DETERMINANTS OF ADHERENCE TO EXCLUSIVE BREAST FEEDING
AMONG HIV POSITIVE MOTHERS ATTENDING CHILD WELFARE CLINIC
AT PUMWANI MATERNITY HOSPITAL, NAIROBI COUNTY, KENYA

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A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF PUBLIC HEALTH (MONITORING AND EVALUATION) IN THE SCHOOL OF PUBLIC HEALTH OF KENYATTA UNIVERSITY

JUNE, 2013
DECLARATION

This proposal is my original work and has not been presented for a degree in any other University.

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DEDICATION

This thesis is dedicated to my Lord, Jesus Christ for His grace and sufficient provision for all that I needed to complete this master’s degree. Secondly, my parents and siblings for their support and finally to my daughter Berur and husband Gerald, who motivated me every passing day as I soldiered on.
ACKNOWLEDGEMENT

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OPERATIONAL DEFINITIONS OF KEY CONCEPTS AND TERMS

**Exclusive Breast Feeding** is feeding an infant with breast milk only for 6 months without any additional liquids or solids apart from prescribed medicine.

**Exclusive Replacement Feeding** is giving an infant approved commercial infant formula milk for 6 months without introducing breast milk or any other liquids and solids apart from prescribed medicine.

**Mixed feeding** is giving an infant less than 6 months breast milk or approved replacement feeds with additional liquids and solids.

**Prevention of Mother to Child Transmission** is the prevention of infection with HIV to a child from the mother during pregnancy, delivery and postnatally by taking ARV prophylaxis, safe delivery and use of recommended infant feeding practices.
**LIST OF ABBREVIATIONS AND ACRONYMS**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AFASS</td>
<td>Acceptable, Feasible, Affordable, Sustainable and Safe</td>
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<tr>
<td>AIDS</td>
<td>Acquired Immunodeficiency Syndrome</td>
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<td>ANC</td>
<td>Antenatal Clinic</td>
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<td>ART</td>
<td>Antiretroviral Therapy</td>
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<td>ARV</td>
<td>Antiretroviral</td>
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<td>CCC</td>
<td>Comprehensive Care Centre</td>
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<td>CI</td>
<td>Confidence Interval</td>
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<td>CWC</td>
<td>Child Welfare Clinic</td>
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<td>EBF</td>
<td>Exclusive Breast Feeding</td>
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<td>EBM</td>
<td>Expressed Breast Milk</td>
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<td>ERF</td>
<td>Exclusive Replacement Feeding</td>
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<td>FGD</td>
<td>Focused Group Discussion</td>
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<td>GIT</td>
<td>Gastro-Intestinal Tract</td>
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<td>HAART</td>
<td>Highly Active Antiretroviral Therapy</td>
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<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<td>KAIS</td>
<td>Kenya AIDS Indicator Survey</td>
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<td>KDHS</td>
<td>Kenya Demographic and Health Survey</td>
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<tr>
<td>KII</td>
<td>Key Informant Interview</td>
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<tr>
<td>KNBS</td>
<td>Kenya National Bureau of Statistics</td>
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<td>KU</td>
<td>Kenyatta University</td>
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<td>KU-ERC</td>
<td>Kenyatta University – Ethics Review Committee</td>
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<tr>
<td>MCH</td>
<td>Maternal and Child Health</td>
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<tr>
<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
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<td>MOMS</td>
<td>Ministry of Medical Services</td>
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<td>MOPHS</td>
<td>Ministry of Public Health and Sanitation</td>
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<td>MTCT</td>
<td>Mother to Child Transmission</td>
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<td>NASCOP</td>
<td>National AIDS/STD Control Programme</td>
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<td>NCST</td>
<td>National Council for Science and Technology</td>
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<td>NVP</td>
<td>Nevirapine</td>
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<tr>
<td>OR</td>
<td>Odds Ratio</td>
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<tr>
<td>PITC</td>
<td>Provider Initiated Testing and Counseling</td>
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<td>PMTCT</td>
<td>Prevention of Mother to Child Transmission</td>
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<td>PNC</td>
<td>Postnatal Clinic</td>
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<td>sdNVP</td>
<td>Single Dose Nevirapine</td>
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<td>UN</td>
<td>United Nations</td>
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<td>UNAIDS</td>
<td>United Nations Programme on HIV/AIDS</td>
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<td>UNICEF</td>
<td>United Nations Children Fund</td>
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<td>VCT</td>
<td>Voluntary Counseling and Testing</td>
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<td>WHO</td>
<td>World Health Organization</td>
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ABSTRACT

Globally, the estimated number of children below 15 years of age living with HIV increased from 1.6 million in 2001 to 2.5 million in 2009. Almost 90% of these children live in sub-Saharan Africa. Over 90% the new infections of HIV are acquired through Mother-To-Child Transmission (MTCT). According to Kenya Aids Indicator Survey (KAIS) report of 2007, nearly 1 out of 10 pregnant women in Kenya are infected with HIV. Exclusive Breast Feeding (EBF) of a child remains the best and safest source of nutrition for the vast majority of infants worldwide and a recommended method of Prevention of Mother to Child Transmission (PMTCT) of HIV. Despite this evidence, Exclusive Breast Feeding (EBF) is at 13% in Kenya. The aim of this study was to identify the factors that influence adherence to exclusive breast feeding among HIV positive mothers attending Child Welfare Clinic at Pumwani Maternity Hospital, Nairobi County. This was a descriptive cross-sectional study utilizing quantitative and qualitative approaches targeting HIV positive mothers with infants aged above 6-12 months. Purposive sampling technique was used to get the 188 study participants who were interviewed using semi-structured questionnaires. In addition, 2 Focused Group Discussions (FGDs) comprising 10 participants each who included peer counselors, community health workers and opinion leaders was conducted using the FGD guide. Key informants from the health facility; 1 clinical officer, 4 nurses, and 1 nutritionist were interviewed using the Key Informant Interview (KII) questionnaire guide. The data from semi-structured questionnaires was analyzed using SPSS version 17.0 software. Descriptive statistics were generated and cross tabulation (Chi-Square test and Fischer’s exact test) was done for relationships of variables. Logistic regression was done to assess the effect of various explanatory variables on adherence to EBF among HIV positive mothers. The recordings of the FGDs and KIIIs were transcribed and main concepts identified. The qualitative data was triangulated with the quantitative data to enhance validity and reliability of the study findings. The results showed proportion of women who adhered to EBF at 69.1%. The following factors influenced adherence to EBF positively: presence of main breadwinner (OR=3.44, p=0.003), food availability (p=<0.001), availability of transport (OR=4.00, p=0.013), mother on ARVs postnatally (OR=0.35, p=0.002), Knowledge on MTCT of HIV (p=<0.001), being taught about EBF in ANC and PNC (OR=7.78, p=0.002), expressing breast milk (p=<0.001), disclosure of HIV status to husband (OR=2.46, p=0.007) and relative (OR=2.29, p=0.033). In conclusion, information sharing on MTCT of HIV antenatally and postnatally should be strengthened in the health facilities and the community using community strategy to improve EBF. Secondly, mothers should also be taught how to express breast milk to feed the baby when the mother is away for long hours. Finally, vulnerable women to be linked to income generating community projects for food security empowerment.
CHAPTER ONE: INTRODUCTION

1.0 Background to the study

UNICEF (2011) and WHO (2010a,) currently recommend that children be exclusively breastfed during the first 6 months of life. Exclusive Breast Feeding (EBF) is recommended because breast milk is uncontaminated and contains all the nutrients necessary for children in the first few months of life. In addition, the mother’s antibodies in breast milk provide immunity to disease, and improved cognitive development. Early supplementation is discouraged for several reasons according to KDHS report of 2008-09. First, it exposes infants to pathogens and increases their risk of common childhood diseases. Second, it decreases infants’ intake of breast milk and suckling, which reduces breast milk production. Third, in low-resource settings, supplementary food is often nutritionally inferior thus causing malnutrition (KNBS & ICF Macro, 2010).

EBF is one of the strategies recommended for developing countries in the Prevention of Mother to Child Transmission (PMTCT) of HIV postnatally (WHO, 2010a; WHO, 2010b). EBF for up to six months is associated with a 3-4 fold decreased risk of HIV transmission as compared to mixed feeding (UNICEF, 2011). This strategy is recommended because Exclusive Replacement Feeding (ERF) is not feasible due to the high cost of supplementary feeds and lack of adequate clean water and poor sanitation in these countries. ERF under such conditions predisposes the children to diarrhoeal diseases and malnutrition which could lead to early infant mortality (UNICEF, 2011).

Many scholars and researchers have shown that breast feeding by HIV positive mothers predisposes the infant to HIV infection. Though breastfeeding is essential for child health
and development in low-resource settings, it carries a significant risk of transmission of HIV-1, especially in late stages of maternal disease (Kesho Bora Study Group & de Vincenzi, 2011). The risk of HIV transmission through breastfeeding is greatest in early infancy (before six months of age) and persists as long as breastfeeding continues. Studies found that a longer duration of breastfeeding is associated with increased risk of Mother to Child Transmission (MTCT) of HIV. This has led to continuous debate on what is the most effective method of PMTCT and what is feasible. A randomized clinical trial done in Nairobi showed that with no intervention the frequency of breast milk transmission of HIV-1 was 16.2%, and 75% of infections occurred within the first 6 months of breastfeeding. The study also found the use of breast milk substitutes prevented 44% of infant infections and was associated with significantly improved HIV-1–free survival (Nduati et al., 2000). However research has shown that with interventions there is no significant difference in morbidity and mortality in HIV exposed infants on EBF or ERF (WHO, 2010a; WHO, 2010b).

In many developed countries, paediatric HIV has been virtually eliminated to less than 2% (WHO, 2010a; WHO, 2010b). This due to strict adherence to WHO recommendations for HIV treatment, PMTCT and infant feeding practices. With this implementation of highly effective interventions and adequate resources to run the PMTCT programmes, these countries have been able to achieve the goal of eliminating MTCT. In low and middle income countries, MTCT is still a real challenge due to the dependency on donor support for PMTCT programmes. In sub-Saharan Africa, Southern and Eastern countries like South Africa, Zambia and Kenya bear a great burden due to the high prevalence of HIV/AIDS. In these countries, majority of the HIV infected women
can only afford breastfeeding as an option to prevent MTCT with prophylactic ARVs for either the mother or infant during the breastfeeding period to reduce the chances of MTCT (WHO, 2010b). Early cessation of breastfeeding to prevent MTCT is discouraged for it may induce under-nutrition. This could in turn enhance infant morbidity and mortality compared to those children who are breastfed for a longer duration.

It is unfortunate that mixed feeding is still the norm for many infants less than six months old in many countries with high HIV prevalence. Some of these countries such as South Africa and Kenya currently have very low EBF rates at 7% and 13% respectively (UNICEF, 2011). Previous studies in sub-Saharan Africa and Asia have shown that socio-demographic variables like maternal education, paternal education, cultural practices and socio-economic status have influence on decision to practice EBF (Chudasama, Patel & Kavishwar, 2009). In Kenya, HIV positive mothers start mixed feeding because they have to fend for their families doing casual jobs which require long working hours and have no privilege of a paid leave like their counterparts in salaried jobs. These women have cultural reservations on expressing breast milk for the child to consume while they are away at work.

1.1 Problem statement

EBF among HIV exposed babies is very low in Kenya. According to MOPHS (2008) in the Child Survival and Development Strategy (2008 – 2015) and KDHS report of 2008-09 (KNBS & ICF Macro, 2010), EBF in Kenya is estimated to be at below 3.2%. Other recent reports from UNICEF (2011) indicate that EBF in Kenya is at 13%. EBF of a child remains the best and safest source of nutrition for the vast majority of infants worldwide. However, this recommended practice is hardly adopted by many mothers. The
government and partners have initiated several programs to promote EBF to enhance child nutrition through MCH services and community based projects. In a study done in Western Kenya, Wachira, Otieno-Nyuya, Ballidawa and Braitstein (2009) found that HIV positive mothers did not practice EBF. Mixed feeding is a common practice in many households for infants under 6 months. A child is breastfed and given additional liquids and foods like porridge, water, herbs, fruits and cows’ milk. Kamau-Mbuthia, Elmadfa and Mwonya (2008) established that the HIV status of a mother had no influence in infant feeding practice in a study conducted in Nakuru. Therefore lack of EBF is not a problem experienced by HIV positive mothers but also those who are negative.

In this era of HIV/AIDS, the National and International HIV and infant feeding guidelines recommend that HIV positive women should either breastfeed exclusively their babies or use ERF, and strongly discourage mixed feeding (WHO, 2000). Mixed feeding has been found to increase the HIV transmission risk substantially more than exclusive breastfeeding. Change of guidelines over the last few years from ERF to EBF for HIV exposed infants has caused confusion leading to conflicting professional advice.

According to KAIS report of 2007, nearly 1 out of 10 pregnant women in Kenya are infected with HIV (9.6%) with minimal differences by urban and rural residence (NASCOP, 2009). Women bear a higher burden of HIV prevalence than men in Kenya, with 11% of the women in Nairobi being HIV infected compared to 3% among men (KNBS & ICF Macro, 2010). Nairobi is second to Nyanza in HIV prevalence rate among
women, hence this poses a major public health concern since mixed feeding contributes highly to MTCT of HIV.

1.2 Justification

The guidelines for PMTCT recommend EBF as one of the feeding methods to reduce the risk of HIV transmission to the babies of HIV-positive women (WHO, 2000). However, there is limited knowledge about HIV positive mothers’ experiences in trying to adopt the recommendations for PMTCT in Pumwani and its effects on adherence to EBF.

Preventing HIV transmission to infants through EBF is essential to meeting the Millennium Development Goal (MDG) 4 and 6 geared at reducing child mortality by two thirds between the years, 1990 – 2015 and combating HIV/AIDS, malaria and other infections. In 2008, four diseases; AIDS, pneumonia, diarrhea and malaria accounted for 43% of all deaths of children under five (UN, 2010). EBF among HIV positive mothers will contribute to reduction of new infant infection with HIV and a decrease in infant morbidity and mortality due to malnutrition and diarrhea. ERF should be Acceptable, Feasible, Affordable, Sustainable and Safe (AFASS). Since there is a risk of non-compliance to AFASS in ERF in developing countries, EBF remains the safest option for HIV exposed infants.

The aim of this study was to determine the factors which influence the adherence to EBF by HIV positive mothers attending Child Welfare Clinic (CWC) at Pumwani Maternity Hospital. Pumwani Maternity hospital is the oldest and the largest maternity hospital in Kenya and serves mothers with varied socio-economic characteristics and especially
those from the surrounding low income areas like Eastleigh, Muthurwa, Majengo and Mathare. It is also a referral hospital with a Comprehensive Care Centre (CCC) for HIV positive clients next to the Maternal and Child Health (MCH) clinic. Thus the HIV positive mothers can use this facility. Therefore, this study will inform healthcare workers and policy makers on the best approach to promote adherence to EBF to prevent HIV infection among infants born to HIV positive mothers.

1.3 Research Questions

1. What are the proportions of HIV positive mothers practicing EBF?

2. What are the demographic and socio-economic factors that influence adherence to EBF among HIV positive mothers?

3. How does level of knowledge and attitudes about EBF among HIV positive mothers influence adherence?

4. What are the health facility related factors influencing adherence to exclusive breast feeding among HIV positive mothers?

1.4 Null Hypotheses

1. Demographic and socio-economic factors do not influence adherence to EBF among HIV positive mothers attending CWC at Pumwani Maternity Hospital.

2. Maternal knowledge and attitudes on EBF do not influence adherence among HIV positive mothers attending CWC at Pumwani Maternity Hospital.

3. Health facility related factors do not influence adherence to EBF among HIV positive mothers attending CWC at Pumwani Maternity Hospital.
1.5 Main objective

The overall aim of the study was to determine the factors influencing adherence to EBF among HIV positive mothers attending CWC at Pumwani Maternity Hospital, Nairobi.

1.5.1 Specific objectives

1. To determine the proportion of HIV positive mothers practicing EBF
2. To identify the demographic and socio-economic factors that influence adherence to EBF among HIV positive mothers
3. To determine how level of knowledge and attitudes influence adherence to EBF among HIV positive mothers
4. To identify health facility related factors influencing adherence to EBF among HIV positive mothers

1.6 Limitations and Delimitations

Limitations: Since the study approach depended on self reported infant feeding practices, some participants may not have disclosed the right information. They may have been recall bias since the mothers had to answer questions relating to events that occurred more than 6 months prior to the study. Health workers may have given biased information by avoiding any comments that would reflect poor service delivery on their side.

Delimitations: Accessing patient records and registers was not difficult in the health facility as earlier anticipated. The sample size was small due to the small number of HIV positive mothers at the facility. However, FGDs and KIIIs were employed to supplement for the small sample.
1.7 Assumptions

The assumption of this study was that the respondents gave information that was true based on their knowledge.

1.8 Conceptual Framework on adherence to EBF

Several factors play a role in influencing adherence to exclusive breast feeding among HIV positive women. Demographic and socio-economic factors, maternal knowledge and attitudes towards MTCT, PMTCT, benefits of EBF, and other feeding options. In addition are the health facility related factors. These determine which infant feeding option an HIV positive mother will settle for as the best for her situation. If she settles to practice EBF and adheres to this method, her infant will enjoy good nutritional status, reduced infant HIV infection, reduced morbidity and mortality (WHO, 2010a). This is summarized in Figure 1.1 below.
Figure 1.1 Conceptual framework on adherence to EBF

Source: Constructed from literature
CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter highlights the literature supporting the study. It gives a detailed account of the problem of HIV transmission in children. It discusses infant feeding practices in the context of HIV using reports and previous studies.

2.1 The magnitude of HIV infection in children

Globally, the estimated number of children below 15 years of age living with HIV increased from 1.6 million [1.4–2.1 million] in 2001 to 2.5 million in 2009 (UNAIDS, 2010). Almost 90% of these children live in sub-Saharan Africa. In 2008, 280 000 children died of AIDS globally (WHO, 2010a; WHO, 2010b). As access to PMTCT services of HIV has increased, the total number of children being born with HIV has decreased. UNAIDS (2010) reported an estimated 370 000 children were newly infected with HIV globally in 2009; a 24% drop from five years earlier. It is reported that over 90% the new infections of HIV are acquired through MTCT (WHO, 2010a; WHO, 2010b).

In 2008, an estimated 1.4 million pregnant women living with HIV in low- and middle-income countries gave birth. Sub-Saharan Africa accounted for 91% of all pregnant women living with HIV, of whom about 70% were concentrated in Eastern and Southern Africa (WHO, UNAIDS &UNICEF, 2009). This explains the high number of children exposed to HIV in sub-Saharan Africa. This region remains heavily burdened by the HIV/AIDS scourge due to limited resources and dependency on donor funding to curb
the spread of HIV/AIDS. According to NASCOP (2009), nearly 1 out of 10 pregnant women in Kenya are infected with HIV (9.6 %) with minimal differences by urban and rural residence.

PMTCT is a highly effective intervention and has huge potential to improve both maternal and child health. WHO (2010a) and WHO (2010b) states that the rate of MTCT in the absence of preventive interventions ranges from 20% to 45%. With specific interventions in non-breastfeeding populations, the risk of MTCT can be reduced to less than 2%, and to 5% or less in breastfeeding populations. UNICEF (2011) and Coutsoudis (2005), states that the risk of MTCT of HIV through breast feeding is 1% and 0.78% per month of breast feeding and therefore the cumulative risk of transmission is approximately 6% and 4% every 6 months of breastfeeding respectively.

2.2 Mother to Child Transmission of HIV

HIV infection transmitted from an HIV-infected mother to her child during pregnancy, labour, delivery or breastfeeding is known as MTCT (WHO, 2010a; WHO, 2010b). As a mode of transmission, MTCT accounts for more than 10% of all new HIV infections globally. In the absence of interventions, the risk of MTCT is 20-45%, with the highest rates in populations with prolonged breastfeeding.

De Cock et al., (2000) suggest the rate of MTCT without intervention during; pregnancy 5-10%, labour and delivery 10 – 15% and breastfeeding 5- 20%. WHO (2006) indicated that, MTCT rates based on infant feeding options without intervention as follows; breastfeeding for 18-24 months (35%), breastfeeding for 6 months (30%) and
replacement feeding (20%). This showed that there is no significant difference on the rate of HIV transmission between infants who are breastfed and those on ERF. The rate of transmission can be reduced by introduction of interventions to prevent MTCT.

2.3 Risk factors for MTCT through breastfeeding

Infant feeding is complex in the context of HIV because of the major influence that feeding practices has on child survival. It is a dilemma to balance the risk of infants acquiring HIV through breast milk with the higher risk of death from causes other than HIV, in particular malnutrition and serious illnesses such as diarrhoea, among non-breastfed infants (Bahl et al., 2005; WHO, 2000).

There are several factors that are associated with an increased risk of MTCT through breastfeeding. Although breastfeeding, relative to replacement feeding, carries an increased risk for MTCT of HIV, this risk is influenced by many factors, including duration and pattern of breastfeeding, and maternal breast health and immunological status (Coutsoudis, 2005). She further states that there is evidence that in developing countries replacement feeding is associated with an increased risk for infant mortality, and modeling exercises suggest that 6 months of breastfeeding may entail less risk than replacement feeding for many HIV-infected women.

Prolonged duration of breastfeeding has been associated with increased risk for MTCT due to prolonged exposure (WHO, 2010a; WHO, 2010b). This can be due to conditions that lead to loss of integrity of the Gastro-Intestinal Tract (GIT) of the infant like oral thrush and diarrhea predispose the infant to HIV infection. In addition, conditions
affecting the mother’s immunity contributing to low CD4 count hence high HIV viral load and inflammatory conditions such as mastitis, fissures and breast abscesses increase the risk of MTCT through breastfeeding. Infant feeding patterns like mixed feeding has been found to increase the risk of MTCT compared to EBF (UNICEF, 2011).

2.4 Prevention of Mother to Child Transmission of HIV

To prevent the transmission of HIV from mother to child, WHO (2010b) promotes a comprehensive strategic approach that includes the following four components. Firstly, primary prevention of HIV infection among women of childbearing age to reduce the number of women of reproductive age infected with HIV. Secondly, prevention of unintended pregnancies among women living with HIV to reduce the number of children infected with HIV antenatally, perinatally and postnatally. Thirdly, prevention of HIV transmission from HIV infected woman to her infant during pregnancy, labour and during breast feeding. And lastly, provision of appropriate treatment, care and support to mothers living with HIV and their children and families. PMTCT can be achieved through Voluntary Counseling and Testing (VCT), use of antiretroviral drugs, safer delivery practices and the implementation of safer feeding practices. This study focuses on the PMTCT through safer infant feeding practices.

2.5 Guidelines for infant feeding for HIV positive mothers

The most appropriate infant feeding option for an HIV-infected mother depends on her individual circumstances, including her health status and the local situation, but should take consideration of the health services available and the counseling and support she is likely to receive. WHO, UNICEF, UNFPA and UNAIDS (2007), recommends that HIV-
infected mothers EBF their infants for the first six months of life unless ERF is acceptable, feasible, affordable, sustainable and safe (AFASS) for them and their infants before that time. In particular, evidence has been reported that antiretroviral (ARV) interventions to either the HIV-infected mother or HIV-exposed infant can significantly reduce the risk of postnatal transmission of HIV through breastfeeding (WHO, 2010a). All breastfeeding should stop once a nutritionally adequate and safe diet without breast milk can be provided.

According to MOPHS (2009), all mothers who are HIV negative or are of unknown status should be encouraged and supported to EBF for the first 6 months and continue breastfeeding with appropriate complementary feeds introduced thereafter. All HIV positive mothers should be given information on available infant feeding options and counseled using recent scientific info on benefits and challenges of each option in order to help them make an informed choice.

All HIV positive mothers who choose to breastfeed should be encouraged and supported to EBF for the first 6 months and continue breastfeeding with appropriate complementary feeds introduced thereafter. Infants of these mothers should be started on NVP prophylaxis from birth and continued through the duration of breastfeeding and stopped one week after completed cessation of breastfeeding. The breast milk can be made safer by heat treatment to denature HIV viruses (MOPHS, 2009).
HIV positive women who meet the AFASS criteria and choose not to breastfeed should be counselled and supported to practice ERF for 6 months and appropriate complementary feeds introduced thereafter. NVP prophylaxis should be given from birth to 6 weeks. In special circumstances determined by a clinician involving infants who cannot breastfeed, e.g. orphans or abandoned babies or where the mother has conditions like mastitis preventing breastfeeding, the infant should be provided with ERF with appropriate complementary feeds introduced thereafter.

### 2.6 Exclusive Breast feeding for PMTCT

A breastfeeding infant to a HIV positive mother remains at risk of acquiring HIV infection throughout the breast feeding period (WHO, 2006). Despite the continued debate on the safety of breast feeding among HIV positive women, there is evidence that EBF indeed decreases the chances of HIV infection in exposed infants. In the developing world, EBF is the best option geared at prevention of HIV transmission and early mortality due to malnutrition and diarrheal conditions due to unsafe water use and poor sanitation in the preparation of replacement feeds. For this reason, HIV positive mothers in resource constrained areas are advised to practice EBF under the prophylaxis of ARV during this period. This is to lower the chances of transmitting HIV to the infant by reducing the viral load of the mother and promoting optimum health of the mother during this period (WHO, 2010b).

In addition, breast milk can be made safe by use of heat treatment of expressed breast milk (EBM) in times when the mother is sick to avoid risks of transmission of HIV when the viral load is high. This is also applicable when she is experiencing breast problems or
transitioning from breastfeeding to replacement feeding (NASCOP, 2010). Heat-treating of EBM to kill the HIV virus can be done by boiling the milk for 1-2 seconds (up to the point of forming) and cooling it precipitously. This is easier and better because there is less denaturation of the proteins including anti-infectious factors than in pasteurisation. The other method is called Holder’s pasteurisation which involves heating the milk to 56°C for 30 minutes.

The breast milk is rich in nutrients and immunological properties which ensure that the infant grows well. It contains non-immune, pre-immune, and immune factors that may alter the infectivity of milk, and therefore the risk of HIV-1 transmission via breastfeeding (Kourtis, Butera, Ibegbu, Belec & Duerr, 2003). Mixed feeding is highly discouraged because it predisposes the infant to increased chances of contracting HIV. In addition, mixed feeding contributes to malnutrition and frequent morbidity and increased mortality due to childhood diseases (WHO, 2010a).

2.7 Barriers to EBF among HIV positive mother

There are several barriers which hinder EBF of infants born to HIV positive mothers. A study in India showed socio-demographic variables like maternal education, paternal education & socioeconomic status has positive association for influencing decision on exclusive breastfeeding (Chudasama et al., 2009). In Botswana, Shapiro et al., (2003) found that none of the women who chose to practice exclusive breast feeding adhered to the recommended practice. This was due to local infant feeding practices and the fear to disclose their HIV status since in Botswana people living with HIV/AIDS are highly stigmatized. HIV-positive mothers fed their infants less favourably than mothers in the
general population, with potentially detrimental effects both on the child's nutrition and on the risk of HIV transmission (Fadnes et al., 2009).

In a study in Hong Kong, mothers who chose and initiate breast feeding, spousal support during the course of behavioural change increases self-efficacy, confidence and competence particularly in the early stages of parenting (Ku & Chow, 2010). Single mothers are often considered deviant in Hong Kong society and have to deal with multiple life stressors that make them less committed to breastfeeding. In addition, Ku & Chow (2010) stated that having a domestic helper was associated with higher socio-economic status and a higher rate of practising exclusive breastfeeding since the domestic helper assisted with housework thus allowing the mother to concentrate on baby care and nursing.

In Tanzania, pressure by family members to introduce food to infants early and factors related to individual circumstances such as returning to work, maternal health, or an inadequate supply of breast milk are the barriers to exclusive breast feeding by HIV positive mothers (Burke, 2004). Capacity to breast-feed exclusively for HIV-positive women may also be reduced if they are symptomatic and sick. A cross-sectional survey on infant feeding practices performed in Mbale District, Eastern Uganda in 2003, found that breast feeding was practiced at a very high rate, however, the use of prelacteal feeding and early introduction of other food items was the norm (Engebretsen et al., 2007). In addition to breast milk, older women in Burkina Faso encourage younger mothers to comply with the tradition of feeding their infants with small portions of herbal
tea to clean the digestive system (Hofmann, De Allegri, Sarker, Sanonc & Böhlerd, 2009).

In a study in Ethiopia, Maru and Haidar (2009) demonstrated the major predictors for making safer choice of infant feeding options ranged from maternal attributes such as mode of delivery, positive attitudes towards infant feedings, disclosure of HIV status to spouse, household income and infant illness. Furthermore, the risks involved in each infant feeding option should be communicated to the mother/father during PMTCT to make informed safer choices. They further stated that advocacy work on the options of feeding and involving spouses in every health and nutrition education session to help mothers choose safer infant feeding options is very important.

Well trained and supportive health care workers can positively influence mothers to EBF their infants. A Health facility which is accessible and affordable with user friendly services promote good health practices like EBF and it encourages clients to utilize services like PMTCT. PMTCT programs have to be tailored with great consideration of the local socio-cultural practices. A study in Uganda found that underlying socio-cultural mechanisms to the recommended infant feeding practices in the communities were not addressed to a larger extent among program implementers (Engebretsen et al., 2010) thus the poor adherence to EBF.
CHAPTER THREE: MATERIALS AND METHODS

3.0 Introduction

This chapter explains the research methodology; the research design, development of research instruments, data collection, analysis and reporting.

3.1 Study Design

This was a descriptive cross-sectional study. The study design employed both quantitative approaches through the use of an interviewer – administered questionnaire and qualitative approach through the use of Key Informant Interview (KII) guides and Focused Group Discussions (FGDs).

3.2 Study Variables

The independent variables were demographic and socio-economic characteristics, knowledge and attitudes of the HIV positive mothers towards EBF, and health facility factors. The dependent variables were levels of adherence to exclusive breast feeding which was measured by feeding the infant with breast milk only for the first 6 months of life with no additional fluids or liquids with an exception of prescribed medicine.

3.3 Study Area

The study was conducted at Pumwani Maternity Hospital, Nairobi. It is the oldest and largest maternity hospital in Kenya with an approximated 70 deliveries per day. The hospital was established by Nairobi City Council and begun operations in 1926. It is located in Pumwani division, Kamukunji constituency, Nairobi County. This facility was purposively selected because it is surrounded by the low-income residential areas of
Eastleigh, Mathare, Muthurwa, and Majengo. The hospital also serves clients with varied cross-cultural and socio-economic characteristics that enriched the study results. This enabled the researcher to make comparisons of the demographic and socio-economic factors influencing adherence to EBF by HIV positive mothers. It is also a referral hospital with a Comprehensive Care Centre (CCC) for HIV positive clients next to the MCH clinic. Thus the HIV positive mothers can use this facility.

3.4 Target Population

The study targeted HIV positive mothers attending CWC at Pumwani maternity Hospital with infants above 6 – 12 months of age.

3.5 Study Population

The study population constituted HIV positive mothers attending CWC.

3.6 Research Instruments

A combination of data collection tools were used to gather the information in the study. Semi-structured questionnaires were administered by an interviewer to the study participants. Key Informants and Focused Group Discussions guides were used to interview key informants and FGD participants respectively as shown in Appendices; II, III and IV.

3.7 Sampling Techniques and Sample Size

**Sampling Techniques**

The study participants were sampled into the study using purposive sampling technique. The number of HIV positive mothers anticipated to attend the clinic was not known.
Therefore, every mother was sampled into the study if she met the inclusion criteria and gave consent. This was done until the sample size of 188 HIV positive mothers with infants aged above 6 to 12 months was achieved. The available health facility workers who met the inclusion criteria were sampled into the study; 1 Clinical Officer, 4 Nurses and 1 nutritionist. They served as Key Informants. The 2 FGDs conducted in the community surrounding the hospital composed of 10 participants who were peer counsellors, Community Health Workers (CHW) religious and community opinion leaders.

Sample Size

The desired sample was obtained using the formula by Fisher et al., (1998) as cited in Kothari (2004).

\[ n = \frac{z^2pq}{d^2} \]

Where:  
- \( n \) = desired minimal sample population (where population is greater than 10,000)
- \( z \) = standard normal deviate which is 1.96 at 95% confidence level.
- \( p \) = proportion of the target population estimated to have a particular characteristic being measured.
- \( d \) = degree of accuracy
- \( q \) = 1-\( p \)
In this case was estimated to be 0.11 of women of reproductive age with HIV in Nairobi (KNBS & ICF Macro, 2010)

$q = 1 - 0.11 = 0.89$

Thus 

\[ n = \frac{1.96^2 \times 0.11 \times 0.89}{0.05^2} = 150.437 \]

Therefore the minimum sample size required for the study was 150. Since the study involved regression to control for confounding effects, regression adjustment of the sample size was done using a typical inflation factor; 1.25 i.e. 

\[ n = 150.437 \times 1.25 = 188. \]

Key informants were drawn from the selected health facility; 1 Clinical Officers, 4 nurses, and 1 nutritionist. Two FGDs each with 10 participants comprising; peer counsellors, CHW, religious and community were conducted.

3.8 Inclusion/Exclusion Criteria

**Inclusion:** Mothers who were diagnosed of HIV antenatally, had infants aged above 6 to 12 months and consented to the study. Health workers who had worked for at least 6 months at the facility and were directly providing therapeutic or/ and supportive care to the HIV positive mothers.

**Exclusion:** Mothers who were too sick to participate and those who were mentally ill.

3.9 Pre-test of Instruments

The research instruments were pre-tested at Babadogo Health Centre. It offers similar services like the Pumwani Maternity Hospital and receives a similar kind of clients. It was done to ensure the validity and reliability of the data collection tools. The exercise
was used to make corrections, clarifications, suggestions and highlight omissions to improve the research instruments

**Validity:** Validity of the research instruments was ensured through the use of a well–designed questionnaire. A pre-test study was done to check on the accuracy of the questionnaire so that the answers obtained from the study were true and accurate. The research instruments, questionnaires and interview schedules were also presented to the experts in the School of Public Health for their input.

**Reliability:** The research instruments were designed to ensure that consistent results were achieved. Reliability was also ensured through selection and training of research assistants, engaging them in the pre-test study and supervising them during the data collection process. Data checking and cleaning was done simultaneously during data collection. At the end of every field day, data was checked for completeness and consistency.

### 3.10 Data Collection Techniques

Data collection was carried out using interviewer administered semi-structured questionnaires by the researcher and trained research assistants. The questionnaire was used to collect data from the HIV positive mothers. The FGDs at the community were conducted using an FGD guide. Key informants at the health facility were interviewed using key informant interview guide.

### 3.11 Data Analysis

The completed questionnaires were coded by the researcher and entered into Statistical Packages for Social Sciences (SPSS) version 17.0 software for analysis. Descriptive
statistics ( Frequencies) were generated and cross tabulation (Chi-Square and Fischer’s exact tests) was done for relationships of variables. Logistic regression was done to assess the effect of various explanatory variables on adherence to EBF among HIV positive mothers. Results were considered significant with P-values of less than 0.05 at 95% Confidence Interval (C.I.). The results of the study were presented in tables, graphs, charts, figures and narration for further descriptions and interpretation. The recordings of the FGDs and KII were first transcribed and main concepts identified. The qualitative data was triangulated with the quantitative data to enhance validity and reliability of the study findings.

3.12 Logistical and Ethical Considerations

Permission to carry out study was sought from Kenyatta University – Ethics Review Committee (KUERC) (Appendix VII), National Council for Science and Technology (NCST) (Appendix VI) and Pumwani Maternity Hospital (Appendix VIII). Informed consent was obtained from the study participants. Confidentiality and anonymity was maintained by not using names of the study participants or any form of identification in the research instruments.
CHAPTER FOUR: RESULTS, DATA ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter deals with the interpretation and explanation of the findings of the study with regard to the stated objectives and research questions. The aim of this analysis was to determine the factors that affect adherence to exclusive breast feeding among HIV positive mothers at Pumwani Maternity Hospital. A descriptive cross-sectional study design was used in the study.

4.2 Demographic and socio economic characteristics of the respondents

A total of 188 HIV positive mothers were interviewed during the study. Those mothers who exclusively breastfed were 69.1%, while those who did not were 30.9%. Those who did not EBF dropped out as follows; at 1\textsuperscript{st} month (6), 2\textsuperscript{nd} month (9), 3\textsuperscript{rd} month (15), 4\textsuperscript{th} month (13), and 5\textsuperscript{th} month (15). Information was sort on age, level of education and marital status. The summary of socio-demographic and economic characteristics of the respondents is shown on Table 4.1. The distribution per age in years of the respondents was as follows; 88.8% were between 15 – 34 years and 11.2% were above 35 years in age. Most of the interviewed mothers had attained post primary education (58.5%) while those with primary education were 41.5%. The majority of the respondents reported to be married (79.8%), while those who were not married were 20.2%.

Majority of the respondents were unemployed (69.7%) while only 30.3% of the respondents reported to have a source of income. The mothers who reported to be the main bread winners were 13.3 % while those who had a husband, relative or other person as the breadwinner were 86.7%. Only 9.6% of the mothers interviewed reported to have
missed food for more than one day in the past 6 months while 90.4% did not. Majority of the mothers interviewed (84%) did not have household assistance while only 16% of them reported having a house-help or a relative assisting with household chores/baby care.

**Table 4.1: Demographic and socio-economic characteristics of respondents**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (n = 188)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age of respondent in years</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 – 34</td>
<td>167</td>
<td>88.8</td>
</tr>
<tr>
<td>&gt;35</td>
<td>21</td>
<td>11.2</td>
</tr>
<tr>
<td><strong>Level of Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>78</td>
<td>41.5</td>
</tr>
<tr>
<td>Post Primary</td>
<td>110</td>
<td>58.5</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>150</td>
<td>79.8</td>
</tr>
<tr>
<td>Not Married</td>
<td>38</td>
<td>20.2</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>57</td>
<td>30.3</td>
</tr>
<tr>
<td>Unemployed</td>
<td>131</td>
<td>69.7</td>
</tr>
<tr>
<td><strong>Main Breadwinner</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self</td>
<td>25</td>
<td>13.3</td>
</tr>
<tr>
<td>Other</td>
<td>163</td>
<td>86.7</td>
</tr>
<tr>
<td><strong>Food availability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>18</td>
<td>9.6</td>
</tr>
<tr>
<td>No</td>
<td>170</td>
<td>90.4</td>
</tr>
<tr>
<td><strong>Availability of House-help</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>30</td>
<td>16</td>
</tr>
<tr>
<td>No</td>
<td>158</td>
<td>84</td>
</tr>
</tbody>
</table>

4.3 Antenatal, Delivery and Postnatal History

4.3.1 Antenatal visits by the respondents

Antenatal care (ANC) is essential in PMTCT. A total of 63.3% of the women reported to have attended at least the 4 recommended antenatal visits while 36.7% attended less than 4 antenatal visits during pregnancy (Table 4.2).
Table 4.2: Antenatal, Delivery and Postnatal History

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (n = 188)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANC visits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;4</td>
<td>69</td>
<td>36.7</td>
</tr>
<tr>
<td>≥4</td>
<td>119</td>
<td>63.3</td>
</tr>
<tr>
<td>HIV diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before pregnancy</td>
<td>65</td>
<td>34.6</td>
</tr>
<tr>
<td>During pregnancy</td>
<td>123</td>
<td>65.4</td>
</tr>
<tr>
<td>Place of delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home</td>
<td>5</td>
<td>2.7</td>
</tr>
<tr>
<td>Health Facility</td>
<td>183</td>
<td>97.3</td>
</tr>
<tr>
<td>Mode of delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spontaneous Vertex Delivery</td>
<td>168</td>
<td>89.4</td>
</tr>
<tr>
<td>Caesarean Section</td>
<td>20</td>
<td>10.6</td>
</tr>
<tr>
<td>Mother currently on ARVs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>76</td>
<td>59.6</td>
</tr>
<tr>
<td>No</td>
<td>112</td>
<td>40.4</td>
</tr>
<tr>
<td>Infant currently on ARVs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>138</td>
<td>73.4</td>
</tr>
<tr>
<td>No</td>
<td>50</td>
<td>26.6</td>
</tr>
</tbody>
</table>

A total of 65% of the women interviewed reported that they were diagnosed with HIV during pregnancy compared to the 34.6% who were diagnosed before pregnancy. This show that majority of the women got to know their status during pregnancy through Provider Initiated Testing and Counselling (PITC) of HIV. Only 2.7% of the women reported to have delivered at home while 97.3% delivered in hospital. This showed that HIV positive mothers know the importance of hospital delivery for safe delivery and PMTCT. The mothers who delivered through spontaneous vertex delivery were 89.4%, while only 10.6% delivered through caesarean section. A total of 40.6% of the mothers reported to be using ARVs during the postnatal period. However a higher number of children were on ARVs (73.4 %) as shown in Table 4.2.
4.3.2 Accessibility of health facility

Some of the mothers reported to have had problems accessing the health facility. As shown Figure 4.1, those who found the health facility to be far were 19.7% and those who lacked transport and lacked money for ANC services were 6.9% and 3.7% respectively.

![Accessibility problems chart](chart.png)

**Figure 4.1: Factors hindering access to health facility**

4.3.3 Breast feeding history

Majority of the mothers (67.4%) started breast feeding within 1 hour after delivery. Those who reported to have initiated breast feeding after 1 hour were 32.6% as shown in Figure 4.2.
A total of 17.6% of the mothers reported to have had less production of milk. Breast engorgement and cracked nipples was also experienced by 7.4% and 6.9% of the mothers respectively. Only 2.7% of the mothers reported to have suffered mastitis (Figure 4.3).

Perceived inadequate supply of breast milk is a barrier to exclusive breast feeding by HIV positive mothers (Burke, 2004). Inflammatory conditions such as mastitis, fissures and breast abscesses increase the risk of MTCT through breastfeeding (WHO, 2010b).
Therefore, mothers should be advised to seek immediate medical attention when they experience any breast problems during breast feeding.

4.4 Knowledge and attitude on HIV by respondents

4.4.1 Knowledge on MTCT of HIV

Mothers were asked if a mother with HIV can transmit the HIV virus to the infant. A total of 87.7% of the mothers said that a mother can transmit the HIV virus to the infant, while 12.2% did not know (Figure 4.4). It is important for an HIV positive mother to know that she can transmit HIV to her infant during pregnancy, delivery or breast feeding for her to take the necessary PMTCT interventions.

![Figure 4.4: Knowledge on MTCT of HIV](image)

Mothers were further asked to identify when they could transmit the AIDS virus to the baby. A total of 91.5% said, during breast feeding, while 53.3% thought it was during delivery. Those who believed transmission occurred during pregnancy were 33.9%. This
is illustrated in Figure 4.5. A study in Uganda found that maternal knowledge on MTCT of HIV during pregnancy was 60%, delivery (85%) and breast feeding (89%) (Byamugisha et al., 2010). The difference on the level of knowledge could be due to the content taught at ANC in the different settings. However, there are similarities on knowledge on transmission during breast feeding. This could suggest that there is emphasis on transmission during health education within the facility or other media that the mothers access HIV information.

![Knowledge on MTCT of HIV](image)

**Figure 4.5 Knowledge on when MTCT of HIV occurs**

### 4.4.2 Information given to respondents in ANC and PNC

The mothers were asked what they were taught during the antenatal and postnatal visits. Exclusive breastfeeding was mentioned by 93.6% of the mothers followed by use of ART by the mother to reduce viral load at 71%. The least (23.9%) mentioned that they were taught exclusive replacement feeding for the infant for 6 months. (Table 4.3)
Table 4.3 Information shared with respondent at ANC and PNC

<table>
<thead>
<tr>
<th>Information shared at ANC and PNC</th>
<th>Taught n (%)</th>
<th>Not Taught n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusive Breast Feeding</td>
<td>176 (93.6)</td>
<td>12 (6.4)</td>
</tr>
<tr>
<td>Exclusive Replacement Feeding</td>
<td>45 (23.9)</td>
<td>143 (76.1)</td>
</tr>
<tr>
<td>Well balanced complementary feeds</td>
<td>115 (61.2)</td>
<td>73 (38.8)</td>
</tr>
<tr>
<td>Use of ART for the mother</td>
<td>132 (70.2)</td>
<td>56 (29.8)</td>
</tr>
<tr>
<td>Use of ARV prophylaxis for infant</td>
<td>108 (57.4)</td>
<td>80 (42.6)</td>
</tr>
</tbody>
</table>

### 4.4.3 Influence on infant feeding practices

In total, 164 of the mothers reported to have been influenced on infant feeding option by somebody; health workers (70.8%), own mother (23.8%), other relative (12.3%), husband (11.5%), peer counselor (6.9%) and mother in-law (0.8%) as shown in Figure 4.6.

![Figure 4.6: Influence on infant feeding practices](chart.png)
Therefore, it is important for health workers to give quality counseling to clients since they influence infant feeding practices the most. Studies have shown that mothers adhered to EBF when well counseled by health workers (Bland et al., 2008; Chopra, Doherty, Jackson & Ashworth, 2005). Health workers must be well trained in the latest PMTCT guidelines and health facility adequately staffed for quality counseling to be possible.

4.4.4 Disclosure of HIV status by respondent

The mothers were asked to name all those they disclosed their HIV status to. The findings showed that 81.8% mothers disclosed their HIV status to their husband (Figure 4.7). This was followed by those who disclosed to relatives at 31.5% and 26.1% to other people. From these findings friends are the least trusted for support at 5.5%. The acknowledgement of the importance of partner involvement in PMTCT programmes has led to a strong call for partner disclosure (Moland et al., 2010).

![Figure 4.7: HIV status disclosure by respondent](image-url)
4.5 Factors influencing adherence to EBF among HIV positive mothers

4.5.1 Demographic and socio-economic factors of the respondents and EBF

The study findings showed that age, level of education, marital status and employment had no influence on adherence to exclusive breast feeding.

**Table 4.4 Demographic and socio-economic factors of the respondents and EBF**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non-EBF (n=58) n (%)</th>
<th>EBF (n=130) n (%)</th>
<th>$\chi^2$ (df)</th>
<th>OR</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of respondent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 – 24</td>
<td>15 (30.6)</td>
<td>34 (69.4)</td>
<td>0.002(1)</td>
<td>0.985</td>
<td>0.485 – 1.995</td>
<td>0.966</td>
</tr>
<tr>
<td>≥ 25</td>
<td>43 (30.9)</td>
<td>96 (69.1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>30 (38.5)</td>
<td>48 (61.5)</td>
<td>3.619(1)</td>
<td>1.830</td>
<td>0.979 – 3.424</td>
<td>0.057</td>
</tr>
<tr>
<td>Post Primary</td>
<td>28(25.5)</td>
<td>82 (74.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>44 (29.3)</td>
<td>106 (70.7)</td>
<td>0.801(1)</td>
<td>0.712</td>
<td>0.337 – 1.502</td>
<td>0.371</td>
</tr>
<tr>
<td>Not Married</td>
<td>14 (36.8)</td>
<td>24 (63.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>16 (32.7)</td>
<td>33 (67.3)</td>
<td>0.101(1)</td>
<td>1.120</td>
<td>0.557 – 2.251</td>
<td>0.751</td>
</tr>
<tr>
<td>Unemployed</td>
<td>42 (30.2)</td>
<td>97 (69.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Breadwinner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self</td>
<td>14 (56.0)</td>
<td>11 (44.0)</td>
<td>8.549(1)</td>
<td>3.442</td>
<td>1.454 – 8.151</td>
<td>0.003*</td>
</tr>
<tr>
<td>Other</td>
<td>44 (27.0)</td>
<td>119 (73.0)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant relationship

The study findings however, showed that those mothers who were not the main breadwinners were likely to adhere to EBF at 73%. There was significant relationship between having a bread winner and adherence to EBF (OR=3.442, 95% CI: 1.454 – 8.151, p = 0.003) as shown in Table 4.4. This was also captured from the FGD where a
participant had this to say, “*EBF is difficult in this community especially if the mother is a bread winner. This applies to both HIV positive and negative mothers. Therefore you will find that the infants are introduced to other foods before they are 6 months old. This is because the infants are left behind with someone who will feed them with other food. If you look closely, despite the teaching on EBF, mixed feeding is introduced as early as 4 months.*”

Another participant noted that, “*Mixed feeding starts as early as 3 weeks or less, especially if the mother is the bread winner. Once she feels she has regained her strength, she starts mixed feeding so that she can go to work.*”

A mother whose household had not stayed without food for more than a day in the past 6 months was likely to adhere to EBF (p = <0.001). Hundred percent of the mothers who missed food for more than a day in 6 months did not exclusively breast feed compared to 23.5% who did not adhere in the group that did not report missing food. This was also cited in an FGD where a participant stated, “*Poverty is a big hindrance here. In this community everyone works in order to get something to eat including breast feeding mothers. Therefore the breast feeding mothers leave their babies behind with food to be fed to them when they go to work. They do not understand anything about expressed breast milk for feeding the baby while she is away. Another issue is many of them say they do not have enough milk and this is because they do not eat well. This makes them unable to EBF for 6 months, it is not their fault; poverty is to blame. They know very well about EBF, because they are taught at the clinics and when they deliver in hospital, but they say it is impossible to practice.*”
4.5.2 Influence of Health facility related factors on EBF

The study findings showed that attendance to ANC for more than 4 times was not significant to adherence to EBF ($\chi^2 = 3.503$, df = 1, $p = 0.061$) as shown in Table 4.5. However, 73.9% of the mothers who attended at least 4 ANC visits practiced EBF compared to 60.9% who went for less than 4 visits. According to Focused Antenatal Care (FANC), every expectant mother is expected to attend ANC for at least 4 visits before delivery.

Table 4.5 Influence of health facility related factors on EBF

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non-EBF (n=58)</th>
<th>EBF (n=130)</th>
<th>$\chi^2$ (df)</th>
<th>OR</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANC Clinic visits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 4</td>
<td>27 (39.1)</td>
<td>42 (60.9)</td>
<td>3.503(1)</td>
<td>1.825</td>
<td>0.969-3.438</td>
<td>0.061</td>
</tr>
<tr>
<td>≥ 4</td>
<td>31 (26.1)</td>
<td>88 (73.9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respondents on ARVs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>14 (18.4)</td>
<td>62 (81.6)</td>
<td>9.239(1)</td>
<td>0.349</td>
<td>0.175-0.698</td>
<td>0.002*</td>
</tr>
<tr>
<td>No</td>
<td>44 (39.3)</td>
<td>68 (60.7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of transport</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>8 (61.5)</td>
<td>5(38.5)</td>
<td>6.165(1)</td>
<td>4.00</td>
<td>1.248-12.817</td>
<td>0.013*</td>
</tr>
<tr>
<td>No</td>
<td>50(28.6)</td>
<td>125(71.4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant relationship

The mothers who reported to be on ARVs were likely to adhere to EBF at 81.6% compared those who were not on ARVs whose adherence was at 60.7% (Table 4.5).

There was a significant relationship between mother being on ARVs in the postnatal period and adherence to EBF ($\chi^2 = 9.239$, df = 1, $p = 0.002$). In study in Rwanda, Peltier and colleagues (2009), found that mothers who were on HAART exclusively breastfed...
by 94.2%. This could be because of the perceived safety of breast milk due to lower HIV viral loads when a mother uses HAART (WHO, 2010a).

The mothers who reported to have lacked transport to attend clinic were likely not to adhere to EBF by 72.7% ($\chi^2 = 6.165, df = 1, p = 0.013$) as shown in Table 4.5. This was also captured from a Key informant who said, “Mother may fail to attend clinic consecutively because of lack of transport especially for those who live far thus they miss their visits. We have been experiencing such cases.” However, long distance to clinic ($p = 0.816$) and lack of money for ANC services ($p = 0.483$) were not significant to EBF.

4.5.3 Influence of maternal knowledge and attitudes on EBF

The HIV positive mothers were asked if a mother who had HIV could transmit it to their babies. The findings showed that those mothers who had knowledge of MTCT were 77.6% likely to EBF compared to their counterparts (Table 4.6). There was a significant relationship between knowledge on MTCT and EBF ($p < 0.001$). This scenario could be explained by a Key informant who said, “Some mothers do not understand what they are taught. They do not ask questions to get issues clarified, so it becomes difficult to assist them, so we encourage them to open up and we also do individual sessions for them.”

Mothers who said they were taught about EBF antenatally and postnatally were likely to EBF (72.2%). In Table 4.6, the relationship between being taught on Exclusive Breast Feeding at ANC and PNC and exclusive breastfeeding was significant ($p = 0.002$).
Table 4.6 Influence of maternal knowledge and attitudes on EBF

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non-EBF (n=58)</th>
<th>EBF (n=130)</th>
<th>Fisher's Exact Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td></td>
</tr>
<tr>
<td>Knowledge on HIV MTCT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>37 (22.4)</td>
<td>128 (77.6)</td>
<td>p(&lt;0.001)*</td>
</tr>
<tr>
<td>No</td>
<td>21 (100.0)</td>
<td>0 (0.0)</td>
<td></td>
</tr>
<tr>
<td>Whether taught EBF at ANC and PNC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>49 (27.8)</td>
<td>127 (72.2)</td>
<td>p (0.002) *</td>
</tr>
<tr>
<td>No</td>
<td>9 (75.0)</td>
<td>3 (25.0)</td>
<td></td>
</tr>
<tr>
<td>Feeding of baby when mother was away for long hours</td>
<td>(n=11)</td>
<td>(n=22)</td>
<td></td>
</tr>
<tr>
<td>Express breast milk</td>
<td>4 (15.4)</td>
<td>22 (84.6)</td>
<td>p (&lt;0.001) *</td>
</tr>
<tr>
<td>Prepared food</td>
<td>7 (100.0)</td>
<td>0 (0.0)</td>
<td></td>
</tr>
</tbody>
</table>

Significant results

Several studies in other settings have shown that when exclusive breastfeeding advice is well defined and women understand the advice well, they succeed in following it (Bland et al., 2008; Chopra et al., 2005). A Ugandan study also found that adherence to EBF is favored by having knowledge of EBF as a method of PMTCT (Matovu et al., 2008).

Thirty three women said, they had to be away for long hours when their infants were below 6 months while the other 155 were always with their infants. The 33 mothers were then asked what they did when away from the baby for long hours. Expressing of breast milk to feed the baby when the mother was away for long hours influenced EBF among 84.6% participants. There was a significant relationship between expressing breast milk
and exclusive breast feeding ($p = <0.001$). However those mothers who prepared food to be fed to the baby while away for long hours did not practice EBF (Table 4.6). This was highlighted during a FGD when a participant said, “It is possible for a mother to express breast milk and the baby can be given later if she is determined. However, many mothers find it difficult to express breast milk because they find it unhygienic. We can’t afford the machine for expressing breast milk but I think it can work if mothers are trained how to express breast milk well.”

Disclosure of HIV status to husband ($\chi^2 = 7.206$, df = 1, $p = 0.007$) and relatives ($\chi^2 = 4.550$, df = 1, $p = 0.033$) was significant in relation to adherence to EBF. This showed that those who disclosed their HIV status to either their husbands or relatives were likely to exclusively breastfeed their infants. There was no significant relationship between disclosure to friends and EBF ($p = 0.059$). This is illustrated in Table 4.7.

As a consequence of stigma, women face a very difficult decision about whether to disclose their HIV status when they learn they are infected (Thairu et al., 2005). This also came out in the FGD as a participant stated that, “Disclosure is another problem. A mother gets tested at the clinic and when she learns she is HIV positive she won’t tell anyone even her husband. Since the father of the child was not counselled on PMTCT and is not aware of the status of the wife, he can give food to the child; other relatives like the mother in-law can do the same. Though they mean no harm in doing so, it is just because of ignorance. This makes the mothers lack support from the family members and especially the husband. Those mothers who join support groups are different because they are encouraged to disclose their status to the spouse”. 
Table 4.7 Influence of disclosure of HIV status on EBF

<table>
<thead>
<tr>
<th>Disclosure of HIV Status</th>
<th>Non-EBF (n=58)</th>
<th>EBF (n=130)</th>
<th>$\chi^2$ (df)</th>
<th>OR</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td></td>
<td></td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Husband</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>34 (25.2)</td>
<td>101 (74.8)</td>
<td>7.206(1)</td>
<td>2.458</td>
<td>1.263</td>
<td>4.785</td>
</tr>
<tr>
<td>No</td>
<td>24 (45.3)</td>
<td>29 (54.7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative(s)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10 (19.2)</td>
<td>42 (80.8)</td>
<td>4.550(1)</td>
<td>2.291</td>
<td>1.056</td>
<td>4.968</td>
</tr>
<tr>
<td>No</td>
<td>48 (35.3)</td>
<td>88 (64.7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant results

A nutritionist who has worked at the MCH clinic for 4 years also stated that, “There is a problem especially if the mother has not disclosed her status to her husband. If the baby cries, he will insist that the baby is given other foods. Lack of disclosure of HIV status to the husband makes it impossible for the mother to get support to exclusively breast feed, since once the husband feels the child is not getting enough from the breast then he’ll pressure the mother to give other foods”.
4.6 Multivariate Analysis

The variables which were significant in univariate analysis were further analyzed using logistic regression. The p-value for each variable was not significant. However, the OR from the multivariate analysis illustrated to what extent the variables influenced adherence to exclusive breast feeding among HIV positive women. This is shown in Table 4.8.

Table 4.8 Relationship between significant variables and EBF

<table>
<thead>
<tr>
<th>Variable</th>
<th>Std. Error</th>
<th>OR</th>
<th>95% C.I.</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lower</td>
<td>Upper</td>
<td></td>
</tr>
<tr>
<td>Main Breadwinner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.785</td>
<td>Ref</td>
<td>0.347</td>
<td>379.764</td>
</tr>
<tr>
<td>Yes</td>
<td>0.941</td>
<td>11.481</td>
<td>3.481</td>
<td>0.124</td>
</tr>
<tr>
<td>Lack of transport</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0.941</td>
<td>Ref</td>
<td>0.037</td>
<td>1.484</td>
</tr>
<tr>
<td>Yes</td>
<td>0.941</td>
<td>0.235</td>
<td>1.484</td>
<td>0.124</td>
</tr>
<tr>
<td>Mother on ARVs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0.578</td>
<td>Ref</td>
<td>0.904</td>
<td>8.717</td>
</tr>
<tr>
<td>Yes</td>
<td>0.575</td>
<td>2.806</td>
<td>8.717</td>
<td>0.074</td>
</tr>
<tr>
<td>Disclosure to husband</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0.575</td>
<td>Ref</td>
<td>0.534</td>
<td>5.091</td>
</tr>
<tr>
<td>Yes</td>
<td>0.575</td>
<td>1.649</td>
<td>5.091</td>
<td>0.385</td>
</tr>
<tr>
<td>Disclosure to relative(s)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0.575</td>
<td>Ref</td>
<td>0.220</td>
<td>2.090</td>
</tr>
<tr>
<td>Yes</td>
<td>0.575</td>
<td>0.677</td>
<td>2.090</td>
<td>0.498</td>
</tr>
<tr>
<td>Taught EBF in ANC and PNC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.388</td>
<td>Ref</td>
<td>0.839</td>
<td>193.511</td>
</tr>
<tr>
<td>Yes</td>
<td>1.388</td>
<td>12.744</td>
<td>193.511</td>
<td>0.067</td>
</tr>
</tbody>
</table>

Mothers with main bread winners were 11 times more likely to exclusively breast feeding compared to those who are the main breadwinners in their own households. The study
also found that mothers who reported to have lacked transport to attend ANC were 80% less likely to exclusively breast feed compared to those who did not lack. The analysis also showed that mothers who were on ARVs postnatally were 3 times more likely to exclusively breast feed than those who were not. Mothers who disclosed their HIV status to husband were 2 times more likely to practice EBF compared to those who did not. However, those who disclosed their HIV status to a relative(s) were 30% less likely to exclusively breast feed compared to those who did not. Finally, those mothers who reported to have been taught about EBF in ANC and PNC were 13 times more likely to exclusively breast feed compared to those who were not taught.
4.7 DISCUSSION

4.7.1 Demographic and socio-economic factors influencing adherence to EBF

Several studies have suggested that demographic factors influence adherence to exclusive breast feeding. A study in India showed socio-demographic variables like maternal education has positive association for influencing decision on exclusive breastfeeding (Chudasama et al., 2009). This study however did not find association of age, education level, marital status and employment with adherence to exclusive breast feeding.

The presence of a main breadwinner for the HIV positive mother was found to influence EBF positively in this study regardless of marital status. However, those mothers who where the sole breadwinners were unlikely to practice EBF. Therefore, this showed that if an HIV positive mother had someone to provide, she was likely to exclusively breast feed. It is very difficult for women to succeed in exclusive breastfeeding for six months when they depend on generating income from work which is added to their domestic chores (Moland et al., 2010). They may need to leave the baby with other care-givers from just a few weeks postpartum (Leshabari, Bllystad, de Paoli & Moland, 2007). A study in Zambia showed that high adherence among married respondents irrespective of age, suggested the importance of social support in determining adherence (Kaliwile & Michelo, 2010).

A mother whose household had stayed without food for more than a day in the past 6 months was likely not to adhere to EBF (p = <0.001). This could be attributed to poverty which may be a hindrance to exclusive breast feeding among HIV positive mothers.
According to a study conducted in Nakuru, Kenya, the lived experience of food insecurity among a sample of low-income, urban Kenyan women reduces their capacity to implement at least one key recommended infant feeding practices, that of EBF for 6 months (Webb-Girard et al., 2010). It is important for a mother to eat well in order for her to produce adequate breast milk for the baby. An inadequate supply of breast milk is a barrier to exclusive breast feeding by HIV positive mothers (Burke, 2004).

### 4.7.2 Prevalence of EBF among HIV positive mothers

A total of 188 HIV positive mothers; 130(69.1%) EBF feeders and 58(30.9%) non EBF feeders were interviewed in this study. The prevalence of EBF among HIV positive mothers in the study was slightly less than that of a study done in Zambia which was 74.0% (Kaliwile & Michelo, 2010). This is a higher percentage compared to a report that indicated that countries such as South Africa and Kenya currently have very low EBF rates at 7% and 13% respectively (UNICEF, 2011). This could be explained by the knowledge acquired by mothers during ANC and PNC health education sessions. According to a study in South Africa, HIV-positive mothers undertake safer infant feeding practices, possibly due to counselling provided through the routine PMTCT programme (Goga et al., 2012). However, there is a gap of 30.9% of those who did not adhere to EBF in this study. This could be attributed to other confounding factors in the study population.

### 4.7.3 Level of knowledge and attitudes on adherence to EBF

The findings of this study indicated that knowledge on MTCT significantly influenced exclusive breast feeding among the mothers. In a study in Zambia, Kaliwile & Michelo
(2010) cited that an understanding that exclusive breastfeeding reduces MTCT of HIV helped mothers adhere to exclusive breastfeeding. This shows the importance of health education on PMTCT in the MCH clinic at the health facility. The key informants interviewed at the health facility stated that they gave health education on PMTCT at every contact with the mother. This was done on individual basis for mothers who were newly diagnosed and FGD sessions are offered for those who are willing. This study also found that EBF was practiced among 72.2% of the mothers who said they were taught EBF antenatally and postnatally. Another study done in Uganda also found that adherence to EBF was favored by having knowledge of EBF as a method of PMTCT (Matovu et al., 2008).

Knowledge on expressing breast milk contributed significantly to the practice of EBF. This was indicated by 84.6% of the mothers who reported to have expressed breast milk and exclusively breast fed their infants. Expression of breast milk a mother some independence from directly feeding her infant and may allow her to return to work or undertake some social activities while continuing to breastfeed (Win, Binns, Zhao, Scott & Oddy, 2006). Qualitative findings from this study found out that there are challenges associated with expression of breast milk. Among the challenges reported included poor hygiene which may prove to be a potential problem in the slums due to lack of water. Therefore, well trained and supportive health care workers can positively influence mothers to EBF their infants.
Disclosure of HIV status to husband and relatives was significant in relation to adherence to EBF in this study. A study in Ethiopia cited one of the major predictors for making safer choice of infant feeding options as disclosure of HIV status to spouse (Maru and Haidar, 2009). These findings are also similar to those of a study done in Uganda, where it was found that EBF was favoured by sharing HIV status with the father and however, there was no significant difference between those who adhered and those who did not adhere to EBF regarding sharing of HIV status results with other family members (Matovu et al., 2008). The qualitative findings from this study showed that mothers who disclosed their HIV status to their husbands were likely to practice EBF since they got support from them.

4.7.4 Health facility factors influence on adherence to EBF

According to Focused Antenatal Care (FANC), every expectant mother is expected to attend ANC for at least 4 visits before delivery (MOPHS & MOMS, 2012), however in this study Antenatal clinic attendance of at least 4 visits did not influence exclusive breast feeding. For a mother to benefit from the clinic attendance the staff should be adequate and well trained. This study found out that all the 6 key informants interviewed at the health facility were trained in PMTCT. A randomized clinical trial in Zambia attributed high uptake of EBF to multidimensional intervention which included intensive and skilled counseling, consistent messages across the health service (Kuhn et al., 2007). This is important because the mothers have to get regular updates on new guidelines on PMTCT. Due to the nature of HIV, research is always on going thus new knowledge that informs formulation of new guidelines and policies. Therefore, a well trained staff is an
asset that every health facility should have to ensure efficiency and effectiveness in PMTCT programs.

The clinic should be accessible to all pregnant mothers. The study findings showed that mothers who lacked transport to attend the MCH clinic were not likely to exclusively breast feed compared to those who did not lack. In total, 61.5% of those who lacked transport did not adhere to EBF. This was also mentioned by a key informant who said that, “A mother may fail to attend clinic consecutively because of lack of transport especially for those who live far thus they miss their visits. We have been experiencing such cases.” PMTCT programs have to be tailored with great consideration of the local socio-cultural practices. Health care programmes and providers need to better understand mothers’ social circumstances, their beliefs, motivations and behaviours, and be better prepared to intervene in ways that permit mothers to ‘hear’ and respond (Thairu et al., 2005).

In the study findings, 81.6% of the mothers who reported to be on HAART adhered to EBF compared to those who were not on HAART. This could be attributed to the health education given during clinic visits. There was a significant relationship between a mother being on HAART in the postnatal period and adherence to EBF (p = 0.002). In a study in Rwanda, Peltier and colleagues (2009), found that mothers who were on HAART exclusively breast by 94.2%. This could be because of the perceived safety of breast milk due to lower HIV viral loads when a mother uses HAART (WHO, 2010a).
CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This study aimed at determining the factors that influence adherence to exclusive breast feeding among HIV positive mothers attending CWC at Pumwani Maternity Hospital. This chapter focuses on the conclusion, recommendations and suggestions for further studies.

5.2 Conclusion

The study findings showed that implementing exclusive breast feeding as part of efforts to prevent mother to child transmission of HIV is still a challenge in resource poor settings. According to this study 30.9% of the HIV positive mothers did not adhere to exclusive breast feeding. Several factors were shown as the likely risk factors associated with non-adherence to exclusive breast feeding among HIV positive mothers. The demographic and socio-economic factors that influenced EBF included lack of a breadwinner and unavailability of sufficient food in the household. Disclosure of HIV status to husband/partner and relatives influenced adherence to EBF positively. Attendance to antenatal clinic for at least 4 visits increased chances of EBF practice. However, those who lacked transport to attend antenatal clinic were likely not to EBF. Information sharing on EBF with the mothers at the health facility both antenatally and postnatally positively influenced adherence to EBF. Those mothers on ARVs postnatally were also likely to exclusively breast feed. Those mothers who reported to have suffered from mastitis did not exclusively breast feed compared to those mothers who experienced other breast feeding problems. Finally, those mothers who prepared food for
the baby when they had to be away for long hours did not EBF compared to those who expressed breast milk to be fed to the infant.

5.3 Recommendations

In order for MTCT of HIV to reduce to less than 2% in Kenya and the sub-Saharan Africa, the Ministries of Health, Non-Governmental Organizations, Faith Based Organizations and other stakeholders should;

1. Information sharing on MTCT of HIV antenatally and postnatally should be strengthened in the health facilities and the community using community strategy to improve EBF.

2. Mothers should also be taught how to express breast milk to feed the baby when the mother is away for long hours.

3. Vulnerable women to be linked to income generating community projects for food security empowerment.

5.4 Further research

1. Research on the best approach to making EBF more acceptable by HIV positive mothers and the society

2. Research on ways to increase expression of breast milk to be fed to infant when the mother is away for long hours to reduce mixed feeding.

3. More research is needed regarding how to achieve high uptake of EBF among HIV-infected women in programmatic settings
REFERENCES


APPENDICES

APPENDIX I: CONSENT FORM

Hallo, my name is ……………………………….I am interviewing study participants on behalf of Winnie Koima. She is a Master of Public Health (Monitoring and Evaluation) student at Kenyatta University, Nairobi. The purpose of the study is to determine factors influencing adherence to exclusive breast feeding among HIV positive mothers in Nairobi, Kenya. The results from this study will enable health care providers and policy makers to address issues related to infant feeding to reduce MTCT of HIV during breast feeding. It will also assist policy makers to formulate policies which are sensitive to the local socio-economic and cultural context. There are no benefits to you or any risks posed to you during the study. All information you give is confidential, your name will not be written in the questionnaire to protect your identity. Your participation is voluntary and you can choose to decline to answer any questions you are not comfortable with. Your participation is highly appreciated. Thank you for your cooperation.

Study participant’s signature…………………………

Date………………………………………………………. 
APPENDIX II: STUDY PARTICPANTS SEMI-STRUCTURED QUESTIONNAIRE

Questionnaire No.………………..Interview No.………………..Date………………

A: SOCIO-DEMOGRAPHIC CHARACTERISTICS

(Ask for the Clinic Attendance card for the infant and use it to counter check information)

1. Date of birth of infant _____/_____/

2. Age of infant in months:____________

3. Age of respondent in years

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 – 19</td>
<td>1</td>
</tr>
<tr>
<td>20 – 24</td>
<td>2</td>
</tr>
<tr>
<td>25 – 29</td>
<td>3</td>
</tr>
<tr>
<td>30 – 34</td>
<td>4</td>
</tr>
<tr>
<td>35 – 39</td>
<td>5</td>
</tr>
<tr>
<td>40 – 44</td>
<td>6</td>
</tr>
<tr>
<td>45 – above</td>
<td>7</td>
</tr>
</tbody>
</table>

4. Highest level of Education:

<table>
<thead>
<tr>
<th>Level</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>1</td>
</tr>
<tr>
<td>Primary</td>
<td>2</td>
</tr>
<tr>
<td>Secondary</td>
<td>3</td>
</tr>
<tr>
<td>College</td>
<td>4</td>
</tr>
<tr>
<td>University</td>
<td>5</td>
</tr>
</tbody>
</table>

5. Marital status:

<table>
<thead>
<tr>
<th>Status</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>1</td>
</tr>
<tr>
<td>Married monogamous</td>
<td>2</td>
</tr>
<tr>
<td>Married polygamous</td>
<td>3</td>
</tr>
<tr>
<td>Divorced</td>
<td>4</td>
</tr>
<tr>
<td>Separated</td>
<td>5</td>
</tr>
<tr>
<td>Widowed</td>
<td>6</td>
</tr>
</tbody>
</table>

6. Religion:

<table>
<thead>
<tr>
<th>Religion</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catholic</td>
<td>1</td>
</tr>
<tr>
<td>Protestant</td>
<td>2</td>
</tr>
<tr>
<td>Muslim</td>
<td>3</td>
</tr>
<tr>
<td>Other (Specify)</td>
<td>……………………………………..</td>
</tr>
</tbody>
</table>


B: SOCIO-ECONOMIC CHARACTERISTICS

7. Employment: 
   Salaried job [ ] 1  
   Self-employment [ ] 2  
   Casual labour [ ] 3  
   Housewife [ ] 4  
   Unemployed [ ] 5

8. If employed, how much was your income in the last month? 
   Less than 1000 [ ] 1  
   1000-2999 [ ] 2  
   3000-4999 [ ] 3  
   5000 – 9999 [ ] 4  
   Above 10,000 [ ] 5

9. Who is the main bread winner in your household? 
   Self [ ] 1  
   Husband [ ] 2  
   Relative [ ] 3  
   Other (specify) …………………………………………………………………………… [ ] 4

10. What is your main source of food for your household? 
   Purchase [ ] 1  
   Household farm/garden [ ] 2  
   Relatives and friends [ ] 3  
   Welfare/NGO [ ] 4  
   Others (specify)……………………………………………………………………… [ ] 5

11. Has your household gone without food more than a day in the past 6 months? 
   Yes [ ] 1  
   No [ ] 2

12. Do you have a house-helper or a relative assisting you with housework and the care of the child? 
   Yes [ ] 1  
   No [ ] 2
C: ANTENATAL, DELIVERY, AND POSTNATAL HISTORY OF THE RESPONDENT

13. How many visits did you attend the antenatal clinic?

   One [     ] 1
   Two [     ] 2
   Three [     ] 3
   Four [     ] 4
   Above five [     ] 5
   None [     ] 6

14. Did you have any problems accessing a health facility for antenatal care? (tick all appropriate)

   Lack of transport [     ] 1
   Long distance [     ] 2
   Lack of money to pay for ANC services [     ] 3
   Other

(specify)........................................................................................................

15. When were you diagnosed with HIV?

   Before pregnancy [     ] 1
   During pregnancy [     ] 2

16. Where did you deliver?

   Home [     ] 1
   Health Facility [     ] 2

17. What was your mode of delivery?

   Caesarean Section [     ] 1
   Spontaneous Vertex Delivery [     ] 2
   Assisted delivery [     ] 3

18. After delivery, what feeding option did you choose?

   Exclusive Breast Feeding [     ] 1
Breast feeding with early cessation [ ] 2
Expressed Heat Treated Breast Milk [ ] 3
Exclusive Replacement Feeding [ ] 4
Home prepared formula [ ] 5
Wet nursing [ ] 6
Mixed feeding [ ] 7

19. In your opinion, what are the benefits of your infant feeding option?

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

20. Are there any problems you have encountered with this method?

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

21. Are you currently on ARVs? Yes [ ] 1 No [ ] 2
22. Is your child on ARVs? Yes [ ] 1 No [ ] 2

23. How many times have you attended PMTCT/MCH clinic since you delivered?

…………………………………………………………………………………………

BREAST FEEDING

24. After delivery, when did you start breast feeding?

   Within 1 hour [ ] 1
   Within the first 12 hours [ ] 2
   Within the first 24 hours [ ] 3
   None [ ] 4
   Other (specify)………………. [ ] 5
25. If you are breastfeeding, how many times did you breast feed yesterday, day and night?

…………………………………………………………………………………………

26. Have you experienced any of these problems during the period you have breastfed?

(Tick all appropriate)

- Breast engorgement [ ] 1
- Cracked nipples [ ] 2
- Mastitis [ ] 3
- Less production of milk [ ] 4
- Ill health that made you not able to go work [ ] 5

27. How did you feed your child at that time of the problem?

- Expressed and heat treated the breast milk [ ] 1
- Continued breast feeding as usual [ ] 2
- Fed the child with other food and breast milk [ ] 3
- Stopped breast feeding [ ] 4
- Other

(specify)………………………………………………………………………………[ ] 5
28. What complementary foods have you introduced to the child? *Read out the list and fill the table to below*

<table>
<thead>
<tr>
<th>Complementary food</th>
<th>Tick</th>
<th>Ingredient/additions</th>
<th>Reasons for additions</th>
<th>Age of introduction</th>
<th>Method of feeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Water</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Sugared water/glucose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Juice/mango/orange/passion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Tea/Cocoa/Soya/Milo</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Fresh milk/goat/kcc</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Wheat/mandazi/chapatti</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Maize/ uji/ugali</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Rice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Sorghum/Millet/Uji/Ugali</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Cassava</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Potatoes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Bananas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Eggs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Fish/omena</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Vegetables/greens/pumpkin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Pulses/beans/ndegu/lentils</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Any other</td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

D: CULTURAL CHARACTERISTICS
29. In your culture, what foods or liquids are fed to an infant from birth to 6 months?

(Tick all applicable answers)

- Cows milk [ ] 1
- Porridge [ ] 2
- Mashed foods [ ] 3
- Boiled Herbs [ ] 4
- Others (specify)................................................................. [ ] 5

30. Who influenced your decision on the type of feeding you are practicing? (Tick all mentioned)

- Health care worker [ ] 1
- Peer counsellor [ ] 2
- Husband [ ] 3
- Mother in-law [ ] 4
- Other relative [ ] 5
- Friends [ ] 6
- Others (specify)................................................................. [ ] 7

31. Have your disclosed your HIV status to;

- Husband [ ] 1
- Relative(s) [ ] 2
- Friend(s) [ ] 3
- Others (specify)................................................................. [ ] 4

E: KNOWLEDGE AND ATTITUDES ON PMTCT
32. Can mothers who have the AIDS virus (HIV) transmit it to their babies?

Yes [ ] 1 No [ ] 2 Don’t know [ ] 3

If the answer is No, proceed to 34

33. When can HIV be transmitted from mother-to-child?(Tick all mentioned)

- During pregnancy? [ ] 1
- During delivery? [ ] 2
- During breast feeding? [ ] 3
Don’t know [  ] 4
Others (specify)……………………………………………………[  ] 5

34. What were you taught during the antenatal visits in regard to infant feeding? (*tick all applicable*)

   Exclusive Breast feeding for 6 months [  ] 1
   Exclusive replacement feeding for 6 months if meets AFASS [  ] 2
   Safe delivery in a health facility [  ] 3
   Use of ART for the mother to reduce viral load [  ] 4
   Use of ARV prophylaxis for the infant while breast feeding [  ] 5
   Other (specify)………………………………………………………………………………[  ] 6

35. What were you taught during the postnatal visits in regard to infant feeding? (*tick all applicable*)

   a) Exclusive Breast feeding for 6 months [  ] 1
   b) Exclusive replacement feeding for 6 months if meets AFASS [  ] 2
   c) Well balanced complementary feeds from 6 months in addition to breast milk until 24 months of age [  ] 3
   d) Use of ART for the mother to reduce viral load [  ] 4
   e) Use of ARV prophylaxis for the breast feeding infant until 1 week of complete cessation of breast feeding [  ] 5
   f) Other (specify)………………………………………………………………………………[  ] 6

36. What did you do if you had to leave home for long hours when the child was below 6 months of age?

   Express breast milk to be fed to the child [  ] 1
   Prepare food for the child [  ] 2
   N/A [  ] 3

37. What do you think can be done to encourage HIV positive mothers to Exclusively Breast feed their children for the first 6 months to prevent transmission of HIV?
...........................................................................................................................................................................
...........................................................................................................................................................................
...........................................................................................................................................................................
...........................................................................................................................................................................

Thank you for your cooperation.
APPENDIX III: FOCUSED GROUP DISCUSSION GUIDE

Date of the Interview…………………………………..
Time………………………………………………

1. What is the best way to feed an infant immediately after birth to 6 months of age?
2. What is the best way to feed an infant born to an HIV positive mother?
3. What are the cultural beliefs regarding Breast Feeding for infants born to HIV positive mothers?
4. What do you think is the importance of Exclusive Breast Feeding?
5. How feasible is Exclusive Breast feeding in this community?
6. How does the community relate to a mother who is HIV positive?
APPENDIX IV: KEY INFORMANT INTERVIEW GUIDE

Date of the interview………………………….
Age (years)…………………………………….
Sex……………………………………………….
Health facility………………………………….
Profession……………………………………...

1. Have you ever undergone through PMTCT training? If yes, when?

2. How many sessions of infant feeding health education do you give to HIV positive mothers antenatally?

3. How many sessions of infant feeding health education do you give to HIV positive mothers postnatally during the first 6 months?

4. In these infant feeding health education sessions, what information do you share with the HIV positive mothers both antenatally and postnatally?

5. In your own opinion, which are the major challenges experienced by the PMTCT mothers on Exclusive Breastfeeding that could lead to non-compliance?

6. What are the challenges faced by the health facility that could affect compliance to exclusive breast feeding among HIV positive mothers?
APPENDIX VI: RESEARCH AUTHORIZATION FROM NCST

REPUBLIC OF KENYA

NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telephone: 254-020-2213471, 2741340
254-020-3351741, 2213223, 2219420
Fax: 254-020-318249, 318240
When replying please quote secretary@ncst.go.ke

P.O. Box 30623-00100
NAIROBI-KENYA
Website: www.ncst.go.ke

NCST/RCD/12A/012/75

Winnie Koinya
Kenyatta University
P.O.Box 43844-00100
Nairobi.

27th August 2012
Date:

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on “Factors influencing adherence to exclusive breastfeeding among HIV positive mothers in Pumwani Maternity Hospital, Nairobi County, Kenya,” I am pleased to inform you that you have been authorized to undertake research in Nairobi Province for a period ending 30th October, 2012.

You are advised to report to the Provincial Director of Medical Services and the Medical Supretendant before embarking on the research project.

On completion of the research, you are expected to submit two hard copies and one soft copy in pdf of the research report/thesis to our office.

DR. M. K. RUGUTT, PhD, HSC.
DEPUTY COUNCIL SECRETARY

Copy to:
The Provincial Director of Medical Services
Nairobi Province.

The Medical Supretendant
Pumwani Maternity Hospital

"The National Council for Science and Technology is Committed to the Promotion of Science and Technology for National Development."
APPENDIX VII: ETHICS LETTER FROM KU-ERC

KENYATTA UNIVERSITY
ETHICS REVIEW COMMITTEE

Fax: 8711242/8711875
Email: kaucr.chairman@ku.ac.ke
          kaucr.secretary@ku.ac.ke
Website: www.ku.ac.ke

P. O. Box 43844
Nairobi, 00100
Tel: 8710901/12
Tel: 8710901/12

Our Ref: KU/R/COMM/51/39-2

Date: August 15th, 2012

Winnie Jepkoei Koina
School of Health Sciences
Kenyatta University
P.O. Box 43844, Nairobi.

Dear Ms. Koina,

APPLICATION NUMBER PKU/036/152 OF 2012 - FACTORS INFLUENCING ADHERENCE TO EXCLUSIVE BREAST FEEDING AMONG HIV POSITIVE MOTHERS IN PUMWANI MATERNITY HOSPITAL, NAIROBI COUNTY, KENYA VERSION 2.

1. IDENTIFICATION OF PROTOCOL

The application before the committee is with a research topic 'FACTORS INFLUENCING ADHERENCE TO EXCLUSIVE BREAST FEEDING AMONG HIV POSITIVE MOTHERS IN PUMWANI MATERNITY HOSPITAL, Nairobi County, Kenya, VERSION 2', dated 8th August 2012.

2. APPLICANT

Winnie Jepkoei Koina
School of Health Sciences
Kenyatta University
P.O. Box 43844, Nairobi.

3. Site

PUMWANI MATERNITY HOSPITAL, Nairobi County - Kenya

4. DECISION

The committee has considered the research protocol in accordance with the Kenyatta University Research Policy (section 7.2.1.3) and the Kenyatta University Ethics Review Committee Guidelines, and is of the view that against the following elements of review,

(i) Scientific design and conduct of study,
(ii) Recruitment of research participant,
(iii) Care and protection of research participants,
(iv) Protection of research participant's confidentiality,
(v) Informed consent process,
(vi) Community considerations.

AND APPROVED that the research may proceed for a period of ONE year from 15th August, 2012.
B. **ADVICE/CONDITIONS**

i. Progress reports are submitted to the KU-ECC every six months and a full report is submitted at the end of the study.

ii. Serious and unexpected adverse events related to the conduct of the study are reported to this board immediately they occur.

iii. Notify the Kenyatta University Ethics Committee of any amendments to the protocol.

When replying, kindly quote the application number above.

If you accept the decision reached and advice and conditions given please sign in the space provided below and return to KU-ECC a copy of the letter.

---

**PROF. NICHOLAS E. GIKONYO**  
CHAIRMAN ETHICS REVIEW COMMITTEE

I, [Signature] accept the advice given and will fulfill the conditions therein.

Signature: [Signature]  
Dated this day of [Date], 2012.

cc. Vice-Chancellor  
Director: Institute for Research Science and Technology
APPENDIX VIII: PERMISSION FROM PUMWANI MATERNITY HOSPITAL

Winnie Koima  
P.O. Box 9149 -00100  
Nairobi

22nd July 2010

Medical Superintendent  
Nairobi City Council  
Pumwani Maternity Hospital  
P.O. Box 42849 - 00100  
Nairobi

Dear Sir,

RE: RESEARCH

I hereby submit my application to carry out my Research at your institution. I am pursuing a Masters of Public Health - Monitoring and Evaluation at Kenyatta University in collaboration with Tulane University - USA and USAID. I have recently completed course and working on my thesis.

I intended to carry out the study between the Month of August and November, 2011. I look forward to your favourable reply.

Yours faithfully,

Winnie Koima  
P57/ 20213/ 2010

22/7/2011

Permission Granted
APPENDIX IX: APPROVAL OF RESEARCH PROPOSAL

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: kubps@yahoo.com
dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 8710901 Ext. 57530

FROM: Dean, Graduate School DATE: 10th March, 2012
TO: Ms. Winnie Koima
C/o Community Health Dept.

REF: P57/20213/10

SUBJECT: APPROVAL OF RESEARCH PROPOSAL

This is to inform you that the Graduate School Board, at its meeting of 1st March, 2012, approved your research proposal for the M.P.H. degree entitled “Factors Influencing Adherence to Exclusive Breastfeeding Among HIV Positive Mothers in Pumwani Maternity Hospital, Nairobi County, Kenya.”

You may now proceed with your data collection.

Thank you.

JOHN M. ODONGI
FOR: DEAN, GRADUATE SCHOOL

c.c. Chairman, Community Health Dept.

Supervisors:
1. Dr. Harun Kimani
   Department of Community Health

2. Dr. Peter Mwaniki
   Institute of Tropical Medicine and Infectious Diseases
   Jomo Kenyatta University of Science & Technology
   P. O. Box 62000-00200
   NAIROBI-KENYA.

JMO/cww

Committed to Creativity, Excellence & Self-Reliance