DETERMINANTS OF ADHERENCE TO ELIMINATION OF MOTHER TO CHILD TRANSIMISSION FEEDING GUIDELINES FOR HIV-EXPOSED INFANTS OF MOTHERS LIVING WITH HIVIN MPIGI DISTRICT

SSENKUMBA ANDREW

2015 – M281 – 10016

UGANDA MARTRYS UNIVERSITY

JUNE, 2017

DETERMINANTS OF ADHERENCE TO ELIMINATION OF MOTHER TO CHILD TRANSIMISSION FEEDING GUIDELINES FOR HIV-EXPOSED INFANTS OF MOTHERS LIVING WITH HIVIN MPIGI DISTRICT

A POSTGRADUATE DISSERTATION PRESENTED TO THE FACULTY OF HEALTH SCIENCE TO FULFILLMENT OF THE REQUIREMENTS

FOR THE AWARD OF THE DEGREE OF MASTER OF PUBLIC

HEALTH IN POPULATION AND REPRODUCTIVE HEALTH

UGANDA MARTYRS UNIVERSITY

SSENKUMBA ANDREW

2015-M281-10016

JUNE, 2017

DEDICATION

To my father and mother, Mr. James Kisanga and Mrs. Rehemah Nabatanzi not forgetting My Grandmother Ms. Namugenyi Aidah. You set me forth into the struggle of this life and the ember you lit is still burning. I also dedicate this work to my wife Annet Namuyomba and my son Ssenkumba Alvin James for relentless support and motivation in my study. God bless you all.

ACKNOWLEDGEMENT

Let me take this opportunity to first of all thank the almighty God for giving me the strength, wisdom, and competence to successfully complete this program.

My humble appreciation goes to Faculty of Health Sciences and the management of Uganda Martyrs University for giving me the special opportunity to pursue my academic dream of being a public health specialist. The environment was very conducive for me to achieve this dream. Allow me in a special way to thank all lecturers in their different capacities for the continuous and tireless support they offered during my stay in Uganda Martyrs University, not forgetting my classmates, friends, nonteaching staff, and the community of Nkozi who made my stay as conducive as possible.

I am indebted to my supervisor; Dr. Everd Maniplefor his academic guidance and advice at all stages of my work. He made the entire study possible. I also thank him for the constant enrichment of knowledge especially in Reproductive health that he always offered when consulted.

Special and heartfelt thanks go to my beloved wife Ms. Namuyomba Annet and my son Prince Ssenkumba Alvin. YoUr continued physical and emotional support provided a compelling solace and impetus towards the success of this work at all stages.

Not forgetting my colleagues and my relatives Uncle Mr. Namakajjo Ronald and my Auntie Mrs. Muyanja Florence and many others who were also always by my side both psychologically and financially, my dear sisters Allen, Angella, Agnes, Aidah and the baby Agatha and my

brothers Alex (the father) and Isaac whose continuous encouragement and financial support have kept me progressive throughout my studies.

Finally, I am vehemently grateful to all those whom I may not have mentioned here but contributed in one way or the other towards the success of this work. May God Bless you all.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

AAP	American Academy of Pediatrics
AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
AOR	Adjusted Odds Ratio
ART	Antiretroviral Therapy
ARV	Antiretroviral
AVERT	Anti-Virus Emergency Response Team
BAM	Becoming A Mother
CDC	Centers for Disease Control and Prevention
CI	Confidence Interval CWC Child Welfare Clinic
EBF	Exclusive Breast Feeding
EBM	Expressed Breast Milk
EMTCT	Elimination of Mother to Child Transmission
ERF	Exclusive Replacement Feeding
HAART	Highly Active Antiretroviral Therapy HIV Human Immunodeficiency Virus
HCWs	Health Care Workers
HIV	Human Immunodeficiency Virus
IEC	Information, education and communication
IEC	Information, education and communication
IYCF	Infant and Young Child Feeding
MCH	Maternal And Child Health

MDG	Millennium Development Goal
MF	Mixed Feeding
MOH	Ministry of Health
MRA	Maternal Role Attainment
MTCT	Mother to Child Transmission
NVP	Nevirapine
PCR	Polymerase Chain Reaction
PFP	Private for Profit
PMTCT	Prevention of Mother to Child Transmission
PNC	Postnatal Clinic
PNFP	Private Not for Profit
SSA	Sub Saharan Africa
UN	United Nations
UNAIDS	United Nations Programme on HIV/AIDS
UNFPA	United Nations Fund for Population programs
UNICEF	United Nations Children Fund
WHO	World Health Organization

DEFINITION OF KEY TERMS

Exclusive breastfeeding: Exclusive breastfeeding means giving an infant no other food or drink, not even water, apart from breast milk (including expressed breast milk), with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines

Infant means a child from birth to 12 months of age

Mixed feeding means partial breastfeeding and giving some other milk, often bottles of infant formula.

Mother-to-child transmission (MTCT) means transmission of HIV to a child from an HIV-infected woman during pregnancy, delivery or breastfeeding. The term "vertical transmission" is commonly used interchangeably with MTCT.

HIV Exposed Infants: Are infants who were born from HIV infected mothers

Mothers with HIV: Mothers who have taken an HIV test with a positive result and know their result

Adherence:

Prevention of Mother to Child Transmission is the prevention of infection with HIV to a child from the mother during pregnancy, delivery and postnatal by taking ARV prophylaxis, safe delivery and use of recommended infant feeding practices

ABSTRACT

Background: Breast milk contains antibodies as well as innate factors that function to inhibit this uptake of the virus, which is why a mixed diet of breast milk and formula has a higher risk for infection than a diet of breast milk alone. Furthermore, mixed feeds can cause inflammation of the mucosal membranes of the baby, allowing HIV to be more readily taken up if mixed feeding is used. This was the basis of the currently followed guidelines by the World Health Organization where exposed infants have to be exclusively breastfed, non adherence of which has been associated with increased Mother to Child Transmission. Areas like Mpigi district that have been noted for having being ravaged by the HIV epidemic have HIV transmission rates from mother to child, including during breastfeeding higher than the national average at rates upwards of 4%

Objective: The purpose of the study was to assess the determinants of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district

Method: The study adopted a facility based descriptive cross sectional research design: The hospital (Nkozi hospital) was purposively sampled to avoid a possible case of eliminating the hospital during the random sampling procedure. The health centers from which the study respondents were obtained where sampled using simple random sampling. At the health facilities, consecutive sampling was used to sample the respondents. Structured interviews and structured questionnaires were used as data collection methods and tools respectively. Data were entered, cleaned and analyzed using SPSS for windows version 20.0

Results: It was found that more than half of the mothers living with HIV in Mpigi district adhered to the breastfeeding guidelines for exposed infants (n = 161, 62%).

At individual level, mothers who had fears of infecting baby while breastfeeding were less likely to adhere to feeding guidelines for exposed infants (AOR = .530, CI = .314 - .895). Mothers who had delivered their last born child normally were three times as likely (AOR = 3.492, CI = 2.260 - 5.931) to adhere to feeding guidelines for exposed infants, while mothers who had disclosed HIV status to anyone else were three point five times as likely to adhere to feeding guidelines for exposed infants (AOR =3.564, CI = 1.338 - 4.941) compared to those who had not disclosed their status to anyone else apart from their partner.

Bivariate results showed that the was no statistically significant relationship between infant characteristics and adherence to infant feeding guidelines for exposed infants ($p<0.05$).

The study still did not find any statistically significant relationship between the health service characteristics and adherence to the infant feeding guidelines for exposed infants

Conclusion: Adherence to feeding adherence for exposed infants among mothers living with HIV in Mpigi district is fairly highly but not satisfactory, it being below the threshold of 80%. About 6 out of every 10 mothers adhere to the guidelines, implying that 4 out of every 10 children born to these mothers are at a very high risk of HIV transmission and could be the ones contributing to the postpartum infant sero conversion rates in the district. The level of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district feeding is significantly determined by individual characteristics of the mothers living with HIV, while infant and health service characteristics do have a significant influence on that level of adherence.

Recommendations: More reassurance and health education needs to be done at both facility and community levels in order to demystify the old notion of all time HIV transmission for as long as breastfeeding is done.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

The background of the study, statement of the problem, study objectives and research questions are presented in this chapter. The chapter also presents the justification and significance of the study, and a conceptual framework.

1.1 Background of the study

Among the most prevalent and devastating pandemics faced by the human population today is one caused by the human immunodeficiency virus (HIV) (Cherukuri, 2017). While this condition is mainly concentrated in countries within Sub-Saharan Africa, with almost one in twenty-five adults in this region living with the disease, it affects populations all around the world including children, making it a global concern (WHO, 2016). Although there are various routes of transmission of this disease and the main mode of transmission is sexual, it can be transferred in other less common ways, one of which includes transmission from a mother to a child either during the late stages of pregnancy, childbirth, or through breastfeeding (CDC, 2016). This is especially cause for concern because at one point, mother-to-child transmission (MTCT) of HIV was the leading source of HIV infection among children below the age of fifteen (UNAIDS, 1999; U.S. Department of Health and Human Services, 2016).

Mother-to-child HIV-1 transmission occurs in utero, peripartum, and postnatal via breastfeeding; without interventions the risk of prenatal HIV-1 transmission is 20 to 45 percent (WHO, 2016; little, 2012). Over the past two decades, clinical trials have demonstrated that the risk of mother-

to-child transmission can be significantly reduced with the administration of antiretroviral medications during pregnancy, delivery, and the early postpartum period (e.g., two to four weeks after delivery) (Little, 2012) in addition to adhering to infant feeding interventions (Kesho, 2010; Marazzi, 2009; Shapiro, 2010; Chasela, 2010).These strategies make up one of the global strategies for controlling, and preventing the spread of HIV/AIDS called the Prevention Of Mother - To - Child Transmission of HIV/AIDS (PMTCT) program.

PMTCT aims at preventing HIV infection of the infant during pregnancy, labor and breastfeeding and has been very successful since its inception. It remains the best way of preventing paediatric HIV infection (Mukhtar-Yola et al., 2009). One of the paediatric HIV infection mode targeted by PMTCT is breastfeeding and this is because of the significant HIV content of breast milk. Breast feeding has also been associated with a high level of paediatricHIV infection. The transmission associated with it (breastfeeding) is high during primary maternal HIV infection as mirrored by a high but transient peak in breast milk HIV load (Humphrey et al., 2010). A fear for breast milk thus developed among counselors and HIV - positive mothers and this challenged the well-established [breastfeeding] culture which called for public health action (Koricho et al., 2010).

Until the year 2008, the World Health Organization (WHO) had advised HIV-positive mothers to avoid breastfeeding if they were able to afford, prepare and store formula milk safely. However, research has since emerged, particularly from South Africa that shows that a combination of exclusive breastfeeding and the use of antiretroviral treatment can significantly reduce the risk of transmitting HIV to babies through breastfeeding (WHO, 2017).On 30 November 2009, WHO released new recommendations on infant feeding by HIV-positive mothers, based on that new evidence. For the first time, WHO recommended that HIV-positive mothers or their infants take

antiretroviral drugs throughout the period of Exclusive breastfeeding and until the infant is 12 months old. This means that the child can benefit from breastfeeding with very little risk of becoming infected with HIV.

Prior research had shown that exclusive breastfeeding in the first six months of an infant's life was associated with a three- to fourfold decreased risk of HIV transmission compared to infants who were breastfed and also received other milks or foods (Lungi 2017). Instrumental in guiding the new recommendations were two major African studies that announced their findings in July 2009 at the fifth International AIDS Society conference in Cape Town. The WHO-led Kesho Bora study found that giving HIV-positive mothers a combination of antiretroviral during pregnancy, delivery and breastfeeding reduced the risk of HIV transmission to infants by 42% (Lungi 2017). The Breastfeeding Antiretroviral and Nutrition study held in Malawi also showed a risk of HIV transmission reduced to just 1.8% for infants given the antiretroviral drug nevirapine daily while Exclusively breastfeeding for 6 months (*Ibid*).

Breastfeeding provides optimal nutrition for infants and beneficial health outcomes for their mothers (AAP, 2013; CDC, 2013). Exclusive breastfeeding (EBF) by all women (i.e., feeding only breast milk and no other foods or fluids apart from medicines) is recommended for the first 6 months (WHO, 2007) and up to two years (AAP, 2013). In resource-limited settings, EBF is also recommended for women infected with Human Immunodeficiency Virus (HIV) for the first 6 months of their infant’s life (WHO, 2010).

Biomedical research has found that for MTCT of HIV to occur via breastfeeding, the virus from the breast milk must be taken up by the epithelial cells and then transported via dendritic cells as the initial step (Shen et al. 2015). Breast milk contains antibodies as well as innate factors that function to inhibit this uptake of the virus, which is why a mixed diet of breast milk and formula

has a higher risk for infection than a diet of breast milk alone (Shen et al. 2015). With a mixed diet, the infant obtains fewer antibodies from the mother's milk, leading to a greater chance of contracting the virus. Furthermore, formula milk can cause inflammation of the mucosal membranes of the baby, allowing HIV to be more readily taken up if mixed feeding is used (Guaraldi and Salvatori 2012). This was the basis of the currently followed guidelines by the World Health Organisation where exposed infants have to be exclusively breastfed, non-adherence of which has been associated with increased Mother to Child Transmission.

In 2015, about 300,000 children were infected with HIV across the globe. Ninety percent of these children acquired the infection through "vertical transmission," with their mothers passing the virus during pregnancy, delivery, or breastfeeding (UNAIDS, 2016). There were 1.8 million children living with HIV by the end of 2015 (AVERT, 2016; U.S. Department of Health and Human Services, 2016). This number is staggering in light of the fact that effective prophylactic medication for the Prevention of Mother to Child Transmission of HIV (PMTCT) is available. If the medication is used correctly, and EBF is practiced, vertical transmission risk decreases to less than 2% (Lallemont, 2012).

New HIV infections among children in the 21 countries in sub-Saharan Africa that have been most affected by the epidemic dropped from 270 000 [230 000–330 000] in 2009 to 110 000 [78 000–150 000] in 2015 (UNAIDS, 2016). Despite this significant progress, the number of children becoming newly infected with HIV remains unacceptably high (AVERT, 2017). The majority of HIV cases in young children are attributed to transmission of this virus from mother to child (Adebimpe 2013). Of the 22 countries prioritized by UNAIDS, in 2013 Uganda had the fourth highest number of new infections among children (MOH, 2014). Breastfeeding is now responsible for the majority of MTCT in the country (UNICEF, 2016).

1.2 Statement of the problem

A mother-to-child transmission rate of 2.9% was achieved in 2015 in Uganda, meeting the Global Plan milestone of reducing mother-to-child transmission of HIV to below 5% among breastfeeding women (UNAIDS, 2016). However, areas like Mpigidistrict that have been noted for having being ravaged by the HIV epidemic had final HIV transmission rates from mother to child, including during breastfeeding higher than the national average at rates upwards of 4% (UNAIDS, 2016). Although the rate of exclusive breastfeeding among HIV sero-negative women in Mpigi district is almost close to the national average of 67% (61.5%), the same rate of EBF among HIV positive mothers particularly has been reported to be below 30% (DHIS, 2016; MOH, 2012). This could explain the high vertical transmission rates among infants born to mothers in the district and also exemplifies the probable fact that mother living with HIV in Mpigi district are not adhering to the feeding guidelines for exposed infants.

This regardless of the fact that as part of the PMTCT service program, mothers living with HIV in Mpigi district are given infant feeding counseling for prevention of breast milk HIV transmission by the health workers at the pre-natal visits and are sometimes provided follow-up counseling at other scheduled study visits (District Health Officer, 2016). Without appropriate interventions meant to increase adherence to the WHO exposed infant feeding guidelines among HIV positive mothers in Mpigi, cases of vertical transmission during the first six months of infants are bound to increase, which might result increased infant mortality rates due to HIV in the district. None the less, a significant gap in knowledge still exists regarding the determinants of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district.

1.3 Research questions

1. What is the level of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district
2. What are the determinants of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district

1.4General objective

To assess the determinants of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district

1.4.1 Specific objectives

1. To determine the level of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district
2. To analyze the determinants of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district

1.5 Justification and significance of the study

For long, health authorities of Mpigi district have battled with the HIV epidemic among people of all ages in the district. Notable among the various efforts put into the fight against HIV is the augmentation of the prevention of mother to child transmission programs at each health facility in the district. Of the pregnant mothers who newly test positive for HIV during each quarter, over 85% of them are initiated on ART, implying that rates of vertical transmission of HIV are expected to be low in the district. However, the district continues to have one of the highest

mother to child HIV transmission rates in the country, with majority of these transmissions occurring in the postpartum period. Although there are a number of factors that could be fueling these transmissions, it an undeniable fact that low adherence to feeding guidelines could be among these (UNICEF, 2016).It was thus justifiable for this study to be conducted among mothers on the EMTCT program in Mpigi district in order to not only assess the level of adherence to the set guidelines but also to identify the determinants of adherence to IYCF guidelines among these mothers.

The findings of this study will be of great use to the district health office as they will point out the level of adherence to the exposed infant feeding guidelines and any barriers to adherence. With that, the health authorities will be able to devise amicable solutions tailored towards improving adherence to the guidelines and thus reducing vertical transmission rates in the district.

To the mothers, this study will point out how the characteristics of the infants could be determining positively or negatively to their IYCF feeding guidelines adherence levels, so that they get on the lookout for those child related characteristics and come up with ways of mitigating their effects on guideline adherence if negative.

Being the very few done in the context of Mpigi district, this study will stimulate the conduct of other related studies in the district so as to obtain a holistic picture of the determinants of adherence to feeding guidelines for exposed infants among mothers living with HIV. It will also provide baseline information for studies to be done in other parts of the country.

1.6 Study scope

1.6.1 Geographical scope

The study was conducted in health facilities located in Mpigi district. Mpigi District is one of the districts of Uganda situated in the Central Region of the country, often referred to as Buganda Region. The district borders with the districts of Wakiso in the North East and East, Mityana in the North, Mubende in the North West, Kalangala and Lake Victoria in the South. Masaka is to the south West and Ssembabule to the West. Mpigi District lies within Central (1) Region in Uganda. It has a population of 251,512 (Census,2014); 7 Lower Local Governments, 56 parishes and 339 Villages. There are two health sub-districts, 40 Health Facilities, of which 23 (57.5%) offer EMTCT services, while 21 (52.5%) offer ART services. Of those that offer ART services, 7 (28%) are PNFP, while 2 (8%) are PFPs.

The district is made up of three counties namely; Butambala, Gomba and Mawokota. There are 16 sub-counties and one urban council, Mpigi Town Council. It has 118 parishes and 738 villages. The health sector comprises of health and environmental departments. The district is sub-divided into four health sub-districts, namely Mawokota North, Mawokota South, Butambala and Gomba

Health sub district	**Referral hospital**	**Health centre IV**	**Health centre III**	**Health centre II**
Mawokota North		1	5	6
Mawokota South	1		4	8
Gomba			3	7

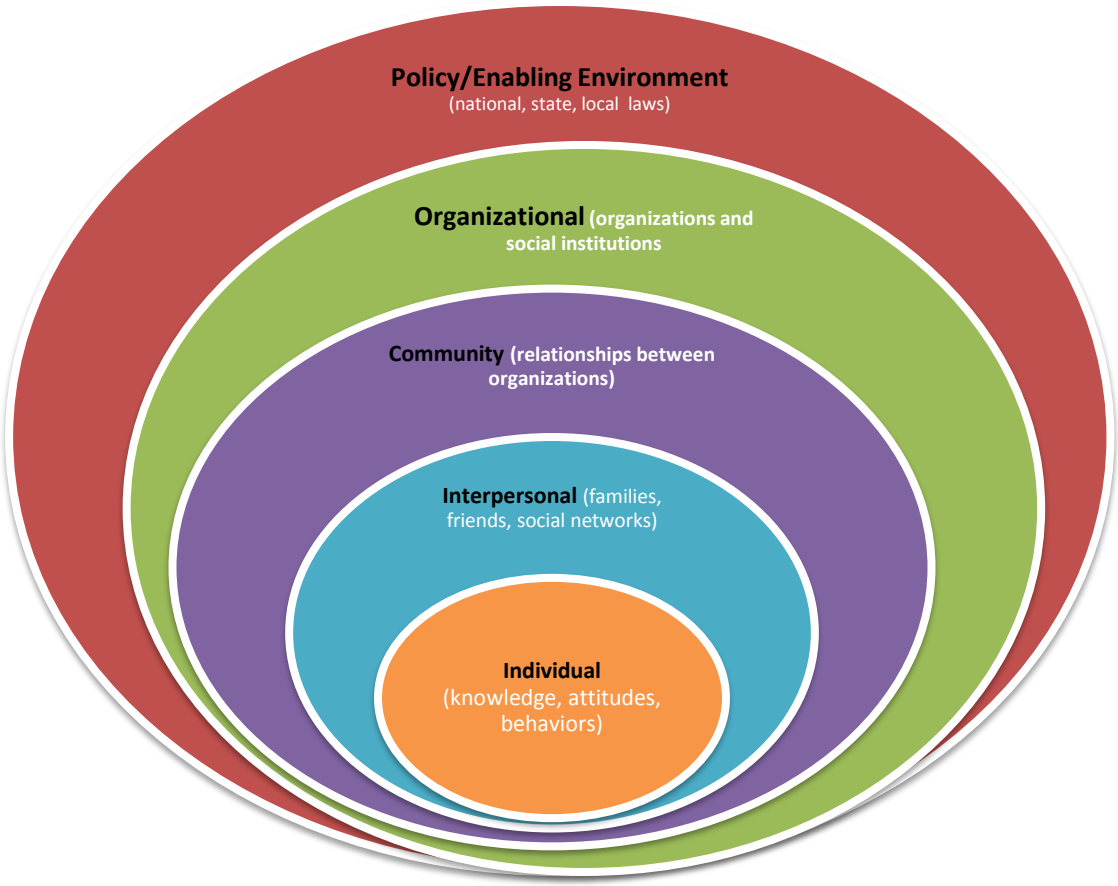
Source: Higher Local Government Statistical Abstract Mpigi District (2009)

1.6.2 Content scope

Content wise, this study was interested in assessing three potential correlates of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district. These were; individual determinants, infant related characteristics and health service characteristics. Adherence to feeding guidelines for exposed infants among mothers living with HIV was based on the WHO guidelines, as stated earlier which point out exclusive breastfeeding for exposed infants.

1.7 Theoretical framework

The study was hinged on the Social Ecological Model (SEM), which is a theory-based framework for understanding the multifaceted and interactive effects of personal and environmental factors that determine behaviors, and for identifying behavioral and organizational leverage points and intermediaries for health promotion within organizations. This model was very appropriate for this study because there was a behavior which the mothers living with HIV had to adopt (adherence to EMTCT feeding guidelines), which the study hypothesized to be subject to both individual characteristics and those in the environment of the mother. In the socio ecological model, there are five nested, hierarchical levels of the SEM: Individual, interpersonal, community, organizational, and policy/enabling environment as shown in the figure below;



Individual: These are the Characteristics of an individual (mother) that influence behavior change (adherence to EMTCT feeding guidelines), including knowledge, attitudes, behavior, self-efficacy, developmental history, gender, age, religious identity, racial/ethnic identity, sexual orientation, economic status, financial resources, values, goals, expectations, literacy, stigma, and others.

Interpersonal: These are Formal (and informal) social networks and social support systems that can influence individual behaviors, including family, friends, peers, co-workers, religious networks, customs or traditions. In this study, there included only the infant characteristics.

Community: Relationships among organizations, institutions, and informational networks within defined boundaries, including the built environment (e.g., parks), village associations, community leaders, businesses, and transportation

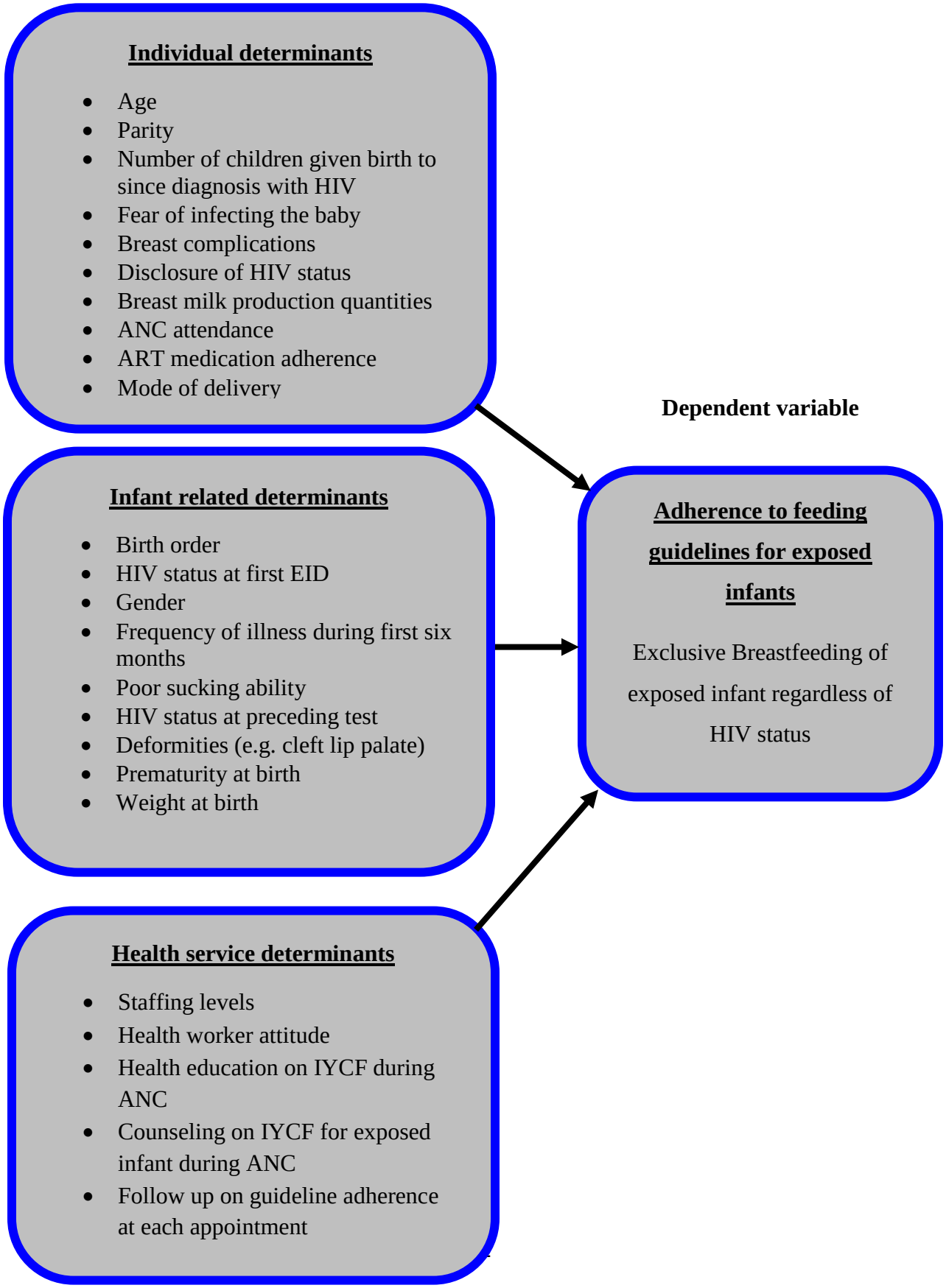
Organizational: Organizations or social institutions with rules and regulations for operations that affect how or how well, for example, MNCH services are provided to an individual or group. In this study, the organization referred to the health institutions.

Policy/Enabling Environment: Local, state, national and global laws and policies, including policies regarding the allocation of resources for maternal, newborn, and child health and access to healthcare services, restrictive policies (e.g., high fees or taxes for health services), or lack of policies that require childhood immunizations

1.8 Conceptual framework

The figure below shows the conceptualization of the variables that were studied. There were three independent variables and one dependent variable. The three independent variables are; individual determinants, infant related characteristics, health service characteristics and the dependent variables was Adherence to feeding guidelines for exposed infants which is exclusive Breastfeeding of exposed infant regardless of HIV status.

Independent variable



CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents a comprehensive review of literature aligned towards determinants of adherence to feeding guidelines for exposed infants among mothers living with HIV. The chapter has been organized following the order and arrangement of the objectives of study. The literature was sourced from various databases including; EMBASE, Springer, PLOSONE, CINHAL, BMC and BMJ. Target was made for articles published between the years 2007 - 2017 in English.

2.1 Adherence to exposed infant feeding guidelines among HIV positive mothers

In 2010, PMTCT interventions were modified according to the WHO guidelines to include routine HIV testing and counseling for pregnant women, dual therapy to prevent MTCT, highly active antiretroviral treatment (HAART) for pregnant women with a CD4 count of ≤350 cells/μl, postnatal infant prophylaxis for breastfeeding HIV positive women, and counseling for safer infant feeding practices, as well as intensified efforts to integrate PMTCT services into routine maternal and child health (MCH) services. The current guidelines recommend exclusive breastfeeding (EBF) as the best feeding alternative for up to six months unless replacement feeding is acceptable, feasible, affordable, sustainable and safe (WHO/UNAIDS/UNICEF 2009).

In resource-limited settings, the promotion of EBF among HIV-infected mothers is a key intervention to reduce infant morbidity and mortality from all causes, including HIV (Rollins et al., 2009; Van de Perre et al., 2013). The mechanism by which EBF is associated with lower mother to child transmission of HIV is believed to be linked to increasing the immunity of the

infant's gastrointestinal barrier, which is thought to be the primary site of infection (Young, 2011). Significant evidence now exists demonstrating that EBF increases HIV free infant survival (an infant who is alive and HIV negative) in resource-limited settings through the dual benefits of reducing vertical HIV transmission and providing optimal nutrition (Engebretsen et al., 2014; Sibeko, Coutsoudis, Nzuza& Gray-Donald, 2009). To reflect this, the WHO (2010) updated its infant feeding guidelines to recommend that in resource-limited settings HIV-infected mothers EBF for the first 6 months of their infant's life.

While many women may enroll in the PMTCT programme, there are many barriers that impede the success of the PMTCT interventions in many sub Saharan African countries. Research shows that often, the recommended feeding options are difficult to adhere to, whether a mother chooses exclusive breastfeeding or exclusive formula feeding (Leshabari et al. 2007). Several studies conducted in the sub-Saharan region on the choice of infant feeding method have shown that while HIV-positive women commonly make a choice to exclusively breastfeed during pregnancy, they often end up practicing mixed feeding early in the baby's life (Matji et al. 2010; Mkwanazi 2009; Thairu et al. 2005). Even where breastfeeding is culturally mandatory, the practices of exclusive breastfeeding and early and rapid cessation of breastfeeding as promoted in the PMTCT program are not necessarily easy to put into practice (Leshabari et al. 2007).

Nwaozuzu (2014) found that about 63% of the mothers in Nigera exclusively breastfed [EBF] their babies, 23% of them chose the exclusive formula feeding option while 14% of them opted for the mixed feeding (MF) method. Only 54% of the mother-infant pairs adhered with the PMTCT guidelines of exclusive breastfeeding of the infants under ARV prophylactic cover for both mother and infant during pregnancy, delivery and breastfeeding. About 46% of the pairs did

not adhere to this PMTCT guideline. The adhering mother-infant pairs group accounted for only one (1) of the six (6) HIV PCR positive results.

Even though WHO and UNCEF recommend Exclusive Breast Feeding for the first six months, the rate remains low throughout the world (World Health Organization, 2009). Globally 38% of children fewer than six months of age were exclusively breastfed in the period of 2005–2012. This rate was higher in the South- East Asia Region (47%) and lower in the European Region (25%), with intermediate values for the African and Eastern Mediterranean regions (35% each) and the Region of the Americas (30%) (World Health Organization, 2013). In developing countries, 39% of infants younger than six months were exclusive breastfeeding in 2010 (Cai, 2012)

Study conducted in South Africa found that only 25% of mothers exclusively breastfed where as 75% of women used formula or mixed feeding during the first 6 months (Human Sciences Research Council, South Africa, 2008). Khanal et el (2013) in their study reports that the prevalence of exclusive breastfeeding declined with increasing infant age, from 68.0% at less than one month to 24.9% at five months. Another study which was conducted in Nigeria and Tanzania reported the rate of EBF among infants younger than 6 months of age was 16.4% and 24.1% respectively (Agho, 2011; Maonga, 2015). In Uganda, 31.5% of children less than six months were exclusively breastfeeding and the rest were mixed feeding (Babirye, 2009).

In Ethiopia, exclusive breastfeeding for the first six months of infant's life is not widely practiced; the national rate was 52%, regardless of mother's HIV status (Central Statistical Agency [Ethiopia], 2012). There is observed prominent decline of EBF as the age of infant increases, the rates are 70.1% from birth to one month, 55.3% at 2 to 3 months and 31.8% at 4 to

5 months with median duration of 2.4 months at national level (Central Statistical Agency [Ethiopia], 2012). Additionally, Studies conducted in district of DebreBerhan and Addis Ababa, Ethiopia revealed that the rate of EBF in infants aged less than six months was 68.6% and 29.3% respectively (Asfaw, 2015; Shifraw, 2015).

Studies in Kenya and Tanzania reported that the rate of EBF among HIV positive women's infants younger than six month as 80.4% and 77% respectively (Okanda, 2014; Williams, 2015). In contrary, Fadnes et el (2009) in their study reported that exclusive breastfeeding of infants under the age of 6 months was less practiced among the HIV-positive mothers than in the general population. Besides, HIV positive mothers were reported to give their infants pre-lacteal feeds which included non- human milk compared to HIV negative mothers. In Ethiopia, Studies conducted in Addis Ababa among HIV positive mothers showed the prevalence of exclusive breast feeding as 30.6 % and 70.1% respectively (Mukerem, 2012; Maru, 2009).

In a study by Mukerem (2012), of the 371 respondents, only 271 (73.0%) practiced exclusive breast feeding. The proportion of respondents who initiated EBF within the first hours of delivery was 350 (94.3%) while very few (1.1%) initialed after eight hours. From a total of 371 mothers, 152 (41.0%) of had stopped breastfeeding. The proportion of respondents who stopped breastfeeding at the age of less than three months, three to six months and after six months were 14 (9.2%), 91 (59.9%) and 47 (30.9%) respectively.

Falnes(2012) conducted a study in Eastern Uganda in which he found that Of 235 HIV-positive mothers that participated in the study, 215 (91.5%) initiated breastfeeding while 20 (8.5%) never breastfed their infants. Among 128 mothers who attended the PMTCT program, 18 (14%) avoided breastfeeding completely, while 2 of those not participating did not breastfeed (p

<0.001). Among the attendees and non-attendees in the PMTCT program, the proportions opting for exclusive breastfeeding during the first three days were not significantly different, 28.1% versus 27.1%, respectively. Ten among the 46 mothers in the better-off quintile did not initiate breastfeeding within the first three days. Nine of these 10 (90%) mothers continued with exclusive replacement feeding. Among the poorer 189 mothers, 11 (42%) out of 26 mothers did not initiate breastfeeding within the first three days continued with exclusive replacement feeding, whereas 15 mothers introduced breastfeeding later on ($p < 0.05$). Within the first two hours after delivery, 131 (56%) had initiated breastfeeding, with 178 (76%) having done so within the first day. Pre-lacteal feeding was given by 150 (64%) while 65 (28%) practiced exclusive breastfeeding during the first three days. Replacement feeding was practiced by only one of the 85 mothers diagnosed with HIV after delivery.

2.2 Determinants of adherence to feeding guidelines for exposed infants among mothers living with HIV

2.2.1 Individual determinants

Some studies view the lack of disclosure of HIV positive status to partner and family members as another barrier to exclusive breastfeeding (Fadnes et al. 2010; Laar and Govender 2011; Leshabari et al. 2007; Sibeko et al. 2009). Studies indicate that partner disclosure is a major condition for the success of the PMTCT program (Moland et al. 2010; Njunga and Blystad 2010; Rujumba et al. 2012). HIV status disclosure serves as an important prevention strategy in the PMTCT interventions. Disclosure promotes adherence to PMTCT prevention strategies and allows an individual to get support from significant others (Mucheto et al. 2011). It has been documented that women are more likely to adhere to PMTCT interventions when they have the

support of their male partners in particular (Medley et al. 2004). However, to receive support, women must disclose their HIV positive status. Women who hide their HIV status are less likely to adhere to selected choice of feeding practice (Kebaabetswe 2007). In addition, partner disclosure is a central concept in PMTCT programmes and is usually a major condition for successful replacement feeding. The assumption is that disclosure will elicit a positive response from family and partner (Sadoh and Sadoh 2010). On the contrary, the process of disclosure is stressful for women because of the uncertainty of evoking a positive response. Some HIV positive pregnant women in a PMTCT program in Zimbabwe viewed the PMTCT program as a divorce program. Most participants who disclosed to their partners in that PMTCT program were divorced after disclosure (Njunga and Blystad 2010).

Researchers further argue that mix feeding is a consequence of HIV positive women not disclosing their status to family members and partners (Doherty et al. 2006b; Fadnes et al. 2010; Sibeko et al. 2009). In addition, Leshabari et al. (2007) argue that raising a child in the African context is not an individual issue but a family issue which often compels the HIV positive woman to disclose to the other people who are part of raising the child. Matji et al. (2010) further argue that infant feeding practices become complex without the necessary support from the family and partner which can be obtained through disclosure

A key barrier to appropriate infant feeding practices is teenager mothers. The challenge for a teenager to appropriately feed her baby is compounded when she is a single mother. Single mothers especially those that are young are concerned about their body look and image (Muko, 2004; Kimani-Murage et al., 2015). In some cases, these mothers are still in school, still looking for fun and often do not have enough time for their babies. As a result, these girls do not initiate

their babies to breast milk because they are afraid than this will mean that the baby will get used to breast milk and keep the young mother away from a baby.

Kimani-Murage et al., (2015) in their study showed that some girls were breastfeeding their babies but did not know how to place the baby in a "breast-feeding position". Peer pressure is a key factor influencing infant feeding practices especially amongst young mothers. Kimani-Murage et al., (2015) reported that children of young mothers are feed when their young mothers are eating and often eat the same food as their young mothers.

The prevalence rates for countries in Sub-Saharan Africa are much higher than other regions in the world. As a result, HIV/AIDS poses a significant health challenge. Studies have reported that mothers are afraid to breastfeed their babies because of fear of transmitting the virus to their children. Kimani-Murage et al., (2015) reported that HIV positive mothers expressed mixed feeding regarding how HIV mothers should breastfeed their babies. Some believed that they should avoid mixed feeding for fear of infecting the baby while others felt that HIV positive mothers should not breastfeed at all (Kimani- Murage et al., 2015).

Unintended pregnancies have been associated with low uptake of breastfeeding. Mothers have been reported to not being able to optimally breastfeed their babies they got pregnant earlier than planned (Kimani-Murage et al., 2015). In Kenya, Kimani-Murage et al., 2015 report that there is a myth that mothers should not breastfeed when they conceive, the challenges that come with pregnancies further make it difficult for mothers to exclusively breastfeed their babies. This poses a significant problem given that breastfeeding is often perceived as a key strategy for family planning in poor households, which rely entirely on breastfeeding to space their children. This is because some mothers perceive modern family planning methods as being harmful. The

perceived negative effects of modern family planning methods include mothers will get fat, the child may ingest the contraceptive through breast milk, a reduction in sex drive and a reduction in milk production. Short term illness and infertility for the baby are also perceived to be potential outcome of the use of contraceptives (Kimani-Murage et al., 2015). Addressing these myths will result in increased uptake of exclusive breastfeeding.

In study conducted in Ethiopia reported (Alemayehu, 2009) that Women who are not married were two times more likely to breast feed their child exclusively than those married Similar another study found that Non Exclusive Breast Feeding were 2.4 times higher among children of currently unmarried mothers compared with married mothers (Egata, 2013). Study in Tanzania reported that single mothers had less odds to practice EBF up to six months then married/cohabiting mothers (Mgongo, 2013).

Mother's occupational status also identified as factors that influence EBF among HIV positive women. Varies studies found that unemployed mothers were more likely to breast feed exclusively than employed mother (Setegn, et al., 2012; Mekuria,, 2015; DebreMarkos, 2015;Bergman, 2016; Yeneabat, 2016). Another study reported that mother who do not work away from home were more likely Exclusive breast feed their infants than those who worked outside the home (Dearden, 2002). Additionally, Study in Tanzania showed that mothers fail to practice exclusive breastfeeding due to the fact that they go to work to supplement family income before their infant reaches six months (Leshabari, 2007). Senarath et al also reported that continuation of breastfeeding at the end of the first year was significantly lower in non-working mothers compared to working mothers (Senarath, 2007). Moreover, mothers who were engaged in different jobs like daily laborer, house servant and pottery were less likely to EBF compared to housewife mothers (Yeneabat, 2016). Mothers whose maternity leave was between seven and

12 months breast fed for a longer duration compared to mothers who had less than six months of maternity leave (Smith, 2015).

There are mixed findings about the relationship between exclusive breast feeding and maternal educational status. Various studies reported that mothers who didn't attain formal education and had lower educational attainments were found to delay the initiation of breast feeding as well as less adhere to Exclusive breast feeding (Onah, 2014;Tamiru, 2012). On the other hand, Studies conducted in Ethiopia and Ireland showed that highly educated mothers fail to exclusively breast feed their children (Smith, 2015; Yeneabat, 2014). Similarly, a study done in the Southern Ethiopia revealed that women who attend primary and above education were found to delay the initiation of breastfeeding practices (Adugna, 2014).

Many studies found that mothers that had two or more children were associated with higher rate of exclusive breast feeding than younger maternal age (Adugna, 2014; Yeneabat, 2014; Asfaw, 2015). Similarly, Della et al (2006) reported that duration of exclusive breastfeeding increases as the age of the mother increases thus women with older age are more experienced and can practice exclusive breastfeeding compared to the ones with younger age. Furthermore, Thairu et al (2006) in their study found that, it is difficult for adolescent mothers to decide on her own how to feed the baby. Whereas, a study conducted in South Africa by Rendani (2011)reported that mothers that had two or more children were practicing more of formula feeding than Exclusive breast feeding.

Various studies identified that the rate of exclusive breast feeding was higher among mothers who gave birth through vagina (Seid, 2014; Coovadia, 2007; Joshi, 2014). Similarly, Mothers who deliver by CS were more likely to practice exclusive replacement feeding than vaginal

delivery (Maru, 2009). Furthermore, another study reported that, emergency and elective caesarean deliveries are associated with a decreased rate of exclusive breastfeeding compared with vaginal delivery (Zanardo, 2010).

On the other side, a study conducted in South Africa among HIV positive women found that mixed feeding was more practiced by women who delivered through vagina (Rendani, 2011). Similarly, there was mixed findings about the relationship between exclusive breast feeding and maternal place of residence. Setegn and his colleagues reported that mothers who live in urban area were associated with timely initiation of breastfeeding (Setegn, 2011). However, study conducted in Malaysia identified that Exclusive breastfeeding was positively associated with rural residence (Tan, 2011).

In Ethiopia, Mukerem (2012) in his study found that the effects of socio-demographic variables, obstetrics history, feeding advice, disclosure of HIV status to spouse, maternal and child illnesses were tested for their associations with adherence to exclusive breastfeeding. Mothers' having formal education (COR=2.2; 95%CI=1.3-3.7), having ≥4 ANC follow up (COR=2.2; 95 CI=1.3-3.7), delivering by caesarean section (COR=0.41; 95%CI=0.21-0.79), having negative attitude towards EBF (COR=0.34; 95 CI=0.2-0.6), having disclosed HIV status to spouse (COR=2.23; 95% CI(1.29-3.85), having financial support from spouse (COR=2.02; 95%CI=(2.20-3.37), mother's illness (COR=0.29; 95%CI=0.16-0.52) and infant's illness (COR=0.52; 95%CI=0.29-0.91) were significantly associated with EBF adherence. Nevertheless, only three of the above variables remained significant during multivariate regression. Mothers who attended more than or equal to four ANC follow-ups were 1.9 times more likely to adhere to EBF than those who attended less than four times (AOR=1.04;95CI=1.04-3.4). Likewise, mothers who experienced illness were 74% less likely to adhere to EBF than who had no illness (AOR=0.26; 95%CI, 0.13-

0.53). In addition, mothers who had negative attitudes towards EBF were 68% less likely to adhere to EBF than those who had positive attitudes. (AOR=0.32; 95%CI= 0.16-0.63).

2.2.2 The infant related determinants

Infant factors also play a central role in the choices of infant feeding options adopted by HIV positive mothers. When children are born with Cleft Lip and Palate, they find it difficult to suck. Cleft is an opening in the lip, the roof of the mouth, or the soft tissue in the back of the mouth (Ogar, 2015). These openings are normally present in early fetal development, and usually close by the tenth to twelfth week of pregnancy. They fail to close in approximately one in every 700 babies born (McNaghten, Wolfe and Onorato, 2007).

They further opined that the causes of cleft lip and palate are not well understood, so may be as a result of a combination of genetic elements with environmental factors, such as drugs, infections, maternal illnesses, and possibly deficiency of folic acid. Children with clefts have special problems, particularly with feeding, ear diseases and speech development, as well as dental problems. Little is known about how to prevent clefts, because fetuses with certain predisposing gene may be at increased risk of developing cleft palate if their mothers smoke. Other factors, such as maternal alcohol abuse, and maternal diabetes have been linked to increased risk of clefts. In situations like this, the child may find it difficult to hold the nipple of the mother properly; hence the mother must find an alternative option of feeding the child (McNaghten, Wolfe and Onorato 2007).

Another infant factor that can determine the choices of infant feeding options is the weight of the baby at birth. This is a medical condition called low Birth weight, and these babies may face serious health problems, and are at increased risk of long term disabilities. It is observed by

Hoat, Huong and Xuan (2010) that children with low birth weight weigh between 2.27 kilo gram and less at birth. Very low birth weight goes as low as 1.36 kilo gram or less. Preterm births occur before the 38th week of pregnancy. However, HIV positive mothers medical problems influence birth weight, especially if she has high blood pressure, diabetes, certain infections or heart, kidney or lung problems. This is also a hereditary factor from the mother to the child which the child suffers at infant stage, and can also influence the choices of infant feeding options adopted by the HIV positive mothers for the health of her child (Magavero, Norton and Saag, 2011).

A premature baby may be anemic. Infants born too soon may not have had enough time to store iron. Low-birth weight babies may not have enough fat to maintain a healthy body temperature. Bleeding in the brain, which can be one of the most severe results of low birth weights, happens in 40 to 45% of very low-birth weight infants. Premature babies often have a potentially dangerous heart problem that affects their infant feeding options (Ogar, 2015). Lifesaving equipment in intensive care nurseries helps sustain low-birth weight babies who otherwise might not survive. The most important prevention is early and regular prenatal care. Women who receive this care can learn good health habits and ways to reduce the risk of having a low-birth weight baby or alternate means of feeding them to survival.

Preterm infants are at increased risk of feeding difficulties (Celik, 2013) and low birth weight infants have been found to be significantly associated with poor attachment and suckling (Goyal, 2011). A study also found that jaundiced infants experiencing bouts of lethargy may experience difficulties latching on and suckling (Scrafford, 2013).

2.2.3 The health service related determinants

Hospitals through counselors play a major role in advocating recommended infant feeding practices and has been found to be of paramount importance during antennal visits and mostly soon after delivery in assisting women in their intended feeding choice, decision making as well as actual practice, which lead to lowered risk of mixed feeding. However, Doherty et al (2006) reports lack of inadequate support from health workers which result in women to change from their intended feeding option as a challenge faced by HIV positive women in sustaining exclusive breastfeeding (Doherty, 2006).

A study in Ethiopia and Bolivia by Adugna (2014)showed that women who had received Breast feeding information from health care personnel before birth or on the maternity ward breastfed exclusively for a longer duration and avoided pre lacteal food to a greater extent However, another study reported that lack of inadequate support from health workers which result in women to change from their intended feeding option as a challenge faced by HIV positive women in sustaining exclusive breastfeeding.

Counselling sessions with HCWs are recognized as the primary platforms for mothers to obtain HIV-related information and infant feeding recommendations (Doherty et al., 2006a; Maman et al., 2012). Therefore, HCWs can have a significant influence on mothers‟ initial feeding choice and practice (Chisenga et al., 2011; Kafulafula et al., 2014). However, studies have found that a significant number of HCWs, including those with relevant training, presented the possibility of MTCT through breastfeeding as a certainty and not a risk, resulting in infant feeding counselling that downplayed EBF (Buskens et al., 2007; Chopra et al., 2009; Kafulafula et al., 2014).

The overestimation of breastfeeding-related postnatal MTCT risk by HCWs in several SSA countries either discouraged mothers from practicing EBF, or encouraged them to switch from EBF to EFF in the early postpartum period (Doherty et al., 2006b; Koricho et al., 2010; Maman et al., 2012). In Tanzania, except for HCWs that had prior training in HIV and infant feeding policy, all counsellors were in favor of EBF for HIV-exposed infants (Leshabari et al., 2007). Poor-quality infant feeding counselling could result in inappropriate feeding choices among mothers leading to a significantly increased risk of postnatal transmission and infant mortality (Doherty et al., 2007).

Information, education and communication **(**IEC) has been used to provide mothers with HIV and their male partners with technically sound and consistent information about infant feeding and PMTCT. It has been used in the clinical setting both as a stand-alone intervention, as in Zimbabwe, (Piwoz et al., 2007) as well as being provided as a way to supplement individual counseling, as in Uganda(Matovu et al., 2008) In the studies reviewed, IEC materials included videos, flyers, flip charts and group lectures provided by nurses.

In Zimbabwe, an intervention developed videos, pamphlets and lectures to be given by nurses about EBF's nutritional benefits, breastfeeding and PMTCT, and healthy breastfeeding practices (avoiding breast health problems, safer sex during breastfeeding, etc.). The IEC was given to mothers both with and without HIV who were choosing to breastfeed, as well as breastfeeding women who chose not to learn their status (Piwoz et al., 2007). This approach should be noted because it provided information without singling out or stigmatizing women with HIV, while at the same time it promoted optimal breastfeeding practices in the general population, per WHO guidelines.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter discusses the methods that were employed in this study for the purpose of answering the research questions. This includes research design, study population, sampling procedures, research instruments, data collection methods, data collection procedures. It further explains and identifies the processes of gathering, analyzing and interpretation of data that was used in this study, quality control issues, Ethical considerations and limitations of the study.

3.1 Study design

The study adopted a facility based descriptive cross-sectional research design. With this design, the study did not have a time dimension, relied on existing differences rather than change following intervention; and, a representative sample (cross section) of respondents (postpartum mothers living with HIV) were selected as study participants. However, the cross-sectional design can only measure differences between or from among a variety of people, subjects, or phenomena rather than change. The design was also used because it is capable of using data from a large number of subjects and, it could enable the estimation of the prevalence of an outcome of interest because the sample was taken from the whole available population of postpartum mothers at the health facilities in Mpigi district. Further, the cross-sectional design generally uses survey techniques to gather data, so it was relatively inexpensive and took little time to conduct. The descriptive component of this design refers to the type of research question, design, and data

analysis that were applied in this study, involving describing the practices of the populations more so numerically.

3.2 Study population

A population refers to the entire group of people, events or things of interest that the researcher wishes to investigate, and it forms a base from which the sample or subjects of the study was drawn (Bryman, 2008). In the present study, this was all mothers living with HIV seeking EMTCT and / or Early Infant Diagnosis services from health facilities in Mpigi district.

Inclusion criteria

- Consenting mothers
- Mothers who were not more than 1year postpartum
- Mothers who were residents of any sub county in Mpigi district
- Mothers whose children were of any sero status
- Mothers with a living baby

Exclusion criteria

- Mothers living with HIV who were below the age of 18 years
- Mothers living with HIV, whose children were above 1 year of age\
- Those who did not meet any of the inclusion criteria

3.3 Sample size calculation

The minimum sample size was calculated using a standard formula for known population size for a cross-sectional study; the Yamane Taro's formula (Reid, 1991), given as.

$$n = \frac{N}{[(1 + N(e)^2]}$$

Where

n = sample size of adjusted population

N = population size is the finite population size = estimated number of mothers living with HIV seeking HIV related care and treatment for their children from health facilities in Mpigi district in a month = 752 (DHIS 2 report 2015/16)

and

e = accepted level of error taking alpha as 0.05

$$n = \frac{752}{1 + 752\ (0.05)^2}$$

n = 261mothers living with HIV attending EMTCT services in Mpigi District

3.4 Sampling procedures

Mpigi district has 23 health facilities that provide EMTCT services of which are 1 hospital, and 22 health centers. To avoid a possible case of eliminating the hospital during the random sampling procedure, it was purposively sampled as opposed to including it in the sampling frame where the health centers were. The health centers from which the study respondents were obtained were sampled using simple random sampling in order to prevent sampling bias during the selection process. In that method, the names of the health centers as provided by the district

health office were written on equal sized pieces of paper, folded and put in an opaque box. Of these 11 (50%) were sampled by picking one piece of paper at a time from the box after each successive ruffle (shaking) to ensure thorough mixing of the papers at each time.

At each sampled health facility, target was made for mothers living with HIV who had come to seek E.I.D (Early Infant Diagnosis) services for their children and those who had come for general ART services but had come with along their children who met the eligibility criteria of the study. Given that most health facilities on average scheduled about 10 mothers for E.I.D appointments in a week save for the hospital were between 20 and 30 are schedules in a week, still a non-probabilistic sampling method was used to sample them. This was done because of the relatively small accessible sample of mothers per facility compared to the sizeable sample size that this study required. Using a random sampling method for the mothers would have eliminated some of them, hence making achievement of the determined sample size a challenge.

Therefore consecutive sampling was used to sample the respondents. Consecutive sampling technique involves selecting all individuals who agree to participate, provided they meet pre-established criteria, until the number of subjects desired has been recruited. Consecutive sampling was used to sample the respondents because it is highly useful when the available subject pool (mothers living with HIV and having children less than 1 year) is limited or when using selection criteria as stringent as to reduce the number of subjects to a point that threatens the generality of findings. Secondly, consecutive sampling methods are typically stronger than other non-probability methods in controlling sampling bias especially if the populations under study is not wide spread (Creswell, 2007), which was the case in this study.

The researcher and his team first visited all the sampled health facilities to ascertain the days upon which appointments for mothers living with HIV had been scheduled. It was on these days (specific to each health facility), that the researcher and his team sampled the respondents. The sampled mothers were briefed first as a group about the study and its benefits, and were later asked to consent, at which point all consented at all health facilities, and were then interviewed.

The table below shows that number of mothers sampled per health facility;

Facility level	**Number of respondents**
Hospital	42
Health centre III	22
Health centre III	14
Health centre III	21
Health centre III	20
Health centre III	17
Health centre III	18
Health centre IV	38
Health centre III	22
Health centre III	14
Health centre III	15
Health centre III	18
Total	261

3.5 Data sources

3.5.1 Primary data collection

Structured interviews, with the study respondents (postpartum mothers) were the primary source of data for this study.

3.5.2 Secondary data collection

Secondary data was collected through desk review of relevant literatures on feeding options, from relevant research reports, journals, Newspapers and publications

3.6 Data collection method

May (2001, p.6) asserts that, "the methods of maintaining and generating conversations with people on a specific topic or range of topics and the interpretations that is made from the resultant data" embodies what is termed interviews. In effect, interviews are ways of delving into "people's biographies, experiences, opinions, values, aspirations, attitudes and feelings" (May 2001, p.6). Following from above, structured interviews were deemed useful for the study because they could allow for empirical material to be collected from first-hand experience through interviews (Moen, 2006). While using these interviews, the respondents were asked questions and provided with response options from which they chose what was appropriate to them. The choice of this type of interviews was premised on the reason that with them, a short period of time would spent while interviewing the respondent given the closed nature of majority of the questions, therefore, more respondents can be interviewed per field work visit. All interviews were conducted in a private area which was offered by the health staff including free waiting areas, free consultation rooms and in the health facility compound were possible.

3.7 Data collection tool

Questionnaires were used as the data collection tools in this study. A questionnaire is an organized collection of questions intended to solicit information from patients in the healthcare domain. These questionnaire define the questions to be asked, how they are ordered and grouped, any intervening instructional text and what the constraints are on the allowed answers. Specifically, a pretested structured questionnaire was used to capture those responses of the mothers. The questionnaire comprised of both close ended questions which were arranged in three Parts. These were Part 1: Socio demographic characteristics, Part 2: Assessment of adherence to exposed infant feeding practices, Part 3: Individual characteristics and Part 4: Infant characteristics. These questionnaires were interviewer administered in order to increase accuracy and validity of the responses given by the mothers. Since the researcher sought to test and quantify the data to be analyzed statistically, a formal standardized questionnaires was designed. In this case, the researcher used prescribed wording and order of questions, to ensure that each respondent receives the same stimuli, prescribed definitions or explanations for each question, to ensure interviewers handle questions consistently and can answer respondents' requests for clarification if they occur and also prescribed response format, to enable rapid completion of the questionnaire during the interviewing process.

3.8 Quality control

The following measures were put in place to ensure the quality and validity of the data and findings of the study:

1. Three research assistants or data collection personnel with a health background were recruited and trained well (intensively) for one day. They were trained on; How to administer the

questionnaire, Translate technical terms into local language (Luganda), To respect the dignity and human rights of the participants, Obtain verbal consent from all participants before questionnaires are administered, and also the basics of birth preparedness and complication readiness. After the training, role plays were held whereby the assistants were tasked to interview each other in an interviewer - researcher scenario so as to confirm whether the training had been effective.

2. Each day, data was checked on the field to ensure that all information has been properly collected and recorded.

3. Errors and omissions detected were discussed with the respective research assistants and the necessary corrections made.

4. There was regular monitoring by the principal investigator at the study area to review questionnaires presented by the field staff for consistency. Appropriate corrections were made. Data that were clearly inconsistent and corrections could not be made, were excluded from processing and analysis since it could affect the consistency and validity of the results.

5. All data collected were entered in SPSS (version 20.0). The Researcher verified how data had been coded and entered into the computer

Daily checks of questionnaires, and proper data management

After each field day, the researcher carried out verification checks on all filled questionnaires to find out whether all questions had been responded to and whether there are any invalid responses. If any were found, the researcher and her team endeavored to find a solution for any anomalies found.

3.9 Data analysis

The questionnaire were checked for completeness and coded before data entry. Data were entered, cleaned and analyzed using SPSS for windows version 20.0. First, simple frequency distributions were done to show the proportions of each attribute. Descriptive statistics (frequency, and percentages) were used for all variables.

A cross tabulation with chi-square test statistics was employed to examine the associations and differences in the study variables between the study groups by comparing the observed and expected counts between the study groups. If the discrepancies between the observed and expected counts were large, the chi-square value was large, but if no discrepancies exist the chi-square value was closer to 0 (Kirkwood & Sterne, 2003; Witt &McGrain, 1986). The level of significance was defined as two-sided p-value ≤ 0.05. The dependent variable was assessed at the nominal level to determine if the participants had adhered to EMTCT feeding guidelines or not. The chi-square test was an appropriate choice for this variable because the measures were categorical and independent of each other (Munro, 2005).

Then, all variables which showed association at bivariate analysis at (P value < 0.05) were fitted into the multiple logistic regression model by stepwise (forward selection) method to test for the association of each with the dependent variable at 95 % confidence level. Then final model obtained includes all variable which determine the BPCR. P-value and 95 % confidence interval (CI) for odds ratios (OR) were used to confirm the significance of the associations. Variables with P-value less than 0.05 were considered significantly correlated.

3.10 Ethical considerations

Approval to conduct the study was obtained from the University Ethical Review Committee. Permission to conduct the study in Mpigi district was obtained from the district authorities who included the District Health Officer of Mpigi district.

The participants in this study were nor coerced to be participants, they were first briefed about the study, and either given a consent or read to them its contents, and after which they were asked to consent before interviews started.

The participants were made aware of the fact that the methods and tools that were to be used in the study posed minimal risk to them. For example, some questions on their obstetric history may be embarrassing to them. They were assured that anonymity and high level of confidentiality was applied to every information they provided. Maximum privacy was ensured as much as possible and that they had the right not to answer any question they were not comfortable with.

Benefits to participants

The participants were informed that the research did not guarantee any direct or short term benefit. It was expected however, that the information elicited would inform policies and programmes in the region to prevent maternal mortality and improve maternal health.

Compensation

It was made known to the participants that, there was neither compensation nor reward for participating in the study. Willingness to participate was purely voluntary.

Rights of participants and Right to Opt out of the Research

Participants were made to understand that they had the right:

- To decline enrolling in the study
- Not to answer questions they are uncomfortable with
- Withdraw from the study completely and yet not suffer any consequences, punitive measures or decline in the quality of care they receive at the facility.

3.11Dissemination of finding

This study upon completion will serve as resource material for researchers, managers, policy makers etc. To reach these targets, the final copy of this study will be Uganda Martyrs University. Besides, it will be given to the district health office of Mpigi and the Medical Superintendent in-charge of the hospital. The findings will also be presented at the appropriate meetings, seminars, workshops and publishing in scientific journals.

CHAPTER FOUR: FINDINGS

4.0 Introduction

This chapter presents the results of the study, according to objectives chronologically. The results have been both tabulated and also presented in statistical figures.

4.1 Socio demographic characteristics

Table 1: Socio demographic characteristics of the mothers sampled

Variable	Response	Frequency (n = 261)	%
Current age in years			
	20 - 27 years	60	23.0
	28 - 35 years	39	14.9
	36 - 42years	97	37.2
	43 - 50 years	65	24.9
Current marital status			
	Single	61	23.4
	Married	176	67.4
	Separated	15	5.7
	Widowed	9	3.4
Current education level			
	Lower primary (P1 - P4)	64	24.5
	Upper primary (P5 - P7)	79	30.3
	Secondary (O level)	65	24.9
	Secondary (A level)	34	13.0
	Post-secondary education	19	7.3
Religious affiliation			
	Christianity	174	66.7
	Islam	87	33.3

The results in the tables above show that many of the mothers who participated in the study were in the age bracket of 36 - 42years (n = 97, 37.2%). The majority of the mothers were married(n = 176, 67.%), and had been educated up to Upper primary level (P1 - P5) (n = 79, 30.3%).The majority of the mothers were affiliated to Christianity by religion (n = 174, 66.7%)

4.2 Infant feeding characteristics

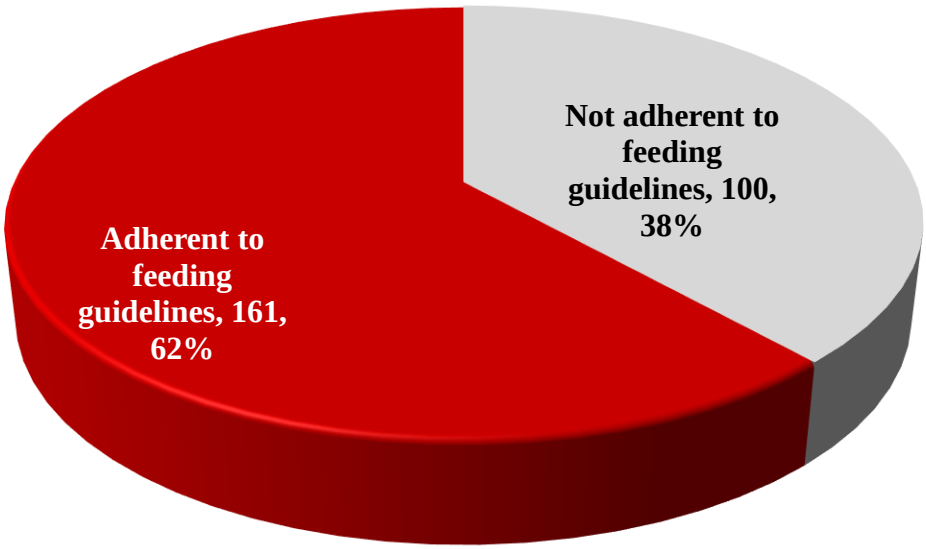
Table 2: Exposed infant feeding characteristics of the mothers

Variable	Response	Frequency	%
Breast fed child			
	Yes	246	94.3
	No	15	5.7
	Total	***261***	***100.0***
If yes, breastfeeding exclusive?(only breast milk for six months)			
	Yes	161*	65.4
	No	85	34.6
	Total	***246***	***100.0***
Duration before initiating breastfeeding			
	Less than 1 hour after birth	178	72.4
	1 – 5 hours after birth	40	16.3
	More than 5 hours	28	11.4
	Total	***246***	***100.0***
Age at introduction of other foods in the child diet			
	1 month	13	5.0
	2 months	45	17.2
	3 months	51	19.5
	4 months	37	14.2
	5 months	15	5.7
	At or after 6 months	100	38.3
	Total	***261***	***100.0***

****Adherent population***

Almost all mothers generally breastfed their children (n = 246, 94.3%), however more than half of them breastfed exclusively (gave only breast milk for six months) (n = 161, 65.4%). Almost three quarters of the mothers initiated breastfeeding within the first hour of birth (n = 178, 72.4%). Slightly more than a third of the mothers introduced other foods in the child diet after 6 months (n = 100, 38.3%).

Figure 1: The level of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district



Basing on the WHO guidelines of feeding exposed infants, it was found that more than half of the mothers living with HIV in Mpigi district adhered to the breastfeeding guidelines for exposed infants (n = 161, 62%).

4.3 The individual characteristics and adherence to feeding guidelines for exposed infants

Table 3: The individual determinants of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district

			Adherence to feeding guidelines		
	n	**%**	**Adherent (n = 161)**	**Not adherent (n = 100)**	**X2 P Value**
Parity					
One	34	13.0	22(64.7%)	12(35.3%)	
Two	73	28.0	44(60.3%)	29(39.7%)	
Three	88	33.7	55(62.5%)	33(37.5%)	**X^2 = 0.948**
Four	54	20.7	34(63.0%)	20(37.0%)	**P = 0.918**
More than four	12	4.6	6(50.0%)	6(50.0%)	
Children given birth to since diagnosis with HIV					
One	155	59.4	96(61.9%)	59(38.1%)	
Two	85	32.6	54(63.5%)	31(36.5%)	**X^2 = 0.896**
Three	21	8.0	11(52.4%)	10(47.6%)	**P = 0.693**
Had fears of infecting baby while breastfeeding					
Yes	172	65.9	115(66.9%)	57(33.1%)	**X^2 = 5.715**
No	89	34.1	46(51.7%)	43(48.3%)	**P = 0.017***
Number of children with positive status					
None	230	88.1	146(63.5%)	84(36.5%)	**X^2 = 3.797**
One	30	11.5	14(46.7%)	16(53.3%)	**P = 0.150**
Two	1	.4	1(100.0%)	0(.0%)	
Description of residence					
Rural	165	63.2	109(66.1%)	56(33.9%)	**X^2 = 3.633**
Urban	96	36.8	52(54.2%)	44(45.8%)	**P = 0.057**
Antenatal care attendance					
Yes	253	96.9	155(61.3%)	98(38.7%)	**X^2 = 0.619**
No	8	3.1	6(75.0%)	2(25.0%)	**P = 0.431**
Mode of delivery of previous pregnancy					
Normal	212	81.2	137(64.6%)	75(35.4%)	**X^2 = 4.121**
Caesarean	49	18.8	24(49.0%)	25(51.0%)	**P = 0.042***
Postnatal care attendance					
Yes	148	56.7	86(58.1%)	62(41.9%)	**X^2 = 1.851**
No	113	43.3	75(66.4%)	38(33.6%)	**P = 0.174**

Disclosed HIV status partner					
Yes	165	63.2	103(62.4%)	62(37.6%)	**X^2 = 0.103**
No	96	36.8	58(60.4%)	38(39.6%)	**P = 0.748**
Disclosed HIV status to anyone else					
Yes	146	55.9	98(67.1%)	48(32.9%)	**X^2 = 4.145**
No	115	44.1	63(54.8%)	52(45.2%)	**P = 0.042***
Experience any breastfeeding problems					
Yes	101	38.7	56(55.4%)	45(44.6%)	**X^2 = 2.715**
No	160	61.3	105(65.6%)	55(34.4%)	**P = 0.099**
Had enough breast milk during the first six months					
Yes	129	49.4	78(60.5%)	51(39.5%)	**X^2 = 0.161**
No	132	50.6	83(62.9%)	49(37.1%)	**P = 0.688**
Ever missed a dose of ART medication during the first 6 months					
Yes	224	85.8	138(61.6%)	86(38.4%)	**X^2 = 0.004**
No	37	14.2	23(62.2%)	14(37.8%)	**P = 0.949**
Current age in years					
20 - 27 years	60	23.0	37(61.7%)	23(38.3%)	
28 - 35 years	39	14.9	23(59.0%)	16(41.0%)	**X^2 = 0.176**
36 - 42years	97	37.2	60(61.9%)	37(38.1%)	**P = 0.981**
43 - 50 years	65	24.9	41(63.1%)	24(36.9%)	
Current education level					
Lower primary (P1 - P4)	64	24.5	37(57.8%)	27(42.2%)	
Upper primary (P5 - P7)	79	30.3	48(60.8%)	31(39.2%)	
Secondary (O level)	65	24.9	41(63.1%)	24(36.9%)	**X^2 = 1.017**
Secondary (A level)	34	13.0	23(67.6%)	11(32.4%)	**P = 0.907**
Post secondary education	19	7.3	12(63.2%)	7(36.8%)	

n = Frequency

% = Percentage

Majority of the mothers were para 3 by study time (n = 88, 33.7%), and more than half of them had given birth to one child since being diagnosed with HIV (n = 155, 59.4%).The majority of the women reported that they had fears of infecting their babies while breastfeeding (n = 172, 65.9%), and more than three quarters of them said they had no children who had tested positive (n = 230, 88.1%). The majority of the mothers described their areas of residence as rural (n =

165, 63.2%), almost all of them had attended antenatal care (n = 253, 96.9%), and more than three quarters of them had delivered their previous pregnancy normally (n = 212, 81.2%).

More than half of the mothers said they attended postnatal care (n = 148, 56.7%), and that they had disclosed HIV status to their partners (n = 165, 63.2%), and had disclosed their HIV status to someone else apart from their partner (n = 146, 55.9%).The majority of the mothers had not experienced any breastfeeding problems (n = 160, 61.3%), and about half of them reported that they never had enough breast milk during the first six months (n = 132, 50.6%).More than three quarters of the mothers reported that they had never missed a dose of ART medication during the first 6 months (n = 224, 85.8%).

At individual level, having fears of infecting baby while breastfeeding during the first six months ($X^2 = 5.715$, P = 0.017), the Mode of delivery of previous pregnancy ($X^2 = 4.145$, P = 0.042) and disclosure of HIV status to anyone else besides the partner ($X^2 = 4.145$, P = 0.042) were found to be significant determinants of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district.

Disaggregated results show that of the mothers who had delivered their previous pregnancies normally, a bigger proportion of them were adherent to the infant feeding guidelines (64.6%) compared to those who had delivered by caesarean section (49.0%).

Mothers who had fears of infecting baby while breastfeeding adhered to feeding guidelines in larger proportions (66.9%) compared to those who had no fears (51.7%). Mothers who had disclosed their HIV status to anyone else apart from their partners adhered to infant feeding guidelines in bigger proportions (67.1%) compared to mothers who had not disclosed their status (54.8%).

Table 4: Logistic regression analysis for the individual determinants of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district

		n	%		Confidence interval at 95% for AOR	
	S.E.	Wald	Sig.	AOR	Lower bound	Upper bound
Had fears of infecting baby while breastfeeding						
Yes	.267	5.651	.017	.530	.314	.895
No						
Mode of delivery of previous pregnancy						
Normal	.325	4.755	.029	3.492	2.260	5.931
Caesarean						
Disclosed HIV status to anyone else						
Yes	.261	4.816	.028	3.564	1.338	4.941
No						

Mothers who had fears of infecting baby while breastfeeding were less likely to adhere to feeding guidelines for exposed infants (AOR = .530, CI = .314 - .895). Mothers who had delivered their last born child normally were three times as likely (AOR = 3.492, CI = 2.260 - 5.931) to adhere to feeding guidelines for exposed infants, while mothers who had disclosed HIV status to anyone else were three point five times as likely to adhere to feeding guidelines for exposed infants (AOR =3.564, CI = 1.338 - 4.941) compared to those who had not disclosed their status to anyone else apart from their partner.

4.4 Infant related characteristics and adherence to feeding guidelines for exposed infants

Table 5: Infant related characteristics influencing adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district

			Adherence to feeding guidelines		
	n	**%**	**Adherent (n = 161)**	**Not adherent (n = 100)**	**X^2 P Value**
HIV status of the child at first EID					
Positive	72	27.6	47(65.3%)	25(34.7%)	**X^2= 0.543**
Negative	189	72.4	114(60.3%	75(39.7%)	**P = 0.461**
HIV status of the child at second EID					
Positive	92	29.5	64(69.6%)	28(30.4%)	**X^2=** 3.732
Negative	169	54.2	97(57.4%)	72(42.6%)	**P** = 0.053
Gender of the child					
Male	168	64.4	106(63.1%)	62(36.9%)	**X^2=** 0.396
Female	93	35.6	55(59.1%)	38(40.9%)	**P** = 0.529
Frequency of falling six during the first six months (in a month)					
None of the time	59	22.6	36(61.0%)	23(39.0%)	
Once	136	52.1	83(61.0%)	53(39.0%)	**X^2=** 0.357
Twice	53	20.3	33(62.3%)	20(37.7%)	**P** = 0.949
More than twice a month	13	5.0	9(69.2%)	4(30.8%)	
Child able to suck well during the first six months					
Yes	168	64.4	103(61.3%)	65(38.7%)	**X^2=** 0.028
No	93	35.6	58(62.4%)	35(37.6%)	**P** = 0.867
Child born at full term (9 months)					
Yes	222	85.1	134(60.4%)	88(39.6%)	**X^2=** 1.104
No	39	14.9	27(69.2%)	12(30.8%)	**P** = 0.293
Weight of the child at birth					
Less than 3500gm	112	42.9	65(58.0%)	47(42.0%)	**X^2=** 1.106
3500gm and above	149	57.1	96(64.4%)	53(35.6%)	**P** = 0.293

The results in table 6 above show that the HIV status of the majority of the children at first EID was negative (n = 189, 72.4%), and still the HIV status of the majority of the children at second EID was negative (n = 169, 52.4%). The majority of the children of the mothers sampled were male (n = 168, 64.4%), and more than half of the children were reported to have been falling sick at least once during the first six months (in a month) (n = 136, 52.1%). The majority of the children were reported to have been sucking well during the first six months (n = 168, 64.4%), and had been born at full term (9 months)(n = 222, 85.1%). The majority of the children has been born with weight exceeding 3500g at birth (n = 149, 57.1%).

Bivariate results showed that there was no statistically significant relationship between infant characteristics and adherence to infant feeding guidelines for exposed infants ($p<0.05$).

4.5 Health service related determinants of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district

Table 6: The health service related determinants of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district

			Adherence to feeding guidelines		
	n	%	Adherent (n = 161)	Not adherent (n = 100)	X^2 P Value
Discussed of infant feeding with between service provider and mother					
Yes	211	80.8	127(60.2%)	84(39.8%)	**X^2 = 1.043**
No	50	19.2	34(68.0%)	16(32.0%)	**P =0.307**
Type of provider discussed with					
Sister/Nurse	225	86.2	137(60.9%)	88(39.1%)	**X^2 = 0.438**
Doctor	36	13.8	24(66.7%)	12(33.3%)	**P = 0.508**
Waiting time for contact with an ART service provider at facility					
< 30 minutes	62	23.8	41(66.1%)	21(33.9%)	
30 min. and 1hr	110	42.1	72(65.5%)	38(34.5%	**X^2 = 3.443**
more than 1hr	89	34.1	48(53.9%)	41(46.1%)	**P = 0.179**
Counselled on IYCF for exposed infant during ANC					
Yes	226	86.6	138(61.1%)	88(38.9%)	**X^2 = 0.278**
No	35	13.4	23(65.7%)	12(34.3%)	**P = 0.598**
Health facility hold Health education sessions for mothers living with HIV on topics like on IYCF					
Yes	152	58.2	94(61.8%)	58(38.2%)	**X^2 = 0.004**
No	109	41.8	67(61.5%)	42(38.5%)	**P = 0.951**
Health workers inquire about breastfeeding status of exposes child at each visit					
Yes	162	62.1	94(58.0%)	68(42.0%)	**X^2 = 2.422**
No	99	37.9	67(67.7%)	32(32.3%)	**P = 0.120**

The results in the figure above show that majority the mothers had been offered discussions about infant feeding by service providers (n = 211, 80.8%), by majorly nurses (n = 225, 86.2). Many of the women reported that one had to wait for about 30 minutes and 1hr to come into contact with an ART service provider at facility (n = 110, 42.2%).

The majority of the mothers reported that they had been Counseled on IYCF for exposed infant during ANC (n = 226, 86.6%), and that the health facilities held health education sessions for mothers living with HIV on topics like on IYCF (n = 152, 58.2%). The majority of the mothers reported that health workers at the respective facilities inquired about breastfeeding status of exposes child at each visit (n = 162, 62.1%).

The study still did not find any statistically significant relationship between the health service characteristics and adherence to the infant feeding guidelines for exposed infants.

CHAPTER FIVE

DISCUSSION

5.0 Introduction

In this chapter, a discussion of the key study findings has been done following the objectives of the study

5.1 The level of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district

More than half of the mothers living with HIV in Mpigi district (62%) breastfed exclusively (i.e. gave only breast milk) for six months. This implies that satisfactory adherence to EMTCT guidelines is still far from being achieved given that the threshold for this is 80% (WHO, 2012), thus calling for more efforts for all players in the health sector of the country. This is lower than the findings in the Amhara Region of Ethiopa, (81%), but similar to the adherence rate in the Oromia Region, (62%), South Nations and Nationalities Peoples Region (64%), in Lebanon (10%), Bangladesh (36%) and the previously reported national exclusive breastfeeding prevalence in Ethiopia (49%) (Oweis, 2008; Alemayehu, 2009). The findings are also higher than what was reported among HIV positive mothers in IlalaMunicipalicity - Tanzania, which was found to be 46% and in other studies 13.3%, 16%, 30.6% and 40% in Tanzania, Kenya, Ethiopia and Uganda respectively (Maru, 2009; Matovu, 2008; Young, 2010). This observed difference may be due to the strengthened PMTCT services. The lower results in other studies

are related to difference in the policy environments in those other countries in that, although the Baby Friendly Health Initiative has been adopted in most of those countries, by the time the studies were conducted, the BFHI was not in place or was in early stages of implementation, unlike in Uganda currently were the BFHI program in conjunction with an intense EMTCT program are in place to ensure adherence to the feeding guidelines.

Almost all mothers in this study generally breastfed their children (n = 246, 94.3%). This level of general breastfeeding is quite satisfactory is reflective of the positive impact of efforts that the government of Uganda through the ministry of Health has put in to ensure universal general breastfeeding rates in the country. Nonetheless, universality has not been achieved yet, hence the need for some more efforts in that endeavor. The breastfeeding rate in this study is almost similar to the Ethiopia national and Oromia regional ever breastfeeding rate (96%) and (94%) respectively (Alemayehu, 2009). Consistently, the results of the current study are similar to other previous studies in countries like Tanzania and elsewhere in Sub-Sahara African countries that have showed that breastfeeding is the culture and well accepted practice where most of the infants are breastfed at one point in time(World Health Organization, 2007; Leshabari, 2007). However, the general breastfeeding rate among mothers living with HIV in Mpigi district was slightly lower that the general breastfeeding rate that the UDHS (2016) reported (98%). The difference between the findings lies in the fact that the UDHS covered all mothers regardless of sero status while the current study covered only HIV positive mothers among whom some fears of HIV transmission to babies are prevalence, hence some do not initiate breastfeeding.

This finding of the current study on the level of adherence to the feeding guidelines is comparable to similar studies conducted in Goba district (71.3%) (Setegn, 2012), Jimma town (67.2%) (Seifu, 2014), Madagascar (68%) (Victoria, 2005), and Brazil (72.5%) (do Nascimento,

2010). It was lower than studies conducted in Ghana (79%) and Iran (82%) (Koosha, 2008). This might be because of the small sample size in Ghana and Iran which increases estimation of exclusive breastfeeding rate. Nevertheless, it higher than studies conducted in Bahir Dar City Administration (50.36%), EDHS (52%), Bolivia (65%), Turk Islands (50.6%) (Karaçam, 2008), UK (35%) (UK Breastfeeding Rates, 2010), and Canada (13.8%) (Al-Sahab, 2010). This might be due to the accessibility of information in the recent times. It might be also because a higher number of participants are housewives, thus increasing the mother-infant bond which in turn boosts breastfeeding.

Dissimilar to the study findings however, in a prospective cohort study in six low and middle income countries, Patel A et al reported higher rates of exclusive breast feeding at 42 days postnatal age from Indian sites (Belgium 99.5% and Nagpur 99%). In the other global network participating sites, the rates ranged from 76% to 99.5% (Patel, 2015). However the rates of EBF at 4-6 months in India in the last 10-15 years were lower than the findings of the current study. Studies in Gujarat and rural Tamilnadu reported prevalence of exclusive breastfeeding at 6 months to be 37% and 34% respectively (Chudasama, 2009; Rad`hakrishnan, 2012).

The majority of the mothers introduced other foods in the child's diet before six months (67.1%), with the proportion increasing per successive month. Similar to the findings of this study, Chandhiok (2015) found that with each additional month, the proportion EBF declined. As the age of the children approached 6 months, the rate of exclusive breastfeeding decreased significantly, which is similar to studies conducted in Iran, Uganda, Sudan, and Ethiopia (Koosha, 2008; Engebretsen, 2007). This might be due to the fact that post-partum care is traditionally given in the first few months after birth where mothers remain at home, creating a chance to exclusively breastfeed their infant. The other possible reason might be that mothers

might have introduced complementary feeding for their infants due to the assumption that breast milk alone would not satisfy their needs as the infant gets older.

It was found in this study that most mothers (72.4%) initiated breastfeeding within one hour after birth, which is the recommended time (World Health Organization UNAIDS, UNFPA, UNICEF, 2010). The same results have been reported by other studies where it is stated that, majority of mothers initiate breast feeding at birth and sometimes within the first day with a reported longer duration of breastfeeding of up to 24 months(Tanzania National Bureau of Statistics, 2011)

In this study, the proportion of mixed feeding was found to be lower (Less than 40%), compared to those reported from HIV positive mothers in Kenya, where proportions were reported to be high at 79% and Ethiopia 15.3% (Amadhila, 2005). Mixed feeding is a dangerous practice as it leads to reduction in dietary antigens and pathogens, which are assumed to provoke an inflammatory response or alter the infants gut integrity, when practiced it leads to absence of promotion of beneficial intestinal micro flora by breast milk hence increase the chance of HIV infection.

5.2 The determinants of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district

5.2.1 Individual determinants

In this study, mothers who had fears of infecting baby while breastfeeding were less likely to adhere to feeding guidelines for exposed infants (AOR = .530, CI = .314 - .895). The fear of HIV transmission through breast milk, even in communities that traditionally breastfeed has developed among HIV-positive women and the health care workers who counsel them (WHO,

UNICEF, UNFPA, UNAIDS, 2010). Similar to this study, other studies have reported that mothers are afraid to breastfeed their babies because of fear of transmitting the virus to their children Kimani-Murage et al., (2015). In addition, the fear of MTCT of HIV has also been documented as a major determinant of sub-optimal adherence to infant feeding practices (including non-exclusive breastfeeding) in most African's communities with high HIV prevalence (Doherty, 2014; Kafulafula, 2014; Ngarina, 2014).

Both in the communities and at health facilities, mothers living with HIV are told about how possible it is for them to transmit HIV to their babies through breastfeeding. Although it is a possibility that at facility level, the mothers are told about the guidelines currently being followed, the old notions of transmission of HIV once a HIV-positive mother breastfeeds still exists among some of these women. The fears that arise as a results of that mindset first of all inhibits and/or prolongs initiation of breastfeeding and secondly prevents consistent breastfeeding, hence low adherence to the guidelines which front exclusive breastfeeding.

In the current study, women who had an emergency c-section were less likely to have adhered to the feeding guidelines. Zanardo et al. (2010) and Amy (2016) found similar results, reporting that women who delivered via emergency c-section were more likely not to have been able to breastfeed their baby at delivery or at discharge. This is because the maternal and fetal stress response associated with complications during delivery, particularly related to c-sections, may be related to increased difficulty and early cessation in breastfeeding during the early postpartum period (Watt, 2012; Brown, 2013). Lactogenesis may be equally affected by the insult of abdominal surgery in both planned and emergency c-sections, although the notion of an "emergency" may invoke a greater or prolonged maternal stress response. Similarly in Nepal mothers who had a vaginal delivery were more likely to breastfeed exclusively than those who

delivered by caesarean section (OR 7.6, 95% CI=1.7-34.1) (Chandrashekhar *et al*., 2007).A study by Evans et al. (2003) found that breast milk transfer among women with c-sections was significantly lower in the first 5 days postpartum, compared to women with vaginal births (Evans et al., 2003). Similarly, Scott and Binns (2007) found that delayed onset of lactation was significantly higher in mothers that delivered via c-section compared to those that delivered vaginally (Scott, 2007). It is postulated that the hormonal pathway that stimulates lactogenesis is disrupted by c-section delivery, either from maternal stress or decreased oxytocin secretion, and can hinder milk production (Zanardo, 2010; Riordan, 2010).

Similar to findings by Mohammed (2010) and Iliff (2005), this study found a significant relationship between disclosure of HIV status and adherence to the feeding guidelines. Mothers who had disclosed their HIV status to other people around them were more likely to be adherent to the feeding guidelines compared to those who had not. Disclosure of HIV status greatly influences infant feeding options of HIV positive mothers when the partner was aware of the HIV status of the mother and involved in the decision Having disclosed their status can have psychological benefits as they do not have to hide while feeding. Secondly, with disclosure, a mother living with HIV will feel no embarrassment seeking routine ART or EID services for her and the baby respectively, where they will be constantly counseled about the need for EBF perpetuating positive behavior change and hence adhering to the feeding guidelines. This is less likely among mothers who have not disclosed to people other than their partners since even just going to the health center and heading straight to the HIV treatment section can be stigmatizing and embarrassing especially when there are other patients waiting in line. With such, they miss out on the counseling, health education they could have obtained from the health facilities.

5.2.2 Infant related determinants

The results of this study did not show any significant relationship between infant related characteristics and adherence to the infant feeding guidelines. Similar to these results, a study by Njeri (2012) found also did not reveal any significant association between infants' characteristic and exclusive breastfeeding. However the findings disagree with those of Alemayehu*et al*. (2010) in Ethiopia where infants less than two months of age were five times more likely to be on exclusive breastfeeding than infants aged four to six months. In Nigeria also, increasing age of the infant were associated with significantly less exclusive breastfeeding as was reported by Agho*et al*. (2011). The non-significant contribution of infant characteristics to adherence to the feeding guidelines among mothers in Mpigi district implies that the infant characteristics that were studied majorly had positive outcomes, which potentially nullified significance.

5.2.3 Health service determinants

Counselling sessions with HCWs are recognized as the primary platforms for mothers to obtain HIV-related information and infant feeding recommendations (Doherty et al., 2006a; Maman et al., 2012). Therefore, HCWs can have a significant influence on mothers‟ initial feeding choice and practice (Chisenga et al., 2011; Kafulafula et al., 2014). However, the current study did not find a significant relationship between health service characteristics and adherence to the guidelines. This is inconsistent the findings by Buskens et al. (2007), Chopra et al (2009), and Kafulafula et al., (2014), and Koricho et al. (2010).The implication of this finding is that possibly, EMTCT programs at facility level are quite efficient and that efforts to perpetuate

adherence to EMTCT guidelines could focus less on the facilities and more on individual mothers as get ways to behavior change.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This chapter presents the conclusions of the study as informed by each of the study objectives, and also recommendations both for policy and further study

6.1 Conclusion

Adherence to EMTCT feeding guidelines among mothers living with HIV in Mpigi district is fairly highly but not satisfactory, it being below the threshold of 80%. About 6 out of every 10 mothers adhere to the guidelines, implying that 6 out of every 10 children born to these mothers are at no risk of HIV transmission, and that the 4 of every 10 could be the ones contributing to the postpartum infant sero conversion rates in the district.

The level of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district feeding is significantly determined by three individual characteristics of the mothers living with HIV in the district. having fears of infecting the baby by breastfeeding, caesarean section delivery mode reduced the likelihood of adherence, while disclosure of 3HIV status to others increased the adherence.

In the context of Mpigi district, infant characteristics do not significantly determine adherence to infant feeding guidelines for exposed infants among mothers living with HIV.

In the context of Mpigi district, health service characteristics do not significantly determine adherence to infant feeding guidelines for exposed infants among mothers living with HIV.

6.2 Recommendations

More reassurance and health education needs to be done at both facility and community levels in order to demystify the old notion of all time HIV transmission for as long as breastfeeding is done. The health service providers could make the health education sessions more interactive to allow mothers to inquire more about the topic being studied; with that, they will be informed that EBF is the best option.

To deal with the problem of low disclosure of HIV status among mothers, health workers / service providers, in conjunction with the district health office, need to first of all sensitize the sero negative population of the communities about HIV as a disease not being a death sentence and that it is just like any other disease. That education will reduce stigmatization tendencies, which might enable mothers to disclose their status

During the counseling, sessions, the mothers ought to be told about disclosure and how they should go about disclosure of status

Before conducting cesarean sections, health workers are urged to first give a Trial labor to the women before considering a caesarean section. Giving them a trial of labor might nullify the need for cesarean section, hence having more normal deliveries, and being adherent to the feeding guidelines.

For the mothers who have undergone cesarean sections, special attention should be given to them during the postnatal period, were they should be educated about galactagogs, which are foods that stimulated milk production. That will help counter the negative physiological changes which due to cesarean sections, hinder milk production and let down, hence increasing adherence.

6.3 Recommendations for further study

It is recommended that further studies are carried out on the influence of infant related characteristics and health service characteristics on adherence to EMTCT feeding guidelines in Mpigi district including other health facilities that were not sampled in the current study. This will help confirm the influence of those variables.

REFERENCES

Adebimpe, Wasiu O.2013.*"challenges facing early infant diagnosis of HIV among infants in resource poor settings." African journal of reproductive health / la revue Africanize* de la santé reproductive 17.1: 122-129.

Adugna, D.T. 2014.*Women's perception and risk factors for delayed initiation of breastfeeding in ArbaMinchZuria, Southern Ethiopia.* Int Breastfeed J, 2014. **9**: p. 8.

Agho, K.E., Dibley, M. J., Odiase,J.I., and Ogbonmwan, S. M 2011. Determinants of exclusive breastfeeding in Nigeria. *BMC Pregnancy and Childbirth*, **11**:2. http://www.biomedcentral.com/1471-2393/11/2.

Alemayehu T, Haidar J, Habte D.2009. Determinants of exclusive breastfeeding practices in Ethiopia. Ethiop J Health Dev., 23: 12-18.

Al-Sahab B., A. Lanes, M. Feldman, And H. Tamim. 2010."Prevalence and predictors of 6-month exclusive. Breastfeeding among Canadian women: a national survey," BMC Pediatrics, vol. 10, article 20

Amadhila J. 2005. *Factors that influence exclusive breastfeeding in Windhoek District in Namibia:* thesis submitted for Master degree at University of Western Cape, 2005: pp.33-35(unpublished)

American Academy Of Pediatrics. *Breastfeeding Initiatives.* Retrieved from http://www2.aap.org/breastfeeding/.

Amy J. Hobbs, Cynthia A. Mannion, Sheila W. Mcdonald, Meredith Brockway, And Suzanne C. 2016. *The impact of caesarean section on breastfeeding initiation, duration and difficulties in the first four months postpartum*. BMC Pregnancy Childbirth; 16: 90.

Asfaw, M.M., M.D. Argaw, And Z.K. Kefene. 2015. *Factors associated with exclusive breastfeeding practices in DebreBerhan District, Central Ethiopia: a cross sectional community based study.* IntBreastfeed J, 2015. **10**: p. 23.

Avert 2016. *Children, HIV and AIDS."* AVERT, 22 Aug. 2016. Web. 27 April. 2017.

Avert .2017. Global information and education on HIV and AIDS, Children, HIV and AIDS. Available from www.avert.org

Babirye, J.N., F. Nuwaha, and A.E. Grulich. 2009.*Adherence to feeding guidelines among HIV-infected and HIV uninfected mothers in a rural district in Uganda.* East Afr Med J. **86**(7): p. 337-43.

Bergman, M., et al. 2016.*Prolonged Exclusive Breastfeeding Through Peer Support: A Cohort Study From a Community Outreach Project in Swaziland.* Journal of Community Health, 2016: p. 1-7.

Brown A, Jordan S.2013. *Impact of birth complications on breastfeeding duration: an internet survey.* J AdvNurs. 2013;69(4):828–839. doi: 10.1111/j.1365-2648.2012.06067.x. [

Buskens I, Jaffe A, Mkhatshwa H 2007. *Infant feeding practices: realities and mind sets of mothers in Southern Africa*. AIDS Care 19(9):1101-1109

Cai, X., T. Wardlaw, and D.W. Brown. 2012. *Global trends in exclusive breastfeeding.* Int Breastfeed J, 2012. **7**.

Celik Ih, Demirel G, Canpolat Fe, Dilmen U 2013.*A common problem for neonatal intensive care units: late preterm infants, a prospective study with term controls in a large prenatal center*. J Matern Fetal Neonatal Med 26: 459–462. pmid:23106478

Centers for disease control and prevention. (2017).“*HIV Transmission.” Centers for Disease Control and Prevention*, 10 Nov. 2016. Web.

Central statistical agency [Ethiopia] an icfinternational, Ethiopia *Demographic and Health Survey 2011*. 2012, Central Statistical Agency and ICF International: Addis Ababa, Ethiopia and Calverton, Maryland, USA.

Central statistical agency [Ethiopia] and orc macro: Ethiopia demographic and health survey (EDHS) 2005. 2006, *Addis Ababa, Ethiopia and Calverton, Maryland, USA*: Central Statistical Agency and ORC Macro

Centres for disease control and prevention 2013. *Breastfeeding Report Card*. Retrieved from: http://www.cdc.gov/breastfeeding/data/reportcard.htm.

Chandhiok N, Singh Kj, Sahu D, Singh L, Pandey A. *Changes in exclusive breastfeeding practices and its determinants in India, 1992-2006: analysis of national survey data. Intern Breastfeeding J*. 2015;10:34.

Chasela Cs, Hudgens Mg, Jamieson Dj, et al. Maternal or infant antiretroviral drugs to reduce HIV-1 transmission. N Engl J Med 2010; 362:2271.

Cherukuri, Anjali. 2017.*"The Role of Breastfeeding in Mother-to-Child Transmission of HIV/AIDS: A Comparative Case Study of Three Countries"*. Honors in the Major Theses. 204. http://stars.library.ucf.edu/honorstheses/204

Chisenga M, Siame J, Baisley K, Kasonka L, Filteau S 2011. *Determinants of infant feeding choices by Zambian mothers: a mixed quantitative and qualitative study*. Matern. Child Nutr. 7(2):148-159.

Chopra M, Doherty T, Mehatru S, Tomlinson M 2009. *Rapid assessment of infant feeding support to HIV-positive women accessing prevention of mother-to-child transmission services in Kenya, Malawi and Zambia*. Public Health Nutr. 12(12):2323-2328.

Chudasama RK, Patel PC, Kavishwar AB. 2009. *Determinants of exclusive breastfeeding in south Gujarat region of India*. J Clic Med Res. 2009;1:102-8.

Coovadia, H.M., et al., 2007. *Mother-to- child transmission of HIV-1 infection during exclusive breastfeeding: the first six months of life: an intervention cohort study.* Lancet, 2007. **369**(9567):p. 1111-1113.

Dearden, K., et al., 2002. *Determinants of optimal breast-feeding in peri-urban Guatemala City, Guatemala.* Pan America Journal of Public Health, 2002. **12**(3): p. 188-190.

Della, A.F., et al., (2006). *Factors associated with breastfeeding at six months postpartum in a group of Australian women,.* International breastfeeding journal, 2006. **1**(1): p. 18.

District Health Officer 2016 *Mpigi HIV & AIDS bulletin.* Volume 1, Issue 1,

do Nascimento M. B. R., Reis M. A. M., Franco S. C., H. Issler, A. A. Ferraro, and S. J. F. E. Grisi, *"Exclusive breastfeeding in southern Brazil: prevalence and associated factors,"* Breastfeeding Medicine, vol. 5, no. 2, pp. 79–85, 2010

Doherty T, Chopra M, Jackson D, Goga A, Colvin M, Persson LA. 2007. *Effectiveness of the WHO/UNICEF guidelines on infant feeding for HIV-positive women: results from a prospective cohort study in South Africa.* AIDS 21(13):1791-1797

Doherty T, Sanders David, Jackson Debra, Swanevelder Sonja, Lombard Carl, et el. 2012. Early cessation of breastfeeding amongst women in South Africa: an area needing urgent attention to improve child health. BMC pediatrics. 12: 105.

Egata, G., Y. Berhane, And A. Worku. 2013. *Predictors of non-exclusive breastfeeding at 6 months among rural mothers in east Ethiopia: a community-based analytical cross-sectional study.* Int Breastfeed J, 2013. **8**(1): p. 8.

Engebretsen Im, Wamani H, Karamagi C, Semiyaga N, Tumwine J, Tylleskär T.2007.*Low adherence to exclusive breastfeeding in eastern Uganda: a community-based cross-sectional study comparing dietary recall since birth with 24-hour recall.* BMC Pediatr. 2007, 7: 10-10.1186/1471-2431-7-10.

Evans KC, Evans RG, Royal R, Esterman AJ, James Sl. 2003. Effect of caesarean section on breast milk transfer to the normal term newborn over the first week of life. Arch Dis Child Fetal Neonatal Ed;88(5):F380–F382. doi: 10.1136/fn.88.5.F380.

Fadnes, L. T., I. M. S. Engebretsen, K. M. Moland, J. Nankunda, J. K. Tumwine, And T. Tylleskär. 2010. "Infant feeding counselling in Uganda in a changing environment with focus on

the general population and HIV-positive mothers-a mixed method approach." *BMC Health Services Research* 10(1): 260.

Fadnes, L.T., et al., *Infant feeding among HIV-positive mothers and the general population mothers: comparison of two cross-sectional surveys in Eastern Uganda.* BMC Public Health,2009. **9**(124).

Goyal RC, Banginwar AS, Ziyo F, Toweir AA 2011.*Breastfeeding practices: Positioning, attachment (latch-on) and effective suckling—A hospital-based study in Libya*. J Family Community Med 18: 74–79. pmid:21897915

Guaraldi, Federica and Guglielmo Salvatori.2012. "Effect of Breast and Formula Feeding on Gut Microbiota Shaping in Newborns." Frontiers in Cellular and Infection Microbiology

Hoat, L.N., Huong, L.T., & Xuan L.T.T., 2010. Community Health Training and Consulting Human Sciences Research Council, *South African National HIV Prevalence, Incidence, Behaviour and Communication Survey, 2008: The Health of our Children* 2010: Cape Town

Humphrey, J.H., Marinda, E., Mutasa, K., Moutten, L.H., Lliff, P.J., Ntozini, R., Chidawanyika, H., Nathoo, K.J., Tavengwa, N., Jenkins, A., Piwoz, E.G., Van De Perre, P., Ward, B.J. And Zvitambo Study Group. 2010, *"Mother to child transmission of HIV among Zimbabwean women who seroconverted postnatal; prospective cohort study",BMJ*.Dec 22; 34:c6580.doi:10:1136/bmj.c6580.

Iliff P, Piwoz E, Tavengwa N, Zunguza CD, Marinda ET, Nathoo KJ, Moulton LH, Ward BJ, Humphrey JH. 2005. *Early exclusive breastfeeding reduces the risk of postnatal HIV-1*

transmission and increases HIV-free survival. AIDS. 2005;19:699–708. doi: 10.1097/01.aids.0000166093.16446.c9. [

Joint United Nations Programme on HIV/AIDS (UNAIDS), 1999. *Prevention of HIV Transmission from Mother to Child: Strategic Options. Geneva*, Switzerland:.

Joshi, P.C., ET AL.(2014).*Prevalence of exclusive breastfeeding and associated factors among mothers in rural Bangladesh: a cross-sectional study.* Int Breastfeed J, 2014. **9**: p. 7.

Kafulafula KU, Hutchinson K Mary, Gennaro Susan and S Guttmacher. 2014. *Maternal and health care workers' perceptions of the effects of exclusive breastfeeding by HIV positive mothers on maternal and infant health in Blantyre, Malawi.* BMC pregnancy and childbirth. 2014; 14: 247.

Karaçam Z., 2008. *"Factors affecting exclusive breastfeeding of healthy babies aged zero to four months: a community-based study of Turkish women*," Journal of Clinical Nursing, vol. 17, no. 3, pp. 341–349

Kesho Bora Study Group, De Vincenzi I. 2011. *Triple antiretroviral compared with zidovudine and single-dose nevirapine prophylaxis during pregnancy and breastfeeding for prevention of mother-to-child transmission of HIV-1 (Kesho Bora study):* a randomised controlled trial. Lancet Infect Dis 2011; 11:171.

Khanal, V., et al., 2014. *Factors Associated with Exclusive Breastfeeding in Timor-Leste: Findings from Demographic and Health Survey 2009–2010.* Nutrients 2014. **6**: p. 1691-1700

Kimani-Murage, E. W., Muthuri, S. K., Oti, S. O., Mutua, M. K., Van De Vijver, S., & Kyobutungi, C. 2015. Evidence of a double burden of malnutrition in urban poor settings in Nairobi, Kenya. *PLoS ONE, 10*(6), e0129943. doi:10.1371/journal.pone.0129943

Koosha A., R. Hashemifesharaki, and N. Mousavinasab. 2008."Breast-feeding patterns and factors determining exclusive breast-feeding," Singapore Medical Journal, vol. 49, no. 12, pp. 1002–1006

Koricho AT, Moland KM, Blystad A 2010. *Poisonous milk and sinful mothers: the changing meaning of breastfeeding in the wake of the HIV epidemic in Addis Ababa, Ethiopia*. Int. Breastfeed J. 5:12.

Koricho, A. T., Moland, K.M And Blystad, A. 2010. *"Poisonous milk and sinful mothers: the changing meaning of breastfeeding in the wake of the HIV epidemic in Addis Ababa, Ethiopia*", *Int. Breastfeed J*, Vol. 5, p. 12.

Laar, S. A. and V. Govender 2011. *"Factors influencing the choices of infant feeding of Hiv positive mothers in Southern Ghana: The role of counsellors, mothers, families and socio-economic status.*" Journal of AIDS and HIV Research Vol 3(7): 129-37.

Leshabari, S. C., A. Blystad, and K. M. Moland. 2007. "*Difficult choices: infant feeding experiences of HIV-positive mothers in northern Tanzania."* SAHARA-J: Journal of Social Aspects of HIV/AIDS 4(1): 544-55.

Leshabari, SC, Blystad A, De Paoli M, Moland MM 2007. HIV and infant feeding counseling: challenges faced by nurse-counselors in northern Tanzania. *Human Resources for Health.*, **5**(18): 5-9

Little KM, Kilmarx PH, Taylor AW, et al.*2011. A review of evidence for transmission of HIV from children to breastfeeding women and implications for prevention.* Pediatr Infect Dis J 31:938.

Lungi Langa .2017.*Breast is always best, even for HIV-positive mothers.* Available from http://www.who.int/bulletin/en/

Magavero, M.J., Norton, W.E., and Saag, M.S., 2011.*Health Care System and PolicyFactors Influencing Engagement in HIV Medical Care: Piecing Together theFragments of a Fractured Health Care Delivery* System; Clin Infect Dis. (2011) 52(suppl 2): S238-S246. Doi: 10.1093/cid/ciq048

Maonga, A.R., et al., 2015. *Factors Affecting Exclusive Breastfeeding among Women in Muheza District Tanga Northeastern Tanzania: A Mixed Method Community Based Study.* Maternal and Child Health Journal, 2015. **20**(1): p. 77-87.

Marazzi MC, Nielsen-Saines K, Buonomo E, et al. 2009. Increased infant human immunodeficiency virus-type one free survival at one year of age in sub-saharan Africa with maternal use of highly active antiretroviral therapy during breast-feeding. Pediatr Infect Dis J 2009; 28:483.

Maru Y and Haidaru J 2009. Infant feeding practice of HIV positive mothers and its determinants in selected health institutions of Addis Ababa, Ethiopia. *Ethiopia Journal of Health development.* 2009, **23**(2):107-114

Matji, J. N., D. F. Wittenberg, J. D. Makin, B. Jeffery, U. E. Macintyre, and B. W. C. Forsyth. 2010. "*Factors affecting HIV-infected mothers' ability to adhere to antenatally intended infant feeding choice in Tshwane."*South African Journal of Child Health 3(1).

Matovu A, Kirunda B, Kabagambe R.G, Tumwesigye N.M and Nuwaha F. 2008. *Factors influencing adherence to exclusive breastfeeding among HIV positive mothers in Kabarole District, Uganda*. *East Africa medical journal* 2008, **85**(4):163-169

Mekuria, G. and M. Edris. 2015. *Exclusive breastfeeding and associated factors among mothers in DebreMarkos, Northwest Ethiopia: a cross-sectional study.* Int Breastfeed J, 2015. **10**(1): p. 1.

Mgongo, M., et al., 2013. *Prevalence and predictors of exclusive breastfeeding among women in Kilimanjaro region, Northern Tanzania: a population based cross-sectional study.* Int Breastfeed J, 2013. **8**(1): p. 12.

Ministry Of Health. 2014. *HIV and AIDS Uganda Country Progress Report*; 2013'

Ministry Of Health (MOH).2011. *Uganda AIDS Indicator Survey. Kampala:*MoH; 2011. [https://dhsprogram.com/pubs/pdf/AIS10/AIS10.pdf].

Mkwanazi, N. 2009. "Rapid Cessation of Exclusive Breastfeeding in Durban, South Africa: A Qualitative Assessment of the Experiences of HIV-infected Mothers and the Perspectives of Their Counsellors and Close Social Networks." University of Oslo, Oslo.

Mohammed A, Shehu AU, Aliyu AU, Zoaka AI. 2010. Infant feeding options, practices and determinants of HIV-positive mothers in Abuja, Nigeria. Niger Medical Journal.;51:14–17.

Mucheto, P., A. Chadambuka, G. Shambira, M. Tshimanga, G. Notion, and W. Nyamayaro. 2011. *" Determinants of nondisclosure of HIV status among women attending the prevention of mother to child transmission programme, Makonde district, Zimbabwe,* 2009." The Pan African Medical Journal 8(51).

Mukerem Medina, Jemal Haidar. 2012.Assessment of the prevalence and factors influencing adherence to exclusive breast feeding among HIV positive mothers in selected health institution of Addis Ababa, Ethiopia. School of Public Health, Addis Ababa University, Addis Ababa, Ethiopia. *Ethiop. J. Health Dev*

Mukhtar-Yola, M., Gwarzo, G.D., Galadanci, H.S., Tukur, J., Farouk, Z.L. and Adeleke, S.I. (2009), "HIV exposed infants: a preliminary report of the Amino Kano Teaching Hospital experience", *Niger Postgrad Med J,* Vol. 16 No. 2, pp. 143-8.

Muluye Dagnachew, Desalegn Woldeyohannes, Mucheye Gizachew, and Moges Tiruneh. 2012. *Infant feeding practice and associated factors of HIV positive mothers attending prevention of mother to child transmission and antiretroviral therapy clinics in Gondar Town health institutions, Northwest Ethiopia*. Published online 2012 Mar 26. doi: 10.1186/1471-2458-12-240

Ngarina M, Tarimo Am Edith, Naburi Helga, Kilewo Charles, Mwanyika-Sando Mary, et al. 2014. *Women's Preferences Regarding Infant or Maternal Antiretroviral Prophylaxis for Prevention of Mother-To-Child Transmission of HIV during Breastfeeding and Their Views on Option B+ in Dar es Salaam, Tanzania*. PloS one. 2014; 9: e85310.

Njerimututho Leah. 2012. *Factors influencing exclusive breastfeeding among infants less than 6 months in kasarani informal settlement, molo district,*kenya. Kenyatta University

Njunga, J. and A. Blystad. 2010. *"The divorce program: gendered experiences of HIV positive mothers enrolled in PMTCT programs-the case of rural Malawi."*Plosone

Nwaozuzu, E.E. and Dozie, I.N. 2014 "*Infant feeding choices of HIV - positive mothers and its impact on the mother-to-child transmission (MTCT) of HIV infection", International Journal of Development and Sustainability,* Vol. 3 No. 4, pp. 642-661.

Ogar Eneji, Joyce Ekor. 2015. *Factors Influencing The Choice Of Infant Feeding Options Among Hiv Positive Mothers Attending Health Facilities In Ogoja, Cross River State,Nigeria.* University Of Nigeria.

Okanda, J.O., et al., 2014. *Exclusive breastfeeding among women taking HAART for PMTCT of HIV-1 in the Kisumu Breastfeeding Study.* BMC Pediatrics, 2014. **14**(1): p. 1-8.

Onah, S., Et Al., (2014). *Infant feeding practices and maternal socio-demographic factors that influence practice of exclusive breastfeeding among mothers in Nnewi South-East Nigeria: a cross-sectional and analytical study.* Int Breastfeed J,. **9**: p. 6.

Oweis A, Tayem A, Froelicher Es.2009.Breastfeeding practices among Jordanian women. Int J NursPrac. 2009, 15: 32-40. 10.1111/j.1440-172X.2008.01720.x.

Patel A, Bucher S, Pusdekar Y, Esamai F, Krebs NF, Goudar SS, et al. 2015. Rates and determinants of early initiation of breastfeeding and exclusive breast feeding at 42 days postnatal in six low and middle-income countries: a prospective cohort study. Reproductive Health;12(Suppl 2):S10.

Radhakrishnan S, Balamuruga SS. 2012. Prevalence of exclusive breastfeeding practices among rural women in Tamil Nadu. Int J Health Allied Sci.;1:64-7.

Rendani, L., et al. 2011. *Infant-feeding practices and associated factors of HIV-positive mothers at GertSibande, South Africa.* ActaPædiatrica,

Riordan J, Wambach K. 2010. Breastfeeding and human lactation. 4. Sudbury: Mass.: Jones and Bartlett Publishers;

Rollins, N. C., Becquet, R., Bland, R. M., Coutsoudis, A., Coovadia, H. M., & Newell, M. L. 2009.*Preventing postnatal mother-to-child transmission of HIV: Context matters.*AIDS,23(6), 740. doi:10.1097/QAD.0b013e328327727b

Sadoh, W. E. and A. E. Sadoh. 2010. *"Experiences of HIV positive mothers who chose not to breastfeed their babies in Nigeria."*African journal of reproductive health 13(1).

Scott JA, Binns CW, Oddy WH. 2007. *Predictors of delayed onset of lactation.* Matern Child Nutr. 2007;3(3):186–193. doi: 10.1111/j.1740-8709.2007.00096.x.

Scrafford CG, Mullany LC, Katz J, Khatry SK, Leclerq SC, Darmstadt GL, et al. (2013).*Incidence of and risk factoes for neonatal jaundice among newborns in southern Nepal.* Tropical Medicine and International Health 18: 1317–1328. pmid:24112359

Seid, A.M., M.E. Yesuf, and D.N. Koye, *Prevalence of Exclusive Breastfeeding Practices and associated factors among mothers in Bahir Dar city, Northwest Ethiopia: a community based cross-sectional study.* Int Breastfeed J, 2013. **8**(1): p. 14

Seifu W., G. Assefa, and G. Egata, 2013. “Prevalence of exclusive breast feeding and its predictors among infants aged six months in Jimma Town, Southwest Ethiopia, 2013,” Journal of Pediatrics & Neonatal Care, vol. 1, no. 3, pp. 4–6, 2014.

Sellen, Daniel W. and Craig Hadley. 2011. “Food Insecurity and Maternal-to-Child Transmission of HIV and AIDS in Sub-Saharan Africa.” Annals of Anthropological Practice 35 (2011): 28-49.

Senarath, U., M. Dibley, and K. Agho 2007. *Breastfeeding practices and associated factors among children under 24 months of age in Timor-Leste.* European Journal of Clinical Nutrition 2007. **61**: p. 387-397.

Serwadda D, Sewankambo N, Carswell J, Bayley A, Tedder R, Weiss R, Mugerwa R, Lwegaba A, Kirya G, Downing R. Slim Disease. 1985.*A new disease in Uganda and its association with HTLV-III infection.* Lancet. 1985;326(8460):849–52.

Setegn T., T. Belachew, M. Gerbaba, K. Deribe, A. Deribew, and S. Biadgilign.2012. *“Factors associated with exclusive breastfeeding practices among mothers in Goba district, south east Ethiopia: a cross-sectional study,” International Breastfeeding* Journal, vol. 7, article 17, pp. 1–8, 2012

Shapiro RL, Hughes MD, Ogwu A, et al. 2010. Antiretroviral regimens in pregnancy and breast-feeding in Botswana. N Engl J Med 2010; 362:2282.

Shen, Ruizhong et al. 2015.“Mother-to-Child HIV-1 Transmission Events are Differentially Impacted by Breast Milk and Its Components from HIV-1-Infected Women.” PLoS One 10.12: 1-16.

Shifraw, T., A. Worku, and Y. 2015. Berhane, *Factors associated exclusive breastfeeding practices of urban women in Addis Ababa public health centers, Ethiopia: a cross sectional study.* IntBreastfeed J,**10**: p. 22.

Sibeko, L., A. Coutsoudis, and K. Gray-Donald. 2009. *"Mothers' infant feeding experiences: constraints and supports for optimal feeding in an HIV-impacted urban community in South Africa.*" Public health nutrition 12(11): 1983-90.

Sibeko, S., Baxter, C., Yende, N., Karim, Q. A., & Karim, S. S. 2011. *Contraceptive choices, pregnancy rates, and outcomes in a microbicide trial.*Obstetrics and Gynecology, 118(4), 895-904. doi:10.1097/AOG.0b013e31822be512

Smith, H.A., et al. 2015. *Early life factors associated with the exclusivity and duration of breast feeding in an Irish birth cohort study.* Midwifery,. **31**(9): p. 904-911.

Tamiru, D., et al., 2012. *Sub-optimal breastfeeding of infants during the first six months and associated factors in rural communities of JimmaArjoWoreda, Southwest Ethiopia.* BMC Public Health. **12**: p. 363.

Tan, K.L., *Factors associated with exclusive breastfeeding among infants under six months of age in peninsular malaysia.* Int Breastfeed J, 2011. **6**(1): p. 2.

Tanzania National Bureau Of Statistics and Icf Macro.2011. *Tanzania Demographic and Health Survey 2009-2010.* Dar es Salaam: National Bureau of Statistics & ORC Macro; 2010.

Thairu, L. N., G. H. Pelto, N. C. Rollins, R. M. Bland, and N. Ntshangase. 2005. "Sociocultural influences on infant feeding decisions among HIV-infected women in rural Kwa-Zulu Natal, South Africa." *Maternal & Child Nutrition* 1(1): 2-10.

U.S. Department Of Health And Human Services 2016. "*Global HIV/AIDS Overview."* Web. 5 Mar. 2017. Available from; AIDS.gov.

UAC (2015) 'An AIDS Free Uganda, My Responsibility: Documents For the National HIV and AIDS Response, 2015/2016 - 2019/2020

Uk Breastfeeding Rates, 2010. Survey, http://www.biomedcentral.com/author/manuscript/coverletter/view.htm?manuscriptId=2093186644176058.

UNAIDS.2016. 'Children and HIV fact sheet'[pdf]

UNICEF.2016. '*Seventh Stocktaking Report On Children &AIDS*, 2016'

Victoria J., B. Agnès, W. Joan et al. 2005. Improving breastfeeding practices on a broad scale at the community level: success stories from Africa and Latin America," Journal of Human Lactation, vol. 21, no. 3, pp. 345–354

Watt S, Sword W, Sheehan D, Foster G, Thabane L, Krueger P, Landy CK (2012). *The effect of delivery method on breastfeeding initiation from the Ontario Mother and Infant Study (TOMIS) III*. J Obstetric Gynecol Neonatal Nursing. 2012;41(6):728–737. doi: 10.1111/j.1552-6909.2012.01394.x.

WHO, UNICEF, UNFPA, UNAIDS. 2010. Guidelines on HIV and Infant Feeding 2010: Principles and recommendations for infant feeding in the context of HIV and a summary of evidence.

WHO. 2010. Guidelines on HIV and infant feeding. Retrieved from: http://whqlibdoc.who.int/publications/2010/9789241599535_eng.pdf

WHO/UNAIDS/UNICEF. 2009. "Towards universal access: scaling up priority HIV/AIDS interventions in the health sector: progress report."

Williams, A.M., et al., 2015. *Breastfeeding and Complementary Feeding Practices among HIV-Exposed Infants in Coastal Tanzania.* Journal of Human Lactation, 2015.

World Health Organization (2016). "*HIV/AIDS." World Health Organization*, 2016. Web. 27 Sept. 2016.

World Health Organization UNAIDS, UNFPA, UNICEF.2010.*Guidelines on HIV and infant feeding. Principles and recommendations for infant feeding in the context of HIV and a summary of evidence.* Geneva. http://whqlibdoc.who.int/publications/2010/9789241599535_eng.pdf

World Health Organization UNAIDS.2007.*Guidance on provider-initiated HIV testing and counseling in health facilities.* Geneva. 2007. http://www.who.int/hiv/pub/guidelines/9789241595568_en.pdf

World Health Organization.2009.*Infant and young child feeding: Model Chapter Model Chapter for textbooks for medical students and allied health professionals*., Geneva. 112.

World Health Organization, 2013. *Maternal, infant and young child nutrition*. 2013: Geneva

World Health Organization. guideline 2016: Updates on HIV and infant feeding. www.who.int/nutrition/publications/hivaids/guideline_hiv_infantfeeding_2016/en/

Yeneabat, T., T. Belachew, And M. Haile, 2014. *Determinants of cessation of exclusive breastfeeding in AnkeshaGuagusaWoreda, Awi Zone, Northwest Ethiopia: a cross-sectional study*. BMCPregnancy Childbirth, 2014. **14**: p. 262

Young Sl, Israel- Ballard, Chantry Cj. Ka. Dantzere Ea, Ngonyani Mm, Nyambo Tm, Ash Dm.2010.Infants feeding practices among HIV + women in Dar Es Salaam Tanzania need for more intensive infant feeding counseling. *Public Health Nutrition.* 2010, **13**(12):1,3,5-6

Young, S. L., Mbuya, M. N., Chantry, C. J., Geubbels, E. P., Israel-Ballard, K., Cohan, D., Latham, M. C. 2011. Current knowledge and future research on infant feeding in the context of HIV: Basic, clinical, behavioral, and programmatic perspectives. *Advances in Nutrition, 2*(3), 225-243.

Zanardo V, Svegliado G, Cavallin F, Giustardi A, Cosmi E, Litta P, Trevisanuto D. elective cesarean delivery: does it have a negative effect on breastfeeding? Birth (Berkeley, Calif) 2010;37(4):275–279. doi: 10.1111/j.1523-536X.2010.00421.x

APPENDIX A: CONSENT FORM

Consent form

How are you? My names are Ssenkumba Andrew, a postgraduate student from Uganda Martrys University. I am conducting a study about the determinants of adherence to feeding guidelines for exposed infants among mothers living with HIV in Mpigi district

General information

I have come to ask for permission from you to participate in this study. Am asking you to read (or have it read to you) this consent form carefully. Participation into this study is voluntary and you are free to or not accept to participate. There will be no any form of payments or rewards to be given to the participants. Your services in the health facility will not be affected in any way by choosing to or not to participate.

All the information you will give us will be treated with confidentiality and no names will be written on any form. If you wish to be provided with the results of your interview, you are requested to provide us with your mobile number on this form. You will also be asked to sign or thumb print in front of a witness to show that you have accepted by your own choice to take part in the study. This form may contain unfamiliar words, thus you may ask us to explain anything you cannot understand

How to do the study

The participants into this study are mothers from the postnatal clinic at this health facility. They are supposed to have finished not more than six weeks since they delivered. After consenting to

be included into the study, Questions will be asked about yourself, your last pregnancy and how you and your baby are doing.

Risks and benefits

There are minimal expected risks in this study since there are no drugs to be given, no samples to be taken or procedure to be performed. There are no payments or any refund to be given as the interview will be conducted during normal visits to the clinic. The results of this study can be used by policy makers to improve on maternal mental health especially after delivery.

Contact information

Consent

I, participant number _____having been informed about the study/having read all the above and understand all what it entails, do willfully without coercion consent to participate in the study.

_____ _____

Client signature/Thumb print Date

_____ _____

Investigator who informed/discussed with client Date

Mobile number (optional) _____

APPENDIX B: QUESTIONNAIRE

PART A: Socio Demographic characteristics

Question	Category	Option chosen (indicate number)
What is your current age in years	1. 20 - 27 2. 28 - 35 3. 36 - 42 4. 43 - 50	
What is your current marital status	1. Married 2. Single 3. Separated 4. Widowed	
What is your current education level	1. Lower primary (P1 - P4) 2. Upper primary (P5 - P7) 3. Secondary (O level) 4. Secondary (A level) 5. Post secondary education	
Religious inclination	1. Christianity 2. Islam	

PART B: Adherence to guidelines

Question	Category	Option chosen (indicate number)
Did you breast feed your child?	1. Yes 2. No	
If yes, was the breastfeeding exclusive?(only breast milk without any other feeds)	1. Yes 2. No	
How soon after birth did you breastfeed your baby for the first time?	1. Less than 1 hour after birth 2. 1 – 5 hours after birth 3. More than 5 hours	
At what age did you introduce other foods in the child diet	1. 1 month 2. 2 months 3. 3 months 4. 4 months 5. 5 months 6. At or after 6 months	

PART C: Individual characteristics

Question	Category	Option chosen (indicate number)
How many children do you have so far	1. One 2. Two 3. Three 4. Four 5. More than four	
How many children have you given birth to since diagnosis with HIV	1. One 2. Two 3. Three 4. Four 5. More than four	
Do you ever have fears of that you might infect the baby while breastfeeding	1. Yes 2. No	
Number of children with positive status	1. None 2. One 3. Two 4. More than two	
Description of residence	1. Rural 2. Urban	
Did you go for antenatal care?	1- Yes 2- No	

What kind of delivery?	1- Normal 2- Cesarean 3- Elective caesarean
Did you go for postnatal care?	1- Yes 2- No
Have you disclosed you HIV status to your partner	1- Yes 2- No
Have you disclosed your HIV status to anyone else?	1- Yes 2- No
Did you experience any breastfeeding problems?	1- Yes 2- No
If yes above, which ones did you experience?	1. Engorgement Painful breast (blocked duct) 2. Sore / cracked nipples 3. Mastitis (Swollen and painful breast) 4. Abscess (Swollen, warm, painful breast
Do you think you had enough breast milk during the first six months	1. Yes 2. No
During the first six months after birth, did you ever miss a dose of your ART medication?	1. Yes 2. No

PART D: Infant related characteristics

Question	Category	Option chosen (indicate number)
What is the Birth order of this child	1. One 2. Two 3. Three 4. Four **5.** More than four	
What was the HIV status of the child at first EID	1. Positiv``e 2. Negative	**1**
What was the HIV status of the child at second EID	1. Positive 2. Negative	
What gender is the child?	1. Male **2.** Female	
How frequent was the child falling during the first six months (in a month)	1. None of the time 2. Once 3. Twice **4.** More than twice a month	
Was the child able to suck well during those first six months	1. Yes 2. No	
Was the child born at full term (9 months)	3. Yes **4.** No	
What was the weight of the child at birth	Less than 3500gm 3500gm and above	

PART E: The health service related determinants

Question	Category	Option chosen (indicate number)
Has a medical provider at this facility ever discussed infant feeding with you?	1. Yes 2. No	
Which type of provider discussed with you?	1. Nurse 2. Doctor	
How long does it take you to get into contact with an ART service provider here at the facility?	1. < 30 minutes 2. 30 min. and 1hr 3. more than 1hr	
Were you counseled on IYCF for exposed infant during ANC?	1. Yes 2. No	
Are you given formula feeds at this facility?	1. Yes 2. No	
Does the health facility hold Health education sessions for mothers living with HIV on topics like on IYCF?	1. Yes 2. No	
Do health workers at this facility inquire about breastfeeding status of exposes child at each visit	1. Yes 2. No	

APPENDIX C: Work plan for implementation of the study

	TIME IN MONTHS												
ACTIVITY	**2016 – 2017**												
	AUG-DEC 2016		**JAN-MAR**	**APRIL**		**MAY**		**JUN**		**JUL**		**AUG**	
Topic identification													
Proposal Development													
Draft proposal presentation													
Proposal Approval													
Preparation and traveling to the study area													
Data collection and entry													
Data analysis													
Reportwriting													
Draft submission for editing													
Amendments and correction of supervisor instructions													
Defense of dissertation													
Binding and submission of the final Dissertation													

APPENDIX D: Budget for expenditure during the study

S/N	Description of the Activity	Quantity	Unit Cost in Uganda shillings	Total cost in Uganda shillings
1	Printing	6 booklets	40,000/=	240,000/=
		2 proposal	20,000/=	40,000/=
2	Data collection equipment's	1 audio voice recorder	200,000	200.000/=
		3audio Recording discs	1,500/-	4,500/=
3	Transportation	To and from field	20,000/= per day	500,000/=
4	Accommodation	Single room	10'000/= per night	300,000/=
5	Spiral Binding	2 copies	3,500/=	7,000/=
6	Hard cover binding	6 copies	30,000/=	180,000/=
7	Feeding	3 meals per day	5000/= per meal	20,000/=
8	Reams of printing paper	2 Rims	14,000/=	28,000/=
9	Airtime	50 vouchers	2000/=	100,000/=
	Total			**1,619,500/=**

APPENDIX E: Introductory letter from Uganda Martyrs University

Uganda
Martyrs
University

Making a difference

Faculty of Health Sciences
7th October 2016

Dear Sir/Madam,

Re: Introducing Mr. Andrew Ssenkumba

This is to introduce to you Mr. Andrew Ssenkumba as a *bona fide* student of the Master of Public Health (Health Promotion- MPH HP) in the Faculty of Health Sciences (FHS) of Uganda Martyrs University (UMU), doing research for his dissertation. The title of his study is:

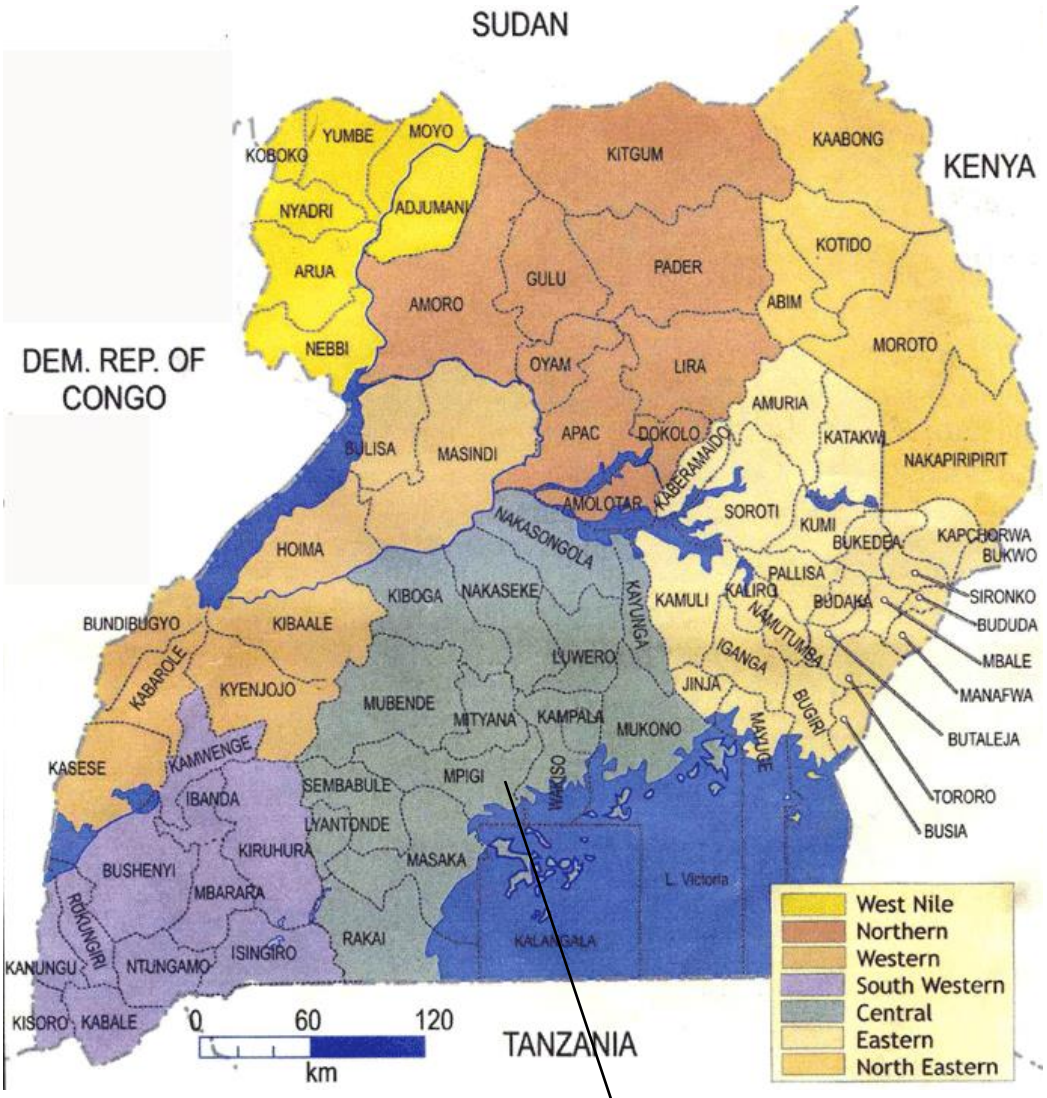
"Factors Affecting Child-feeding Practices by HIV-positive Mothers Undergoing EMTCT in Mpigi District Health Facilities"

The dissertation is a key component of the course requirements. His topic and study protocol have been approved by the relevant authorities of UMU. We believe that it may contribute to better understanding of why some HIV+ women opt to continue breast-feeding their babies beyond the recommended age, despite the significant risk of HIV transmission to the babies. Such knowledge may help policy-makers make suitable plans and interventions to improve the programming for health services, with a view to reduce vertical transmission of HIV in Uganda. We pray that you receive him and give him the relevant support and access.

Yours sincerely,

Dr. Everd Maniple
Senior Lecturer / Supervisor
Faculty of Health Sciences
Tel. 0772592506
e-mail: everdmaniple@umu.ac.ug

SAPPENDIX F: MAP OF UGANDA SHOWING MPIGI DISTRICT



MPIGI DISTRICT MAP

.