

UNIVERSITY OF THE WESTERN CAPE

School of Public Health

**FACTORS INFLUENCING INFANT FEEDING CHOICES  
AMONG MOTHERS LIVING WITH HIV IN  
FRANCISTOWN, BOTSWANA**

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A mini-thesis submitted in partial fulfillment of the requirements for the degree of Master in  
Public Health at the School of Public Health,  
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Keywords: Infant feeding, mothers living with HIV, breastfeeding, PMTCT, ART, formula milk, health care workers.

## DECLARATION

I declare that 'Factors influencing infant feeding choices among mothers living with HIV in Francistown, Botswana' is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Full Name: Catherine Motswere-Chirwa

Date: March 2018

Signed: \_\_\_\_\_



## LIST OF ABBREVIATIONS

AFASS	Acceptable, Feasible, Affordable, Sustainable and Safe
AIDS	Acquired immune deficiency syndrome
ANC	Antenatal care
ART	Anti-retroviral therapy
ARV	Anti-retroviral
BAIS	Botswana AIDS Impact Survey
CDC	Centers for Disease Control and Prevention
CSO	Central Statistics Office
EBF	Exclusive breastfeeding
EFF	Exclusive formula feeding
FP	Family planning
HAART	Highly-active anti-retroviral therapy
HIV	Human immunodeficiency virus
IDCC	Infectious Diseases Care Clinic
MCH	Maternal and child health
MOH	Ministry of Health
NACA	National AIDS Coordinating Agency
PLWHA, PLHA	People living with HIV/AIDS
PMTCT	Prevention of mother-to-child transmission of HIV
SRH	Sexual and reproductive health
UNAIDS	The joint United Nations Programme on HIV/AIDS
UNICEF	United Nations Children's Fund
UNFPA	United Nations Population Fund

VCT

Voluntary counselling and testing

WHO

World Health Organization



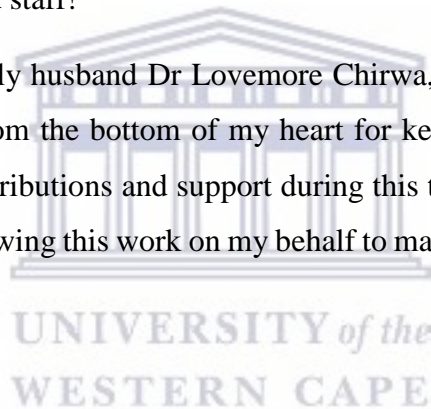
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## **ABSTRACT**

### **Background**

In Botswana the National Prevention of Mother-to-Child Transmission of HIV programme and the National HIV/AIDS Treatment Guidelines are not fully aligned with current World Health Organization recommendations for best infant feeding practices in the context of HIV. The government of Botswana endorses both exclusive breastfeeding and exclusive formula feeding. This study explored factors influencing infant feeding choices among mothers living with HIV in Francistown, Botswana.

### **Methodology**

This study employed an exploratory qualitative research design at Gerald clinic. This is a 24-hour clinic with a maternity ward and an HIV treatment centre. Data was collected from 20 mothers living with HIV/AIDS and 11 health care workers using semi-structured individual interviews. All interviews were transcribed verbatim in Setswana by the researcher and translated into English. A thematic analysis approach was used to analyse the data.

### **Results**

The participants were women aged 18 to 38 with children between the ages of 10 days and 6 months. The majority of the respondents were unmarried. Most of the women had senior secondary school education. Almost a third of the women were unemployed. Most mothers indicated that they were provided with information on infant feeding choices at the health facility. A majority of the mothers opted for exclusive formula feeding, citing fear of transmitting HIV to their children, inconsistent infant feeding practices by employed mothers returning to work and past infant feeding experiences. The study also revealed that some of the healthcare workers were not confident with recommending exclusive breastfeeding to mothers living with HIV due to their beliefs, different and changing national guidelines as well as lack of training.

### **Conclusion**

Although information on infant feeding options is provided at the health facilities in Francistown, most HIV infected mothers opted for exclusive formula feeding with the risk of HIV transmission from mother to child as the most important factor. Health workers lacked the

adequate training and counseling skills to effectively communicate appropriate recommendations on infant feeding among HIV positive mothers.



## **CHAPTER 1 BACKGROUND**

### **1.0 Introduction**

Botswana is a landlocked semi-arid country with a land mass of 582,000 square kilometers located at the southern end of Sub-Saharan Africa. In 2011 Botswana's population stood at just over 2 million people (CSO, 2014).

Botswana is a middle income country with stable governance and economy (World Bank, 2016). The country is also among the countries in the region with the highest HIV prevalence in the world (UNAIDS, 2016). In 2013, the fourth Botswana AIDS Impact Survey (BAIS) estimated that the national prevalence rate of HIV was 18.5 percent (CSO, 2013). According to the same survey, the HIV prevalence among children and adolescents was 2.2 percent in the 1.5 to 4 year olds, 4.7 percent in the 5 to 9 year olds, 3.5 percent in 10 to 14 year olds, and 3.7 percent among the 15 to 19 year olds (CSO, 2013).

In July 2000, with the aim of improving child survival and development through the reduction of HIV-related morbidity and mortality, Botswana rolled out the national Prevention of mother-to-child transmission of HIV (PMTCT) programme in all public health facilities offering sexual and reproductive health (SRH) services (Botswana Ministry of Health, 2011). As a means of reducing HIV transmission from mother to child the programme offered pregnant HIV positive mothers with antiretroviral (ARV) drugs and free infant formula milk as an alternative to breastfeeding.

With the provision of more potent antiretroviral (ARV) drugs to HIV-infected pregnant mothers, Botswana expected that as the programme reached high coverage, about 5,000 new HIV infections per year among infants would be prevented (Botswana Ministry of Health, 2011). Botswana also expected that the rate of mother to child transmission of HIV would fall to rates currently seen in some high income countries. In Eastern Europe and Central Asia vertical transmission of HIV has virtually been eliminated due to the ready availability of HIV prevention, testing and treatment services evidenced by mother to- child transmission rates of less than 2percent (WHO, 2011). The country witnessed a fall in the transmission rate of HIV from mother to child from 2.3 percent in 2008 to 2.0 percent in 2014 (Botswana Ministry of Health, 2014).

In order to encourage countries to further reduce the risk of transmission of HIV from mother to child, in 2009 the World Health Organization (WHO) released recommendations on safe infant and young child feeding practices. The recommendations recognized the importance of providing ARV drugs to the mother during the breastfeeding period (WHO, 2010). The WHO further recommended that national authorities should decide which infant feeding practice to promote in their Maternal and Child Health departments (WHO, 2010).

In order to align itself with these recommendations, Botswana initially adopted the WHO Option B in which all pregnant and lactating women with HIV were offered anti-retroviral therapy (ART) beginning in the antenatal period and continuing throughout the duration of breastfeeding. At the end of breastfeeding those women who did not yet require ART for their own health would discontinue the prophylaxis and continue to monitor their CD4 count, eventually re-starting ART when the CD4 fell to below 350 cells/mm (WHO, 2011). In April, 2015 the government introduced lifelong ART regardless of the CD4 count for PMTCT, referred to as Option B+ as the standard of care (Ministry of Health, 2016).

The government recommends that all women regardless of HIV status be provided with infant and young child feeding information and counseling during ante-natal care (ANC) to ensure they are supported in making the best decision for their situation (Botswana National Treatment Guideline, 2012). It therefore remains the right of every HIV positive mother to decide whether or not to breastfeed her child and her decision would have to be respected (Handbook of the Botswana Integrated HIV Clinical Care Guidelines, 2016).

For HIV infected women for whom formula feeding is acceptable, feasible, affordable, sustainable and safe (AFASS), exclusive formula feeding for the first 6 months and continued until 12 months is recommended. Free infant formula milk is provided at all public health facilities by the government until the infant is 12 months of age. At labor and delivery an infant is given 6 tins (400g) at discharge, 9 tins at 1 month of age and 10 tins from 2 months to 11 months of age.

Pregnant women not on ART, those on ART without documented viral suppression of <400 copies/mL within the last three months, and those diagnosed with HIV at the time of labour are advised not to breastfeed; but if they choose to do so they should be advised to exclusively breastfeed for the first 6 months of life and transition to formula feeding at 6 months, if AFASS conditions are met (Handbook of the Botswana Integrated HIV Clinical Care Guidelines, 2016).

Concerns arose regarding optimal infant feeding practices within the context of the PMTCT programme in Botswana. This has especially been the case as the country has continued to experience higher than expected infant and under-five mortality rates due to non HIV/AIDS-related causes, such as diarrheal diseases as a result of using unclean formula feeding bottles and unsafe water (Botswana National AIDS Coordinating Agency, 2015).

### **1.1 Problem Statement**

Despite strong advances in fighting childhood infectious diseases, Sub-Saharan Africa continues to face considerable challenges in child mortality. In 2013, 3.1 million deaths—half of under-five deaths globally occurred there (The United Nations Children's Fund, 2014). According to the same United Nations Children's Emergency Fund (UNICEF) report, pneumonia, diarrhea and malaria remain as the leading causes of death among children under age five. Botswana is one of the countries in sub-Saharan Africa that failed to achieve the millennium development goal (MDG) 4 for child mortality. In 2015 the under-five mortality rate in Botswana was 44 deaths per 1,000 live births and the MDG4 target was 18 deaths per 1,000 live births (UNICEF, 2015)

A woman infected with HIV can transmit the virus to her child during pregnancy, labour or through breastfeeding (WHO, 2004). Medication referred to as that the use of highly-active anti-retroviral therapy (HAART) has been shown to reduce the risk of HIV to infants through breast-feeding, particularly in areas of the world where replacement feeding is neither safe nor feasible, is very critical (Shapiro et al., 2010). Based on accumulated evidence on the effectiveness of ART in reducing HIV transmission through breast milk, the WHO recommends exclusive breastfeeding for the first six months of life, with the introduction of appropriate complementary foods under ART cover (WHO, 2016).

The two guiding practice statements in the 2016 WHO guidelines address the issue of mixed feeding in the presence of ART and support for women who due to work or school commitments may be unable to breastfeed for 12 months. The practice statements reassure health workers and mothers that ART reduces the risk of postnatal transmission in the context of mixed feeding and that shorter durations of breastfeeding are better than not breastfeeding at all. Several countries including South Africa (Kuhn, 2015) have adopted these guidelines which for the first time since the emergence of the HIV epidemic align feeding recommendations for women living with HIV and the general population of women.

Botswana has not adopted these guidelines as no determination has been made about which feeding practice will maximize HIV-free survival. A choice between two feeding options (exclusive breastfeeding or exclusive formula feeding with free formula milk) is still recommended.

Data shows that in Botswana the number of mothers living with HIV who opt for formula feeding is considerably higher than the number of mothers who choose to breastfeed their infants (Ndubuka, 2013). Another study also showed that approximately 90 percent of all HIV infected mothers reported feeding their babies with infant formula (Paulson and Nadege, 2013). Coincidentally Botswana government has reported poor infant formula preparation, handling and storage at the household level (Ministry of Health, 2010). It has also been noted that there was sub-standard infant and young child feeding counseling by healthcare workers, a weak supply chain management system for PMTCT commodities and supplies, and a “spill-over” of infant formula feeding from PMTCT to non-PMTCT mothers (Paulson and Nadege, 2013).

It would therefore be critical to assess the factors that influence infant feeding choices among HIV infected breastfeeding mothers in view of the current WHO guidelines that show that breastfeeding is safe for HIV positive women on ART and is a critical factor for improving child survival, and the hazards posed by unsafe formula milk preparation practices.

## **1.2 Purpose of the study**

The purpose of the study was to describe factors that influence infant feeding choices/options among mothers living with HIV and review health workers’ perceptions towards choices made by these women. The key public health theme that this study addressed is low uptake of exclusive breast feeding among mothers living with HIV despite literature that shows that exclusive breastfeeding among mothers living with HIV has been made safer through the use of ART. This was a qualitative study based in a high HIV prevalence city of Francistown. The results of the study could inform policy makers and strategic planning for health care workers on issues associated with infant feeding choices among mothers living with HIV and could inform government policy change on infant feeding in the context of HIV.

## **CHAPTER 2 LITERATURE REVIEW**

### **2.1 Introduction**

In 2016 there were an estimated 36.7 million [30.8 million–42.9 million] people living with HIV globally (UNAIDS, 2017). The Joint United Nations Programme on HIV/AIDS (UNAIDS) has noted that the number of people who are newly infected with HIV is declining in most parts of the world. New HIV infections among children declined by 47percent since 2010, from 300 000 [230 000–370 000] in 2010 to 160 000 [100 000–220 000] in 2016 (UNAIDS, 2017). Furthermore, around 76percent [60–88percent] of pregnant women living with HIV had access to ARV medicines to prevent transmission of HIV to their babies in 2016, according to UNAIDS report of 2017.

Botswana is one of nine southern African countries that continue to bear the bulk of the global burden of HIV and AIDS with an adult prevalence of more than 10 percent (NACA, 2015; CSO, 2013). The 2013 BAIS IV noted that although there had been a decline in HIV prevalence among pregnant women in Botswana from 37.4 percent in 2003 to 30.4 percent in 2011, the national HIV prevalence rate had risen to 18.5 percent compared to 17.6 percent in 2008 (CSO, 2013). This is in line with global trends in HIV infection that demonstrate an overall increase in HIV prevalence and substantial declines in AIDS related deaths largely attributable to the survival benefits of antiretroviral treatment (Kharsany and Karim, 2016). Mother to child transmission rates continued to decline in 2016 with the country achieving transmission rates of 1.4percent at six weeks (National PMTCT data, 2016). This means that Botswana is poised to achieve the Global Plan elimination targets (CSO, 2013).

### **2.2 Infant and Young Child Feeding in the Context of HIV**

An assessment of the WHO's HIV and Infant Feeding Guidelines of 1998, 2001, 2006 and 2010 reveal frequent updates and changes as new evidence regarding breastfeeding and HIV transmission became available. The 1998 guidelines stated that ‘when children born to women living with HIV can be ensured uninterrupted access to nutritionally safe and adequate breast milk substitutes, then they are at less risk of illness and death (Paulson and Nadege 2013). The 2001 and 2006 guidelines recommended that “When replacement feeding is AFASS, then avoidance of breastfeeding is recommended; otherwise, exclusive breastfeeding is recommended during the first six months of life” (WHO, 2001; WHO 2007).

In 2008 the WHO initiated a process to review new evidence regarding interventions that might reduce HIV transmission through breastfeeding, and to consider the implications for recommendations on infant feeding in the context of HIV (WHO, 2010). The WHO then released the 2010 *Guidelines on HIV and Infant feeding* with key recommendations on ART for pregnant women and preventing HIV infection in infants. One of the three key recommendations was provision of ARV drugs to the mother or child to reduce the risk of HIV transmission during the breastfeeding period. This was the first time the WHO had enough evidence to recommend ART to breastfeeding mothers (WHO, 2010). A recent systematic review and meta-analysis has reported a postnatal transmission rate of 1.08 percent at six months with breastfeeding and ART (Bispo et al, 2017).

In 2009, the WHO encouraged governments to recommend one infant feeding practice for HIV-positive mothers to be promoted and supported by maternal, newborn and child health services. Since then, almost all countries prioritised in the UNAIDS '*Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive*' have adopted the approach of promoting and supporting breastfeeding and the provision of lifelong ART as the strategy to optimise HIV-free survival among HIV-exposed, uninfected infants and children (WHO, 2016).

The recommendations stated that women who breastfeed and receive ART should exclusively breastfeed their infants for 6 months and continue breastfeeding until 12 months of age and only then consider stopping. At the same time the guidelines acknowledged that there are countries, namely those with low infant and child mortality rates, where replacement feeding may remain the best strategy to promote HIV-free survival among HIV-exposed infants (WHO, 2012)

For the first time the guideline promoted an alignment between infant feeding recommendations for mothers living with HIV and uninfected as well as mothers whose HIV status is unknown. It recommended that mothers who are known to be HIV uninfected or whose HIV status is unknown should be counselled to exclusively breastfeed their infants for the first six months of life and then to introduce complementary foods while continuing breastfeeding for 24 months or beyond. The WHO consolidated guidelines on the use of ARV drugs for treating and preventing HIV infection were updated in 2013 and again in 2016 (WHO, 2013, 2016c). The WHO now recommends lifelong ART for all from the time when any adult (including pregnant and breastfeeding women) or child is first diagnosed with HIV infection (WHO, 2016)



### **2.3 The Botswana PMTCT Programme**

The Government of Botswana launched the PMTCT programme in April 1999 with the aim of improving the survival and development of children through the provision of health services to reduce transmission of HIV to infants (Ministry of Health, 2014). In 2014, the PMTCT programme was available in all the 634 health facilities that provide Maternal and Child Health services. Overall, 95 percent of households live within 8 km of a health facility, 97 percent of women attend four antenatal visits during pregnancy and deliver in a health facility (Ministry of Health, 2007). As a result of these efforts the percentage of pregnant women who were tested for HIV and received their results (during pregnancy, during labour and delivery, and during the post-partum period, including those with previously known HIV status) increased from 49 percent in 2002 to 94.3 percent in 2014 (NACA, 2015).

The PMTCT data also show that for the same period, the absolute number of women who newly tested HIV positive gradually decreased from 14,058 in 2011 to 11,845 in 2014 (NACA, 2015). The 2014 PMTCT data also reveals that out of the 11,845 HIV positive pregnant women who received antiretroviral medicine, about half of them (50.2 percent) were already on ART before their pregnancy (NACA, 2015). The estimated percentage of child HIV infections from women living with HIV delivering in the past 12 months was 1.8 percent in 2014 compared to a high of 2.5 percent in 2013. However, due to poor turnaround times at the laboratory, only 41.6 percent of infants born to HIV-positive women received a virological test for HIV within two months, although this figure was lower than that for 2013 (47 percent) (Ministry of Health, 2014).

### **2.4 Infant feeding and HIV in Botswana**

In 1999 when the PMTCT programme was piloted and implemented in Botswana, the government recommended a national budget for provision of free infant formula milk to all mothers living with HIV (Ministry of Health, 2008). The national infant feeding policy supported the "avoidance of breastfeeding" and provision of free infant formula to all mothers living with HIV for a period of 12 months.

In 2001 the government evaluated infant feeding practices among HIV infected women and noted that around 90 percent of all mothers living with HIV reported feeding their babies with infant formula whereas only 3 percent reported exclusive breast feeding. This infant feeding practice was noted to be in line with the Botswana PMTCT guidelines recommendation which

emphasised “avoidance of breastfeeding” as a way to reduce HIV transmission (Republic of Botswana, 2005).

The results of a needs assessment on HIV and infant feeding in Botswana showed that exclusive breast feeding rates among HIV-infected women who chose to breastfeed were low (31 percent), formula feeding preparation and storage was poor especially among uninfected women, and PMTCT-trained staff knowledge regarding HIV and infant feeding was also generally poor, with only 2 hrs training during the 2 weeks PMTCT counselling course.(Luo, 2002)

Between November 2005 and February 2006 there was an outbreak of diarrhoea in Botswana. The diarrhoea outbreak was associated with severe acute malnutrition, during which 553 children lost their lives (Creek et al, 2010). Up to 63 percent of infants born to HIV infected women were formula fed from birth and 20 percent of infants born to HIV negative women were weaned from breast milk before 6 months. Many of the children developed severe acute malnutrition during or after diarrhoea; 42 percent developed marasmus, 21percent developed kwashiorkor and most were growing poorly before the onset of the diarrhoea and were not being adequately managed despite monthly weighing at the clinics. Twenty-two percent of the hospitalised children died (Creek et al, 2010). These findings emphasized the need to focus efforts to address infant and young child feeding in Botswana.

Creek et al (2010) reported that as a result of the diarrhoea outbreak, the government changed the national infant feeding guidelines in July 2006 to align them with the WHO. The revised guidelines recommended exclusive formula feeding to mothers living with HIV for whom formula is ‘AFASS’ and exclusive breastfeeding to HIV positive women for whom formula feeding is not ‘AFASS’. In 2010, the Government of Botswana decided to initiate the national rollout of triple ARV prophylaxis to pregnant women and breastfeeding mothers not eligible for HAART (PMTCT Guideline, 2011).

In 2014 the PMTCT data showed that out of 11,845 HIV positive pregnant women who had received ART to reduce the risk of mother-to-child transmission, a total of 1,730 women were provided with ART for themselves or their infants during the breastfeeding period (NACA, 2015). The same data also indicated that breastfeeding which is a recognized viable option to reduce child mortality regardless of the HIV status, was chosen by only 18 percent of the HIV infected mothers in 2014. Botswana also has a very low prevalence of exclusive breastfeeding

in the general population with only 20 percent of infants under 6 months reported to be exclusively breastfed in 2007 (Countdown, 2015).

Table 1 below depicts Botswana’s current Infant and Young Child Feeding Recommendations (Botswana National HIV/AIDS Treatment Guideline, 2012).

<b>Client Situation at time of delivery</b>	<b>Feeding recommended in first 0-6 months</b>	<b>Feeding recommended beyond 6-24months</b>
HIV-negative women	Exclusive breastfeeding (no added foods or liquids, not even plain water).	Breastfeeding until at least two years of age plus introduction of complementary foods at six months of age.
HIV infected women for whom formula feeding is AFASS	Exclusive formula feeding (no added foods or liquids, not even plain water)	Formula feeding until 6 months of age plus introduction of complementary foods at six months of age. Continue formula feeding until 12 months of age. From 12–24 months of age, offer animal milk and/or other milk products (yoghurt, cheese and sour milk) plus complementary foods.
HIV infected women for whom formula feeding is not AFASS*	Exclusive breastfeeding (no added foods or liquids, not even plain water)	At six months, assess the mother's situation using AFASS criteria: <ul style="list-style-type: none"> <li>• If formula feeding is still not AFASS, breastfeeding until 12 months of age (or until formula feeding becomes AFASS )</li> <li>• If formula feeding is AFASS, gradual weaning (over a period of one month)</li> </ul>

		with introduction of formula feeding Introduce complementary foods when baby is six months of age; from 12–24 months of age, offer animal milk and/or other milk products (yoghurt, cheese and sour milk) plus other complementary foods.
Women of unknown HIV status*	Depending on HIV test outcome, either EFF or EBF	Complete HIV test as a matter of priority

The Botswana National HIV/AIDS Treatment Guideline further stipulates that likewise, there are situations when formula feeding is not safe due to unclean water supply or inability of the mother to maintain strict hygienic formula milk preparation practices. Before recommending (or not recommending) breastfeeding one must therefore consider all aspects of a mother’s social and medical situation like HIV status or mastitis (Handbook of the Botswana Integrated HIV Clinical Care Guidelines, 2016). The guidelines continue to say that the risk of HIV transmission from breastfeeding outside of research conditions in Botswana is unknown. According to the guidelines, it therefore remains the right of every HIV positive mother to decide whether to breastfeed her child and her decisions should be respected (Handbook of the Botswana Integrated HIV Clinical Care Guidelines, 2016).

The government recommends that all women regardless of the HIV status be provided with infant feeding information and counseling during ANC to ensure they are supported in making the best decision for their situation, whether to formula feed or breastfeed (Handbook of the Botswana Integrated HIV Clinical Care Guidelines, 2016). Although the government’s position on infant and young child feeding has evolved over the years and the PMTCT program has continued to make significant strides, there are some challenges that need to be addressed in order to eliminate new HIV infections and reduce infant mortality. One of the main challenges noted is still high stigma attached to infant formula feeding as revealed by the Stigma Index survey of 2013 (NACA, 2015). At the same time the country has achieved no increase the number of mothers living with HIV who choose to exclusively breastfeed while on ART

despite new recommendations by WHO on infant feeding in the context of HIV. Furthermore, as noted by Shapiro et al (2003) it is also questionable if the 'AFASS' criteria in Botswana is really assessed by health care workers or met by mothers living with HIV. It will therefore be important to understand how mothers living with HIV and health care providers perceive exclusive breastfeeding in the era of HIV.



## **CHAPTER 3 METHODOLOGY**

### **3.1 Aim and Objectives**

This study aimed to explore factors that influence infant feeding choices/options among mothers living with HIV and health care workers in Francistown, Botswana.

The objectives of the study are:

- a. To explore perceptions of mothers living with HIV towards infant feeding options/choices
- b. To understand the perspective of mothers living with HIV towards exclusively breastfeeding their infants
- c. To explore the perception of health care workers towards infant feeding options for mothers living with HIV

### **3.2 Study Design**

This was a qualitative, exploratory study that used individual semi-structured interviews on mothers living with HIV and PMTCT program key informants (nurse/midwives and Health Care Assistants (HCAs/counsellors) rendering Infant and Young Child Feeding (IYCF) services in the PMTCT programme at Gerald clinic in Francistown, Botswana.

Qualitative research is ideal for investigating the perceptions of people on a given phenomenon or why certain decisions are taken. Undertaking such research involves dealing with people's feelings, beliefs and culture (Black, 1994). Qualitative research is also effective in obtaining culturally specific information about values, opinions, behaviours, and social contexts of a particular population (Mack et al, 2005). The strength of the qualitative approach as explained by Mack et al (2005) is its ability to provide complex textual descriptions of how people experience a given situation. For this dissertation, the study sought to explore and understand the experiences of mothers living with HIV about infant feeding and HIV and how health care workers support mothers to make informed decisions on infant feeding in the context of HIV and how they perceive infant feeding choices made by mothers living with HIV w

Since this study sought to understand individual perceptions and attitudes, the strength of the qualitative approach was that data were based on the participants' own categories of meaning, which is useful for studying a limited number of cases in more depth (Robson, 2011).

### **3.3 Study Setting**

Botswana is divided into administrative districts which are managed by local councils (Government of Botswana, 1981). Francistown is Botswana's second largest city with a population of 100,079 according to the 2011 Botswana Census and is administered by the Francistown City Council (FCC). The council, through the Francistown District Health Management Team (FDHMT), is responsible for provision of primary health care in Francistown. The public health system in Francistown consists of one referral hospital, 3 clinics that operate 24 hours, 10 clinics that are open for 8 hours a day, and 2 health posts.

The study was conducted at one of the 3 public clinics that operate 24 hours called Gerald Estates Clinic. The clinic is a health facility with a maternity ward and an Infectious Disease Care Clinic (IDCC), a centre at which clients are initiated on ART. The clinic is located in a high density and low income locality with a population of 8,948 people according to the population census of 2011 (Population and Housing Census, 2011). This clinic reported that from January to November 2016 34.8 percent of women tested HIV positive during their ANC visits, a rate much higher than the district prevalence of 24.3 percent (FDHMT Report, 2016).

### **3.4 Study Population and Sampling**

The study population comprised of mothers living with HIV and health care workers at Gerald clinic in Francistown. These mothers were identified by health care workers in the clinic during their post-natal care (PNC) or monthly baby weighing visits or when collecting formula milk for their infants. Health care workers who were key informants included PMTCT coordinator, nurse/midwives and PMTCT lay counselors also known as Health Care Auxiliaries working in sexual and reproductive health sections.

A purposively sampling method was used to select the study participants (Palys, 2008. In purposive sampling, a population is sampled with a purpose in mind. Purposive sampling targets a particular group of people). For the purpose of this study, I sampled mothers living with HIV who have either chosen to formula feed or breastfeed to get more understanding on their feeding choices. Twenty mothers who agreed to participate in the study after receiving information on the study from health care workers were interviewed. Health care workers involved in counselling mothers living with HIV on infant feeding were also sampled to understand their experiences of the counselling process. The study was introduced to all HCWs during the clinic morning briefs and individuals were invited to volunteer to be interviewed.

Appointments were scheduled with health care workers depending on their work schedule and availability.

### **3.5 Data Collection**

Face -to -face individual semi-structured interviews were used to collect data from both groups of participants. This method was selected because it has a distinct advantage of enabling the researcher to establish rapport with potential participants and therefore gain insights from them (Leedy and Ormrod, 2001). This also allows the researcher to clarify ambiguous answers and when appropriate, seek follow-up information.

Before data collection I met the clinic management staff including the Nurse-in-Charge and health workers at the MCH, the IDCC and maternity sections, and mothers living with HIV who had brought their children to the clinic individually in order to explain the purpose of the interviews, the reasons why they had been approached, and the expected duration of the interview. I also answered questions that the potential participants had and obtained informed consent from each of the healthcare workers and mothers that indicated willingness to participate in the study (Refer to appendices 1-4 for informed consents).

A private and confidential space was identified in the clinic outpatient department to interview mothers and another room was identified at the maternity department to interview health care workers. Initially I thought that afternoons would be the most appropriate time to interview health workers but adjustments had to be made when I noticed that the staff was mostly busy during those times. As a result evenings and weekends were selected to interview health care workers. The mothers living with HIV were interviewed during the day.

Two separate interview guides were developed for this study:

a) An interview guide for health workers in the clinic. (see Appendix 5)

This was a standardized interview guide containing information on the purpose, issue of confidentiality, the duration of the interview and how the interview will be conducted. It also had guiding questions on the perception of health care workers on infant feeding in the context of HIV.

Key questions asked health care workers were as follows:

- What are infant feeding options available for women who are HIV negative and HIV positive in your health facility?



- When a mother is HIV positive, what is the most appropriate feeding option to reduce the chances of passing HIV to her baby?
  - What experiences have you had as a health care provider on exclusive breastfeeding in the context of HIV in this health facility. (Probe for the rate/uptake of breastfeeding in the clinic among mothers living with HIV)
  - How do you feel about mothers living with HIV who choose to breast feed?
  - What are the barriers faced by mothers living with HIV who choose to breast feed?
  - What are the changes needed to support infant feeding among mothers living with HIV in your health clinic?
- b) An interview guide for mothers living with HIV identified in the clinic (see Appendix 6). This was also a standardized interview guide containing information on the purpose, issue of confidentiality, the duration of the interview and how the interview will be conducted. It also had guiding questions on the perception of health care workers on infant feeding in the context of HIV.

The key questions asked mothers living with HIV were as follows:

- What infant feeding options were mothers living with HIV provided while you they were pregnant with their current children during ANC visits?
- Infant feeding choice made while they were pregnant and why they decided on that method of feeding?
- The most appropriate feeding method for mothers who are HIV positive that reduce the chances of passing HIV to the baby?
- Support they received from health care providers, family or community about infant feeding?
- What experiences they had as mothers living with HIV on the method they chose to feed your child and their feeling about the method they were using to feed their children while they are HIV positive?
- Some of the barriers they faced since they opted to choose this method of feeding?

For both groups of interviews I collected information until I reached saturation and I realized I could not get any new information. When you reach a point of saturation, it means that you are starting to collect the same ideas over and over from your sample. A total of 20 mothers living with HIV and 11 health care workers that consisted of 10 nurse/midwives and 1 health care auxiliary were interviewed.

Both the interview guides and the consent forms were available in English and Setswana, the predominant languages spoken in Botswana. All interviews were tape recorded and transcribed afterwards. All this was done with consent and agreement from the interviewees.

### **3.6 Data Management**

The information collected in the interviews was kept secure at all times by the investigator. Paper documents were stored in locked file cabinets; the data collection tool and the tape recorder were stored in separate file cabinets to further protect information of the participants. The electronic files were stored on encrypted network drives using password-protected desktop computers. The audio tape used did not contain information that may personally identify participants. Every after an interview with participants the audio conversation was labelled numerically either 'Patient 1' or 'Health Care Worker 1' depending on whether the interview was with the mother or health care worker. The audio tapes will be destroyed at the end of the study and paper documents will be shredded in a machine.

### **3.7 Data Analysis**

All interviews were transcribed verbatim in Setswana by the researcher. Thematic analysis approach was used for this qualitative research. Thematic analysis approach emphasizes the meaningful nature of people's participation in social and cultural life (Robson 2011). The focus was on an analysis of the meanings people confer upon their own and others actions.

Transcripts were printed, read through thoroughly and paragraphs and sentences were coded line by line using highlighters to identify same or similar expressions and/or meanings. Various meanings were identified from the transcripts and they were eventually grouped together into major themes that related to the study objectives and these themes were Infant feeding information provided to mothers at ANC; Infant feeding practices chosen by mothers; Factors that influenced mothers on infant feeding choices, Perception of mothers towards infant feeding options in the context of HIV; Health workers perception on infant feeding options among mothers living with HIV and challenges they face related to the method they opted.

The analysis was supplemented with other sources of information to satisfy the principle of triangulation and increase trust in the validity of the study's conclusions. For example, this was done by analysing transcribed interviews along with observational field notes. The purpose of multiple sources of data is the researcher looks for patterns of convergence to develop or

corroborate an overall interpretation. Triangulation may therefore be better seen as a way of ensuring comprehensiveness and encouraging a more reflexive analysis of the data. (Mays and Pope, 2006). For this study I triangulated sources of information by examining the consistency of different information provided by health care workers and mothers living with HIV on knowledge of EBF in the context of HIV, perceptions on the best infant feeding method for mothers living with HIV and their attitude towards EBF in the context of HIV.

In summary, a good qualitative analysis discovers patterns, coherent themes, meaningful categories, and new ideas. It uncovers better understanding of a phenomenon or process.

### **3.8 Rigour**

Rigour in qualitative research has to do with the ability to determine if the conclusions drawn by the researcher are trustworthy. That makes them comparable to validity and reliability in quantitative research.

For the study to meet the requirement of rigour, different strategies were used to demonstrate that it is credible and provides an accurate reflection of what participants actually expressed, experienced and perceived. Data triangulation through meeting mothers living with HIV who opted to either EBF or EFF and health care workers as key informants assisted to increase validity by corroborating descriptions.

I also used an audit trail strategy. Creswell and Miller (2000) explain that an audit strategy is established by researchers documenting the inquiry through journaling, memoing, keeping a research log of all activities, developing a data collection chronology and recording data analysis procedures clearly. This audit trail was documented during implementation of the study and data collection and was reviewed during the analysis.

Because I have been involved with PMTCT research since 2005 and I have interacted with both mothers living with HIV and health workers at different facilities in Francistown including the study site, reflexivity was used to guard against the influence of personal opinions about the research topic. It further assisted to identify preconceived ideas I may have brought into the research especially among health workers whom I have interacted with before. I noted that during the interviews, some of the health workers expected me to go back to what we used to do and expected me to discuss management issues and how things had changed since the graduation of the PMTCT programme from the CDC funding. In addition I noticed that some

healthcare workers expected me to know more about the topic and some were hesitant to answer some of the questions thinking that I represent management. The staff was reassured that this was a study that sought their own views and opinions, not the researcher's; that there were no right or wrong opinions and views, and that the information collected would be kept confidential and securely guarded.

### Study Limitations

Qualitative research has numerous strengths when properly conducted but it is worth mentioning the most common limitations of qualitative research. Qualitative research generalizability is seen to be problematic. It is concerned with the concepts and idiosyncratic characteristics of a select group; therefore, the findings or theory may only be applicable to a similar group (Thomson, 2011). These findings cannot be extended to wider populations with the same degree of certainty that quantitative analyses can. This is because the findings of the research are not tested to discover whether they are statistically significant or due to chance (Atieno, 2009). Furthermore, research quality is heavily dependent on the individual skills of the researcher and more easily influenced by the researcher's personal biases and idiosyncrasies and the volume of data makes analysis and interpretation time consuming (Anderson, 2010).

As a way of mitigating some of the limitations of these parametric assessments resampling methods which are based upon repeated sampling within the same sample are more commonly being used as methods of statistical inference, because they often are simpler and more accurate, require fewer assumptions, and have greater generalizability (Garson, 2006).

This study was set up to be conducted in the facility but it became a challenge to meet some of the working mothers at the clinic and they preferred to be followed up at home after being identified at the clinic by health workers and informed of the study. At the beginning, the researcher thought it would be ideal to interview health workers in the afternoon when the clinic is less busy but it turned out that the facility was a very busy clinic and appointments had to be made for each health worker looking at appropriate time that suited each one of them.

We then settled to conduct interviews over the weekends and during evening or night shifts. This really worked very well for both the researcher and the participants since it did not interfere with their day to day work. The interviewer did not have to wait for long for health workers to finish their work. Small sample size is a limitation as the research was only

conducted at one health facility. The findings can therefore only be transferable to similar health facility settings.

### **3.10 Ethical Considerations**

One ethical approval was obtained from the University of the Western Cape Ethics Committee. The Permanent Secretary for Botswana Ministry of Health Human Research Development Committee (HRDC) ethics committee granted permission to conduct the study (see Appendix 7) and the Francistown District Health Team granted written approval (see Appendix 8).. The head of the facility also granted approval to allow the researcher to interview mothers living with HIV and health care workers.

Before the research could proceed the protocol was shared with the ethics committees to respond to the potential psychological distress that the interview might cause the women. Participation was voluntary for all mothers and health workers identified. An information sheet explaining details about the study, benefits and risks, the voluntary nature of the study and assuring them of confidentiality was provided in Setswana for mothers and read to participants.

### **3.11 Informed consent**

To ensure that all women fully understood the benefits and risks of the study regardless of literacy level, all women who were eligible and willing to participate in the study were read a statement in their own language describing participation in the study and the risks and benefits of the study. Women who understood and accepted these conditions signed their consent prior to participation. A copy of the consent form was provided to participants (see Appendixes 1, 2, 3 and 4 for information sheets and consent forms)

Access to counselling and support was established if a woman requested or appeared to need it, following an interview. Where necessary, an appropriate referral was made to a suitable professional for further assistance or intervention. Some of the women had questions about treatment they were taking and the formula milk. They were all referred to the health workers for assistance.

## CHAPTER 4 RESULTS

### Characteristics of the participants

Table 2 shows the characteristics of the 20 mothers living with HIV who were interviewed. The women were between the ages of 18 and 38. These mothers had children between the ages of 10 days and 6 months. Majority of the women (45 percent) were within the age group of 25-29 years. The majority (75 percent), of the respondents were single at the time of the interview. All women interviewed had some form of formal education, 5 percent had primary education, 30 percent had junior secondary (form 2 or form 3), 35 percent had senior secondary (form 5) and 30 percent had above secondary educational status respectively.

Regarding occupation, 7 (35 percent) of the respondents were either government or non-government employed, followed by 3 (15 percent) who were informally employed e.g. working for a drought relief programme or running small semausu (spaza) shops, the rest (10 women), were not employed. All these mothers interviewed were actively on lifelong ART.

Eleven health care workers that were interviewed included 10 nurse/midwives and 1 health care auxiliary.

**Table 2. Characteristics of mothers living with HIV who were interviewed**

Socio-demographic		Frequency	Percentage
Age group	15-19	1	5
	20-24	1	5
	25-29	9	45
	30-34	6	30
	35-39	3	15
	40-44	0	0
	<b>Total</b>	<b>20</b>	<b>100</b>
Marital status	Single	15	75
	Married	5	25

Socio-demographic		Frequency	Percentage
	<b>Total</b>	<b>20</b>	<b>100</b>
<b>Educational status</b>	No formal education	0	0
	Primary	1	5
	Junior Secondary	6	30
	Senior Secondary	7	35
	Above secondary	6	30
	<b>Total</b>	<b>20</b>	<b>100</b>
	<b>Employment status</b>	Formal employed	7
Informal employed		3	15
Unemployed		10	50
<b>Total</b>		<b>20</b>	<b>100</b>

Three broad perceptions emerged from mothers in this study: (i) Breastfeeding is best if mother is on treatment, (ii) Formula feeding is safe and there is no chance of HIV transmission (iii) If a mother is HIV positive, formula feeding is the most appropriate method to feed the baby but socially challenging for the mother.

While most healthcare workers were well informed of the national guidelines and provided information to breast feeding mothers as recommended, not all of the healthcare providers were confident with the information they gave.

The findings of the study will be presented under the following themes: 1. Infant feeding information provided to mothers at ANC. 2. Mothers' choices about infant feeding. 3. Factors that influenced mothers on infant feeding choices 4. Health workers perceptions on infant feeding choices among mothers living with HIV.

#### **4. Infant feeding information provided to mothers at ANC**

Most of the mothers that participated in this study indicated that they were provided with information at the ANC on infant feeding options while they were pregnant with their current babies.

*Yes ma'am I was taught. Through these teachings I was made to choose between two options, exclusive formula-feeding and exclusive breastfeeding. I was taught that if I choose to breastfeed my child, I can only breastfeed for 6 months. If I choose to feed the baby formula then I would have to feed the baby purely formula without feeding the child anything else -Pt3 (EFF)*

*When I went to register my pregnancy, they explained that I could either choose to breastfeed or feed my baby formula. When it came to the idea of breastfeeding I wanted more information on how it works, because in the olden days we knew that we were not allowed to breastfeed if you were HIV positive. So I wanted to know why now we are allowed to breastfeed. So then they explained to me how it is possible and they gave me all the necessary information. They explained that if you are on treatment and you follow the doctor's instructions, there is no way the virus can pass to the baby -Pt13 (EBF)*

There were some mothers who said that they had forgotten what they had learnt about infant feeding.

*Aaah, I have forgotten....I can't remember anything -Pt7 (EFF)*

One mother said she was not provided any information on infant feeding options.

*...to be honest I was never given any information to tell the truth. We were just coming for ANC and they will only talk about formula feeding. That a bottle is not good for babies. That's all I know. They just emphasised that it's difficult to clean bottle and the bottle collects a lot of infection. They said we should give them using cups... That's why you see the baby using a cup -Pt6 (EFF)*

One mother indicated that she was only given information on EFF.

*(Long pause...) I was taught that when a mother living with HIV has a baby, she shouldn't breast-feed, she should formula-feed only -Pt14 (EFF)*



## **4.2 Mothers' choices about infant feeding**

While almost all mothers showed knowledge and understanding why EBF was generally recommended to children during the first 6 months of life, this method of feeding was rarely chosen or practiced by mothers living with HIV who participated in the study.

From the twenty women who were interviewed, only three mothers chose EBF. Most women opted to formula feed their infants although they were well informed about the benefits of breastfeeding.

*-Exclusive..... because breast milk is good, it has good nutrition, it's healthy, it makes babies grow well.... it reduces infections and all that, when we formula feed, most the times you find out that we don't clean our bottles nicely, also... honestly mixed feeding is not a good thing. It's better to breastfeed because breast milk it has got all the nutrients that are needed by the baby -Pt15 (EFF)*

*The nurses explained that when a child is still very young, the baby needs a lot of nutrients. Breast milk is clean and if you use formula, cleanness is compromised. But breast milk is very pure and clean. When it comes from the breast, it is less contamination.....however I decided to feed my baby formula -Pt3 (EFF)*

*Breast milk has all the nutrients that the baby needs. And breast milk prevents opportunistic infections. I really wanted to breastfeed but because of the challenges I had...aaah! -Pt4 (EFF)*

## **4.3 Factors that influenced mothers on infant feeding choices**

The choice to either breast feed or formula feed was influenced by various factors. These factors included fear of HIV transmission from the mother to the baby, working mothers returning to work, mother's health and mothers' past experiences.

### **4.3.1 Fear of HIV transmission to the baby**

Findings from this study revealed that the majority of mothers who opted for EFF chose this method of feeding because of fear of possible transmission of HIV from mother to child.

*I really wanted to breast feed my baby especially when I heard I can breastfeed exclusively for six months then I had doubts that I may not be fair to my child, then I decided to use formula.....I suspected that I may transmit the virus to the baby -Pt4 (EFF)*

*I chose to formula feed. I didn't want this programme of breastfeeding for 6 months....aaah I didn't want it at all. They kept saying it's not 100percent and it scared me a lot and I said aaah if it's not 100 percent I will end up infecting my child, I found out that it was dangerous and I got scared -Pt6 (EFF)*

*...but as for now we have fear, it's just fear that what if my child goes through this, it's something that we don't allow our children to go through, so sometimes it's also better to formula feed, just to avoid the risk even though sometimes mothers fail to take care of the bottle and baby utensils. You find out that at the end of the day the baby ends up at risk -Pt15 (EFF)*

One participant indicated that her decision to breastfeed was influenced by knowing a mother who indicated that her baby had contracted HIV through breastfeeding.

*I have learnt that it's the best decision for me to just formula-feed my baby instead of breastfeeding, because the dangers of breastfeeding are a lot....that if I breastfeed my baby there is a possibility that I might pass the HIV to them. I have an experience from some girl, a friend of mine.....She had breastfed for 6 months and after those 6 months the baby got sick. She was breastfeeding everyday till the baby turned 1. The baby wasn't gaining weight. She then took the baby to the hospital.....Yes she found out that she had contracted the HIV -Pt10 (EFF)*

Some mothers also expressed fear of mixed feeding as a risk for HIV transmission:

*I chose to formula feed because it's very safe as compared to breastfeeding.....Sometimes if I am not around I am scared that somebody may decide to give the baby something else. But if its formula feeding, they will only give the baby a bottle...Even giving water.... because I was told that if you give them water and formula at the same time it can irritate the baby stomach and cause infection. So if you then feed the baby breast milk, the virus may pass to the baby -Pt1 (EFF)*

Some mothers who opted for EBF even when they were on ART did not fully trust the method to totally prevent the transmission of HIV.

*...Even though I chose to breastfeed, I must say I do have my doubts deep down. I will be relieved after I see my baby's results being good-Pt13 (EBF)*

*Even as I am still breastfeeding...hey, I still have doubt...I feel my child may be infected with HIV. But they have given me medicine to give to the baby...-Pt20 (EBF)*

#### **4.3.2 Employed mothers returning to work after maternity leave**

There were some mothers whose infant feeding choice was influenced by their employment status. In particular, mothers who were required to go back to work.

*I chose to formula feed, looking at the fact that I had to go back to work soon and thus I felt that feeding my baby formula was safer than breastfeeding. If I breastfed and wasn't around .... The baby would suffer... The main issue was that the child will be left with the caregiver and I will not be around most of the day.-Pt3 (EFF)*

*I feel like with the decision that I have taken to formula-feed, sometimes when you are away as a mother, I feel like the people you leave with your child are not going to have the same hygiene with the bottles. Maybe you are used to boiling them in water, and the next thing another person will just casually rinse them when you are away and then pour the milk, without boiling it. Pt10 (EFF)*

*When it came to the duration for breastfeeding, they said that any amount of time was good, but until 6 months. I had been worried about it because I had to go back to work at some point, so they said 3 months, 5 months or 6 months were okay. They said they would support whatever I chose. But if I remember correctly they said up to 6 months Pt13 (EBF)*

#### **4.3.3 Past experiences of practising infant formula feeding**

Some of the women who had other children while they were aware of their HIV positive status indicated that their choice of feeding was determined by what they had practiced with their previous infants.

*.... (Giggles) I never said I liked the method (laughs further). When it comes to all the children that I have had since being HIV positive (please give a number), there's not a single one that I have breastfed. I chose to formula-feed them.-Pt5 (EFF)*

*I decided to accept what was there and give my baby formula. I have been giving my other babies formula and I asked myself why should I breastfeed this one? -Pt6 (EFF)*

*I chose formula because I'm not used to breastfeeding.... (Laughs)... Yes because it's what I am used to (Giggles) -Pt12 (EFF)*

#### **4.4. Perceptions of mothers towards infant feeding options in the context of HIV**

Two broad perceptions ultimately emerged from the data collected: (i) Breastfeeding is best if a mother is on treatment, (ii) Formula feeding is an appropriate method to feed the baby but was socially challenging for the mother.

##### **4.4.1. Breastfeeding is best if a mother is on treatment**

In this study, some of the mothers stated that exclusive breastfeeding was the most appropriate choice for the baby as long as the mother was on ART. Despite this knowledge, some of the women still opted for formula feeding:

*The method that is good for feeding is umm... For example if you are breastfeeding as a mother, you should be on the treatment, and take the medication... what's it called? AZT? Is it the one? Umm that is given to the baby during that time period of 6 month whilst you are breastfeeding. You as a mother should make sure that you take your pills every single day and be strict with them... umm take them with... umm what's it called? What can I say? Strict? Umm... take them regularly -Pt8 (EFF)*

*...the virus can pass to the baby if you do not enrol in PMTCT. If you can breastfeed your baby without doing the PMTCT programme and drinking the pills and medication offered your child will be infected. PMTCT is a very good programme that suppresses the virus from transmitting to your baby .... -Pt11 (EBF)*

*These pills work for 24 hours in someone's body. So if I decided to drink them at 7 o'clock, I must make sure that at exactly 7 o'clock then I should drink them. Because the moment I miss them by a few minutes, the body begins to weaken. So the body weakens there is chance for the virus to increase in the breast milk and the baby is able to contract the HIV virus from breastfeeding. To ensure that we don't allow the virus*

*to transmit to the baby we need to follow the doctor's instructions and take the medication on time-Pt13 (EBF)*

*...personally I think it's the method I have chosen....of formula feeding....because the baby is not in contact with you through the breast. At the same time I was told that if I am on treatment I can breastfeed my baby. Even though I chose formula because the baby is not in contact with me-Pt2 (EFF)*

#### **4.4.2 Formula feeding is socially challenging**

Even though the majority of mothers felt that EBF was the best method of feeding and some wished that they could breastfeed their babies, most mothers chose EFF in spite of the social challenges they faced.

*...yes challenges are there. Even if people gossip out there all you do is ignore ... at the end of the day you are protecting your children..... I don't even have time to listen to them -Pt4 (EFF)*

*... (Interruptions...) I don't feel good about it (formula feeding), but since I already have the HIV Virus, I have had to accept it....I had wanted my babies to breast feed, -Pt14 (EFF)*

*...even though I missed out on bonding....that is a feeling... I missed it honestly. Of course breastfeeding is good...I wish she had tasted mummy's milk, playing with mummy's breasts...but I have to accept! -Pt15 (EFF)*

*No I don't have any issue with it. It used to bother me because people would say that my child is big because it drinks milk from the hospital. Then I decided that if my family and parents accept my status and situation, then I don't care what anyone else says in the streets. They would just talk.....I had once sent another lady to get the milk for me, and then she went to Ipelegeng (group of drought relief workers) and it became the topic of discussion. Then I just decided that, that's just how Batswana are -Pt10 (EFF)*

#### **4.5 Health workers perceptions on infant feeding choices among mothers living with HIV**

Even though interviews with health workers revealed that they informed women about the choice between exclusive breastfeeding and exclusive formula feeding as indicated below,

health care workers expressed fears and concerns of infant feeding in the context of HIV. They were concerned about continued changing guidelines from government; feeling that it is not completely safe to breast feed while HIV positive; uncertainty that women will exclusively breastfeed and not give some other food substances.

*Umm basically what we do is give them an opportunity for them to choose what to feed their babies. Some will choose to breastfeed for the first 6 months and then change to formula whilst others will choose not to breastfeed at all, they would want to feed their babies formula. For those who choose to use formula, we teach them how to make the formula and then... umm what's it called... How she takes it and how long she takes it in the clinic. We also go on and explain the hygiene required on the bottles she uses for the child, how she should feed the baby as well as the fact that when the baby is on formula she shouldn't mix it with food such as solids, she should feed the baby the formula only. As for those women who choose to breastfeed, we try to encourage them, that as they chose to breastfeed, she will breastfeed the child for those months that she wants -HW3*

*Currently we are looking into two options; exclusive breastfeeding and exclusive formula feeding. For mothers living with HIV it's either formula feeding or breastfeeding but they can later do mixed feeding after six months. For HIV negative women we encourage exclusive breast feeding and HIV testing after every 3 months - HW2*

*Uhm... We are having exclusive breastfeeding , we are also having formula feeding that is given in the clinic... so both mothers they have to choose what they want, but specifically we are looking at positive mothers when it comes to feeding formula that we are giving, that's the one that we are giving them, then breastfeeding it's also there for those who are HIV positive, and for those who are negative ...uh.... we advise them to breastfeed, but we still have those who want to formula feed even though they are negative -HW4*

*The options are breast feeding and formula feeding. Mothers living with HIV, they are the ones who take the choices, we are the ones who just give the information on what type of feeding that we have and they're the ones who choose the method they want to*

*feed. As for mothers living with HIV normally they formula feed and no one of them wants breastfeeding -HW5*

Some health care informants expressed mixed feelings towards EBF in the context of HIV. Their perception and attitude on the most appropriate feeding method for mothers living with HIV varied and was influenced by their own fears and concerns.

*A woman who says they want to breastfeed... (Pause for a long time) ...personally I feel like... I'd rather encourage formula feeding, because we don't know what goes on, just for the sake of the baby. Yes..... (Laughs)..... At least you know that the baby will be safe 99 percent ...-HW6*

*I am really scared of that one (Breastfeeding). Because like before we used to know that the main infant feeding method was breastfeeding. Then the government turned against us and said we are encouraging mother to feed with bottles and we are not giving them an opportunity to know that breastfeeding is the best. We were told to give mothers a choice. But as we speak nowadays they are encouraged to breastfeed. Even though we encourage them to breastfeed I still have reservations about that. I don't know... if this is the fact that from the start we were told that chances of transmission of the virus are there during breastfeeding. Even if they try to move us from that thinking...we still have reservations -HW7*

*When we teach them, we umm.... well personally I emphasize formula feeding because there won't be any contact with the child, because she will just be giving the child formula without breastfeeding, because sometimes she can feed the child things that can ultimately cause it to contract the virus. Like porridge etc. and then later continuing to give it breast milk, so normally we encourage formula feeding to mothers living with HIV but usually she can come to a decision and then change her mind, you'll have to teach her about breastfeeding and how to do it in such a way that she avoids transmitting the virus to her baby-HW3*

Some of the health care workers expressed concern on their level of infant feeding knowledge in the context of HIV. They felt inadequate to educate or provide information to mothers who

come and express the desire to breastfeed while they have the virus. Specifically they expressed concerns about training and the need for continued education and training as guidelines change.

*I think we also need to be trained more on the topic of breastfeeding even if women are HIV positive, because the time that we were training we were being taught in the context of formula feeding, so sometimes this other option of breastfeeding becomes difficult - HW3.*

*Uh... workshops they help us health care workers, they give us that energy that you know, you'll be willing to teach women, we get tired of being in the office all day, we need to go out and benchmark in other districts, it used to work, we used to go for workshops, you won't be tired... I see these women everyday... I'd have more solutions if I was out benchmarking in other districts or bring something different... But I'm still here, I do the same thing, I give the same information to the patient without having some initiative. You find out that whatever is initiated is not working, but someone has better solutions on the other side... why can't we meet and exchange those ideas -HW4.*

*...You know it's been a long time since we have had a conference or workshop. I have PMTCT workshop long time back, I think 2009. Most of the updates and the new things that come in, I am still behind.....HW6*

## **4.6 Challenges**

### **4.6.1 Challenges faced by HIV positive women in practising EFF**

Occasionally formula ran out and mothers would be compelled to either buy from the shops (which are expensive) or borrow from other mothers which they would return after getting their supplies from the clinic.

*I usually have challenges especially if I have to buy formula for my baby since I am not working as well.....Yes but still when the milk runs out I have to ask my mother to buy me formula (chuckles)...-Pt2 (EFF)*

*As for the formula, it finishes before month end and then this would mean that I have to go and buy it. As I speak, they had given me formula, but it is finished now and I can only get a new one from the clinic the coming Friday -Pt9 (EFF)*



*Yes and it is burdensome to a mother especially if you are not working. It's very expensive to buy formula from the shops.....I try to ask from people around who use formula, and then I refund them back after I have collected my supply from the clinic-*  
*Pt1 (EFF)*

Erratic supply of formula was noted as one challenge by some of the mothers.

*The challenges I have experienced are not much. Sometimes there is no formula in the clinic even though it's not very frequent.....Mostly I buy if there is no formula. But later on they give us -Pt3 (EFF)*

In addition to the erratic supply of formula, some of the participants were not happy with the times for collecting the milk from the clinic. Even though milk collection times were not stipulated at this 24-hour clinic it was expected that healthcare workers give formula to all mothers requesting for it at any time of the day. Yet it was noted that some healthcare workers especially nurses turned away mothers who came after normal working hours stating that the officer (Lay Counsellor) responsible to give formula has knocked off.

*...where we get baby formula, the service is very poor. I remember one day I went there and there was no one. I went to the next office and the nurse told me they can't help there without telling me who can help me. I ended up going home without help. And there is another thing that formula can be only given between mornings to 12noon. If you come after 2pm, you will not be given formula. I take that every government offices have times of operation. We are people, sometimes we get held up -Pt3 (EFF)*

#### **4.6.2 Lack of domiciliary visits by health workers**

Mothers felt that they were not receiving support from health workers in their home settings. Among all women interviewed, only one mother mentioned that she was visited at home. Health workers also expressed the same sentiments.

*The other thing is that... You find out that most of the time you go to the clinic and just go home and no one comes to check how you are doing at home. Something has to be done. Maybe some health worker does follow up at home to see what's happening at home. Since I delivered, no one came home to see if I am ok, whether I am coping. Once you give birth and you are given formula that's it! They don't know if you are coping or not"-Pt15 (EFF)*

Lack of transport by health care workers was noted as a challenge to conduct domiciliary visits

*What I know... you know when you have... a woman out there in the village or whatever? You're supposed to follow up the women to go and see what is going on in their homes, but recently in the past 2 years we haven't been doing the domiciliary visits, they are very important because you don't know what's out there, there are those who are formula feeding, you don't know if they are taking care of their babies utensils or what, those days when we went we used to find out that hey...! The environment is appalling! But at least if you are there you would help and show them this is how it is supposed to be done to take care of the utensils, boil them and what, what, ... but now we lack transport. We lacked transport for 2 years now-HW6 (EFF)*



## CHAPTER 5

### DISCUSSION

The discussion of the findings study will be presented under the following themes: 1. Infant feeding information provided to mothers at ANC. 2. Mothers' choices about infant feeding. 3. Factors that influenced mothers on infant feeding choices 4. Health workers perceptions on infant feeding choices among mothers living with HIV.

Mothers living with HIV who were interviewed in this study described that they were provided with information on infant feeding choices. Most of the mothers opted for EFF, citing fear of transmitting HIV to their children as the most important factor in their choice. In addition, three broad perceptions emerged from mothers in this study: (i) Breastfeeding is best if mother is on treatment, (ii) Formula feeding is safe and there is no chance of HIV transmission (iii) If a mother is HIV positive, formula feeding is the most appropriate method to feed the baby but socially challenging for the mother. The study also revealed that some of the healthcare workers were not confident with recommending EBF to mothers living with HIV. Part of the reason for lack of confidence had to do with health workers' own perceptions and opinions regarding infant feeding in the context of HIV. They were not all comfortable with recommending EBF to an HIV positive mother as they believed that this method still carried the risk of HIV transmission. Some health care workers indicated that they lacked adequate knowledge and skill to effectively counsel women on infant feeding. In addition health care workers expressed fears and concerns of infant feeding in the context of HIV. They were concerned about continued changing guidelines from government; feeling that it is not completely safe to breast feed while HIV positive and uncertainty that women will exclusively breastfeed and not give some other food substances.

#### 5.1 Infant feeding information provided to mothers at ANC

Most mothers were knowledgeable about the two modes of infant feeding practices provided for by the health system in Botswana, which is in accordance with the national guidelines. However, it was unclear what the quality of the counselling they received was and whether and how much of it influenced the infant feeding choices. Furthermore, mothers described the risks of HIV transmission through breastmilk but none of them described any risks of formula feeding. Similarly the health care workers interviewed expressed concern advising women to breastfeed but did not describe counselling mothers about any of the risk of formula feeding.

Effective counselling is crucial to ensuring that the correct information is provided. One study conducted in Kenya showed that counselling and education were effective in imparting knowledge about safe infant feeding practices in the context of HIV as stigma related to HIV posed a formidable barrier to EBF (Odeny, 2016).

## **5.2 The infant feeding practices chosen by the mothers**

Whereas most of the mothers that participated in this study showed understanding on why EBF was generally recommended for the first 6 months of life, this method of feeding was rarely chosen or practiced by these mothers. In this study, very few mothers exclusively breastfed their children. From the total number of twenty women who were interviewed, only three mothers chose EBF. These feeding patterns are consistent with findings from studies conducted in Tanzania (Young, 2010) and Zambia (Hazemba, 2016) which showed low uptake of EBF among mothers living with HIV.

Since the introduction of the PMTCT program in Botswana in 1998 health care workers have been exposed to changing advice relating to infant feeding in the context of HIV. This may have brought confusion and lack of clarity among health care workers. This was noted in a study done in Papua New Guinea in 2013, that the shift in thinking from abrupt cessation of breastfeeding of HIV-exposed infants at four to six months, as advised by WHO in 2001, to the continuation of breastfeeding after the introduction of food and other fluids at six months, as advised in 2009 may bring misunderstanding and inconsistencies in the information given. The study found that the updated guidelines and policies were not adequately disseminated among health workers. (Valley, et al, 2013).

Lack of detailed understanding about the importance and mechanisms through which breast milk can be safely fed to infants in the context of HIV among both health workers and mothers could be one of the reasons why exclusive breastfeeding in the study area was sub-optimal. The study showed that, none of the health workers described assessing mothers' home circumstances (AFASS) when counselling on infant feeding choices and none described any risks associated with lack of breastfeeding. This is very concerning as research has found that formula feeding without having the required home circumstances (safe water, regular source of fuel for boiling water, financial resources to ensure uninterrupted formula supplies etc.) can result in a higher risk of HIV transmission or death compared to formula feeding with the recommended AFASS criteria (Doherty et al, 2007).

### **5.3 Factors that influenced mothers infant feeding choices**

The choice of EBF made by most mothers was determined by various factors which included fear of HIV transmission to the baby, working mothers returning to their jobs and the mothers' past experiences.

#### **5.3.1. Fear of HIV transmission to the baby**

The majority of mothers interviewed who opted for EBF chose this method of feeding because of fear of the possibility of transmission of HIV from the mother to the child. This fear persisted even though all of these mothers were on lifelong ART. The fear of transmission of HIV as an important factor in infant feeding choice has been observed in other studies. In some communities in sub-Saharan African countries, the fear of MTCT of HIV was noted as a major determinant for non-EBF among mothers living with HIV in South Africa (Doherty et al, 2012), Malawi (Kafulafuta, 2014), and Ethiopia (Bekere, 2014). In all these studies mothers were provided with ART to prevent mother to child transmission of HIV. It therefore seems that HIV infected mothers choose not to breast feed their infants even under the cover of ART, which dramatically reduces the risk of breast milk transmission (Nwaozuzu and Dozie, 2014).

Furthermore, Mol (2008) states that fear of being identified with HIV often kept people from seeking to know their HIV status, discussing prevention, changing unsafe behaviour, and seeking effective supporting care.

#### **5.3.2 Working mothers**

The proportion of women in the study sample who were formally employed (35 percent) cited going back to work as the main reason for not opting for and initiating EBF. According to the International Labour Organisation (ILO, 2016) women in active employment in Botswana accounted for 47.7percent of the total labour force. This shows that a significant proportion of women are adopting an independent lifestyle and are spending more time at their workplaces. As such the working mother is stretched between family and employment as they are anticipated to accomplish duties as mothers and wives, and in addition meet their professional responsibilities. This particularly poses a challenge to the nursing mother who has to feed the young infant more regularly. The question that arises is how the working mother can attend to her infant while continuing to work.

Employment has been shown to have a negative influence on both the initiation and duration of breastfeeding (Fein, 1999 and Kurinij, 1989). Breastfeeding mothers have also attributed early weaning to unsupportive work environments (Ortiz, 2004) and lack of privacy to express breast milk (Raju, 2006). If the workplace is not baby/mother-friendly, it is hard for a mother to continue with breastfeeding. A study conducted in Brazil showed that most women who return to work after delivery usually discontinue breastfeeding if they are not provided with due support by their employer (Brasilielo, 2012). Kimbro (2006) found that women at high risk for not breastfeeding who made plans to return to full-time work during the month before actually doing so had 1.34 times the odds of terminating breastfeeding as mothers who, during the same month, did not plan to return to work.

Workplaces that have a policy on lactation that clearly defines the roles and responsibilities for both supervisors and employees help to ensure that all breastfeeding mothers have access to consistent support. Mills (2009) showed that a breastfeeding-friendly workplace for the employed mother is recommended to increase the initiation and duration of breastfeeding.

Lack of break time, inadequate facilities for pumping and storing milk, lack of resources that promote breastfeeding, and lack of support from employers and colleagues are among the challenges faced by employed mothers who want to continue breastfeeding by expressing their milk in the workplace (Hawkins, 2007).

#### **5.3.4 Past Experience**

The study revealed that some mothers opted for EFF because they had formula fed all their previous children. Whether past behaviour always predicts future actions has been a question of debate for decades. While some scholars believe that this is so, not all agree with the notion. In general it seems that people who have behaved in a certain way at one point in the past are likely to do so again in the future (Bentler & Speckart, 1981; Budd, North, & Spencer, 1984; Mittal, 1988; Ouellette & Wood, 1998). The notable exception to a behaviour not being repeated is if the consequences of performing it the first time were disastrous (Skinner, 1953). Moreover, situational factors that did not exist when the behaviour was first performed may prevent its recurrence (Liska, 1984).

Very few studies have been conducted among HIV positive women on breastfeeding patterns in multiparous mothers. One notable study conducted by Nagy (2001) in Szeged, Hungary, on the effect of duration of earlier breastfeeding on the duration of breastfeeding with subsequent births by reviewing the medical records of 327 women who had had at least two deliveries,

found a significant negative correlation between the duration of first breastfeeding and the change of breastfeeding duration at the second breastfeeding. The study also found that mothers who breastfed their first child for 0–7 months significantly increased the duration of breastfeeding with the second child, whereas mothers who breastfed their firstborn for 8 months or longer significantly reduced breastfeeding with the second baby. The study concluded that the duration of breastfeeding of the second child was significantly related to previous breastfeeding experience.

In another study that was conducted in Hong Kong, 559 multiparous mothers were recruited and followed prospectively for 12 months or until the infant was weaned to examine the effect of previous breastfeeding experience on subsequent breastfeeding duration. The study showed that mothers were more likely to breastfeed their current babies because they had practised a similar feeding method with the other children

It would seem that for breastfeeding, past experiences can influence future infant feeding practices.

#### **5.4. Perceptions of mothers towards infant feeding options in the context of HIV.**

Three broad perceptions emerged from this study: (i) Breastfeeding is best if mother is on treatment, (ii) Formula feeding is safe and there is no chance of HIV transmission (iii) If a mother is HIV positive, formula feeding is the most appropriate method to feed the baby but socially challenging for the mother.

##### **5.4.1. Breastfeeding is best if mother is on treatment**

This study has shown that most mothers believe that EBF is an appropriate option for a mother living with HIV if she is on ART. However, few of these mothers chose to EBF. Breastfeeding is vital to the health of children, reducing the impact of many infectious diseases, and preventing some chronic diseases (WHO, 2003). It has been shown that breastfeeding by HIV-positive women who are not on ART, have low CD4 cell count and/or high viral load, are a major means of HIV transmission (O’Shea, 1998).

Current WHO recommendations suggest that ART should be initiated and continued for life in all individuals who test HIV-positive, including pregnant and breastfeeding women living with HIV regardless of the WHO clinical stage and the level of the CD4 cell count. In this study all of the 20 mothers interviewed were on lifelong ART, yet only 3 chose to breastfeed

their infants and these women expressed fear and uncertainty of what might happen to their children.

The Kesho Bora study found that giving HIV-positive mothers a combination of ART during pregnancy, delivery and breastfeeding reduced the risk of HIV transmission to infants by 42 percent (WHO, 2011). The Breastfeeding, Antiretroviral and Nutrition (BAN) study undertaken in Malawi also showed reduced risk of HIV transmission to 1.8 percent for infants given the antiretroviral drug nevirapine daily while breastfeeding for 6 months (van der Horst, 2008).

In spite of these findings it will be a challenge to change the ingrained culture of formula feeding in Botswana, considering that the government has not yet adopted the 2016 WHO HIV and infant feeding recommendations which support breastfeeding for mothers living with HIV who are taking ART as the government continues to provide free formula milk for women choosing this option.

#### **5.4.2. Perceptions about formula feeding**

Even though formula feeding is expensive and carries risks of additional illness and death, particularly where the levels of infectious disease are high and access to safe water is poor (UNICEF, 2015), most mothers who participated in this study considered formula feeding as the most appropriate feeding option for women infected with HIV. The main argument for this particular method among women was that there is no contact with the mother's breast and there is no possibility of transmitting the HIV virus to the baby. The mothers seemed to be more concerned about HIV than practical challenges that they faced, which could make AFASS difficult to achieve. Furthermore none of the mothers mentioned any risks associated with formula feeding such as increased likelihood of diarrhoeal disease.

This study was in line with a study that was conducted in Nigeria where the majority of the respondents perceived infant formula to be preferable to exclusive breastfeeding because of the risk of contracting HIV through breastfeeding (Abiona et al., 2006).

#### **5.4.3 Formula feeding is the most appropriate method but socially challenging**

The social relations surrounding infant feeding are of utmost importance for the mother's initial choice and her potential to adhere to that choice. A mother may make a decision on how to feed her infant during or after counseling but she may not execute that decision because of her social environment.



Even though most mothers felt that EBF was the ideal for their babies, EFF was chosen as the most appropriate feeding method for mothers living with HIV regardless of stigma experienced by some mothers. HIV-related stigma and discrimination refers to the prejudice, negative attitudes and abuse directed at people living with HIV and AIDS which continues to be prevalent in most communities. In some instances over 50 percent of people reported having discriminatory attitudes towards people living with HIV (UNAIDS. 2015).

One study found that participants who reported high levels of stigma were over four times more likely to report poor access to care (Sayles, 2006). In Botswana formula milk is dispensed free of charge at all government clinics to mothers living with HIV who opt for EFF. The feeding mother carrying a can of formula milk may face the same sort of stigma and discrimination as she is easily identified as being HIV positive. Since the mother may not want to be identified as such she may be compelled to mix feed her infant. Such a finding was revealed in one study in Nigeria that found that mixed feeding was attributed to among other factors, fear of being identified as HIV positive (Maru, 2006).

### **5.5 Healthcare Workers' Perceptions**

This study has found that while most healthcare workers were well informed of the national guidelines and provided information to breast feeding mothers as recommended, not all of the healthcare providers were confident with the information they gave.

Healthcare workers are the primary source of information on infant feeding. They have the responsibility of relaying the correct information as stipulated in the national guidelines. Healthcare staff should therefore have the necessary knowledge, attitudes and skills on breastfeeding and non-breastfeeding. The lack of knowledge about the risks of not breast feeding on the part of health personnel can be a major barrier to improving child health.

Carvalho (2015) undertook a systematic review of approaches to breastfeeding training. The review included studies performed between 1992 and 2010 in countries from five continents; four of them were conducted in Brazil. The training target populations were nurse practitioners, doctors, midwives, and home visitors. Many kinds of training courses were applied. Five interventions employed the theoretical and practical training of the Baby-Friendly Hospital Initiative. All kinds of training courses showed at least one positive result on knowledge, skills, and/or professional/hospital practices, most of them with statistical significance.

While education of health care providers does not necessarily ensure that staff have received up-to-date and evidence-based knowledge of breastfeeding management, lack of training and supervision often lead to poor and inconsistent breastfeeding information. The significant deficits in breastfeeding knowledge may result in premature supplementation or cessation of breastfeeding by the mothers. Several studies undertaken in South Africa and the region have revealed poor quality of infant feeding counselling to mothers living with HIV (Chopra et al 2005), and a rapid assessment of infant feeding counselling in Kenya, Malawi and Zambia found widespread misunderstanding of the risk of HIV transmission through breastfeeding (Chopra, 2009).

One study that conducted a systematic review of the literature using the Cochrane Pregnancy and Childbirth Group's trial register, measured staff knowledge, attitudes and compliance with the Baby Friendly Hospital Initiative (BFHI) in randomized controlled trials comparing breastfeeding education and training for healthcare staff with no or usual training and education. The study identified a lack of good understanding among healthcare workers on breastfeeding, and this was associated with early cessation of breastfeeding (Gavine, 2017). Healthcare providers need the necessary knowledge on breast feeding to ensure that mothers feed their infants according to the stipulated guidelines.

This study has found that most mothers demonstrated knowledge of the two infant feeding options during their ANC visits, but many chose and stuck to formula feeding because of fear of transmitting HIV. Health workers were themselves ambivalent about EBF for HIV positive mothers, with only a few unreservedly recommending it. Health workers also discussed how they had not had sufficient training and updates whilst the guidelines and evidence has changed.

While the WHO recommends that breast feeding under the cover of ART is the best infant feeding option for HIV positive mothers, the Botswana Guideline recommends that all women regardless of the HIV status be provided with infant and young child feeding information and counselling to ensure they are supported in making the best infant feeding decision and the government continues to provide free formula milk. Research in South Africa has found that the provision of free formula milk has an influence on the decision to formula feed (Doherty et al, 2010). South Africa ceased the provision of free formula milk through government health facilities in 2012 following a policy decision to support breastfeeding for all mothers irrespective of HIV status (Ijumba, 2012).

The Botswana policy stance (which makes no clear choice between the two feeding options) has contributed to the confusion/lack of clarity, fear and misinformation about EBF in the context of HIV. Jumba et al (2015) conducted a cluster-randomized trial to assess the impact of generalist community health workers (CHW) delivering a community-based intervention package on a number of key outcomes related to PMTCT and HIV-free survival. The study demonstrated that an integrated package delivered by systematically supervised, remunerated, full-time CHWs resulted in significant and favorable effects on infant feeding patterns at 12 weeks of age, in a context with high HIV prevalence among mothers. In this study the lack of adequate training and continuous skilling of health workers regarding appropriate infant and young child feeding was cited as one of the factors limiting health workers' ability to provide effective infant feeding counselling and support. Furthermore the lack of home-based support for women was also reported to be a barrier to optimal infant feeding choices taken by mothers.



## **CHAPTER 6**

### **CONCLUSIONS AND RECOMMENDATIONS**

#### **6.1 Conclusions**

Appropriate infant feeding choices are an important factor in the promotion of infant development and survival. Having sufficient counseling skills and infant feeding information, health workers may help create a positive attitude among women towards appropriate infant feeding options.

According to the WHO (2010), as a global public health recommendation, all infants should be exclusively breast fed for the first six months of life to achieve optimal growth, development and good health. In this study, most mothers living with HIV did not choose exclusive breastfeeding for the first six months. This could mean that a significant number of infants are at risk of the effects of inappropriate feeding choices made by mothers, such as increased risk for infectious diseases.

Mothers were aware of the two modes of infant feeding options available, in accordance with the Botswana treatment guideline being EBF and EFF. They even understood the changes that had been made to the WHO guidelines regarding exclusive breastfeeding for a minimum period of 6 months, without mixing feeds with any solids or liquids. However, this knowledge did not translate to EBF being chosen by most mothers in the study.

Health workers felt challenged to provide information and counselling on EBF in the context of HIV. This was evidenced by the low number of women who participated in the study who had opted for EBF with similarly low EBF prevalence noted in the general population in the country.

Infant feeding choices by mothers living with HIV were determined by various factors, which included fear of HIV transmission to the baby, working mothers returning to their work and past infant feeding experiences.

The health care workers indicated inadequacy in providing appropriate information on breastfeeding to HIV infected mothers.

Both mothers and health care workers perceived breastfeeding as the best method for feeding infants, however they believed that formula feeding was the most appropriate and is a safe method of feeding for mothers living with HIV as there is no chance of HIV transmission to

the baby. This is in spite of the socio-economic and structural challenges described by the mothers regarding formula supply, preparation and storage.

Lack of resources for health workers to conduct domiciliary visits was cited as an important factor hindering the effective implementation of the PMTCT programme. The staff also indicated training workshops were crucial to ensuring that non-contradictory information is relayed to breast feeding mothers.

## **6.2 Recommendations**

The following recommendations are made:

### **1. Infant feeding information provided to mothers at ANC**

- Mothers living with HIV should be provided with information on infant feeding choices at every encounter with the healthcare workers and the women should be encouraged to seek clarification on their choices when in doubt.
- In addition, counselling and support to mothers living with HIV as well as general health messages intended for the public, should be delivered empathetically so as not to undermine optimal feeding practices in the general population.

### **2. Factors that influenced mothers on infant feeding choices**

For working mothers baby/mother initiatives should be encouraged in both the government and private sectors. Women who have lactation problems should be adequately evaluated to exclude any physical condition. Baby care facilities should be included in the workplaces. These facilities should be a family-friendly space that is safe and hygienic for young children.

### **Perceptions of mothers towards infant feeding options in the context of HIV**

Women should be provided with accurate information on infant feeding choices for HIV positive mothers to make informed decisions. Brochures and/or pamphlets with consistent information should be developed and distributed to feeding mothers. Mothers need to receive accurate information on the risks of breastfeeding and the risks of not breastfeeding for infant health.

### **3. Key informants' perception on infant feeding choices among mothers living with HIV**

It is recommended that information on breast feeding choices should be provided by well-trained and informed healthcare workers who should have adequate knowledge on current infant feeding practices. The informants should be supported to make follow up domiciliary visits.

#### **4. Transforming infant feeding knowledge into practice**

Healthcare workers especially nurse/midwives and counsellors providing counseling services to feeding mothers should be adequately trained and mentored on the current guidelines and have a series of in-service trainings regarding updated policies and appropriate counseling strategies. These trainings are critical to reach health care providers who will recommend and oversee infant feeding in the context of HIV and transform knowledge into practice. In addition, multi media campaigns through radio and television as well as traditional (kgotla) meetings and village health committees will be needed to assist in moving this knowledge of safe infant feeding in the context of HIV to changed practices among women living and the community at large.

#### **5. Revising the Botswana national Guidelines**

The Botswana government should consider revising its policy on infant feeding to align it with the 2016 WHO recommendations. This will ensure consistency on the information provided and reduce confusion among healthcare workers.

Since the study also showed that most mothers feared that in their absence others looking after the baby may not adhere to practicing the same feeding method, the government should promote activities that will that working mothers spend more time with their children.

## REFERENCES

- Abiona, T.C., Onayade, A.A., Ijadunola, K.T., Obiajunwa, P.O., Aina, O.I. and Thairu, L.N. (2006). Acceptability, feasibility and affordability of infant feeding options for HIV-infected women: A qualitative study in south-west Nigeria. *Maternal and Child Nutrition*, 2: 135–144.
- Anderson C. (2010). Presenting and Evaluating Qualitative Research; *Am J Pharm Educ*. 2010 Oct 11; 74(8): 141
- Bispo S, Chikhungu L, Rollins N, Siegfried N, Newell M-L (2017), Postnatal HIV transmission in breastfed infants of HIV-infected women on ART: a systematic review and meta-analysis. Available at: <http://onlinelibrary.wiley.com/doi/10.7448/IAS.20.1.21251/full>
- Botswana Central Statistics Office (CSO) (2014). Botswana National Mortality Ratio (MMR) 2009-2013. Gaborone
- Botswana Central Statistical Office (CSO) (2014), Population and Housing Census (2011) Analytical Report, Gaborone, Botswana.
- Botswana Central Statistical Office (CSO) (2013), Botswana AIDS Impact Survey IV Summary Results, Gaborone, Botswana. Available at <http://www.worldbank.org/en/country/botswana/overview>. Updated: Apr 12, 2016.
- Botswana Employment Act (1982), Gaborone, Botswana. Available at <http://www.elaws.gov.bw/law.php?id=1673>
- Bekere A., Garoma W., Beyene F. (2014) Exclusive Breastfeeding Practices of HIV Positive mothers and its Determinants in Selected Health Institution of West Oromia, Ethiopia. *Journal of Nutrition & Food Sciences*.
- Bentler P.M., Speckart G. (1981). Attitudes “cause” behaviors: A structural equation analysis. *Journal of Personality and Social Psychology*; 40:226–238
- Black, N. (1994). Editorial. Why we need Qualitative Research. *Journal of Epidemiology and Community Health*, 48: 425-426
- Budd R.J., North D., Spencer C. (1984). Understanding seat-belt use: A test of Bentler and Speckart’s extension of the theory of reasoned action. *European Journal of Social Psychology*; 14:69–78.

Chopra M, Doherty T, Mehattru 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.* 2009 Dec; 12(12):2323-8. doi: 10.1017/S1368980009005606. Epub 2009 Apr 30. PMID: 19402947

Chopra M<sup>1</sup>, Doherty T, Jackson D, Ashworth A (2004). Preventing HIV transmission to children: quality of counselling of mothers in South Africa.

Creek TL, Kim A, Lu L, et al. Hospitalization and mortality among primarily non-breastfed children during a large outbreak of diarrhea and malnutrition in Botswana, 2006 (2010).  
Creswell, J. W and Miller, D. L. (2000). Determining Validity in Qualitative Inquiry. *Theory into Practice*, 39(3): 122-130

Doherty T., Sanders D., Jackson D., Swanevelder S., Lombard C., et al. (2012). Early cessation of breastfeeding amongst women in South Africa: an area needing urgent attention to improve child health. *BMC pediatrics*. 2012; 12: 105.

Doherty T, Sanders D, Goga A and Jackson D (2010). Implications of the new WHO guidelines on HIV and infant feeding for child survival in South Africa. Available: <http://www.who.int/bulletin/volumes/89/1/10-079798/en/>.

Embree JE, Njenga S, Datta P, et al. (1999). Risk factors for postnatal mother-to-child transmission of HIV-1. Paper presented at: Second Conference on Global Strategies for the Prevention of HIV Transmission from Mothers to Infants; Montreal, Canada. p. Abstracts: 201.

Fein SB, Roe B. (1998). The effect of work status on initiation and duration of breast-feeding. *Am J Public Health*. 1998; 88(7):1042–1046

Francistown District Health Management Team (FDHMT). (2016). Francistown, Botswana.

Garson, G. D. (2006) Resampling Retrieved April 12, 2006, from <http://www2.chass.ncsu.edu/garson/pa765/resamp.htm>.

Gavine A, MacGillivray S, Renfrew J. M, Siebelt L, Haggi H and McFadden A. (2017). Education and training of healthcare staff in the knowledge, attitudes and skills needed to work effectively with breastfeeding women: a systematic review. *International Breastfeeding Journal*, 2017 12:6



Giugliani R. J. E. (2004) Common problems during lactation and their management. *J. Pediatr. (Rio J.)* vol.80 no.5 suppl. Porto Alegre.

Global Nutrition for Growth Compact (2013) available on [www.scalingupfornutrition.org](http://www.scalingupfornutrition.org).

Government of Botswana. Ministry of Health (2007). *Botswana Family Health Survey IV*. Gaborone.

Hawkins SS, Griffiths LJ, Dezateux C, Law C. (2007). Maternal employment and breastfeeding initiation: findings from the Millennium Cohort Study. *Millennium Cohort Study Child Health Group. Paediatr Perinat Epidemiol.* 2007 May; 21(3):242-7

Hazemba, N. A., Ncama, P. B., Sithole, L., S. (2016). Promotion of exclusive breastfeeding among HIV-positive mothers: an exploratory qualitative study, *International Breastfeeding Journal*, 2016 11:9

Ijumba P., Doherty T., Jackson D., Tomlinson M., Sanders D., Swanevelder S., Persson L (2015). Effect of an integrated community-based package for maternal and newborn care on feeding patterns during the first 12 weeks of life: a cluster-randomized trial in a South African township. *Public Health Nutr.* 2015 Oct; 18(14): 2660–2668. Published online 2015 Feb 9. doi: 10.1017/S1368980015000099

Jalal M, Dolatian M, Mahmoodi Z, Aliyari R (2017). The relationship between psychological factors and maternal social support to breastfeeding process; *Electron Physician.* 2017 Jan; 9(1): 3561–3569.

John GC, Nduati RW, Mbori-Ngacha D, et al. Correlates of mother-to-child human immunodeficiency virus type 1 (HIV-1) transmission: association with maternal plasma HIV-1 RNA load, genital HIV-1 DNA shedding and breast infections. *J Infect Dis.* 2001; 183: 206–212. [PubMed]

Kafulafula K.U., Hutchinson K.M., Gennaro S., Guttmacher, S. 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.

Kharsany A.B.M., Karim Q.A (2016). HIV Infection and AIDS in Sub-Saharan Africa: Current Status, Challenges and Opportunities; *Open AIDS J.* 2016; 10: 34–48.

Kuhn L (2015). Breastfeeding and the 2015 South African guidelines for prevention of mother-to-child transmission of HIV; 2015: 3-5

Kimbrow RT (2006). On-the-job moms: work and breastfeeding initiation and duration for a sample of low-income women. *Matern Child Health J.* 2006; 10(1):19–26

Kurini N, Shiono PH, Ezrine SF, Rhoads GG (1989). Does maternal employment affect breastfeeding? *Am J Public Health.* 1989; 79(9):1247–1250

Leedy, P. & Ormrod, J. (2001). *Practical Research: Planning and design (7th Ed.)*. Upper Saddle River, NJ: Merrill Prentice Hall. Thousand Oaks: SAGE Publications.

Liska AE. (1984). A critical examination of the causal structure of Fishbein/Ajzen attitude–behavior model. *Social Psychology Quarterly.* 1984; 47:61–74.

Luo, C. (2002). PMTCT - Infant Feeding the Botswana Experience. UNICEF, Eastern and Southern Africa Regional Office: 1-7.

Mack, N., Woodsong, S., MacQueen, K.M., Guest, G. & Namey, E. (2005). *Qualitative Research methods: A data collector's Field Guide*. North Carolina 27709, USA: Family Health International. Available at: <http://www.fhi.org>. Malterud, K. (2001). Qualitative research: standards, challenges, and guidelines. *Lancet* 358, 483-488.

Marinda, P., Chibwe, N., Tambo, E., Lulanga, S., Khayeka, C., (2017). Challenges and opportunities of optimal breastfeeding in the context of HIV option B+ guidelines. *BMC Public Health*, 17:541

Maru S., Datong I., Selleng D., Mang E., Inyang B., Ajene A., Guyit R., Charurat M., Abimiku A. (2009). Social Determinants of Mixed Feeding Behavior among HIV-Infected Mothers in Jos, Nigeria; *AIDS Care.* 2009 Sep; 21(9): 1114–1123.

Mays N, Pope C. Qualitative research: observational methods in health care settings. *BMJ.* 1995; 311(6998):182–184.

Mills SP. Workplace lactation programs: a critical element for breastfeeding mothers' success. *AAOHN J.* 2009 Jun; 57(6):227-31

Ministry of Health (2010). *The World Breastfeeding Trends Initiative (WBTi) Botswana Assessment Report 2010*:13

Ministry of Health (2011). Botswana National Guidelines: Prevention of mother-to-child transmission (PMTCT) of HIV. Gaborone, Botswana.

Ministry of Health (2012). Botswana National HIV/AIDS Treatment Guidelines. Gaborone, Botswana.

Ministry of Health in collaboration with WHO (2008), Best practice document: Scaling up of Prevention of Mother-To-Child Transmission and Early Infants Diagnosis of HIV: Experience from Botswana. Gaborone, Botswana

Ministry of Health (2016). Botswana National HIV/AIDS Treatment Guidelines, Gaborone, Botswana.

Ministry of Health. (2009). Botswana second generation HIV antenatal sentinel surveillance technical report. Gaborone, Botswana: Gaborone, Botswana: Department of HIV/AIDS Prevention & Care.

Ministry of Health (2009). Early infant HIV diagnosis – DNA PCR testing using dried blood spot (DBS): Participant procedure manual. Gaborone, Botswana: Department of HIV/AIDS Prevention & Care.

Ministry of Health (2009). National positive health, dignity and prevention strategy (2009-2016). Gaborone, Botswana: Department of HIV/AIDS Prevention & Care.

Ministry of Health (2015). The National Nutrition Strategy (2015-2020). Gaborone, Botswana.

Ministry of Health, UNPFA & UNAIDS (2011). National sexual reproductive health and rights (SRHR) and HIV&AIDS linkage in Botswana: 2011 annual work plan for Botswana. Gaborone: Botswana: Department of Public Health.

Ministry of Health (2011). Botswana national guidelines: Prevention of mother-to-child transmission (PMTCT) of HIV. Gaborone, Botswana: Department of HIV/AIDS Prevention and Care.

Mittal B (1998). Achieving higher seat belt usage: The role of habit in bridging the attitude–behavior gap. *Journal of Applied Social Psychology*. 18:993–1016.

Mol, A. (2008). *The Logic of Care: Health and the Problem of Patient Choice*, London: Routledge

Mock P. A, Shaffer N, Bhadrakom C, Siriwasin W, Chotpitayasunondh T, Chearskul S, Young NL, Roongpisuthipong A, Chinayon P, Kalish ML, Parekh B, Mastro TD. (1999). Maternal viral load and timing of mother-to-child HIV transmission, Bangkok, Thailand. Bangkok Collaborative Perinatal HIV Transmission Study Group. *AIDS*. 1999 Feb 25; 13(3):407-14.

National AIDS Coordinating Agency (2015). Progress Report of the National Response to the 2011 Declaration of Commitment on HIV and AIDS. Reporting Period: 2014. Gaborone, Botswana.

National AIDS Coordinating Agency (2009). The Second National Strategic Framework for HIV and AIDS: 2010-2016. Gaborone, Botswana: NACA.

Ndubuka J., Ndubuka N., Li Y., Marshall C. M., Ehiri J., Knowledge, attitudes and practices regarding infant feeding among HIV-infected pregnant women in Gaborone, Botswana: a cross-sectional survey. *BNJ Open*, Volume 3, Issue 11: 117

Ngulube, P. (2015). Qualitative data analysis and interpretation: systematic search for meaning, in Mathipa, ER & Gumbo, MT. (eds). Addressing research challenges: making headway for developing researchers. Mosala-MASEDI Publishers & Booksellers cc: Noordyk, pp. 131-156.

Ochieng Pamela Atieno O, P (2009), an analysis of the strengths and limitation of qualitative and quantitative research paradigms, Masinde Muliro University of Science and Technology, Kenya

O'Shea S, Newell ML, Dunn DT, Garcia-Rodriguez MC, Bates I, Mullen J, Rostron T, Corbett K, Aiyer S, Butler K, Smith R, Banatvala JE(1998). Maternal viral load, CD4 cell count and vertical transmission of HIV-1. *J Med Virol*. 54(2):113-7.

O'Brien M1, Buikstra E, Hegney D (2008). The influence of psychological factors on breastfeeding duration. *J Adv Nurs*. 63(4):397-408

Ortiz J, McGilligan K, Kelly P (2004). Duration of breast milk expression among working mothers enrolled in an employer-sponsored lactation program. *Pediatric Nurse*. 2004; 30(2):111-119

Ouellette JA, Wood W (1998). Habit and intention in everyday life: The multiple processes by which past behavior predicts future behavior. *Psychological Bulletin*. 124:54–74.

Palys, T. (2008). Purposive sampling. In L. M. Given (Ed.). *The Sage Encyclopedia of Qualitative Research Methods*. (Vol.2). Sage: Los Angeles, pp. 697-8.

Odeny BM, Pfeiffer J, Farquhar C, et al (2016). The stigma of exclusive breastfeeding among both HIV-positive and HIV-negative women in Nairobi, Kenya. *Breastfeed Med*. 11 (5):252–8.

Paulson A. and Nadege P. A. (2013). A review of infant feeding policy in Botswana within the context of best practices for the prevention of mother to-child transmission (PMTCT) of human immunodeficiency virus (HIV): *Academic Journals*, 1998-2012

Ijumba P, Doherty T, Jackson D, Tomlinson M, Sanders D, Persson LÅ. (2012). Free formula milk in the prevention of mother-to-child transmission programme: voices of a peri-urban community in South Africa on policy change. *Health Policy and Planning*, Volume 28, Issue 7, 1 October 2013, Pages 761–768, Available: <https://doi.org/10.1093/heapol/czs114>

Raju TNK (2006). Continued barriers for breast-feeding in public and the workplace. *J Pediatr*. 2006; 148(5):677–679

Republic of Botswana (2010). *Health sector HIV/AIDS strategic plan (2010 – 2016)*. Ministry of Health. Gaborone, Botswana.

Robson, C. (2011). *Real World Research. A Resource for Users of Social Research Methods in Applied Settings*.

S, Moffat C, et al (2006). Antiretroviral regimens in pregnancy and breast-feeding in Botswana. *N Engl J Med*. 2010; 362(24):2282–94. [PMC free article: [PMC2999916](https://pubmed.ncbi.nlm.nih.gov/20554983/)] [PubMed: [20554983](https://pubmed.ncbi.nlm.nih.gov/20554983/)]

Shapiro RL, Thior I, Gilbert PB, Lockman S, Wester C, Smeaton LM, et al. Maternal single-dose nevirapine versus placebo as part of an antiretroviral strategy to prevent mother-to-child HIV transmission in Botswana. *AIDS*. 2006; 20(9):1281–8. [PubMed: [16816557](https://pubmed.ncbi.nlm.nih.gov/16816557/)]

Sayles, J. et al (2009). The Association of Stigma with Self-Reported Access to Medical Care and Antiretroviral Therapy Adherence in Persons Living with HIV/AIDS, *Journal of General Internal Medicine* 24(10)

Skinner BF. Science and human behavior. New York: Macmillan; 1953  
Statistics Botswana (2014). Botswana National Mortality Ratio (MMR) 2009-2013. Gaborone, Botswana: 1-11

The Central Statistics Office & NACA (2009). 2008 Botswana AIDS impact survey III: Statistics report. Gaborone, Botswana.

The Joint United Nations Programme on HIV/AIDS (2011). Checklist for rapid review of national PMTCT plans. Geneva, Switzerland: UNAIDS.

Thior I, Lockman S, Smeaton LM, et al. Breastfeeding plus infant zidovudine prophylaxis for 6 months vs formula feeding plus infant zidovudine for 1 month to reduce mother-to-child HIV transmission in Botswana: a randomized trial: the Mashai Study. JAMA 2006; 296:794-805.

UNICEF (2015). Levels & Trends in Child Mortality. UN Plaza, New York, USA. (Online) Available:

[http://www.unicef.org/publications/files/Child\\_Mortality\\_Report\\_2015\\_Web\\_9\\_Sept\\_15.pdf](http://www.unicef.org/publications/files/Child_Mortality_Report_2015_Web_9_Sept_15.pdf)

UNICEF (2015). Countdown to 2015 maternal newborn and child survival: A Decade of Tracking Progress for Maternal, Newborn and Child Survival: The 2015 Report. New York

UNAIDS (2011). Joint United Nations Programme on HIV/AIDS. Global Monitoring Framework and Strategy for the Elimination of new HIV Infections among Children by 2015 and keeping their Mothers Alive. Geneva, Switzerland: UNAIDS. (Online) Available [http://www.unaids.org/sites/default/files/media\\_asset/20110609\\_JC2137\\_Global-Plan-Elimination-HIV-Children\\_en\\_1.pdf](http://www.unaids.org/sites/default/files/media_asset/20110609_JC2137_Global-Plan-Elimination-HIV-Children_en_1.pdf)

UNAIDS (2013). Joint United Nations Programme on HIV/AIDS. Global Report. UNAIDS Report on the Global AIDS Epidemic. (Online) Available: <http://files.unaids.org/en/media/unaids/contentassets/documents/epidemiology/2013/gr2013>

UNAIDS (2015) 'On the Fast-Track to end AIDS by 2030: Focus on location and population' [pdf]

Van der Horst C, Chasela C, Ahmed Y, Hoffman I, et al and for the BAN Study team (2008). Modifications of a large HIV prevention clinical trial to fit changing realities: A case study of the Breastfeeding, Antiretroviral, and Nutrition (BAN) Protocol in Lilongwe, Malawi. Contemp Clin Trials. 2009 Jan; 30(1): 24–33. Published online 2008 Sep 7. doi: 10.1016/j.cct.2008.09.001

WHO /UNICEF (2003). Global strategy for infant and young children feeding. (2003). Available at: [http://www.who.int/child\\_adolescent\\_health/documents/9241562218/en](http://www.who.int/child_adolescent_health/documents/9241562218/en). Accessed February 4, 2010

Vallely L M, Angel K, Kupul M, et al (2013) Infant feeding in the context of HIV: a qualitative study of health care workers' knowledge of recommended infant feeding options in Papua New Guinea. Available at: <https://doi.org/10.1186/1746-4358-8-6>

WHO (2010). World Health Organization. Guidelines on HIV and infant feeding. Principles and recommendations for infant feeding in the context of HIV and a summary of evidence. Geneva, Switzerland. (Online) Available: [http://apps.who.int/iris/bitstream/10665/44345/1/9789241599535\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/44345/1/9789241599535_eng.pdf)

WHO (2010). Guidelines on HIV and Infant Feeding. Principles and recommendations for infant feeding in the context of HIV and a summary of evidence. (Online) Available: [http://www.who.int/maternal\\_child\\_adolescent/documents/9789241599535/en/](http://www.who.int/maternal_child_adolescent/documents/9789241599535/en/)

WHO (2011), Countdown to Zero: Global Plan for the Elimination of New HIV Infections among Children by 2015 and Keeping Their Mothers Alive. Geneva, Switzerland: UNAIDS.

WHO (2011). Towards the elimination of mother-to-child transmission of HIV in low-prevalence and concentrated epidemic settings in Eastern Europe and Central Asia; 2011;17-34

Young, S., Ballard, A. I. K., Dantzer A. E., Ngonyani A. M., Nyambo, T. M., Ash, M. D., Chantry, J. C. (2010). Infant feeding practices among HIV-positive women in Dar es Salaam, Tanzania, indicate a need for more intensive infant feeding counselling Public Health Nutr. 13(12): 2027–2033.

## APPENDICES

### *Appendix 1*

Table 1: Infant and Young Child Feeding Recommendations AFASS Criteria

\*\*Women of unknown HIV status should be counseled and tested for HIV.

\*AFASS = acceptable, feasible, affordable, sustainable and safe.

- Acceptable: The mother perceives no significant barrier(s) to choosing this feeding option for cultural or social reasons, or for fear of stigma and discrimination.
- Feasible: The mother has adequate time, knowledge, skills, social/family support, and resources to obtain formula regularly, to prepare feeds, and to feed the infant.
- Affordable: The mother and family, with available community and/or health system support, can pay for the costs of the replacement feeds – including formula, fuel (to boil water), and clean water – without compromising the family's health and nutrition spending.
- Sustainable: The mother has access to a continuous and uninterrupted supply of infant formula until the infant is 12 months old.
- Safe: Formula is correctly and hygienically stored, prepared, and fed in nutritionally adequate quantities; infants are fed with clean hands and using clean utensils, preferably by cups.

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Appendix 2



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**CONSENT FORM**

**Title of Research Project: Factors influencing infant feeding choices among mothers living with HIV in Francistown, Botswana**

The study has been described to me in language that I understand. My questions about the study have been answered. I understand what my participation will involve and I agree to participate of my own choice and free will. I understand that my identity will not be disclosed to anyone. I understand that I may withdraw from the study at any time without giving a reason and without fear of negative consequences or loss of benefits.

**Participant's name.....**

**Participant's signature.....**

**Date.....**

*Appendix 3*



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**MOKWALO WA TUMALANO WA GO BOTSOLOTSA DIPOTSO**

**MOKWALO WA TUMALANO**

**Leina la Patlisiso: Mabaka a a amang bomme ba ba tshelang ka mogare wa HIV ka ditshwetso tse ba di tsayang mabapi le go jesa bana ba bone mo Francistown, Botswana**

Patlisiso e, e tlhalositswe ka teme e ke e tlhaloganyang sentle. Dipotso tsame tsotlhe tse ke di boditseng di arabilwe. Ke tlhaloganya gore go tsaya karolo game go ama eng mme ebile ke dumele go tsaya karolo ka bonna. Ke tlhaloganya fa maina ame a ka seke a itsesiwe ope fela. Ke tlhaloganya fa ke ka tswa mo patlisisong e nako nngwe le nngwe ke sa neela mabaka ape fela gape ke sa boifi sepe se se bosula se se ka nteragalelang kgotsa go bona tsotlhe tse ntsholofelang molemo.

**Leina la motsaya karolo.....**

**Monwana wa motsaya karolo.....**

**letsatsi.....**

*Appendix 4*



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### INFORMATION SHEET

#### **Project Title: Factors influencing infant feeding choices among mothers living with HIV in Francistown, Botswana**

This is a research project being conducted by Catherine Motswere-Chirwa at the University of the Western Cape. You are invited to take part in a research study to examine factors that influence infant feeding choices among mothers living with HIV in Francistown. This research study is for mothers who are 18 years of age and older. You are invited to participate in this research project because you are HIV positive and you have a child who is 6 months or below. I would like to interview you and ask you questions on your experiences and perceptions on the infant feeding options you have made, your decisions to test for HIV, your pregnancy, choice of feeding methods and disclosure of your status.

#### **What will I be asked to do if I agree to participate?**

Before you decide whether to take part in the study it is important that you understand what the research is for and what you will be asked to do. Please take time to read the following information. It is up to you to decide whether or not to take part.

If you agree to be in the study and decide to take part you will be given this information sheet to keep. You will also be asked to sign a consent form. You can change your mind at any time and withdraw from the study without giving a reason.

You will be asked to be interviewed and answer some questions that will take about one hour. Some questions will be about your health, infant feeding options and the reasons why you chose the way you are feeding your child. I am also requesting your permission to record the interview. It will be recorded on audio tape and then transcribed onto a computer.

**Would my participation in this study be kept confidential?**

We will not share any information about you gathered during the study outside the research team. The information we collect as part of the interview discussion will be kept confidential and all responses to questions and discussion points will be kept confidential. Your response will be treated with full confidentiality and anyone who takes part in the research will be identified only by code numbers or false names

The audio tape used will not contain information that may personally identify you. Your name will not be used during the interview nor included on any data collection tool. Data forms and audio tapes used in the study will be kept in locked file cabinet and storage areas. Identification codes will only be used on data forms. Electronic data will be held only on password-protected computers accessible only to me. The audio tapes will be destroyed at the end of the study. The information will be collected into a report which will be shared with the lecturers of SOPH at the University of Western Cape and your identity will be protected.

**What are the risks of this research?**

There may be some risks from participating in this research study. Because you are HIV positive you may experience psychological distress when we discuss about issues surrounding your status. Interview questions about infant feeding in the context of HIV may be uncomfortable to answer, but participants can decline to answer questions or end the interview at any time. In addition if study confidentiality procedures are not followed by researchers, there may be a risk of HIV status disclosure.

All human interactions and talking about self or others carry some amount of risks. We will nevertheless minimise such risks and act promptly to assist you if you experience any discomfort, psychological or otherwise during the process of your participation in this study. Where necessary, an appropriate referral will be made to a suitable professional for further assistance or intervention.

### **What are the benefits of this research?**

This research is not designed to help you personally, but the results may help the investigator learn more about infant feeding choices in the context of HIV. We hope that, in the future, other people might benefit from this study through improved understanding of factors that influence mothers living with HIV in making infant feeding choices for their children. This study is expected to benefit the Government of Botswana by providing information that can assist mothers living with HIV to make informed decisions for their children and it may influence government policies on PMTCT.

### **Do I have to be in this research and may I stop participating at any time?**

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

### **What if I have questions?**

This research is being conducted by Catherine Motswere Chirwa and SOPH at the University of the Western Cape. If you have any questions about the research study itself, please contact Catherine Motswere-Chirwa at: PO Box 3031944, Francistown on telephone number 71719960 or at e-mail address [cchirwa09@gmail.com](mailto:cchirwa09@gmail.com).

Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

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This research has been approved by the University of the Western Cape's Senate Research Committee. (REFERENCE NUMBER: to be inserted on receipt thereof from SR)





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## INFORMATION SHEET

### **Leina la Patlisiso: Mabaka a a amang bomme ba ba tshelang ka mogare wa HIV ka ditshwetso tse ba di tsayang mabapi le go jesa bana ba bone mo Francistown, Botswana**

E ke patlisiso e e dirwang ke Catherine Motswere-Chirwa go tswa mmadikolo ko University ya Western Cape. O lalediwa go tsaya karolo mo patlisisong e e lebelelang mabaka a a amang bomme ba ba tshelang ka mogare wa HIV ba a tsayang ka go jesa bana ba bone. O laladiwa go tsaya karolo mo patlisisong e ka o tshela ka mogare wa HIV gape ka o na le ngwana yo o ko tlase ga dikgwedi tse thataro ebile o tseletse lenaneo la thibelo mogare go tswa ko go mmangwana go ya losieng.

### **Ke tsile go botswa eng fa ke dumela go tsaya karolo?**

Pele o ka dira tshwetso ya go tsaya karolo mo patlisisong e, go botlhokwa go tlhaloganya gore patlisiso e ke ya eng gape o tsile go botswa eng? Ka tsweetswee tsaya nako go bala dikgang tse di latelang. Go tswa mo go wena gore a o batla go tsaya karolo kgotsa ga o batle.

Fa o dumela go tsaya karolo mo patlisisong o tla fiwa tsebe ya dikgang go sala ka yone. O tla kopiwa go baya monwana mo pampiring ya tumalano. O ka fetlola mogopolo wa gago nako nngwe le nngwe o bo o sa tlhole o tsaya karolo mo patlisisong o sa neela mabaka ape.

O tla kopiwa go araba dipotso tse di tla tsayang oura e le nngwe fela. O tla botsolotswa o bo o kopiwa go araba dipotso ka maitemogelo le ka fa o lebelelang ditshwetso tse o di tsereng ka go jesa ngwana wa gago, ditshwetso ka tlhatlhobelo mogare, boimana le go bua ka mogare wa

gago wa HIV. Ke kopa tletla ya go dirisa sekapa mantswa ka nako ya potsolotso. Tsotlhe tse di mo sekapa mantsweng se tla kwalolelwa mo pampiring le mo computareng.

### **A go tsaya karolo game mo patlisisong e go sephiri?**

Ga re na go bua ka dikgang tsa gago le ope kwa ntle ga badiri ba patlisiso. Tsotlhe tse re buisanang ka tsone ka nako ya patlisiso di tla nna sephiri. Dikarabo tsa gago di tla tsewa ka sephiri se segolo. Mongwe le mongwe yo o tsayang karolo mo patlisisong e o tla itsiwa ka maina a maitlhamelo kgotsa ka dinomoro.

Setsaya mantswa ga se na go nna le dikgang tse di ka amanang le wena. Leina la gago ga le na go dirisiwa ka nako ya potsolotso kgotsa mo dipampiring tsa potsolotso. Difomo tsotlhe tsa dikgang le sekapa mantswa tse di tla dirisiwang di tla bewa mo lefelong le le babalesegileng le lotlelega.. Maina a maiterelo a a tla dirisiwang a tla dirisiwa fela mo difomong tsa potsolotso. Dikgang tse di mo computareng di tla siriletswa ka nomoro e e itseweng ke nna fela. Ditsaya dikgang di tla senngwa fa re fetsa patlisiso. Dikgang tsotlhe di tla gobokwa ko bofelong di bo di kwalwa mo repoteng e e tla bonwang ke barutabana ba mmadikolo ko University of Western Cape.

### **Diphatsa tsa go tsaya karolo ke eng?**

Go ka nna le diphatsa ka go tsaya karolo mo patlisisong e. Gonne o tshela ka mogare wa HIV, o ka itemogela matshwenyego a a amang maikutlo a gago fa re buisana ka dikgang tse di amang seemo sa gago sa mogare. Dipotso ka tlhakanelo dikobo le go bua ka seemo sa gago di ka go ama kgotsa tsa go tlabisa ditlhong, mme fela o ka gana go di araba kgotsa wa emisa potsolotso.

Go kopakopana le batho ba ba bangwe le go buisana ka dikgang tse di go amang kgotsa ka batho ba bangwe go ka nna le bodiphatsa. Re tla leka ka bojotlhe go fokotsa bodiphatsa jo, re bo re go thusa fa o ka itemogela maikutlo a a sa siamang ka nako ya patlisiso. Fa go tlhokegang teng, re tla go romela ko o ka bonang thuso e e maleba.

### **Ke eng se se ka ntsholofelng molomo ka patlisiso e?**

Patlisiso e ga e a direlwa go go thusa ka bowena, mme maduo a teng a ka thusa mmotsolotsi go ithuta ka dotshwetso tse di tsewang ka go jesa ngwana go lebilwe mogare wa HIV. Re solofela gore mo nakong e e tlang batho ba ka ithuta mo patlisisong e ka go tsaya ditshwetso



tša go jesa bana tše di ka ba thusang go tlhaloganya tsotlhe tše ba ka di itseng tše di ka solofelang bana ba bone mosola.

Patlisiso e gape e ka thusa goromente wa Botswana ka dikgang tše di ka thusang bomme ba ba tshelang ka mogare go tsaya ditshwetso tše di maleba ka bana ba bone gape e ka thusa lenaneo la thibelo mogare go tswa ko go mmangwana go ya ngwaneng.

### **A ke patelesega go tsenelela patlisiso e kgotsa ke ka ema nako nngwe le nngwe?**

Go tsaya karolo mo patlising e ke boithaopi. O ka tsaya tshwetso ya go tsaya karolo kgotsa go sa tsaya karolo. Fa o tsaya tshwetso ya go tsaya karolo mo patlising e, o ka emisa nako nngwe le nngwe fa o batla. Ga go sepe se se ka go diragalelang fa o tsaya tshwetso ya go emisa go tsaya karolo mo patlising e.

### **Jaanong fa kena le dipotso?**

Patlisiso e e dirwa ke Catherine Motswere Chirwa ko mmadikolo wa University of the Western Cape. Fa o na le dipotso o ka ikgolaganya le Catherine Motswere-Chirwa at: PO Box 301974, Francistown mo mogaleng wa 71719960 kgotsa e-mail address [cchirwa09@gmail.com](mailto:cchirwa09@gmail.com).

Fa o ka nna le dipotso mabapi le patlisiso e le ka ditshwanelo tša gago kgotsa wa eletsā go bua ka mathata a o kopaneng le one mabapi le patlisiso e, o ka ikgolaganya le: Prof Tanya Doherty

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## Appendix 6

### Semi-structured Interview Guide for Health Care Workers

- Cadre:

- How long have you worked as a health care worker?

- What services do you provide pregnant women in this facility?

1. What are infant feeding options available for women who are HIV negative and HIV positive in your health facility?

2. Why is exclusive breastfeeding generally recommended for babies from birth until 6 months of life?

3. What factors can increase the chances that mothers living with HIV will pass HIV to her baby through breast milk

4. When a mother is HIV positive, what is the most appropriate feeding option to reduce the chances of passing HIV to her baby?

(PROBE: why that particular feeding method is most appropriate)

5. What support do you provide mothers living with HIV who opt to breastfeed?

6. What experiences have you had as a health care provider on exclusive breastfeeding in the context of HIV in this health facility. (Probe for the rate/uptake of breastfeeding in the clinic among mothers living with HIV)

7. How do you feel about mothers living with HIV who choose to breast feed?

8. What are the barriers faced by mothers living with HIV who choose to breast feed?

9. What are the changes needed to support infant feeding among mothers living with HIV in your health clinic?

## **Appendix 7**

### **Semi-structured Interview Guide for Mothers**

- Age
  - How many children do you have?
  - How long have you been living with HIV?
1. What infant feeding options were you provided while you were pregnant with your current child during ANC visits?
  2. Tell me about infant feeding choice you made while you were pregnant?
  3. Why did you decide on that method of feeding? What method are you currently using on your current child?
  4. Why is exclusive breastfeeding generally recommended for babies from birth until 6 months of life?
  5. What factors can increase the chances that mothers living with HIV will pass HIV to her baby through breast milk
  6. When a mother is HIV positive, what is the most appropriate feeding option to reduce the chances of passing HIV to her baby?  
(PROBE: why that particular feeding method is most appropriate)
  7. What support did you receive from health care providers, family or community about infant feeding?
  8. What experiences have you had as a mother living with HIV on the method you chose to feed your child?
  9. How do you feel about the method you are using to feed your child while you are HIV positive?
  10. What barriers did you face since you opted to choose this method of feeding?
  11. What are the changes needed to support infant feeding among mothers living with HIV in your community?

## Appendix 8

### Botswana HRDC Approval Letters

TELEPHONE: 363 2766  
FAX: 391 0647  
TELEGRAMS: RABONGAKA  
TELEX: 2818 CARE BD



Republic of Botswana

MINISTRY OF HEALTH  
PRIVATE BAG 0038  
GABORONE

REFERENCE NO: HPDME 13/18/1 X (861)

10 January 2017

Health Research and Development Division

Notification of IRB Review: **New application**

Ms. Catherine Motswere-Chirwa  
P O Box 301974  
Francistown  
Botswana

**Protocol Title:**

**FACTORS INFLUENCING INFANT FEEDING  
CHOICES AMONG HIV POSITIVE MOTHERS IN  
FRANCISTOWN, BOTSWANA**

HRU Approval Date:	10 January 2017
HRU Expiration Date:	09 January 2018
HRU Review Type:	HRU reviewed
HRU Review Determination:	Approved
Risk Determination:	Minimal risk

Dear Ms. Motswere-Chirwa

Thank you for submitting new application for the above referenced protocol. The permission is granted to conduct the study.

This permit does not however give you authority to collect data from the selected sites without prior approval from the management. Consent from the identified individuals should be obtained at all times.

The research should be conducted as outlined in the approved proposal. Any changes to the approved proposal must be submitted to the Health Research and Development Division in the Ministry of Health for consideration and approval.

Furthermore, you are requested to submit at least one hardcopy and an electronic copy of the report to the Health Research, Ministry of Health within 3 months of completion of the study. Approval is for academic fulfillment only. Copies should also be submitted to all other relevant authorities.

#### **Continuing Review**

In order to continue work on this study (including data analysis) beyond the expiry date, submit a Continuing Review Form for Approval at least three (3) months prior to the protocol's expiration date. The Continuing Review Form can be obtained from the Health Research Division Office (HRDD), Office No. 7A.7 or Ministry of Health website: [www.moh.gov.bw](http://www.moh.gov.bw) or can be requested

via e-mail from Mr. Kgomotso Motlhanka, e-mail address: [kgmmotlhanka@gov.bw](mailto:kgmmotlhanka@gov.bw) As a courtesy, the HRDD will send you a reminder email about eight (8) weeks before the lapse date, but failure to receive it does not affect your responsibility to submit a timely Continuing Report form

#### **Amendments**

During the approval period, if you propose any change to the protocol such as its funding source, recruiting materials, or consent documents, you must seek HRDC approval before implementing it. Please summarize the proposed change and the rationale for it in the amendment form available from the Health Research Division Office (HRDD), Office No. 7A 7 or Ministry of Health website: [www.moh.gov.bw](http://www.moh.gov.bw) or can be requested via e-mail from Mr. Kgomotso Motlhanka, e-mail address: [kgmotlhanka@gov.bw](mailto:kgmotlhanka@gov.bw) . In addition submit three copies of an updated version of your original protocol application showing all proposed changes in bold or "track changes".

#### **Reporting**

Other events which must be reported promptly in writing to the HRDC include:

- Suspension or termination of the protocol by you or the grantor
- Unexpected problems involving risk to subjects or others
- Adverse events, including unanticipated or anticipated but severe physical harm to subjects.

If you have any questions please do not hesitate to contact Mr. L. Moremi at [lamoremi@gov.bw](mailto:lamoremi@gov.bw), Tel +267-3914467 or Kgomotso Motlhanka at [kgmotlhanka@gov.bw](mailto:kgmotlhanka@gov.bw) at 3632751. Thank you for your cooperation and your commitment to the protection of human subjects in research.

Yours faithfully



L. Moremi  
**For /Permanent Secretary**



**Vision:** *A Model of Excellence in Quality Health Services.*  
**Values:** *Botho, Equity, Timeliness, Customer Focus, Teamwork.*



Appendix 9

Francistown DHMT Approval

**GREATER FRANCISTOWN DHMT**

ALL CORRESPONDENCE TO  
BE ADDRESSED TO DHMT  
COORDINATOR



PRIVATE BAG F372  
FRANCISTOWN BOTSWANA  
TELEPHONE: 2413808  
FAX: 2406178

Republic of Botswana

**REF:** GFDHMT 7/1/11 I

**DATE:** 2<sup>nd</sup> February 2017

**TO:** Ms Catherine Motswere – Chirwa  
P.O.Box 301974  
Francistown

Dear Sir/Madam

**PERMISSION TO CONDUCT RESEARCH**

The above captioned matter refers.

Greater Francistown District Health Management Team has acceded to your request to conduct a research at Gerald clinic with as per your request.

You are therefore advised to contact Nurse in charge of Gerald clinic, who will take all the necessary steps to enable you to do your conduct your research.

By copy of this letter nurse in charge of the above mentioned health facility is duly informed.

Thank you.

Yours Faithfully

A handwritten signature in blue ink, appearing to be 'Imili Muchapa', written over a horizontal line.

Dr Imili Muchapa  
For **GFDHMT COORDINATOR**

**cc:** Nurse in charge – Gerald clinic