County. The sub-county is approximately 90 kilometers to Kisumu city and about 500 kilometers to Nairobi city. The sub-county has an area of approximately 438 square kilometers, with two divisions (West and East Rachuonyo) each of which borders Lake Victoria. Rachuonyo North sub-county is in Homa Bay County with population coverage 185,135 people and women of reproductive estimated to be 23,614 (KDHS, 2014). The sub-county has HIV prevalence of 22.2% in the general population while 19.1% women of reproductive age have HIV and approximately 45,000 people live with HIV (NASCOP, 2015).The economy of North Rachuonyo is dominated by fishing, small scale farming and small scale business.

3.2 Study Design

A facility based descriptive cross-sectional study design was used where a quantitative method was adopted to collect data. Descriptive cross-sectional study is where phenomenon and potentially related factors are measured at a specific point in time for a defined population (Creswell and Plan, 2007).

3.3 Study Population

The study participants were sampled from HIV infected pregnant women, mothers of highly exposed infants and PMTCT providers as key informants in the sampled health facilities. Mugenda and Mugenda, (2003) formula was used to calculate sample size which was important in determining the number of respondents to involve in the study. The sample frame of respondents was drawn from 3,575 estimated numbers of pregnancies in the sub-county (KDHIS, 2014).

3.3.1 Sample Size determination

To determine the sample size, the formula by Mugenda and Mugenda, (2003) was used:

$$n=\frac{z^2pq}{d^2}$$

Whereby;

n- Represents the sample size (if the target population is more than 10,000).

z- Represents the standard normal deviation at the required confidence level, in this case its 1.96 at 95% confidence interval.

p- Represents the proportion in the target population estimated to have characteristics being measured. Since no reasonable estimate was available, 50% was used.

q- Represents (1-p) which is equal to 1-0.5=0.5.

d- Represents the degree of accuracy/ level of statistical significance set which is 0.05. 5% sample error

Therefore

$$n=\frac{(1.96)^2 \text{ X } 0.5\text{X}0.5}{0.05)^2}$$

=385

There were 30 health facilities in North Rachuonyo offering PMTC services as at year 2015. Simple random sampling was used to select 20 health facilities. From the calculation stated above, a minimum of 385 HIV infected pregnant women and HEI mothers attending the ANC clinic were eligible to be interviewed.

The study then randomly selected 20 health facilities, which had a minimum of two health care workers working in mother child health clinics.

The selected participants were 337 HIV positive pregnant women in second trimester, and 48 mothers of highly exposed infants who were on follow up in the

clinics. Highly exposed infants (HEI)number were calculated by using 12.5% sub county pediatric HIV prevalence. The samples sizes were obtained as depicted in table 1.

Table 3.1 : Sites sampled and number of participants per level of health facility in Rachuonyo North.

Health Facility Category	Total Number in Sub county	Number of clinics who Participated	Number of health care providers	Number of pregnant mothers participated	No of HEI mothers
Sub County Hospital Level 4	2	1	2	17	2
Health center's Level 3	7	5	10	83	12
Dispensaries Level 2	15	10	20	170	24
Faith Based Facilities	6	4	8	67	10

3.4 Sampling design

A single stage cluster sampling method drawn from 20 health facilities was done where a simple random sampling lottery was employed. The level of health facility establishment was used to form clusters and the clustering of facilities was based on the classification of health facilities done by Ministry of Health. Both cluster and simple random sampling methods were applied to obtain the number of intended

respondents for the interviews. From each facility, HIV infected pregnant women and HEI mothers were evenly distributed based on HIV workload reports of clients attending the facility. After establishing the clusters from a total of 20 health facilities, eligible respondents sampled were interviewed with guided questionnaires (see below). Four Community Health Workers (CHWs) who were also mentor mothers were recruited as research assistant and trained on recruitment of cases and filling of the questionnaire. The investigator participated in the filing of the questionnaire and conducting the interviews.

3.5.1 Inclusion criteria

1. Pregnant women HIV infected and were on follow up, either tested or known positive and in their second trimester of pregnancy
2. Highly exposed infant (HEI) mothers who were still on follow ups in the clinics
3. Health care staff utilizing the services within the facility.
4. All sampled respondents who gave written consent were allowed to participate in the study.

3.5.2 Exclusion criteria

To avoid bias the study focused on HIV infected pregnant women who had been enrolled for ANC services in the facilities and were on follow up. The following subjects were excluded in the study: -

i. Women who were HIV positive but too ill to participate.
ii. Pregnant Women HIV infected but still in first trimester.
iii. Staff that were in administration level.

3.6 Data collection

3.6.1 Tools

A pretested interviewer administered research questionnaire was used. Semi-structured questionnaires were developed and were used as the survey tool for the study. The questionnaire had both open ended and closed ended question.

3.7.2 Questionnaire administration

Data was collected by the principal investigator and four research assistants. Research assistants were trained on how to use data collection instruments, data and their general conduct during data collection with regard to respondent's privacy and confidentiality before the actual data collection exercise. The study questionnaires were filled from a representative sample of pregnant women infected with HIV and health facility staffs in sampled facilities. A pre-tested questionnaire was used to collect data.

3.7Pre-testing of questionnaire

The questionnaires were piloted at two health facilities that were not to participate in the final study within the sub-county. The purpose of the pilot study was to seek comments on clarity of statements and length of time needed to complete the questionnaires. Changes in format and content were then incorporated in the final questionnaire.

3.8.1 Variables obtained using the questionnaire

The questionnaire was used in the study as shown in Appendix 1. The categories of the variables were:

3.8.2 Socio-demographic variables

These included age, marital status, level of education, occupation/ work area attached residence/duration, gestational age, parity, when first diagnosed with the disease, number of household members, disclosure status, family/ community perceptions on HIV among pregnant women.

3.8.3 Economic variables

These included income levels, source of income and how they use the incomes especially inform of expenditure, cost of accessing services including transport cost to and from health facilities for PMTCT services.

3.8.4 Prevention variables

These included uses of ARV prophylaxis, compliance and adherence, infant feeding options and practices, effective PMTCT clinic attendance, referral, linkage and retentions for both mother and baby as a community engagement through program health system strengthening.

3.8.5 Medical variables

These included supply chain with focus on ARTs, HIV test kits, CD4, PCR-DNA, lab services, maternal and neonatal services in terms of knowledge gap and engagement with private facilities.

3.8.6 Highly Exposed Infant, (HEI)

The variables included: mode of feeding, access to ARVs, tests done, outcome period and cohort analysis. The infant feeding options were dichotomized into appropriate infant feeding choice (exclusive breastfeeding, infant formula milk feeding) and inappropriate infant feeding choice (mixed feeding, complimentary breast feeding, complimentary formula feeding, cow's milk). In this study exclusive breastfeeding was defined as giving an infant less than six months no other food or drink apart from breast milk. Infant formula milk feeding was defined as giving an infant less than six months breast milk substitutes when it is affordable, feasible, acceptable, sustainable and safe.

Mixed feeding was defined as giving an infant less than six months breast milk and other foods and liquids.

Complimentary formula feeding was defined as giving an infant breast milk substitutes with food and liquids.

Complimentary breastfeeding was defined as giving an infant breast milk and other foods when breast milk becomes insufficient to satisfy the nutritional requirements of the infant, Cow's milk was defined as milk from either cow or goat fed on an infant who is less than six months.

3.8.7 Health technical staff interview

The variables included in the study were human resource capacity and gap analysis, knowledge and trainings taken to support PMTCT, mentorship and support supervision structure, health care approach to PMTCT such as disclosure, pre and post-test counseling, stigma attitude, safety precautions and procedures.

3.9 Observation checklist

Observation was used to explore capacity and workload at the facility levels where mothers sought PMTCT services. This study was moderated with structured checklist which is inserted in appendix I.

3.10 Data analysis

Data was entered into MS Excel® (Microsoft, USA) and then exported to SPSS version 17® (IBM- Chicago model) for analysis. The collected data underwent quality checks to ensure thorough editing and coding. The summary of the findings were arrived at through descriptive data analysis which involved presenting results using text, proportions, percentages figures, graphics, tables and charts data as tables, text, graphs.

In inferential statistics, Pearson regression with bivariate and multivariate analyses was applied. The comparisons between socio demographic variables and prevention variables, economic variables with medical variables, prevention variables with HEI and medical staff variables. The scale of measurements of data to be collected included quantitative, qualitative dependent and independent variables. These variables had have both explanatory and response characteristics.

3.11 Ethical considerations

Approval and clearance was sought from institutional Ethics Review Committee of Moi University Teaching and Referral Hospital. Further, the North Rachuonyo sub county health management team authorized the study to be undertaken. Informed consent of patients was obtained before participating in the study. Standard care was given to participants regardless of whether they consented or declined to participate

in the study and subjects were not exposed to any risk by participating or declining to participate in the study.

The records were coded to eliminate names and other personal identification of respondents throughout the study process to ensure anonymity. No incentives were given to the study subjects.

CHAPTER FOUR

RESULTS

4.1 Response rate

A total of 385 women responded to the questionnaires with 29 questionnaires being returned incomplete but had a threshold for inclusion as they were missing either 3 or 4 questionnaires not fully answered thus meeting the threshold to be included in the study, 95% CI (89.4 – 94.7) (5.3 – 10.6). This was achieved through phone call backs and followed up of the administered instruments to the respondent in person to ensure that every respondent took part in the study and questionnaire returned (Table 4.1)

Table 4. 1 Response rate of respondents

Response	Frequency (n=385)	Proportion (%)	95% CI
Questionnaires returned answered complete	356	92.5	89.4 – 94.7
Questionnaires returned not fully answered	29	7.5	5.3 – 10.6

4.2 Socio-demographic characteristics of HIV positive women attending antenatal care clinics.

The study determined socio-demographic characteristics (age, marital status, occupation and education) of HIV positive women attending antenatal care clinics.

4.2.1. Age and Marital Status

Majority (43.6%, 95% CI:38.7 – 48.7) of women were within the 15–24 years age group. The mean age of the women being 25.7+/-5.23 years (SD = 5.23) with a range of 31 and median of 33. All measures of tendency were plausible within 95% CI (33.8 – 43.6). However, (2.1%, 95% CI: 1.0 - 4.1) of the respondents were below the age of 15 years were which is considered as the most at risk population in relation to

reproductive health. Most of respondents (67.3 %) were married while 30.9% were single mothers.(Figure 4.1 and 4.2).

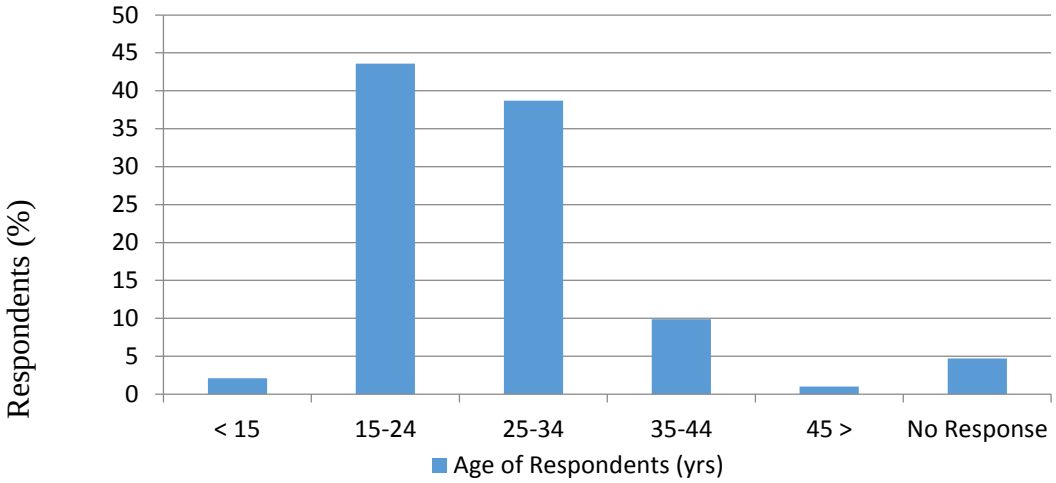


Figure 4.1 : Distribution of Respondents by Age

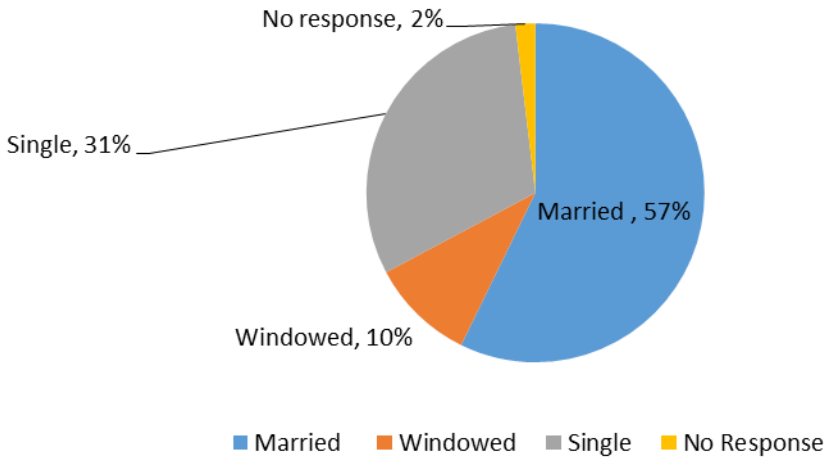


Figure 4.2: Distribution of Respondents by Marital Status

4.2.3 Education level

According to the study, majority (54.6%, 95% CI: 49.5 - 59.5) and (24.9%, 95% CI: 20.8 - 29.5) of the respondents had completed primary and secondary level of

education respectively, However those who had attained tertiary level of education were (12.2%, 95% CI: 9.3 – 15.9).(Figure 4.3).

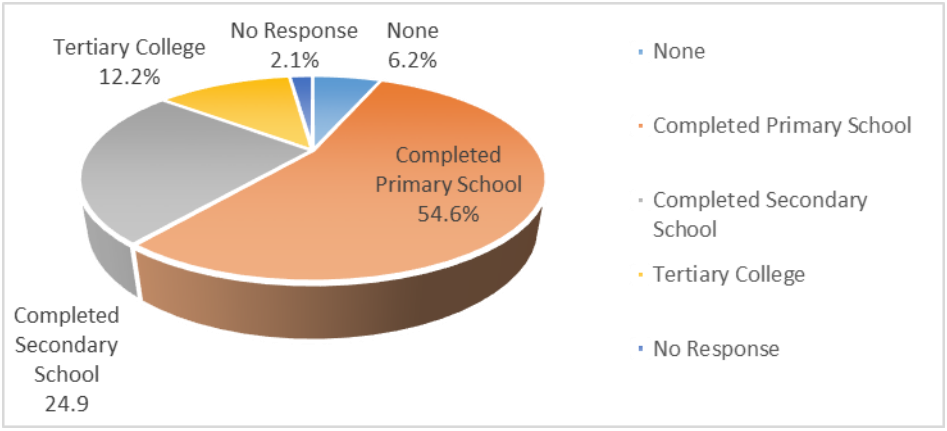


Figure 4. 3:Distribution of respondents by Education

4.2.4 Nature of occupation of respondents

The study also showed that majority of the respondents were housewives 249 (64.7%), with only 73 (19%) in formal employment, while 51 (13.2%) reported to be engaged in business. This shows that about only 1 in every 5 respondents involved in the study had independent source of income. (Figure 4.4).

N = 385

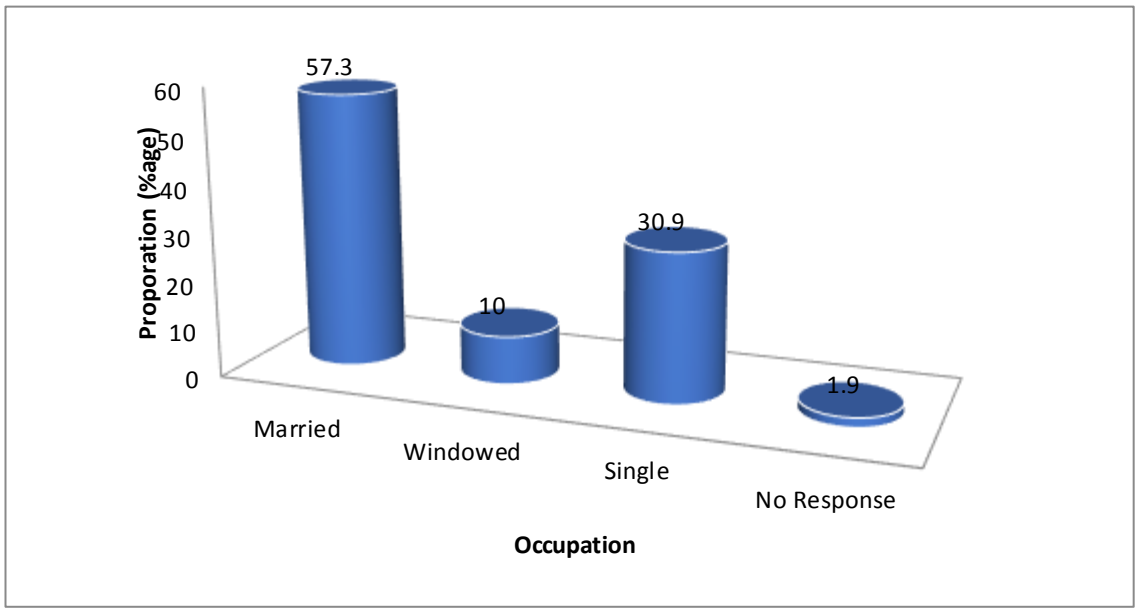


Figure 4. 4: Distribution of respondents byOccupation

4.3 Spouse/partner seeking permission for HIV Counseling and Testing in North Rachuonyo.

In the interviews, respondents were asked if they sought permission from their partners/ spouses before doing HIV Counseling and Testing for PMTCT. Majority, (60%, 95% CI:55.0 -64.8) of the respondents did not seek permission, while only (30%, 95% CI:25.7 - 34.9) sought permission. (Table 4.2).

Table 4.2: Women who sought permission from their spouse/partner to do HIV Counseling and Testing in Rachuonyo North Sub- county.

Sought permission	Frequency (n=385)	Proportion (%)	95% CI
Yes	116	30.1	25.7 - 34.9
No	231	60.0	55.0 - 64.8
No response	38	9.9	7.3 - 13.3

4.4 HIV positive disclosure with spouses in 385 respondents from Rachuonyo North Sub-County

Following HIV testing and counseling, respondents were asked if they disclosed the test outcome to their spouses/partners. Majority (50.4%, 95% CI:45.4 - 55.4) of the respondents reported to have disclosed their status to spouses/ partners, while approximately good proportion (40%, 95% CI:35.0 - 45.0) hadn't let their status known by their spouses. (Table 4.3).

Table 4. 2 : HIV positive disclosure with spouses among respondents attending PMTCT clinics in Rachuonyo North Sub-County.

Reasons	Frequency (N=385)	Proportion (%)	95% CI
Yes	194	50.4	45.4 - 55.4
No	154	40.0	35.2 - 45.0
No response	37	9.6	7.0 – 13.0

4.5 Respondent's reason for non-disclosure of HIV results to spouse/ partner

For those who did not disclose the main reasons that were indicated by the respondents were perceived fear of stigma and discrimination, (37%, 95% CI: 29.7-45.0), afraid of physical abuse/ violence from spouse/ partner (35.1%, 95% CI: 27.9 - 43.0), unknown fear of being abandoned/divorced by husband and family(14.3%,95% CI:9.6 – 20.8).Table 4.4.

Table 4. 3 : Respondent's reason for non-disclosure of HIV results to spouse/ partner

Variable Reasons	Frequency (n = 154)	Proportion (%)	95% CI
Single parent/non-committal relationship	21	13.6	9.0 – 20.1
Afraid of being abandoned/divorced by husband and family	22	14.3	9.6 – 20.8
Afraid of physical abuse/ Violence by husband	54	35.1	27.9 - 43.0
Fear of stigma and discrimination by partner	57	37	29.7 –45.0

4.6 Perceived reactions on PMTCT of HIV by relatives of respondents attending antenatal care clinics from Rachuonyo North

The response as to the reaction of relatives to respondents HIV status shows that the majority (36.4%, 95% CI:31.7 - 41.3) would be accepted and cared for by the family, (22.9%, 95% CI: 18.9 – 27.3)understood the impact of HIV disclosure in support of child care whereas good proportion (13.0%, 95% CI: 10.0 -16.7) feared physical violation. (Table 4.5).

Table 4. 4 Perceived reactions on PMTCT of HIV by relatives of respondents.

Response	Frequency (n = 385)	Proportion (%)	95% CI
Will be thrown out of home/ divorced	78	20.3	16.5- 24.6
Will be physically violated	50	13.0	10.0 -16.7
They will start to care for me	140	36.4	31.7 - 41.3
Support in child care	88	22.9	18.9 – 27.3
Relatives will be angry with me	29	7.5	5.3 - 10.6

4.7 Cultural issues that influence utilization of PMTCT among respondents attending antenatal care clinics in Rachuonyo North

On cultural issues that influence HIV positive women attending antenatal care clinics (ANC). Among the respondents, the main cultural practices which impeded attendance to ANC clinics were belief on women inheritance (26.8%, 95% CI:22.6 - 31.4), spouse stigmatization and discrimination (24.7%, 95% CI:20.6 - 29.2) and (17.1%, 95% CI:13.7- 21.3), sexual rituals to cleanse the homestead with unknown partners as referred to "jackowiny" inform of protecting the family, while good number of respondents (9.1%, 95% CI:6.6- 12.4)were categorical that use of herbal/ alternative medicine, "manyasi" is a remedy to all problems an expectant mother may be diagnosed with. (Table 4.6).

Table 4. 5 : Cultural issues that influence utilization of PMTCT among respondents attending antenatal care clinics in Rachuonyo North.

Response	Frequency (n= 385)	Proportion (%)	95% CI
Women inheritance impedes participation in HIV/ AIDS awareness programs.	103	26.8	22.6 -31.4
Men stigmatizing and discriminating HIV positive spouses.	95	24.7	20.6 - 29.2
Community perception/ intimidation against HIV positive women on property inheritance	86	22.3	18.4 – 26.8
Widows carefree sexual rituals – to protect the family- having sex with unknown partners "jakowiny".	66	17.1	13.7 - 21.3
Use of herbal medicine "manyasi" from TBAs as a remedy to antenatal clinic.	35	9.1	(6.6 - 12.4)

4.8 Socio-economic issues that influence utilization of PMTCT of HIV among respondents attending antenatal care clinics in Rachuonyo North Sub- County

On the socio-economic issues that influences respondents attendance to antenatal care clinics, Most (19.2%,95% CI:15.6 - 23.5)of the respondent felt that gender inequality in context to formal employment (17.7%, 95% CI:14.2 - 21.8) limited support for pregnant women to attend health facility as a social institution respectively as sub factors influencing PMTCT utilization whereas (17.1%, 95% CI:13.7 - 21.3) felt traveling costs associated to distance to health facility to attend antenatal care clinics(16.4%, 95% CI:13.0 - 20.4) as constraints of poverty associated with HIV stigma and(15.8%, 95% CI:12.5- 19.9) low participation of women in socio economic developments as factors influencing utilization of PMTCT of HIV.(Table 4.7).

Table 4. 6 Socio-economic issues that influence utilization of PMTCT of HIV among respondents attending antenatal care clinics in Rachuonyo North Sub-County

Variable	Frequency (n=385)	Proportion (%)	95% CI
Gender inequality in context to formal employment	74	19.2	15.6 - 23.5
Limited support for pregnant women to attend health facility as a social institution	68	17.7	14.2 - 21.8
Traveling costs associated to distance to health facility to attend antenatal care clinics	66	17.1	13.7 - 20.8
Constraints of poverty associated with HIV stigma.	63	16.4	13.0 - 20.4
Low participation of women in socio economic developments	61	15.8	12.5 - 19.9
Negative husband's perceptions on business associate Women.	53	13.8	10.7 - 17.6

4.9: Monthly Income level of the respondents attending antenatal care clinics in Rachuonyo North.

The study showed that income levels of HIV positive women attending antenatal care clinics in Rachuonyo North where majority (44%) of the respondents stated to have an income of between Kshs.5 000 and Ksh. 10 000, while (30%) stated that they earned below Ksh. 5,000. (Figure 4.5)

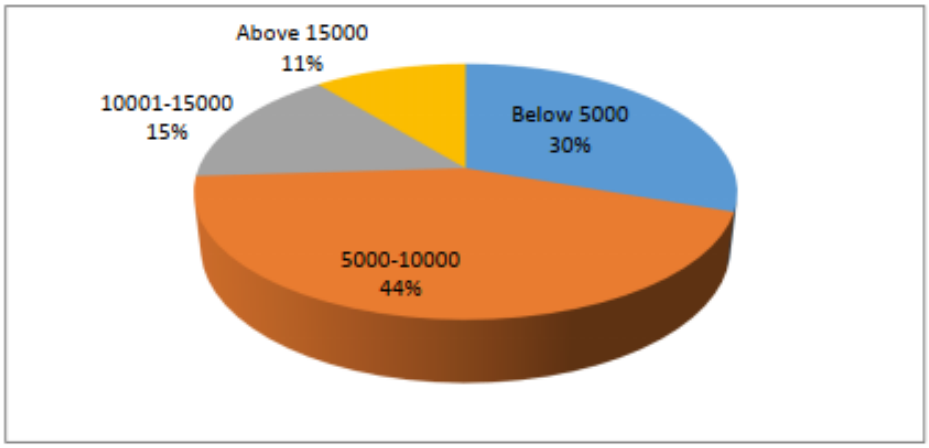


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Figure 4.5 : Monthly Income level of the respondents attending antenatal care clinics in Rachuonyo North Sub- County

4.10: Association between socio-demographic characteristics and PMTCT of HIV among women attending antenatal care clinics in Rachuonyo North Sub–County

The study assessed the association between socio-demographic characteristics and utilization of PMTCT services amongst HIV positive women attending antenatal care clinics in North Rachuonyo Sub-County. There was a significant association between utilization of PMTCT services and age ($p<0.04$), marital status ($p<0.03$) and education ($p<0.02$). However the study revealed there was no significant association between utilization of PMTCT services and occupation ($p>0.2$. (The table 4.8)

Table 4. 7 : Association between socio-demographic characteristics and PMTCT of HIV among women attending antenatal care clinics in North Rachuonyo Sub–County

Variable	ANC for PMTCT (Yes=1, No=0) Yes	No	COR (95% CI)	AOR(95% CI)	P = Value
Age					
<15	6	2	1.00	1.00	___
15-24	120	47	0.51(0.31- 0.85)	0.6 (0.43-0.89)	0.034
25-34	89	60	0.48 (0.29-0.79)	0.59(0.33-0. 69)	<0.001
35-44	30	8	2.54(1.15- 5.68)	1.10 (0.38- 3.10)	<0.001
≥ 45	4	0	7.620(4.47-8.36)	5.64(1.82-6.68)	<0.780 0.041
Marital status					
Single	80	39	1.00	1.00	___
Married	201	57	2.88 (2.05-3.95)	2.08(1.33- 3.42)	0.021
No response	7	0	5.69 (4.98,8.78)	4.49(2.82- 6.78)	0.234 0.033
Education level					
None	24	0	1.00	1.00	0.020
Primary school	180	30	1.65 (0.036-0.88)	2.54 (1.28- 4.20)	0.540
Secondary school	70	26	2.55 (1.88-3.50)	2.32 (1.39 -3.51)	<0.001
Tertiary/ College	40	6	5.58 (3.46- 7.88)	4.38 (1.92 - 6.71)	<0.001
No response	8	0	5.21 (3.58- 8,91)	3.49 (1.82 - 6.68)	0.320 0.020
Occupation					
Housewife	200	49	1.00	1.00	___
Employed	70	3	5.75 (3.64-9.02)	5.64(3.88 - 8.95)	0.502
Business	40	10	7.10(7.70-11.78)	6.07 (7.13 - 9.81)	0.101 0.232

**Association is significant at the 0.05 level and below

AOR (95% CI) = 1.00, COR (95% CI) =1.00, ANC, PMTCT

4.11: Types of infant feeding options practiced among respondents attending antenatal care clinics in Rachuonyo North Sub-County

In assessing infants feeding options among the respondents, mixed feeding was the most (28.6%) practiced choice of feeding, followed by exclusive breastfeeding (26.0%), with complementary formula feeding as the least adopted choice (9.1%). (Table 4.9).

Table 4. 8 : Infants feeding options among respondents attending antenatal care in Rachuonyo North Sub-County

Variable	Frequency (n = 385)	Proportion (%)	95% CI
Mixed feeding	110	28.6	24.3 – 33.3
Exclusive breastfeeding	100	26.0	21.8 – 30.6
Complementary breastfeeding	60	15.6	12.3 – 19.6
Cow's milk	40	10.4	7.7 – 13.9
Exclusive formula	40	10.4	7.7 – 13.9
Complementary formula	35	9.1	6.6 – 12.4

4.12: Infant feeding option choices among 385 women with HIV exposed children still below 18 months in Rachuonyo North

The findings of the study showed that majority (30.4%, 95% CI: 26.0 - 35.2) of the respondents practiced exclusive breastfeeding below six months of babies age while (24.4%, 95% CI: 26.0 - 35.2) exclusively breast fed the babies for periods above six months. Minority (6%, 95% CI: 4.0 - 8.8) of the respondent practiced exclusive formula feeding as an option for infants feeding above six months of age (Table 4.10).

Table 4. 9 Infants feeding options among 385 women with HIV exposed children below 18 months in Rachuonyo North Sub-County

Variable		Frequency (%)	Proportion (%)	95% CI
Exclusive breastfeeding	<6 months	94	24.4	20.4 - 29.0
>6 months		117	30.4	26.0 - 35.2
Exclusive formula feeding	<6 months	38	9.9	7.3- 13.3
>6 months		23	6.0	4.0 - 8.8
Mixed feeding	> 6 months	60	15.6	12.3- 19.6
> 6 months		53	13.8	10.7-17.6

4.13: Reasons for breastfeeding as an option adopted by respondents with infants of age 18 months and below attending antenatal clinics in Rachuonyo North Sub–County

The reasons why respondents practiced breastfeeding as an option included: reasoning that exclusive breast feeding is good for baby's health(28.6%, 95% CI:24.3 - 33.3), it was less costly and readily available compared to the commercial milk formula (24.9%, 95% CI: 20.8 - 29.5). (Table 4.11).

Table 4. 10 Reasons for breastfeeding as an option adopted by the respondents with infants of age 18 months and below attending antenatal clinics.

Reasons for breast feeding	Frequency (n=385)	Proportion ((%)	95% CI
Exclusive breastfeeding is healthy to baby	110	28.6	24.3 - 33.3
Less costly and easily available associated with use of baby formula	96	24.9	20.8 - 29.5
Breastfeeding promotes maternal confidence of a mother	80	20.8	17.0 - 25.1
Breastfeeding has sense of achievement and satisfaction for mother and child	68	17.7	14.2 - 21.8
No response	31	8.1	5.7 -11.2

4.14: Factors determining infant feeding options among 385 women of reproductive age attending antenatal clinics in Rachuonyo North Sub-County

The reasons given by respondents regarding for adoption of specific infant feeding options included: health status of the mother (20.3%, 95% CI: 16.5 - 24.6), place of delivery (15%, 95% CI: 11.8 - 19.0), peer influence (14.3%, 95% CI: 11.1 - 18.2),husband and extended family influence (9.9%, 95% CI: 8.2- 14.5) and religious beliefs (9.6%, 95% CI :5.7- 11.2) (Table 4.12).

Table 4. 11 : Factors determining infant feeding options among 385 HIV positive women in Rachuonyo North Sub-County

Variable	Frequency (n=385)	Proportion (%)	95% CI
Health status	78	20.3	16.5 - 24.6
Place of delivery	58	15	11.8 - 19.0
Peer influence	55	14.3	11.1 - 18.2
Customs/ culture	46	12	9.1- 15.6
Husband directives	42	11	8.2- 14.5
Family influence	38	9.9	7.3- 13.3
Economic status	37	9.6	7.0 - 13.0
Religion	31	8	5.7- 11.2

4.15: Association between HIV infected mothers and feeding therapies adoption among women attending antenatal care clinics in Rachuonyo North Sub–County.

The bivariate and multivariate analysis revealed that exclusive breast feeding increased the odds of attending ANC for PMTCT even though there was no significant association between exclusive breast feeding and practice of ANC for PMTCT, (AOR=2.78, 95% CI: 2.06-7.68) and p>0.05. There was significant association between mixed feeding and attendance of ANC for PMTCT, (AOR=2.42, 95% CI: 2.06-25.45) p value< 0.021. Mixed feeding increased the likelihood of attending ANC for PMTCT by almost 3 times.(Table 4.13).

Table 4. 12: Association between HIV infected mothers and feeding therapies adoption among women attending antenatal care clinics.

Variable	ANC for PMTCT (Yes=1, No=0)		COR (95% CI)	AOR (95% CI)	P = Value
	Yes	No			
Infant feeding options					
Exclusive formula feeding	40	29	1.00	1.00	____
Exclusive breast feeding	150	42	3.32(2.72, 6.07)	2.78 (2.06, 7.68)	0.650
Mixed feeding	101	22	6.32(0.72,46.07)	2.42(2.06,25.45)	0.021 0.029

**Association is significant at the 0.05 level and below

AOR (95% CI) = 1.00, COR (95% CI) =1.00, ANC, PMTCT

.4.16: Knowledge, Attitude and Practices (KAPs) of HIV Infected Women on Prevention of Mother to Child Transmission in Antenatal Care ClinicsMajority (66%,95% CI:61.3 – 70.7) of the respondents were knowledgeable of HIV transmission and prevention of mother to child transmission and approximately (34%95% CI: 29.3 – 38.7) did not have adequate knowledge of PMTCT for HIV based on fourteen variables that were being tested.

Over half (52.7%, 95% CI: 47.8 – 57.6) of the respondents believed that drug compliance and adherence is key in ensuring their babies are born healthy with some respondents(22.1%,95% CI: 18.2 – 26.2) noting that good nutrition to the mother supports baby being born healthy. However, good proportion of respondents (11.4%95% CI:8.3- 14.5) believed on other health care supportive services to ensure healthy baby. (Table 4.14).

PMTCT of HIV strategy. (Table 4.15).

Table 4. 13: Women knowledge, attitude and practice (KAPs) of HIV on PMTCT in antenatal care clinics in Rachuonyo North Sub- County

.

Variable	Frequency (n = 385)	Proportion (%)	95% CI
Category (0-8) not knowledgeable	131	34.0	29.3 – 38.7
Category (9-14) knowledgeable	254	66.0	61.3 – 70.7
How mothers ensured that their children are born healthy in essence to (KAPs)			
Taking drugs as ordered	203	52.7	47.8 – 57.6
Good nutrition for the mother	85	22.1	18.2 – 26.2
Attending clinics/ hospital delivery as scheduled	53	13.8	10.3 - 17.3
Others	44	11.4	8.3 - 14.5

*Other includes: seeking healthcare services when feeling unwell from qualified health personnel's, physical exercise, and getting adequate rest.

4.17: Knowledge of PMTCT Intervention amongst 385 HIV Positive Women in Rachuonyo North

Most (42.1%,95% CI: 37.2- 47.1) of the respondents had knowledge on use of ARV prophylaxis and exclusive breastfeeding as option1for PMTCT and approximately one third (22.9%,95% CI: 18.9 - 27.3) of the respondents had knowledge on option 2 where use of ARVs and breast milk substitute as an intervention for PMTCT for HIV, whereas minority(11.4% ,95% CI: 8.6 - 15.0) of the respondents practiced mixed feeding with use of ARV prophylaxis which is not an advocated practice for PCMT HIV strategy. (Table 4.15)

Table 4.14: Knowledge of PMTCT intervention among 385 HIV positive women in Rachuonyo North Sub- County

PMTCT Interventions	Frequency (n = 385)	Proportion (%)	95% CI
Use of ARV prophylaxis (for mother and baby) and exclusive breastfeeding (option1)	162	42.1	37.2- 47.1
Use of ARV prophylaxis (for mother and baby) and breast milk substitute (option2)	88	22.9	18.9 - 27.3
Use of ARV prophylaxis (for mother and baby) and mixed feeding options (option3)	44	11.4	8.6 - 15.0
Mixed options 1,2 and 3	43	11.2	8.4 - 14.7
Options2 and 3 only	26	6.8	4.6 - 9.7
ARV only	22	5.7	3.8 - 8.5

4.18: Highly Exposed Infants Mothers knowledge on HIV follow up tests as an intervention of PMTCT amongst 385 HIV positive women in North Rachuonyo

Most (46.5%, 95% CI: 41.5-51.5) of the respondents had knowledge on immediate follow-up test of HIV for the babies should be done at 6weeks with first immunization. However nearly one third (28.1%,95% CI: 23.1- 32.8) understood that the HIV test for the baby should be appropriate before child reach 6 months of age, while some (7.5%, 95% CI:5.3 - 10.6) had knowledge that a HIV confirmation test need to be done between 12- 18 months of age. (Table 4.16).

Table 4. 15 : Highly Exposed Infants (HEI) mother knowledge on HIV follow-up tests as an intervention of PMTCT amongst 385 HIV +V Women in Rachuonyo North Sub- County

HEI Test Interventions	Frequency (n =385)	Proportion (%)	95% CI
DNA- PCR test done at 6 weeks	179	46.5	(41.5-51.5)
PCR done at first contact before 6 months	108	28.1	(23.1-32.8)
Antibody test done by 12 – 18 months of life	29	7.5	(5.3 - 10.6)
No need for test if given drugs	27	7.0	(4.8 -10.0)
Have not been told	24	6.2	(4.2 - 9.1)
Others (I do not know)	18	4.7	(3.0 - 7.3)

4.19 Standard comparison of antenatal care attendance of the 385 HIV positive women of reproductive age based on the WHO standards for Maternal and Neonatal Care

Majority (64.9%,95% CI:60.0 - 69.6)of the respondents had ≥4 antenatal care visits which were considered to be adequate according to WHO standards while good proportion of respondents(35.1%, 95% CI: 30.4 - 40.0)had not attended ANC adequately as per minimum package of ANC care, whereas, most 72.2%(95% CI: 67.7 - 76.7) of the respondents attend ANC clinics in government health facilities (Table 4.17).

Table 4.16 Standard Comparison of antenatal care attendance of the 385 HIV positive women of reproductive age using WHO standards for maternal and neonatal care

Clinic visits	Frequency n = (385)	Proportion (%)	95% CI
Adequate (4 visits and above)	250	64.9	60.0 - 69.6
Inadequate (below 4 visits)	135	35.1	30.4 - 40.0
Place of attended all ANC clinics			
Government Health facility	278	72.2	67.7 - 76.7
Other (in Chemist, TBAs or Herbalists)	107	27.8	23.3 - 32.3

4.20 Attitude of 385 women of reproductive age towards ANC and HIV screening in Rachuonyo North

In relation to ANC uptake, majority (51.4%, 95%; CI: 46.4 – 56.4) of the respondents stated that it was of a high benefit to them, while some (22.3%, 95% CI: 18.4 - 26.8) felt that it was of moderate importance. Majority (71.2%, 95% CI: 66.7 –

75.7) of the respondents were interested in attending ANC for PMTCT services. In assessment of health seeking behavior, 37.1% of the respondents seek all their treatment in a legally designated health facilities while, 29.6% felt they also seek alternative treatment as a remedy to health care. Majority, (65.5%) of the respondents were still willing to re test for HIV, however (21%) felt no need and not willing to test again. (Table 4.18).

Table 4.17 Attitude of 385 HIV positive women of reproductive age in Rachuonyo North Sub- County

Interested in ANC			
Yes	274	71.2	**66.7 – 75.7**
No	91	23.6	**19.3 – 27.9**
No response	20	5.2	**3.2 – 7.4**
HIV positive health seeking behavior			
Seek treatment in health facilities	143	37.1	**32.2 – 42.1**
Conceal status	114	29.6	**25.1 –34.1**
Refuge from friends/relatives	27	7.0	**4.5 – 9.5**
Alternative medicine	54	14.0	**10.5- 17.5**
Don't know	47	12.2	**8.6 - 15.5**
What is the reaction to someone with HIV			
Well understood (positive)	203	52.7	**47.8-57.6)**
Full of regrets (negative)	122	31.7	**27.2 – 36.4**
I don't care (No response)	60	15.6	**12.1 -19.4**
Behavior of someone living positively			
Apparently healthy	153	39.7	**34.8 - 44.6**
Very sick	95	24.7	**20.4 – 29.0**
Sickness and death	50	13.0	**9.7 – 16.3**
Don't know	35	9.1	**6.2 – 12.1**
No response	52	13.5	**10.2 – 16.8**
Willingness to test for HIV during attendance			

Yes	252	65.5	**60.8 – 70.2**
No	81	21.0	**16.9- 25.1**
No response	52	13.5	**10.2- 16.8**

4.21: Reasons why respondents support giving birth at home as it is a major challenge in PMTCT service delivery in Rachuonyo North.

Most of the respondents (16.9%, 95% CI: 13.4 - 21.0) were convinced that the health facilities are not well equipped to handle deliveries. However, other reasons for delivering at home, included lack of money to pay for the services (16.1%, 95% CI: 12.7- 20.1), distance to health facility (14.8%, 95% CI:11.6 - 18.7). However, some respondents (8.6%, 95% CI: 6.1 - 11.8) recognize religious beliefs supports child birth in home settings (Table 4.19).

Table 4.18: Reasons why respondents support giving birth at home in Rachuonyo North Sub-County

Reasons for home delivery	Frequency (n = 385)	Proportion (%)	95% CI
Health facilities not equipped to handle deliveries	65	16.9	13.4 - 21.0
Lack of money to pay health facilities as they charge a lot	62	16.1	12.7 -20.1
Distance to health facilities with poor roads	57	14.8	11.6 - 18.7
We have good TBAs to handle deliveries	48	12.5	9.5 - 16.2
Staff attitude to women in labor	44	11.4	8.6 - 15.0
Customs/ cultural beliefs	40	10.4	7.7- 13.9
Husband prefers home delivery	36	9.4	6.8 - 12.7
Religious beliefs	33	8.6	6.1 - 11.8

4.22: Association between Antenatal clinic and attitude on PMTCT among women attending clinics in Rachuonyo North

A binary logistic regression model was fit on attitude on PMTCT (Good attitude=1 and Poor attitude=0) and ANC health seeking behavior and willingness to test for HIV during attendance of ANC as the factors. With alternative medical care/TBA as a reference Category, ANC health seeking behavior had a statistically significant effect on attitude on PMCT. For instance, seeking treatment in a health facility increased the likelihood having good attitude towards PMTCT by 57%, (95%; CI AOR=1.57(1.09-4.15) (p - value<0.004). Non-disclosure has no statistical significant effect on good attitude towards PMTCT, (p- value>0.754). Other ANC seeking behaviors had no statistically significant effect on good attitude towards PMTCT. Overall there was significant association between attitude on PMTCT and health seeking behavior p=0.004<0.05. Willingness to test for HIV had a significant association with attitude on PMTCT, (p - value<0.001).(Table 4.20).

Table 4. 19 : Association between Antenatal clinic and attitude on PMTCT among women attending clinics in Rachuonyo North

	Attitude on PMTCT (1=Good, 0=Poor)				
Variable	Good	Poor	COR(95% CI)	AOR(95% CI)	P-value
ANC Health seeking behavior					
Alternative medical care/TBA	14	40	1	1	___
Seeking treatment in health facility	112	30	6.28(2.13-21.2)	1.57(1.09-4.15)	0.004
Non-disclosure- keeping to self	96	18	8.17(1.99-15.7)	2.64(0.37-14.7)	0.754
Others	60	17	6.78(2.26-17.57)	1.36(0.39-17.56)	0.95
					0.020
Willingness to test for HIV during attendance					
Yes	231	20	3.18(1.21-7.45)	1.90(1.08-8.21)	<0.001
					—
No	81	52	1	1	<0.001

**Association is significant at the 0.05 level and below

AOR (95% CI) = 1.00, COR (95% CI) =1.00, ANC, PMTCT

4.23: Practices of PMTCT interventions among 385 women with regards to ANC and HIV in Rachuonyo North Sub-County

On practices of women with regards ANC and HIV, majority (75.8%, 95% CI: 71.1 - 79.9) of the respondents showed that they attended ANC clinic more than 2 visits, whilesome good proportion of respondents (15.8%, 95% CI: 12.4 – 19.9) had less than two visits for care. Most women are attended for ANC services indispensaries (52.9%, 95% CI: 47.7 – 57.9) and health centers (26.2%,95% CI: 23.2 – 32.3) respectively which are government health facilities. There was evidence that majority (71.2%, 95% CI:66.7 - 55.7) of the respondents were counseled at first visit to the ANC clinic as a component of PMTCT service strategy. (Table 4.21).

Table 4. 20 : Practices of PMTCT interventions among 385 women with regards to ANC and HIV

Attended ANC above 2 visits	**Frequency (n =385)**	**Proportion (%)**	**95% CI**
Yes	278	75.8	71.1 - 79.9
No	58	15.8	12.4 – 19.9
No response	49	8.4	6.0 – 11.8
Level of health facility attended			
Dispensaries	194	52.9	47.7– 57.9
Health centres	101	26.2	23.2 – 32.3)
Sub-County/ Faith based mission hospital	62	16.1	13.4 – 21.1
Others	28	7.3	3.4 – 11.6
Counseled in the first ANC visit			
Yes	274	71.2	66.7 - 55.7
No	59	15.3	11.8 - 18.8
No response	52	13.5	10.2 – 16.8

Attended ANC above 2 visits	Frequency (n =385)	Proportion (%)	95% CI
Yes	278	75.8	71.1 - 79.9
No	58	15.8	12.4 – 19.9
No response	49	8.4	6.0 – 11.8
Level of health facility attended			
Dispensaries	194	52.9	47.7– 57.9
Health centres	101	26.2	23.2 – 32.3)
Sub-County/ Faith based mission hospital	62	16.1	13.4 – 21.1
Others	28	7.3	3.4 – 11.6
Counseled in the first ANC visit			
Yes	274	71.2	66.7 - 55.7
No	59	15.3	11.8 - 18.8
No response	52	13.5	10.2 – 16.8

4.24: Association between Antenatal clinic and Practices on PMTCT among women attending clinics in Rachuonyo North

In assessing association of the practices of PMTCT and ANC services, the study showed significant association between practice of PMTCT and counselling for HIV at first ANC visit (AOR = 2.9, 95% CI: 1.13-4. 72) and $p<0.05$. Post-test counseling increased the likelihood of practice of PMTCT by almost three times as compared to pre-test counseling. Overall there was significant association between counselling at ANC and practice of PMTCT, $p=0.031<0.05$.

Majority (72%) of the womenhad attended ANC during last pregnancy. There was strong significant association between practice of PMTCT and having attended ANC during the last pregnancy (AOR=1.88, 95% CI: 1.18-4.58) and $p<0.001$. Having

attended ANC during the last pregnancy actually increased the likelihood of practice of PMTCT by 88%. Overall there was significant association between practice of PMTCT and having attended ANC during last pregnancy, $p<0.001$.

In assessing Number of ANC visit for current pregnancy, majority 128(33.2%) of women had at least three ANC visits. There was significant association between practice of PMTCT and three ANC visits, with three ANC visits increasing the odds of practice of PMTCT by almost four times (AOR=3.5, 95% CI: 0.57-57.13) and $p<0.05$. Moreover, there was strong significant association between practice of PMTCT and four and above ANC visits (AOR=1.14, 95% CI: 1.21-2.59) and $p<0.001$. Overall there was significant association between practice of PMTCT and number of ANC visits attended, $p<0.001$. (Table 4.22)

Table 4. 21 : Association between Antenatal clinic and Practices on PMTCT among women attending clinics in Rachuonyo North

Variable	Practice of PMTCT (1=Yes, 0=No) Yes	No	COR(95% CI)	AOR(95 % CI)	P-value
Counseled for HIV test on first ANC visit					
Pre-test counseling	270	115	1	1	__
Post -test counseling	348	37	6.18(1.41-19.82)	2.9(1.13-4.72)	0.039
					0.031
ANC during last Pregnancy					
Yes	206	71	4.88(1.78-10.56)	1.88(1.18-4.58)	<0.001
No	61	46	1	1	__
					<0.001
Number of ANC visit for current pregnancy					
One	33	25	1	1	__
Two	81	11	1.4(1.12-23.53)	1.81 (0.35-11.7)	0.501
Three	85	43	1.82(0.22-23.27	3.5(0.57-57.13)	0.003
Four and above	73	32	1.47(1.60-5.44)	1.14(1.21-2. 59)	<0.001
					<0.001

**Association is significant at the 0.05 level and below

AOR (95% CI) = 1.00, COR (95% CI) =1.00, ANC, PMTCT

4.25: Views of 385 HIV positive women regarding health workers attitude to Patients in North Rachuonyo Health Facilities

Most of the respondents (30.4%, 95% CI: 26.0- 35.2) felt that healthcare workers were well trained and accommodative, while almost a third of the respondents (26.5%,95% CI: 22.3- 31.2) identified staff shortage in health facilities as hampering service delivery. Some respondents (12.5%, 95% CI: 9.5 – 16.2) were discouraged due to long waiting time for services, whereas others (6.8%, 95% CI: 4.6 – 9.7) feared misplacement of files resulting into unpredictable follow ups (Table 4.23).

Table 4. 22 : Views of respondents regarding health workers attitude to Patients in North Rachuonyo Health Facilities

Respondents views	Frequency (n = 385)	Proportion (%)	95% CI
Health workers are well trained and accommodative to all	117	30.4	26.0- 35.2
Health care workers are few to handle the cases in the centres	102	26.5	22.3- 31.2
They don't take time to listen/ handle us with confidence	60	15.6	12.3 -19.6
Long waiting time for ANC	48	12.5	9.5 – 16.2
They are sometimes unkind/ rude to patients	32	8.3	5.9 -11.5
Some misplace our files leading to no clear follow-up	26	6.8	4.6 – 9.7

4.26: Suggested reason for lack of utilization of PMTCT Services by women from Rachuonyo North.

The reasons given by the respondents for lack of utilization of PMTCT services included fear of the discrimination and stigmatization by relatives and community (51.7%,95% CI: 46.7- 56.7), protracted cost of services and drugs(18.2%,95% CI: 14.6 - 22.4), fear of perceptions (13.2%, 95% CI: 10.2 - 17.0) and health care workers attitude (6.8%, 95% CI: 4.6 -9.7) (Table 4.24).

Table 4.23 : Reasons for lack of utilization of PMTCT Services by women from Rachuonyo North

Opinions	Frequency (%)	Proportion (%)	95% CI
Fear of public discrimination and stigmatization	199	51.7	(46.7- 56.7)
Protracted and high cost of drugs	70	18.2	(14.6 - 22.4)
Perception/ family destabilization	51	13.2	(10.2, 17.0)
Religious beliefs	39	10.1	(7.5 – 13.6)
Poor health care workers attitude	26	6.8	(4.6 -9.7)

4.27: Recommendations made by women regarding Improving PMTCT care among women attending antenatal care services in Rachuonyo North Sub-County

Some respondents (24.7%, 95% CI: 20.4 – 29.2) felt that drug compliance and adherence are key in improving PMTCT care whereas some (21.3%,95% CI:17.5-25.7) noted that empowering women through trainings, home visits and social mobilization is important. About (11.9%, 95% CI: 9.1- 15.6) of the respondents stated that provision of prompt and quality healthcare services in more health facilities and some respondents (6.8%,95% CI: 4.2 - 9.7) recommended training, deploying of mentor mothers in the community to be equally important in improving PMTCT uptake (Table 4.25).

Table 4. 24 Recommendations made by respondents regarding Improving PMTCT care among women attending antenatal care services in Rachuonyo North Sub County

Recommendations	Frequency (n = 385)	Proportion (%)	95% CI
Drug compliance and adherence be monitored at convenient locations to ease access	95	24.7	(20.4 – 29.2)
Empowering women on HIV strategies by CHWs through training, home visits and social mobilization	82	21.3	(17.5- 25.7)
Health workers need to be more discrete with HIV status of clients	66	17.1	(13.7- 21.2)
Create more awareness through male involvement	50	13.0	(10.0 - 16.7)
Provide prompt and quality services in more health facilities respectively	46	11.9	(9.1- 15.6)
Train and deploy mentors' mothers for PMTCT programs in the community	26	6.8	(4.2 - 9.7)
No response/ suggestions	20	5.2	(3.4 – 7.9)

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1. Discussion

5.1.1. Socio-demographic, socio cultural and socio-economic characteristics of HIV positive women attending antenatal care clinics in North Rachuonyo Sub-County

In order to achieve of Sustainable Development Goals (SDGs), creating awareness and enhancing PMTCT practice has important role particularly in the reduction of childhood and maternal morbidity and mortality which in turn has enormous impact on socio-economic development of a given country (UNICEF 2015).

The current study investigated the existing barriers towards elimination of mother to child transmission of HIV in North Rachuonyo sub-County.The results of the study showed that majority of the antenatal attendees were within the age group of 15-34 years. At national level, the highest HIV prevalence was reported on this age group showing that HIV control strategies should be focused on this age cohort (NASCOP 2014).

The present study showed that HIV testing was a personal decision for majority of pregnant mothers who could undertake it without seeking permission from their spouse/partners. This is considered as a cultural change because traditionally in Africa, women once married were required to seek permission from their spouses in seeking health services (Robert *et al*., 2009). Other studies in Ethiopia reported that 64.9% to 66.8% of married women were not seeking permission in determining their HIV status (Penguin *et al*., 2006). In urban Uganda, 80% of mothers had disclosed their HIV status to their partners. All pregnant women are encouraged to know their HIV infection status, as well as that of their sexual partners (Bujunirwe and Muzoora, 2015). Only by knowing one's HIV status can the health workers make appropriate health care management recommendations and the couple make appropriate decisions about maintaining their health and that of their unborn baby. Pre-conception care is encouraged where an opportunity arises and a birth plan is

discussed with the pregnant woman. This calls for emphasis of PMTCT of HIV among women of reproductive age by raising awareness in all women of reproductive age group (Idris, *et al*., 2005).

The findings of the present study showed that the fear of physical abuse, stigma and rejection, separation and not committed in a relationship necessitated the respondents' not to disclose their status to their spouses. These findings were similar with the study in Uganda where disclosure was more difficult in HIV-positive women owing to the threat it posed to family stability (Medley *et al*., 2010). In this study, some few women accepted to go for HIV counselling and testing but shifted the burden of disclosure from them to health workers. This was similar with findings on disclosure in a study done on sexual partners in Ethiopia (Penguin*et al*., 2012). The current study current study observed that male participation in PMTCT services was low and this is similar to a study in Uganda which showed that male participation in the PMTCT activities was as low as 16% (Bajunirwe and Muzoora, 2005). Decisions about whether to disclose HIV – positive status are often hindered with profound fear that disclosure would damage the social relations between women and their partners. This fear would manifest in the form of women being abandoned, physically abused/ violated or being accused of bringing HIV infection into the family (Bajunirwe and Muzoora, 2005). In Rachuonyo North, as in other African communities', traditional beliefs and norms restrict women making sound decisions pertaining to her life and that of the entire family without involvement of the spouse/ male partner knowledge (Allan *et al*., 2014). Besides, husbands being the bread earners, have to take sole role of costs involved in health services for the wife (Rogers *et al*., 2006).Disclosure to and involvement of male partners in HIV testing has been associated with higher adherence to PMTCT interventions and improved infant outcomes (Adebola *et al.*, 2012).In this scenario, involvement of husbands in the PMTCT services is more likely to increase utilization of PMTCT services by pregnant women. However, women not seeking permission from their spouse/partners has many down sides such as family intimidation and rejection.

The findings from the study demonstrate that socio cultural factors affect utilization of PMTCT services in Rachuonyo North sub-county. These factors are perceptions

ranging from positive to negative that influences utilization PMTCT services. Although there was good uptake of services in the sub-county, there were negative perceptions, for example, fear of stigma and discrimination that influences the decisions and actions towards PMTCT services. This finding is consistent with scholarly assertions which suggest that stigma and discrimination are major deterrent to VCT of HIV (AVERT, 2014). Furthermore, other studies conducted in other parts of Africa pointed out HIV stigma and discrimination to have negative effects in promotion of PMTCT services, treatment, care and support (Awiti *et al*., 2012).

In Rachuonyo North, the perception of stigma and discrimination, physical abuse, rejection/ divorce and the fear regarding seropositive status spread also influenced non- disclosure and compliance among HIV positive pregnant women. This is considered as a cultural influence because traditionally in Africa, women once married they are subordinate to their husbands and therefore required to seek permission from their spouses in seeking health services (Medley *et al*., 2010). However, these cultural beliefs are slowly being eroded with the percentage of women seeking permission to determine their health status or seek medical services and a tag not being submissive to their spouses increasing. (Otieno *et al*., 2012). In concurrence with this finding woman who are married and had discussed HIV testing prior to the test often disclosed their diagnosis to their partners (Antelman *et al.,* 2011). This illustrates one-way violence against women and their ongoing fears can contribute to women's experience of HIV and influence over PMTCT utilization.

The study findings showed that (74%) of the respondents earn less than Kshs. 15,000 monthly. This is lower than the wage indicator at 4.9 dollars per hour by Kenya National Bureau of Statistics (KNBS, 2010). This affects the ability of pregnant women to afford, access and utilize PMTCT related services due to costs. These costs include the transport to and from the facility and cost sharing fee for tests. Negative enablers such as structural constraints at health facilities including long distant to clinics, long waiting lines with perception of stigma and discrimination significantly reduce effective uptake of PMTCT services in Rachuonyo North. Stigma and discrimination are grounded on the wrong knowledge and information (Idris*et al.,* 2010). This is because stigma is all about attitude taken by a community

while discrimination follows with unjust practice towards individual or group (Robert *et al.,* 2009). It is therefore important to advocate for Community sensitization and mobilization about HIV and related services inorder to explain the wrong conception about HIV infection and improve PMTCT services. In addition, this can be achieved through strengthening of community out-reach services with a project-based mentor mothers advocacy on women education, empowerment for the pregnant women. The findingswere similar to a study done in Eastern Uganda on strengthening the prevention of mother to child transmission (Rujumba*et al*., 2012) and a study finding in Malawion access to HIV testing, care and treatment (Robert *et al*., 2009).

The study revealed that among the main cultural practices which impede uptake of PMTCT services especially as regards management of HIV cases were belief on women inheritance, sexual rituals by unknown person, commonly referred as "jackowiny" (in Luo dialect) in essence of cleansing the family and home stead and use of herbal/ conventional medicine for treatment of HIV cases. Similar findings have been reported amongst other African communities (Juliet *et al.,* 2014) and (Bajunirwe *et al.,* 2005). It is thus important to advocate for culturally appropriate strategies to effectively demystify all these myths and beliefs with involvement of all stakeholders within the community in PMTCT efforts to achieve its mandate. Similar study findings on culture and HIV/ AIDS in sub-Saharan Africacondoms are rarely used in ritual sexual practices because unless seminal and vaginal fluids mix, the practice is perceived to not be properly observed (Agot, 2010). In Uganda 2005, cultural practices such as wife inheritance inform of widow cleansing had been targeted for elimination and this has lowered actually lowed HIV infection to below 6.8%. This has been achieved where wife inheritance has been stopped and women given decision making powers through stakeholder involvement (Juliet *et al.,* 2014).

The current study findings also showed that stigma and discrimination in the health care settings are likely associated with limited access and utilization of the PMTCT services by the pregnant women. The above findings are similar to those done in rural Uganda which showed that health system as part of the social context in which PMTCT services are delivered and utilized (Muyinda and Seeley, 2007). There is

need to support pregnant mothers, especially those who are HIV positive beyond the clinic setting emerged as priority area. Furthermore, this was associated with limited number of the PMTCT sites, lack of working materials and inadequate knowledge on PMTCT updates (Ntetae*t al.,* 2010, Reis *et al.,* 2005). Secondly, it can be handled through service expansion to meet demand needs, universal provision of working tools, on job training, mentorship and facilitative supervision to health care providers handling these pregnant women for PMTCT services. The findings demonstrated that key strategies geared towards preventing the mother to child transmission of HIV includes efforts to increase knowledge and information of PMTCT to clinics and community universal attendance and availability ANC/PMTCT clinics (Chigevenga, 2013).

The current study findings revealed that provision of the correct information was critical reason why women enrolled in PMTCT programs. It has been shown that advocacy of prevention of mother to child transmission of HIV is associated with use of the PMTCT services (Adeneye, *et al.,* 2007). For example, if the pregnant woman is knowledgeable on the need to protect her child and improve her life by using PMTCT services, chances to uptake PMTCT services will definitely increase (Awitie*t al*., 2012). This shows the need of sensitizing and mobilizing the community on PMTCT and related services and grounding on the correct information and knowledge about HIV/ AIDS and component services through community and religious leaders, (Gundel *et al,*. 2009).

The study findings also revealed that the number of visits of ANC in the health care settings are likely associated with utilization of the PMTCT services by the pregnant women. This was further complicated by knowledge and information on family and community supportive environment. Other studies have reported similar findings which showed that post-test counselling of pregnant on essential messages about PMTCT are stressed to both HIV positive and HIV negative women (Nteta *et al.,* 2010, Reis *et al.,* 2005). These limitations can be handled through service expansion to meet demand needs, universal provision of supportive environment to empower women through on job training, mentorship and facilitative supervision to health care providers handling these pregnant women for PMTCT services (Chigevenga, 2013).

5.1.2 Determinants and Proportion of HIV Infected Mothers Complying With Feeding and Therapies Initiated in Antenatal Care Clinics in North Rachuonyo Sub-County

Infant feeding option is key in early life and critical determinant to child survival, growth and development. This come with challenge in the context of HIV due to vertical transmission of HIV from mother to child. The current study showed that the choice of infant options are majorly influenced by social and economic factors within the mothers living environment. This was similar with study that showed that choice of infant feeding is affected by the matrix of socio-economic factors (Wapan'gana, 2013). These factors culminate around mothers/ family income, occupation, disclosure of HIV status to spouse, neighbors and peer influence (Permar*et al.*,2013). Income affects affordability and access to infant feeding with women in low resource setting are mostly affected (WHO 2010). The relevance of these findings are important in targeting the interventions focusing social domains towards improving prevention of mother to child transmission of HIV (Oguta *et al*., 2001). Other studies show that enforcement of collaborative roles in advocating and practicing the recommended infant feeding options is relevant in the fight against HIV/ AIDS (Muyinda and Seeley, 2007).

The recommended Infant feeding practices include breast feeding, replacement feeding and mixed-feedings among mothers of infants aged twelve months and below (Okon 2012; Buskens, 2005). Findings from the current study showed that replacement feeding was less likely practiced as an infant feeding option by HIV positive mothers in Rachuonyo North.Mothers were also concerned that exclusive replacement feeding might raise suspicion of HIV positive status (De Cock 2000). However, breast feeding and mixed feeding were reported as common feeding practices among women as they were either exclusively breast feeding or partially breast feeding.(UNICEF 2012).The findings were similar with a study South Africa with a belief that breast milk alone is not adequate to make the baby grow 'fat and shiny' an expectation from kin and neighbors'(Coutsoudis *et* al., 1999). According to WHO (2010) guidelines, HIV positive mothers are recommended to practice exclusive breast feeding for 6 months of infant's life and gradually introduce

complementary foods while continuing breastfeeding for at least 12 months as long as the mother and or the child are on ARVs treatment. On the basis of these results it is therefore revealed that most mothers do not follow recommended guidelines.

The findings in the current study showed that breast feeding was the most acceptable infant feeding practices and explains why Mother to child transmission of HIV does not occur more often as predicted (Permar *et al*,. 2013). Similar findings were found in a study done in Kenya showing breast feeding as the most acceptable feeding option and culturally rooted as the main practice to feed an infant (Ogutu *et al*., (2001) Therefore, the fact that majority of pregnant women HIV infected understands breast feeding is a positive finding. Inappropriate infant feeding options exposes the child to high risk of illnesses, poor growth, development and even death. However, breast milk is standard with all nutrients, readily available and infants need it in early stages of life (UNAIDS 2010). It is also worth noting that HIV neutralizing antibody and TNA proteins in breast milk is known to inhibit HIV (NAS, 2013). If the infant is breast feeding, there is increased risk of acquiring HIV throughout the entire breastfeeding period (Miotti *et al*., 2000). However, it is recommended that if the infant is diagnosed at 6-12 months, a confirmatory test must be done after 18 months of age and infant should have stopped breast feeding for more than 6 weeks (AVERT, 2014). This was a positive remark from respondents that indicated that with all good practices in ANC services and HEI follow ups the baby is likely to be born free of HIV and stay healthy.

The study findings revealed that majority of HEI who were on follow up and had actually benefited from the PMTCT services and the results indicated that with proper management HIV among children can be reduced significantly below 2%. (Adebola *et al*., 2012). This was similar with a study done in Malawi which showed that proper follow up, linkage and care is a factor in HIV reduction among children. (Miotti *et al*., 2000).

In summary it is imperatively important to sensitize health professional and recipient mothers on appropriate infant feeding choices/ options by recommended guidelines in infant feeding. It is also important to note that early infant diagnosis of HIV

provides opportunity to strengthen appropriate feeding options to the HIV exposed children (Kalembo&Zgambo 2012). Failure to adhere put infants at risk of HIV and other infections.

5.1.3 Knowledge, Attitude and Practices of HIV Infected Women on Prevention of Mother to Child Transmission in Antenatal Care Clinics in North Rachuonyo Sub- County

In the study knowledge and attitude were identified as factors influencing utilization of PMTCT in Rachuonyo North as majority of the respondents who attended ANC. Similar to other studies, there was a substantial number of respondents who were knowledgeable on basic PMTCT of HIV based on 14 indexes that were assessed (Mana 2012 and Schoalen *et al*,. 2012). However, the findings were in contrast with the study done in southern Tanzania where only quarter of the women had adequate knowledge on PMTCT of HIV infection. This difference can be explained by the fact that majority of study participants in Rachuonyo North had some basic level of education. It has been observed that being HIV positive raises concerns about one's health and that of unborn child.

In the current study, the majority of pregnant women who were interviewed were aware of the possibility of a HIV infected woman transmitting an infection to her unborn child. This may be contributed by the sensitization and advocacy on HIV/ AIDS through public media as well as well as ANC counselling. This finding appear contrast to a study done in Southern Tanzania, where women were not aware of the possibility of an infected mother transmitting the infection to her child (Gunden*et al*., 2009). Further, during counselling HIV positive pregnant women are provided with additional information on ARVs prophylaxis, infant feeding issues, disclosure and partner testing (Adebola *et al*., 2012).

The current study findings revealed that infants aged twelve months and below were highly exposed to HIV. Other Similar findingsshowed that early infant diagnosis of HIV provides critical opportunity to strengthen follow up of HIV exposed children. This knowledge and information on early identification of HIV exposed and infected infants, early linkage to prevention for the exposed and care and treatment, provide

reassuring information to families of uninfected children and aid an evaluation of PMTCT interventions (Adeneye, *et al*,. 2007; Solomie and Teka, 2005).

The current study also showed that majority of women had attended ANC clinic at least twice during pregnancy. This is a positive finding because missed opportunities can be explored in the subsequent ANC visits such as additional information on ARV prophylaxis, infant feeding issues, disclosure and partner testing (Katushabe*et al*,. 2007). Similar study in Tanzania disclosed that HIV positive pregnant women with frequent visits to ANC for PMTCT services are two more times knowledgeable than those who have attendedANC for PMTCT service less than two times (Gundel,. *et al*2009). Emphasizing the need for HIV positive pregnant woman to attend ANC regularly is therefore mandatory. Currently HIV infected pregnant women start ARV prophylaxis as early as 14 weeks of pregnancy and continue up to one year of breast feeding (WHO, UNAIDS 2015).

The findings of the present study revealed that attitude towards PMTCT interventions such as ANC- HIV testing and counselling, referral and link-aging, follow ups, ARV prophylaxis and appropriate infant feeding choices are influenced by the knowledge of the respondents. The finding is similar to a study done in Kabeho -Rwanda showing that early initiation of ART, follow up and sustained appropriate feeding option are key to reduction of HIV reservoir (Gill*et al.,* 2015). Therefore, during ANC visits by pregnant women essential messages about PMTCT are stressed so as to equip them with this knowledge as the attitude of a person may affect the interest of utilizing the services (Katushambe, 2007).New infections and high viral loads during pregnancy pose the greatest risk of transmission of HIV from mother to the unborn baby. Thus, primary prevention, ARVs prophylaxis as well as treatment is highly recommended. In Kenya, 25% of women have unplanned pregnancy and there is 60% unmet needs for family planning among HIV positive women (Adebola *et al*., 2012). This calls for strengthening of family planning services in counties with high HIV prevalence as this can offer a chance to further prevent MTCT of HIV.

The present study also revealed that marital status, occupation and age as being significantly associated with the level of knowledge and attitude on mother to child transmission of HIV. Similar findings have also been reported in several studies in Africa. This may be contributed by the fact that women who are married are assumed to be responsible and can defend her status in a social context unlike the unmarried who are exposed to different community perceptions of the pregnancy and more so when they are young (Gundelet *al*., 2009).

The findings of the current study revealed that the health workers were very few to efficiently offer quality services, taking little time to listen and handle clients with confidence misplacing patients' files thus discouraging respondents from continuing access to PMTCT services as they take long hours queuing before they are attended to by the clinicians. Women receiving treatment and those who declined treatment, community members and even health workers stated that the negative attitude of some health workers posed a barrier to participation in PMTCT services (KAIS, KDHS 2012). This contributes to an increase in the number of HIV positive women not linked to care and failure to prevent MTCT (Chigevenga, 2013). This is similar tofindings of a study in Nairobi, Kenya which showed long wait periods at the health facility, negative views about the program and program staff, and lack of clarity regarding ability to continue with services after several missed appointments were some reasons reported for patient dropout from services (Awiti*et al*., 2011).

The present study findings showed that the women also faced stigma within the health care facility by staff who may hold negative views about women living with HIV thus compromising optimal services. The findings were more similar to study done in health facilities in Ethiopia where health care workers are not enthusiastic about handling deliveries for women who are known to be HIV positive for fear of accidental infections (Chigevenga, 2013). This stigmatizes and show of discrimination among women HIV positive, thus calls for the need of training to health facility staffs in safety precautions and procedures (Muyinda and Seeley, 2007).

The current study also revealed that attitude a person has on something may affect the interest of that person knowing or utilizing the service. Majority of the pregnant women perceived HIV testing for pregnant women to be important.These findings were similar with the study in Ethiopia where HIV testing in ANC was not well perceived owing to the threat it posed to family stability(Medley *et al*., 2010).This is a very positive and encouraging finding that pregnant women have a positive attitude towards PMTCT interventions. Therefore thorough and adequate counselling of pregnant women for them to have these useful information is very important by strengthening the health infrastructures' (WHO 2012).

The study also showed that most of the respondents were living in in the rural areas where health care services can only be sort in health centers and dispensaries. Similar findings in Sudan and Uganda demonstrated that these levels of health care are poor resource health settings (Nuwagaba – Biribonwaha, 2007).Therefore it is important to comprehensively develop a health care policy empowering health care systems with efforts to improve PMTCT services in the rural areas.Furthermore, access and utilization of services resonates well with quality, acceptable and adequate resources (WHO 2012)

In the present study a number of factors were found to be associated with non-utilization of PMTCT program. These included perceived discrimination and stigmatization by the public, protracted high cost of services and drugs, ignorance on person's status on HIV, denial, having weak perception in PMTCT as a service among mothers attending antenatal clinics and health care workers attitude in providing PMTCT services. This was similar with findings on towards universal access, scaling up in the health sector report, Kenya (NACC and MOH, 2010). The above findings are also similar to those done in Mbeya , Tanzania which showed that elimination of mother to child transmission of HIV can be done through addressed through advocacy on socio-economic, cultural and health factors that compel HIV positive pregnant women to stay away from health facilities when they are due to give birth (Theuring*et al*., 2009).

5.2 **Conclusions**

Socio- cultural, economic factors and health care systems are important barriers to influence utilization of PMTCT services in North Rachuonyo. Pregnant women who are still young, lowly educated and living far away from the health facilities and suffering from gender inequalities are less likely to access and use PMTCT services. However, the inability of the health systems as social institution to effectively and efficiently engage the community on the PMTCT services co-exists with the constraints of HIV perception of stigma and discrimination, physical abuse/ violence, negative cultural beliefs, poverty, intimidations and low likely support for the HIV positive pregnant women.

1. Finally, the inefficiency of healthcare workers in advocacy on disclosure of HIV status to partners is another barrier encountered in this study as it hinders male participation in PMTCT programmes. PMTCT programmes have suffered a series of set-backs because male involvement has been associated with high adherence to PMTCT interventions and improved infant outcomes.
2. Infant feeding is a determinant to child survival, growth and development more so dictated in early life. In the context of HIV due to vertical transmission from mother to child it's more challenging. The study concluded that there was general non adherence to WHO (2010) guidelines. Therefore, it is important to sensitize communities in Rachuonyo North to adhere to infant feeding guidelines and ARV regimens in context of HIV to prevent mother – to- child infection. This is because the choice of infant feeding practices in majorly influenced by social and economic factors within the mothers living environment.
3. It was concluded that pregnant women HIV positive with more than four visits for ANC for PMTCT are more knowledgeable. The knowledge on when MTCT occurs, the availability of preventive measures is critical and key determinant and this may influence women to attend ANC clinics regularly for effective and efficient PMTCT interventions. Therefore, it is important to deliver correct information on the PMTCT service access and

utilization by promoting the facilitators and addressing the barrier factor due to limited information in their present and future pregnancies.

It was also encouragingand positive finding that there was anoverall significant association between attitude on PMTCT and health seeking behavior. In conclusion, there is need to support pregnant mothers especially HIV positive beyond the clinic setting as priority area.

5.3 Recommendations

The study recommends based on the objective that:

1. Further expansion of friendly and regular outreach PMTCT services within the reach of all communities living within and surrounding Rachuonyo North, more so to targetsocio-cultural MTCT support systems strengthening beyond care at health facility level. This will enhance access and utilization of PMTCT services by the pregnant women at family and community level with the context of social engagement.
2. Intensify an elaborate PMTCT for HIV strategy by sensitizing pregnant women on vertical transmission and associated risks to mothers including infant feeding choices. This activity should be achieved throughhealth and nutrition education targeting community with behaviour change addressing cultural factors that research revealed to influence MTCT of HIV among HIV positive women.
3. Further strengthening of community mentor mother program in Rachuonyo North. This is more likely to provide opportunity to improve access and utilization of PMTCT services through community support. For this to happen deliberate efforts on PMTCT related issues must be integrated with Reproductive health training of PMTCT mentor mother. Once they are trained regular follow up to ensure continuous interaction and facilitative supervision for feedback and mutual support.
4. Further engagement of community through male involvement on PMTCT services. With a focused skilled man power key information, knowledge and

practices that improves access and utilization of PMTCT comprehensive care and services is very important to HIV free generation

5.3.1 Suggestions for further research

The study suggests research on

1. The cost effectiveness and innovative educational strategies that adapt to clinical impact of PMTCT of HIV on socio-cultural beliefs
2. Male engagement and link to PMTCT

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APPENDICES

Appendix 1 : Questionnaire

Pregnant Mothers Infected with HIV

Factors influencing utilization of Prevention of Mother to Child Transmission of HIV Among women attending antenatal clinics in Rachuonyo North sub-county, Homa Bay County, Kenya.

Category of health facility: MOH SCH ☐ Health Centre ☐ Dispensary ☐ FBO/Mission ☐

ASSERTIVE STATEMENT

This survey is strictly for learning purposes and all information shall be strictly treated with confidentiality.

SECTION I:

1. Do you ask for permission from your spouse/partner to do HCT?

Yes. ☐ **No.** ☐

2. Is there HIV positive disclosure among spouse?

Yes. ☐ **No.** ☐

3. Which of the following statement represents respondent's reason for non-disclosure of results to spouse/partner? Indicate with a tick (√) the ones applicable to you, where 5= Strongly Agree, 4 = Agree, 3= Undecided, 2= Disagree, 1= Strongly Disagree.

Reasons	1	2	3	4	5
Afraid of been abandoned/ divorced by husband and family					
Physically abused by husband					
Separated from the children					
Hospital to inform him					

Husband will tell everybody ending up with intimidation among peers					
Single parenthood and non-committal relationship					

4. Which of the following statements represent the reactions of relatives to HIV results? Indicate with a tick (√) the ones applicable to you, where 5= Strongly Agree, 4 = Agree, 3= Undecided, 2= Disagree, 1= Strongly Disagree.

Will be thrown out of home	1	2	3	4	5
Will be physically violated					
They will start to care for me					
Yet to inform relatives					
Relatives will be angry with me					

5. Kindly select the category that represents your position. Indicate with a tick (√) the ones applicable to you, where 5= Strongly Agree, 4 = Agree, 3= Undecided, 2= Disagree, 1= Strongly Disagree.

Variable	1	2	3	4	5
Age:					
<15					
15-24					
25-34					
35-44					
≥ 45					
No response					
Marital status:					
Married					
Single					
Widow					
No response					

Education:					
None					
Started Primary School					
Completed Primary School					
Completed Secondary					
No response					
Occupation:					
Housewife					
Trader					
Other					
No response					

5. Which of the following statements represent cultural issues that influence HIV positive women attending antenatal care clinics?. Indicate with a tick (√) the ones applicable to you, where 5= Strongly Agree, 4 = Agree, 3= Undecided, 2= Disagree, 1= Strongly Disagree.
6.

Statements	1	2	3	4	5
Cultural practices such as women inheritance impede women participation on HIV/AIDS awareness programs.					
Men are not supporting women to attend antenatal clinics neither do they get involved.					
Inheritance of property discriminates and intimidates women who are HIV positive					
Widows care free cultural rituals to protect the family by having sex with unknown partner as an obligation of the tradition.					
Preference to Herbal medicines from TBAsas supersedes antenatal care clinic					

7.a. Which of the following statements represent socio-economic issues that influence HIV positive women attending antenatal care clinics? Indicate with a tick (√) the ones applicable to you, where 5= Strongly Agree, 4 = Agree, 3= Undecided, 2= Disagree, 1= Strongly Disagree.

Statements	1	2	3	4	5
The community does not support women socio economic activities.					
Women do more domestic chores like fetching firewood, water, grinding maize, taking care of family thus not financially independent.					
Women are financially incapable of sponsoring themselves to attend antenatal care clinics					
The community does not care whether women attend antenatal care clinics or not.					
Low participation of women in economic activities affect their progress in improving socio-economic development					
Women afraid of venturing into entrepreneurial activities without getting express permission from their husbands					

7. b. Kindly indicate with a tick (√) how can you rate your monthly income in support of your family

Variable	1	2	3	4	5
Below 5,000 Kshs					
5,001- 10,000Kshs					
10,001- 15,000 Kshs					
15,001- 20,000 Kshs					
Above 20,000					

SECTION II

8. Which of the following reasons highly exposes women to home deliveries in the location where you live? Indicate with a tick (√) the ones applicable to you, where 5= Strongly Agree, 4 = Agree, 3= Undecided, 2= Disagree, 1= Strongly Disagree.

Reason	1	2	3	4	5
Health facilities not well equipped to handle deliveries					
Lack of money to pay for the services in the health facilities					
Husband not permitting					
Good TBAs within the community that handles deliveries than health care workers					
Distance to HF with poor roads					
Others: Please mention:					

9. What Age of highly exposed infants is your child representing? Indicate with a tick (√) the ones applicable to you, where 5= Strongly Agree, 4 = Agree, 3= Undecided, 2= Disagree, 1= Strongly Disagree.

Age of youngest child (months)	1	2	3	4	5
0-6 months					
7-12 months					
13-36 months					
37 -60 months					

10. a. Do you or intend to breast feed your baby after giving birth? Indicate with a tick (√)

Yes. [ ] No. [ ]

10. b If Yes what are the reasons for opting for Breastfeeding as choice of infant feeding? Indicate with a tick (√) the ones applicable to you, where 5= Strongly Agree, 4 = Agree, 3= Undecided, 2= Disagree, 1= Strongly Disagree.

Reasons for Breast feeding as option chosen	1	2	3	4	5
Exclusive breastfeeding for healthy to baby					
High cost associated with use of baby formula so it's cheap and readily available on demand					

Breast feeding makes a woman feel like a mother					
Breast milk adequately protect the baby					
No response					

11.a. What are the choices of infant feeding options do you know?

Feeding choices	1	2	3	4	5
Complimentary formula feeding					
Complementary breast feeding					
Exclusive breast feeding					
Exclusive formula feeding					
Mixed feeding					
Others:					

11. b. Kindly indicate with a tick (√) what actually dictates to you or will dictate to you choice of child feeding option

Variable	1	2	3	4	5
Health status					
Place where I'll give birth					
Common practice with neighbors					
Economic status by time of birth					
Family influences and support					
Religion					
Other:					

12. Kindly indicate your ANC attendance. Indicate with a tick (√) the ones applicable to you, where 5= Strongly Agree, 4 = Agree, 3= Undecided, 2= Disagree, 1= Strongly Disagree.

Variable	1	2	3	4	5
No. of ANC visits					
Category					
Frequency (%)					
n = 192					
Place of ANC:					
HF					
Other					

SECTION III

12.a. Kindly indicate with a tick (√) how you will ensure your unborn child is healthy and does not contract HIV infection

Variable	1	2	3	4	5
Taking my drugs as indicated					
Attending clinics- ANC/ PSC as scheduled					
Taking nutritional advices as appropriate					
Plan to deliver in established health facility					
Family influences and support					
Seeking medical attention from qualified health worker when sick					
Other:					

12.b. Which of the following statements represent the respondents Knowledge of PMTCT Intervention? Indicate with a tick (√) the ones applicable to you, where 5= Strongly Agree, 4 = Agree, 3= Undecided, 2= Disagree, 1= Strongly Disagree.

Interventions	1	2	3	4	5
Use of ARV Prophylaxis (for mother baby) and exclusive breast feeding (Option 1)					
Use of ARV Prophylaxis (for mother/ baby) and breast milk substitute. (Option 2)					
Use of ARV Prophylaxis (for mother/ baby) and mixed feeding options. (Option 3)					
Options 1,2 and 3					
Options 2 and 3 only					
ARV only					

Variable	1	2	3	4	5
ANC					
High benefit					
Medium benefit					
Low benefit					
No benefit					
No response					
Interested in ANC:					
Yes					
No					
No response					
HIV positive					
Seek treatment in HF					
Conceal status					
Leave community					
Alternative medicine					
Don’t know					
Heard of anyone with HIV:					
Yes					
No					
No response					
Effect of HIV on positive person					
Apparently healthy					
Very sick					
Sickness & death					
Don’t know					
No response					
Willing to test for HIV:					
Yes					
No					
No response					

13. Kindly indicate with a tick (√) when your child is likely to be tested for HIV as an intervention after giving birth

Variable	1	2	3	4	5
DNA- PCR at 6 weeks after delivery/ first immunization schedule					
PCR done at any first contact with baby before 6 months					
Normal antibody test when grow					
Not necessary when I observe all the precautionary measures in ANC					
I have not been told in the clinic					
I don't know					
Other:					

14. Kindly indicate Attitude of women of reproductive age towards ANC and HIV screening. . Indicate with a tick (√) the ones applicable to you, where 5= Strongly Agree, 4 = Agree, 3= Undecided, 2= Disagree, 1= Strongly Disagree.

15. Kindly indicate the practices of women with regards ANC and HIV.. Indicate with a tick (√) the ones applicable to you, where 5= Strongly Agree, 4 = Agree, 3= Undecided, 2= Disagree, 1= Strongly Disagree.

Variable	1	2	3	4	5
Attend ANC:					
Yes					
No					
No response					

Where they go for ANC:					
Health facility					
TBA					
Chemist					
Herbalist					
Do not attend ANC					
Where they deliver their babies					
Home					
Health facility					
TBA					
First pregnancy					
Been tested for HIV					
Yes					
No					
No response					

16.a. Which of the following statements represents the respondents views on Health workers attitude? Indicate with a tick (√) the ones applicable to you, where 5= Strongly Agree, 4 = Agree, 3= Undecided, 2= Disagree, 1= Strongly Disagree.

Reasons	1	2	3	4	5
Health Workers are sometimes careless – e.g. misplace files					
Long waiting time for ANC					
Health Workers are sometimes aggressive					
Health workers are well trained and accommodative to all					
Health workers are few to handle all cases effectively					
They are sometimes unkind to clients with uncalled displacements of tempers					

16.b. Which of the following statements represent the respondents suggested reason for non utilization of PMTCT Services? Indicate with a tick (√) the ones applicable to you, where 5= Strongly Agree, 4 = Agree, 3= Undecided, 2= Disagree, 1= Strongly Disagree.

Personal Opinions					
Protracted and Burden of drugs and cost					
Poor health care workers attitude					
Ignorance					
Lack of concern in behavior					
Denial of HIV status					
Fear of public discrimination and stigmatization					
I don't know					

17. If you have any additional suggestion/ recommendation or information/ comment concerning PMTC kindly indicate below

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Appendix 2 : Interview Guide For Health Workers

Factors influencing utilization of Prevention of Mother to Child Transmission of HIV Among women attending antenatal clinics in Rachuonyo North sub-county, Homa Bay County, Kenya.

Category of health facility: MOH SCH ☐ Health Centre ☐ Dispensary ☐ FBO/Mission ☐

1. Do respondents' ask for permission from their spouse/partner to do HCT?
2. What is the position with regard to HIV positive disclosure among spouse?
3. Why do you think respondents prefer non-disclosure of results to spouse/partner?
4. What is the reactions of relatives to HIV results?
5. What are the cultural issues that influence HIV positive women attending antenatal care clinics?
6. What are the socio-economic issues that influence HIV positive women attending antenatal care clinics?
7. What are the reasons for home deliveries among women of reproductive age?
8. What Age of highly exposed infants do majority of infants represent?
9. Which Breastfeeding options have majority of respondents adopted?
10. What is the adequate ANC attendance in the clinic?
11. How is the respondents Knowledge of PMTCT Intervention?
12. What is the Attitude of women of reproductive age towards ANC and HIV screening?
13. What are commonly advocated practices of women with regards ANC and HIV?
14. Which of the following statements represents the respondents views on Health workers attitude
15. What do you think contributes to low-utilization of PMTCT Services?
16. If you have any additional suggestion or information, question or comment concerning PMTC kindly indicate below

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Appendix 3 : Irec Approval

INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC)

MOI TEACHING AND REFERRAL HOSPITAL
P.O. BOX 3
ELDORET
Tel: 33471//2/3

MOI UNIVERSITY
SCHOOL OF MEDICINE
P.O. BOX 4606
ELDORET

Reference: IREC/2015/224
Approval Number: 0001629

12th May, 2016

Allan James W. Otieno,
Jomo Kenyatta University,
School of Public Health,
P.O. Box 43844,
NAIROBI-KENYA.

INSTITUTIONAL RESEARCH & ETHICS COMMITTEE
12 MAY 2016
APPROVED
P. O. Box 4606-30100 ELDORET

Dear Mr. Otieno,

RE: FORMAL APPROVAL

The Institutional Research and Ethics Committee has reviewed your research proposal titled:-

"Factors Influencing Utilization of Prevention of Mother to Child Transmission of HIV among Women Attending Antenatal Care Clinics in Rachuonyo North Sub-County Homa-Bay County Kenya."

Your proposal has been granted a Formal Approval Number: ***FAN: IREC 1629*** on 12th May, 2016. You are therefore permitted to begin your investigations.

Note that this approval is for 1 year; it will thus expire on 11th May, 2017. If it is necessary to continue with this research beyond the expiry date, a request for continuation should be made in writing to IREC Secretariat two months prior to the expiry date.

You are required to submit progress report(s) regularly as dictated by your proposal. Furthermore, you must notify the Committee of any proposal change (s) or amendment (s), serious or unexpected outcomes related to the conduct of the study, or study termination for any reason. The Committee expects to receive a final report at the end of the study.

Sincerely,

PROF. E. WERE
CHAIRMAN
INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE

cc	CEO	-	MTRH	Dean	-	SOP	Dean	-	SOM
	Principal	-	CHS	Dean	-	SON	Dean	-	SOD

Appendix 4 :BPS Research Approval

JOMO KENYATTA UNIVERSITY
OF
AGRICULTURE AND TECHNOLOGY

DIRECTOR, BOARD OF POSTGRADUATE STUDIES

P.O. BOX 62000
NAIROBI – 00200
KENYA
Email: director@bps.jkuat.ac.ke

TEL: 254-067-52711/52181-4
FAX: 254-067-52164/52030

REF: JKU/2/11/ TM310-C006-5930/2014

08th October, 2015

ALLAN JAMES. W. OTIENO
C/o Kisii CBD
JKUAT

Dear Mr. Otieno,

RE: APPROVAL OF RESEARCH PROPOSAL AND SUPERVISORS

Kindly note that your MSc. research proposal entitled: "**Factors Influencing Utilization of Prevention of Mother to Child transmission of HIV among Women Attending Antenatal Care Clinics in Rachuonyo North Sub-County –Homa Bay County, Kenya** "has been approved. The following are your approved supervisors:-

1. Prof. Simon Karanja
2. Dr. John Kagira

Yours sincerely,

PROF. MATHEW KINYANJUI
DIRECTOR, BOARD OF POSTGRADUATE STUDIES

Copy to: Director, Kisii CBD

Appendix 5 :MOH ACCEPTANCE LETTER

REPUBLIC OF KENYA

MINISTRY OF HEALTH

Telegrams: "Medical" Kendubay.
Telephone:
When replying, please quote
E mail: dmohrachuonyonorth@gmail.com

Medical Officer of Health
Rachuonyo North Sub County
P.O. Box 47-40301
Kendu-Bay

MOH/GC/16/16

14th May 2016

The Director
Board of Postgraduate Studies
Jomo Kenyatta University of
Agriculture and Technology
P O Box 62000 – 00202
NAIROBI

Dear Sir/Madam,

RE: ACCEPTANCE: ALLAN JAMES W. OTIENO – TM310-C006-5930/2014

The above student has been accepted in Rachuonyo North Sub County to undertake his research project entitled ***'Factors Influencing Utilization of Prevention of Mother to Child Transmission of HIV among women attending Antenatal Care Clinics in Rachuonyo North Sub County – Homa Bay County, Kenya'.***

Yours faithfully,

Dr. Ochola Ephraim
Medical Officer of Health
RACHUONYO NORTH SC

MEDICAL OFFICER OF HEALTH
RACHUONYO NORTH SUB-COUNTY
14 MAY 2016
P. O. Box 47 - 40301
KENDU-BAY

cc. All Health Facility In-Charges – Rachuonyo North Sub County
(Kindly accord him the necessary assistance and cooperation)

Appendix 6 : Map of Homa Bay/ Rachuonyo North