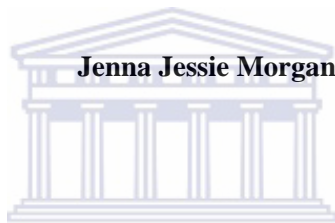


**University of the Western Cape
Faculty of Community and Health Sciences
School of Nursing P/Bag X17, Bellville 7535, South Africa**

**Factors influencing the infant feeding choices of HIV
positive mothers at a level two hospital in Cape Town**



A mini-thesis submitted in partial fulfilment of the requirements for the degree of
Magister Curationis in Advanced Midwifery and Neonatology in the School of
Nursing, University of the Western Cape.

Supervisor: Dr J. Jeggels

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Keywords:

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Abstract

Background: In 2009, approximately 130 000 children in Southern Africa under the age of 15 were newly infected with HIV, with vertical transmission being the most common cause of HIV infection. HIV positive mothers are therefore faced with a unique dilemma about which infant feeding choice to make. Prior to 2006, formula feeding was the recommended feeding choice in an attempt to minimise vertical transmission of HIV. In 2006, the risks associated with formula feeding necessitated a change in the recommendations to allow for either exclusive formula feeding or exclusive breastfeeding. The clinical guidelines were reviewed in 2010, when research on the effectiveness of prevention of mother to child transmission efforts suggested a decrease in such transmissions, even when exclusive breastfeeding. Currently the recommendations focus on the contextual appropriateness of the infant feeding choice. The imminent withdrawal of free formula is a new development within the prevention efforts. **Aims and Objectives:** This study aimed to describe the infant feeding choices of HIV positive mothers on discharge from a level two hospital, in Cape Town. The study objectives included determining the infant feeding choice and the factors that influence HIV positive mothers' infant feeding choice on discharge from the hospital. **Research Methodology:** A descriptive survey study design was used as it lends itself to the description of the new developments regarding prevention of mother to child transmission and the meaning it has for the infant feeding choices made by HIV positive mothers. A quantitative approach was used to establish the specified factors that currently affect HIV mothers' infant feeding choices. A non-random consecutive sampling technique was used. The data collection method took the form of a questionnaire. Data analysis was performed through SPSS 20 to produce descriptive and inferential statistics to establish relationships between the independent and dependent variables. **Results and Recommendations:** The number of exclusive breastfeeding participants was higher (54%) than the exclusively formula feeding participants (46%), which is in keeping with the institution's trends for the previous year (2011). Statistical significance was difficult to establish due to the small scale of the study, but clinical significance with the establishment of the factors influencing infant feeding choices was

considered. These led to the following recommendations: reorientation of infant feeding counselling towards the criteria of acceptability, feasibility, affordability, sustainability and safety, in view of the withdrawal of free formula and promotion of exclusive breastfeeding as the single infant feeding strategy. **Ethical Considerations:** Ethical clearance was sought from the Ethics Committee of the University of the Western Cape, Research Committee of the level two hospital and informed consent was obtained from the participants.



Declaration

I declare that *Factors influencing the infant feeding choices of HIV positive mothers at a level two hospital in Cape Town* is my own work, that it has not been submitted before for any degree or examination at any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

Jenna Jessie Morgan

Date.....

Signed:.....



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Thank you to the staff of the level two hospital and Prof. Fawcus for allowing me to conduct my research on site. To Dr. Kroon, thank you for the access to research material and clinical advice.

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To my husband: your patience and love throughout this process has been the only constant factor and for this I am eternally grateful. To my mom, thank you for providing an environment in which to grow and imparting your girls with ambition. To my sister, mother in law, Paola and Felicia, your friendship and help during this time has given me untold strength.

To my God, Jesus Christ, Your faith in me knows no bounds, in Your grace I walk.

For all HIV positive mothers and finally for Gran...

Acronyms

AFASS	Acceptable, feasible, affordable, sustainable and safe
AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Treatment
HIV	Human Immunodeficiency Virus
HAART	Highly Active Antiretroviral Therapy
MOUs	Midwifery Obstetric Units
MTCT	Mother to Child Transmission
PMTCT	Prevention of Mother to Child Transmission
SPSS	Statistical Package for Social Sciences
SAS	Statistical Analysis Software
WHO	World Health Organization



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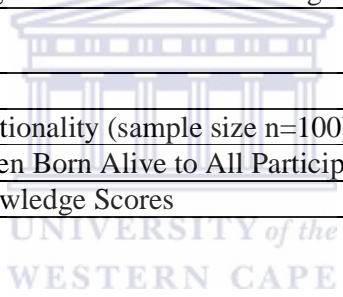
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Chapter One

Orientation to the Study

1.1.Introduction

The first chapter provides an orientation to the study. The orientation is initially illustrated by the means of a brief background, the rationale and problem statement. Following this, the study's aim, objectives and method of enquiry are presented. The study's ethical considerations are also briefly presented.

1.2.Background

In 2009 it was estimated, that in southern Africa approximately 130,000 children under the age of 15 years were newly infected by the human immunodeficiency virus (HIV) (UNAIDS, n.d.). Vertical transmission, where an HIV infected mother transmits the infection to her infant, accounted for the majority of these infections. These mother-to-child transmission (MTCT) occur during the intra-uterine, intra-partum and postnatal period. The overall risk of MTCT is 30 - 45% if no intervention for prevention is undertaken. Breastfeeding accounts for 5 - 20% of post-natal transmissions if there are no preventative measures in place (World Health Organization, 2008).

In 2006, the World Health Organization (WHO) recommended that, in an effort to reduce the MTCT rate, either formula feeding or breastfeeding was equally safe for infants born to HIV positive mothers. An HIV positive mother has to meet the following criteria to exclusively formula feed: it has to be acceptable, feasible, affordable, sustainable and safe (AFASS). If an HIV positive mother did not meet the AFASS criteria, she was encouraged to breastfeed exclusively for the first six months of the infant's life and then wean immediately. Mixed feeding was highly discouraged, due to the high risk of HIV transmission (Coutsoudis, Pillay, Kuhn, Spooner, Tsai & Coovadia, 2001).

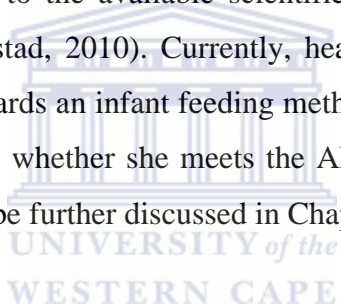
Already in 2000, the WHO estimated that there was a six-fold risk of mortality due to diarrhoeal disease in infants who were not breastfed, in comparison to those who were breastfed. The WHO also found a two-fold increase in the mortality rate due to pneumonia for the same category of infants, but these findings alone did not motivate a change in recommendations regarding infant feeding for HIV positive mothers. The movement away from formula feeding towards breastfeeding was finally supported by studies affirming the low transmission rates achievable from various antiretroviral medications and regimes (WHO, 2010; Thior, Lockman, Smeaton, Shapiro, Wester, Heymann et al., 2006). The most significant was the Kesho Bora study, which established an overall reduction of 54% in mother to child transmissions during breastfeeding (WHO, 2010). The research encouraged a review of the prevention of mother to child transmission (PMTCT) programme globally and in South Africa.

South Africa's President Jacob Zuma, during his annual speech on World AIDS Day in 2009, announced additional interventions to increase the antiretroviral treatment access to priority groups including pregnant women and infants, in an effort to reduce maternal and child mortality and improve life expectancy. These intervention strategies were included in the 2010 South African Clinical Guidelines: Prevention of Mother-to-Child Transmission, developed for implementation in April 2011. The emphasis in 2010 remained safe feeding practices through the prevention of MTCT and the avoidance of the underlying morbidity related to formula feeding. These findings and subsequent implementation provide the HIV positive mother with a safer means of exclusively breastfeeding her infant by facilitating access and changing pharmaceutical regimens to more effective prevention of MTCT.

Significant new developments have occurred with regards to PMTCT following the proposal stage of this study. During the National Breastfeeding Consultative Meeting held in August 2011, the previously mentioned dangers of formula feeding and the damage done to the promotion of breastfeeding were on the agenda. The Tshwane Declaration was drawn up at this meeting, with its main focus being the promotion,

protection and support of exclusive breastfeeding. The declaration proposed that HIV positive mothers should practise exclusive breastfeeding while either the mother or infant uses antiretroviral treatment. The declaration further suggested that formula feeds should no longer be provided by public health facilities. During the data collection period of this study, free formula was still available, but in April 2012 the Department of Health announced that formula should no longer be supplied by public health care facilities (Department of Health, 2012).

Through clinical observation, it appears that the initial dominant formula feeding recommendations continue, despite growing evidence to support the HIV positive mothers' option to breastfeed their infants. The fear of HIV transmission, even though out of proportion to the available scientific evidence, remains a challenge (Koricho, Moland & Blystad, 2010). Currently, health care workers need to guide HIV positive mothers towards an infant feeding method that is contextually the safest for her infant, specifically whether she meets the AFASS criteria and the safety for breastfeeding, which will be further discussed in Chapter 2.



1.3.Rationale

The subject of mother to child transmission (MTCT) is of interest to the researcher, as a lot of resources are allocated towards this field in an effort of prevention. However the impact of the resources and the leading interventions aimed at preventing MTCT has only been researched initially, and during the interim periods research has been limited. The researcher holds a particular interest in the period during which an HIV positive mother makes her initial and carried-through exclusive infant feeding choice. These deliberations have stemmed from a gradual increase of HIV positive mothers in the study setting choosing to exclusively breastfeed rather than exclusively formula feed their infants, even with the ever changing PMTCT interventions - a case in point being the 2010 Clinical Guidelines PMTCT implemented in April 2011 and the phasing out of free formula for implementation in

April 2012 (Middleton, 2012). The researcher would like to establish the infant feeding choices made by HIV positive mothers and establish if there is a relationship between the selected factors. The study was the researcher's endeavour to have a broader understanding of potential determinants of HIV positive mothers' infant feeding choices. This has implications for the practice of all health care workers assisting HIV positive mothers with their initial exclusive infant feeding choices and subsequently their infant feeding practices. The study will provide baseline data in view of the imminent phasing out of free formula feed from public health care facilities.

1.4.Problem Statement

HIV can be transmitted through breastfeeding. The earlier attempts to prevent MTCT centred on exclusive formula feeding as the safest feeding choice for HIV positive mothers. However, despite the legacy of formula feeding, exclusive breastfeeding has now become a safer infant feeding choice for HIV positive mothers, following the implementation of the revised South African Clinical Guidelines of 2010 for PMTCT and the imminent phasing out of free formula. What are unclear are the possible factors influencing the HIV positive mothers' exclusive infant feeding decisions in the Western Cape. After an extensive literature review, it was decided that for the scope of this study, the following six factors will be investigated, namely: employment status, parity, infant feeding counselling, disclosure of HIV status, knowledge of PMTCT and knowledge of the phasing out of formula feeding.

1.5.Aim

The aim of the study was to describe the factors influencing infant feeding choices of mothers at a level two hospital in Cape Town.

1.6.Objectives

- The objectives of this study were to determine the infant feeding choice of the HIV positive mothers discharged from a level two hospital in Cape Town.
- The objectives of this study were to determine the factors that influence the infant feeding choices of HIV positive mothers discharged from a level two hospital in Cape Town.

1.7. Research Questions

The primary question of this study is:

- What are the infant feeding choices of the HIV positive mothers at discharge from the level two hospital in Cape Town?

The sequent and secondary question for this study is:

- What factors influence the infant feeding choices of the HIV positive mothers at discharge from a level two hospital in Cape Town?

1.8.Hypothesis

A hypothesis is a proposal or a tentative implied relationship between two variables. A hypothesis needs to be tested to confirm the relationship for the hypothesis to be accepted by the scientific community (Neuman, 2006).

A simple or causal hypothesis statement guides this study containing only bivariate (i.e. two) variables.

Null hypothesis (H_0): There is no relationship between HIV positive mothers' infant feeding choice and the specified factors.

Alternative hypothesis (H_a): There is a relationship between HIV positive mothers' infant feeding choice and the specified factors.

1.9. Research Methodology

The study adopted a quantitative approach, as it is the most appropriate approach for the descriptive aim of the study and the descriptive study design. Quantitative research focuses on small numbers of concepts, often begins with preconceived ideas, analyses numeric information through statistical procedures and incorporates logistical deductive reasoning (Brink, Van Der Walt & Van Rensburg, 2006).

The study took on the structure of a non-experimental descriptive study design. Descriptive study designs and the selected survey study type set out to quantify the extent of a situation or problem (Katzenellenbogen, Joubert & AbdoolKarim, 1997). Surveys are used to ask respondents about their beliefs, opinions, characteristics and past or present behaviours. Surveys are appropriate for self-reported beliefs and behaviour. With a survey it is possible to measure many variables and ask many things at one time (Neuman, 2006).

Non-experimental designs allow for the collection of data to take place as a phenomenon naturally occurs. Descriptive designs are based on the following assumptions: the variables exist in the study population and can be described, current literature is insufficient to describe the variables, and existing studies provide rational and theoretical frameworks in the case of a known concept (Brink et al., 2006). The descriptive design allowed the researcher to describe the specified factors influencing the HIV positive mother's decision regarding her infant's feeding choice within the context of the newly implemented Clinical Guidelines for PMTCT 2010, whereas preceding studies were conducted whilst previous PMTC guidelines were implemented.

The study's dependent variable was the infant feeding choice, with the attributes being either exclusive breastfeeding or exclusive formula feeding. The independent variables were the specified factors that influence the HIV positive mother's infant

feeding choice (dependent variable). The independent variables include: economic status, obstetric history: gravity, infant feeding counselling, HIV status disclosure, knowledge regarding PMTCT and infant feeding, and lastly knowledge regarding the phasing out of free formula. These variables were chosen due to their frequency and evidence in literature as will be presented in chapter 2.

1.10. Definition of Concepts

HIV positive mothers – Refers to a female who has taken an HIV test with a positive result and knows that result (Department of Health, 2010). For the purpose of this study HIV positive mothers, will include all women discharged with a live infant, and who have had an HIV test with a positive result.

Infant – a human from birth up till 12 months of age (Department of Health, 2010).

Exclusive Breast Feeding – Infant feeding practice where an infant receives only breast milk and prescribed medication, but no other liquids or solids including water (Department of Health, 2010).

Exclusive Formula Feeding – Infant feeding practice where an infant receives no breast milk. Instead the infant receives nutrition from a suitable commercial formula (Department of Health, 2010)

Mixed Feeding – Infant feeding practice where an infant receives a combination of breast milk, suitable commercial formula, water or solid/semi-solid food (Department of Health, 2010)..

Infant Feeding Choices – The exclusively chosen method of nutrition by an HIV positive mother for her infant on discharge from the selected level two hospital.

Economic Status – Either the participant herself is employed or has another form of household income either from a spouse, family member or domestic partner who

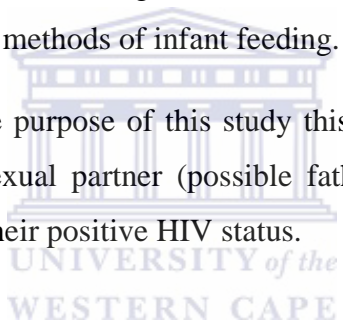
contributes to the household. For this study, unemployed is considered as having no form of own or household income.

Parity – The status of a woman with regard to the number of children she has been pregnant with or borne (Freshwater & Maslin-Prothero,1994). Primigravida: having had only one pregnancy. Multigravida: having had two or more pregnancies.

Primary health care services – For the purpose of this study this will imply the facility where the HIV positive mother received her initial and primary information, which informed her infant feeding choice.

Knowledge of infant feeding options – The information HIV positive mothers have about breastfeeding, formula feeding and mixed feeding and the consequences of using the afore-mentioned methods of infant feeding.

HIV disclosure – For the purpose of this study this will indicate if a HIV positive person has informed a sexual partner (possible father or care giver of the child), family and friends about their positive HIV status.



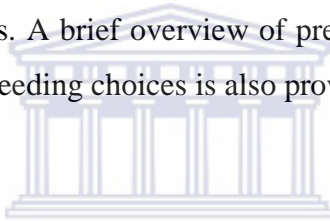
1.11.Ethical Considerations

Formal clearance and approval for the study was granted by the Higher Degrees Committee and the Senate Committee of the University of the Western Cape (Appendix A). The researcher obtained permission to conduct the interviews at the level two hospital from the chairperson of the Research Committee (Appendix B), following the presentation of the proposal at the hospital's research committee meeting. Participants' ethics were addressed with the use of individual information sessions, information sheets and informed consent by the researcher herself. Further ethical considerations will be discussed in Chapter 3.

1.12. Structural Overview of Chapters

Chapter 1 introduced the study, providing a brief background, the rationale and problem statement. The study's aim, objectives, study questions and hypothesis were presented which provide guidance for this study. The research methodology, definition of concepts and the ethical considerations were also conveyed.

Chapter 2 provides a literature review on historical, current and future matters relating to infant feeding options and infant feeding choices of mothers who are HIV positive. It also covers the new developments of PMTCT interventions with regard to the 2010 PMTCT guidelines and the imminent phasing out of free formula from public health care facilities. A brief overview of previously published study findings on determinants of infant feeding choices is also provided.



Chapter 3 presents the study design and study setting. Sampling is elaborated on with regard to the study population, sample size, sampling technique and procedure. The data collection tool, data collection process and pilot study are discussed. Finally data analysis is expanded on in view of validity, reliability and ethical considerations.

Chapter 4 provides the reader with a presentation of the findings of this study. The findings are presented in the following order: demographic data, HIV positive mothers' infant feeding choices, and the specified factors influencing infant feeding choices. The specified factors include employment status, parity, infant feeding counselling, disclosure of HIV status, knowledge of PMTCT and knowledge of phasing out of free formula.

Finally, chapter 5 provides a discussion of the results of this study as well as relevant literature to support significant findings with relation to demographic information, infant feeding choices and factors influencing this choice, and an accompanying summary. The study's limitations are followed by the recommendations, including implications for infant feeding by HIV positive mothers, policy implications, implications for health care information and recommendations for future research. A retrospective conclusion is offered from the researcher with regard to the research process.

1.13. Conclusion

In the first chapter an orientation to the study and planned presentation of the research report was provided. The chapter initially offered an extensive background and rationale for the study. The problem statement was formulated to inform the aim, objectives, research questions and hypothesis. This was followed by a brief discussion of the proposed research methodology, definition of concepts and ethical consideration. The latter were expanded on in the upcoming chapters. Finally an overview of the chapters was offered for an ease of reference to the rest of the research report.

Chapter 2

Literature Review

2.1. Introduction

The following literature review aims to present available literature regarding infant feeding options for HIV positive mothers, the legacy and the progression of the prevention of mother to child transmission (PMTCT) programmes, the changes that occurred in 2010, which led to the additional changes in 2011. Finally the literature review will conclude with a brief overview of previously identified determinants of HIV positive mothers' infant feeding choices in quantitative and qualitative literature.

2.2. Human Immunodeficiency Virus and Mother to Child Transmission

The latest summary from WHO and UNAIDS (2010) estimates new HIV infections amongst children at 390 000 in 2010. The infection rate had decreased by 15% from 2001 and was 21% below that of 1997, during the peak of the HIV epidemic. However there are still an estimated 3.4 million children under the age of 15 years living with HIV globally. In 2009, approximately 130 000 children in southern Africa under the age of 15 became newly infected with HIV (UNAIDS, n.d.). Mother to child transmission of HIV can occur during the antenatal and intrapartum period. Postnatal transmission can occur during breastfeeding. In the absence of preventative measures in place, pregnancy and labour can contribute to 15-20% of transmissions, whereas breastfeeding alone can cause 5-20% of infections. It is also estimated that where there are no preventative measures in place, breastfeeding contributes one-third to a half of HIV infections in infants in Africa (De Cock, Fowler, Mercier, Vincenzi & Saba et al., 2000).

2.3. Infant Feeding Choices of HIV Positive Mothers

The infant feeding choices of HIV positive mothers include exclusive formula feeding where acceptable, feasible, affordable, sustainable, and safe (AFASS) criteria are met, or exclusive breastfeeding. Mixed feeding has been strongly discouraged.

Exclusive breastfeeding was recommended when formula feeding could not be practised in a safe manner meeting the AFASS criteria. Exclusive breastfeeding is defined as a feeding practice in which infants only receive breast milk and no other liquids, not even water, while prescribed medication is acceptable (South African National AIDS Council, 2010). The benefits of breastfeeding cannot be ignored, taking into consideration that exclusive breastfeeding up to 12 months is able to prevent up to 13% of deaths among under-five year olds globally (Jones, Steketee, Black, Bhutta & Morris, 2003). In the broader maternal context exclusive breastfeeding can also improve general maternal health and help prevent postpartum haemorrhage.

HIV transmission can be reduced greatly by prophylactic treatment regimes. One of the most successful studies was the Kesho Bora study that feasibly reduced MTCT rates during breastfeeding by 54% (WHO, 2010). A problem identified in South Africa is the low exclusivity rate at which breastfeeding is practised. The national proportion of all living children in South Africa who have been exclusively breastfed until the age of six months according to predictive indicator data in 2008 was only 25.7%. This is nevertheless an improvement, as it was as low as 6.8% in 1998 and 8.3% in 2003 (Department of Health, Medical Research Council & Measure DHS, 2002). As this predictive statistical information shows, even though exclusive breastfeeding is on the rise, it is by no means at an optimum level in the general population, which leaves a concern as to the exclusivity of breastfeeding practices in HIV positive mothers.

Exclusive formula feeding naturally eliminates the risk of HIV transmission via breastfeeding. In South Africa all HIV positive mothers who choose to exclusively formula feed receive free commercial formula for the first six months of the infant's life (Department of Health, 2008). However, exclusive formula feeding should only be practised where an HIV positive mother can meet the AFASS criteria: acceptability of formula feeding within the given community; feasibility to obtain the resources to mix the formula feed correctly; affordability to continue the formula feeding method after the free formula is no longer provided; and sustainability to provide continuous safe formula feeding. The safety of formula feeding is increased by the following means: hygienic preparation, storage and cup feeding (World Health Organization, 2007). For the majority of the South African population, compliance with the AFASS criteria is not a reality, due to socio-demographic patterns and urban-rural inequalities (Doherty, Sanders, Goga & Jackson, 2011).

Mixed feeding, a combination of breastfeeding, formula feeding, other liquids and foods (South African National AIDS Council, 2010), is highly discouraged. HIV transmission during breastfeeding is increased if the infant's mucous membranes are damaged. The damage of the mucous membranes can occur if an infant is given cow's milk or from allergic reactions to formula feed which will affect the permeability of the membrane (Rollins, Filteau, Coutsoadis & Thomas, 2001) All service providers have therefore established that these practices pose the highest risk of HIV infection (Coutsoadis et al., 2001).

Several studies compare the dual morbidity of breastfeeding and formula feeding. A randomised trial in urban Kenya found that formula-fed infants whose mothers had access to clean water, free formula and frequent health care worker support had a 40% lower risk of HIV transmission, but their mortality rates were similar to the breastfeeding group (Mbori-Ngacha, Nduati, John, Reilly, Richardson et al., 2001). The Mashai study, another randomised trial conducted in Botswana, determined that HIV infection rates among breastfed infants on Zidovudine prophylaxis were 9%

versus 5.6% among formula-fed infants at 7 months of life. However, cumulative infant mortality of formula-fed infants at 7 months was significantly higher than the Zidovudine and breastfed group. By the age of 18 months, the mortality rates between formula-fed and breastfed groups were not significantly different (Mbori-Ngacha et al., 2001).

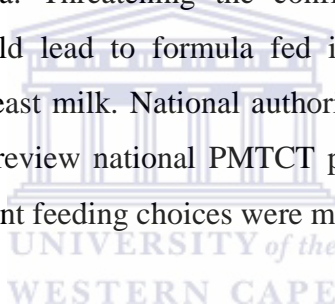
2.4. Infant Feeding Recommendations Prior to 2010

Before antiretroviral treatment (ART), infant mortality due to HIV was estimated to account for 35.2% of deaths at one year of age and 52.5% by two years of age (Newell, 2001). In an effort to reduce mortality, the WHO recommendations on the prevention of MTCT were issued in 2000. In 2001, after consultation with many policy makers and scientists, South Africa's Department of Health introduced the prevention of mother-to-child transmission of HIV (PMTCT) programme. Initially the programme was piloted as mono-therapy. Nevirapine was used in an effort to reduce the number of HIV infected babies born to HIV positive mothers. However, after 2005 it was established that Nevirapine alone was insufficient to improve infant and maternal outcome, as resistance to Nevirapine was occurring. In 2008, the clinical guidelines were changed to dual therapy and Highly Active Antiretroviral Therapy (HAART). Newborns were only given seven days of antiretroviral medication, thus not providing effective postnatal PMTCT for the mothers who had decided to breastfeed their infants. Mothers who had chosen exclusive breastfeeding were encouraged to stop breastfeeding by six months (Goga, Van Wyk, Doherty, Colvin, Jackson & Chopra, 2009). Infant feeding choices were either exclusive breastfeeding for the first six months of life with a high rate of transmission, or exclusive formula feeding.

The WHO (2010), in association with the French National Agency for Research on AIDS and Viral Herpes and the US Centre for Disease Control, conducted the Kesho Bora Study. The randomised controlled trial established that providing a combination

of three antiretroviral medications to pregnant and breastfeeding mothers, was an effective way to reduce the transmission of HIV to infants. The rate of transmission during breastfeeding was thereby reduced by 54%. The preliminary findings of this study prompted the WHO in 2009 to review their guidelines regarding ART usage during pregnancy and breastfeeding. The recommendations included the provision of HAART to all pregnant women with a CD4 at or below 350 cells/mm³. The HIV positive mothers not qualifying for HAART should be provided with ART's during pregnancy and infant ART's for the duration of 6 weeks.

A great deal of literature supports the recommendation that formula feeding of infants in some low to middle income countries may be neither safe nor feasible, and may be linked with social stigma. Threatening the confidentiality of the HIV positive mothers' HIV status could lead to formula fed infants losing out on protective antibodies available in breast milk. National authorities were encouraged to analyse their social contexts and review national PMTCT policies and guidelines to ensure that the safest feasible infant feeding choices were made possible (WHO, 2010).



2.5. Infant Feeding Recommendations after 2010

President Jacob Zuma's speech on World AIDS day on 1 December 2009 made recommendations congruent with the WHO's recommendations. This was achieved through the revised clinical guidelines for the Prevention of Mother-to-Child Transmission 2010. The guidelines prescribed that pregnant HIV positive women with a CD4 count of 200mm or less, instead of 350 mm, would be eligible for ART. All other HIV positive mothers would receive treatment for PMTCT at 14 weeks instead of at 28 weeks of pregnancy, as was previously the case. Mothers with a CD4 of 350mm or less will remain on lifelong ART's. Infants of mothers who do not meet the criteria for lifelong ARTs will receive Nevirapine daily until breastfeeding is ceased (South African National AIDS Council, 2010). This regime would reduce the

risk of mother to child transmission of HIV in general, but most significantly for this study, ensure an overall reduction of 54% of HIV transmission through breastfeeding.

2.6. Infant Feeding Recommendations During and Subsequent to 2012

The new advances in PMTCT stem from the developments which occurred during the National Breastfeeding Consultative Meeting held in August 2011. The previously mentioned dangers of formula feeding and the subsequent damage done to the promotion of breastfeeding were at the forefront of this meeting. The Tshwane Declaration was drawn up, with its main focus being the promotion, protection and support of exclusive breastfeeding, following the WHO 2010 guidelines. The promotion of exclusive breastfeeding includes HIV positive mothers, who should practise exclusive breastfeeding while either the mother or infant uses ART for a period of 12 months. The declaration is a simple two-page document that leaves the implementation of its intentions vague (The Tshwane declaration of support for breastfeeding in South Africa, 2011). The success of the PMTCT programme is clear as evident in the national MTCT rate been 3,5 percent among infants aged 4 to 8 weeks according to Goga et al. (2010; in Leach-Lemens, 2011).

The recommendations contained in a WHO Bulletin include a focus on one single infant feeding strategy (Doherty et al., 2011). It was suggested that this method in South Africa should be exclusive breastfeeding. The intention is to build confidence in a single strategy that would lead to the greatest child survival rate and benefit the total child population in South Africa as a whole, as most children in South Africa have not been exposed to HIV.

The Tshwane Declaration suggests that formula feeds should no longer be provided by public health care facilities. This came into effect on 1 April 2012. The provision of free formula to HIV-positive mothers is being phased out (Middleton, 2012). The implication of this revision would leave breastfeeding as the predominant infant

feeding method, but whether this would correlate with the predominant infant feeding choice of HIV positive mothers remains to be seen. According to the Department of Health (2012) brochure addressing this change, formula milk will only be supplied if medically indicated. The brochure specifically states that HIV positive mothers or their infants should take ART's throughout the breastfeeding period, which should be up to 12 months of the infant's life. The challenge remains the exclusivity of this method, which is crucial for the success of PMTCT. The concern remains the low occurrence of exclusive breastfeeding, which was discussed earlier.

2.7.Determinants of Infant Feeding Choices

The Clinical Guidelines of PMTC 2010 stipulate that HIV positive mothers should be counselled by a trained health care professional at the post-test counselling stage of HIV testing, and that counselling should continue at all following antenatal visits. She should receive high quality, unambiguous and unbiased information regarding the risks of HIV transmission through breastfeeding and the risks associated with formula feeding, with mixed feeding being discouraged. However, it is recommended that HIV positive mothers need individual assessment and counselling to fit their unique infant feeding circumstances (Jackson, Goga, Doherty & Chopra, 2008).

An Ethiopian exploratory study found that the fear of breastfeeding perceived by HIV positive mothers was disproportionate to the evidence of risk and resulted in the avoidance of exclusive breastfeeding or, if no other choice was available, extreme guilt and unease. The study's recommendations included that exclusive breastfeeding should be promoted as the best infant feeding option, whether the mother is HIV positive or negative (Koricho et al., 2010).

Research studies have identified several of the determinants of infant feeding choices. In a Zambian study five key determinants were identified. The qualitative sample

included midwives as well as HIV positive and negative mothers with infants aged 9 to 18 months. The main determinants of infant feeding choices were formula cost, health workers' influence, influence of relatives, stigma associated with HIV and non-disclosure of HIV status, as well as not maintaining the exclusivity of neither formula nor breastfeeding (Chisenga, Siame, Baisley, Kasonks & Filteau, 2011).

A study conducted in a district hospital in KwaZulu-Natal, on the choice of breastfeeding or formula feeding, utilising both questionnaires and focus groups for data collection. The study found that fear of HIV transmission through breastfeeding led HIV positive mothers to prefer to formula feed. The majority of the formula feeders in this study did not meet the AFASS criteria for formula feeding. The mothers who chose to breastfeed were older and decided earlier in their pregnancy to do so (Swarts, Kruger & Dolman, 2010).

A quantitative study done at the Gert Sibande District located in Mpumalanga established infant feeding practices as well as factors that affect the choice of infant feeding option. The study included PMTCT knowledge, antenatal care, delivery and infant feeding practices as the factors affecting HIV positive mothers' infant feeding choice. This study was conducted prior to the implementation of the 2010 PMTCT Guidelines. The Gert Sibande study consisted of a nearly entirely African sample of 98.8% HIV positive mothers (Ladzani, Peltzer, Mlambo & Phaweni, 2010). This study however, was conducted in the Western Cape where the population demography is very different, i.e: Coloureds represent 51% and Africans represent 28% of the population (Provide Project, 2009). The Gert Sibande study determined that 13-20% of HIV positive mothers did not have a clear knowledge of mother-to-child transmission. Sixty percent of the HIV positive mothers in the study population chose to formula feed; they tended to be older mothers, to have had male involvement during their antenatal care, they have also disclosed their HIV status to their partners and their partners knew their own HIV status. Of the remainder of the mothers, 36%

chose to breastfeed and, of particular concern, was that 12% chose to mix feed. Health care workers in the maternity wards encouraged breastfeeding while health care workers at primary level care facilities handed out free infant formula, which created a confusing message for HIV positive mothers. The recommendation was that a unified message about infant feeding options, aligned to the national policy, be shared with the HIV positive mothers (Ladzani et al., 2010).

In South Africa, where formula feed was until recently available free of charge to HIV positive mothers, it appears that formula feeding was practised regardless of the AFASS criteria. It therefore remains to be seen whether the availability of ARTs will be enough to empower a change in infant feeding choices made by HIV positive mothers. Furthermore, the phasing out of free formula in the coming months may have a further influence and will be addressed in the recommendations of this study.

2.8. Conclusion

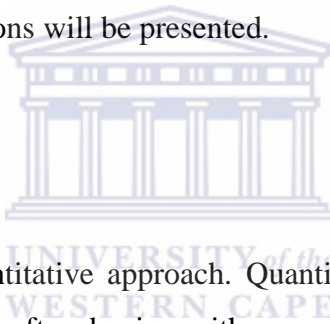
The 2010 PMTCT guidelines were in operation during the data collection process of this study. However, during the data collection process, preparation for the new developments in PMTCT and the phasing out of free formula feeding were in the planning phase. In the literature review the factors that have previously been shown to influence HIV positive mothers' infant feeding choices were presented. Due to the limitations of this study, only specified factors will be incorporated as independent variables. The selection was guided by the literature presented in the literature review (Chisenga et al., 2011). The Gert Sibande study especially guided the selection of the specified factors influencing HIV positive mothers infant feeding choice (Ladzani et al., 2010). As South Africa's ability to provide the necessary resources and health education becomes more aligned to the ever growing body of knowledge pertaining to prevention of MTCT, what remains uncertain is how this will affect the infant feeding choices of South African HIV positive mothers.

Chapter 3

Research Methodology

3.1. Introduction

This chapter provides a structured overview of the research methodology and the quantitative approach that was implemented in this study. The chapter is structured as follows: the study design and study setting will be presented. The sampling method is then discussed with regard to study population, sample size, sampling technique and procedure. The data collection tool and the data collection process will be explained. The pilot study, data analysis, validity and reliability will be discussed and finally, the study's ethical considerations will be presented.



3.2. Study Design

The study adopted a quantitative approach. Quantitative research focuses on small numbers of concepts and often begins with preconceived ideas, analyses numeric information through statistical procedures as well as incorporating logical deductive reasoning (Brink et al., 2006). The quantitative approach was chosen as it was best suited to the descriptive aim and the selective descriptive study design chosen for this study. It will lend itself to the numerical data output required for the first objective, namely establishing the percentage distribution of mothers' infant feeding choices. Deductive reasoning, which is a component of quantitative research, lends itself well to examining the specified factors influencing infant feeding choices established in the literature and applying these to specific study setting.

The study took on the structure of a non-experimental descriptive study design. A non-experimental descriptive study design implies that the researcher collects data as

it is found in a selected setting and does not implement a specific intervention. It provides for an answer to questions as to how much and which types of people do things or think in a particular way (Hall & Hall, 2004). The researcher chose the data collection time as it was the interim period where the PMTCT South African Guidelines of 2010 were well established and in progress, so as to describe the infant feeding choices and factors influencing these. No intervention was undertaken by the research. The imminent phasing out of free formula was considered as one of the specified factors that could influence infant feeding choices, but had not yet been implemented.

Katzenellenbogen et al. (1997) explain that descriptive study designs and the selected survey study type normally set out to quantify the extent of a situation or problem. Surveys are used to ask respondents about their beliefs, opinions, characteristics and past or present behaviours. Surveys are appropriate for self-reported beliefs and behaviour. With a survey, it is possible to measure many variables and ask many things at one time (Neuman, 2006). The study's aim is to establish at present, during the interim period, what mothers' infant feeding choices are and which factors influence these choices. In this study, a survey was conducted by the researcher as the data collector and the participants self-reported their beliefs and knowledge.

Non-experimental designs allow for the collection of data to take place as a phenomenon naturally occurs. Descriptive designs are based on the following assumptions: the variables exist in the study population and can be described; current literature is insufficient to describe the variables, and existing studies provide rational and theoretical frameworks in the case of a known concept (Brink et al., 2006). The descriptive design allowed the researcher to describe the specified factors influencing the HIV positive mother's decision about her infant's feeding choice within the context of the newly implemented Clinical Guidelines for PMTCT 2010 and the

imminent cessation of free formula. Preceding studies were conducted during earlier PMTC guidelines.

In this study the dependent variable is the infant feeding choice with the attributes being either exclusive breastfeeding or exclusive formula feeding. The independent variables are the specified factors that influence the dependent variable i.e. the HIV positive mother's infant feeding choice. The independent variables include: economic status, obstetric history, employment status, parity, infant feeding counselling, disclosure of HIV status, knowledge of PMTCT and knowledge of phasing out of free formula. For the purpose of this study, employment status is defined as the participant having either her own income or someone in her household having an income that contributes to the household's wealth. The researcher chose the specified factors as they have been shown to be relevant in South Africa, as illustrated in Chapter 2. The researcher wanted to apply them within her local setting and due to the nature of a mini-thesis it was not possible to include all the possible factors that may influence infant feeding choices in this study.

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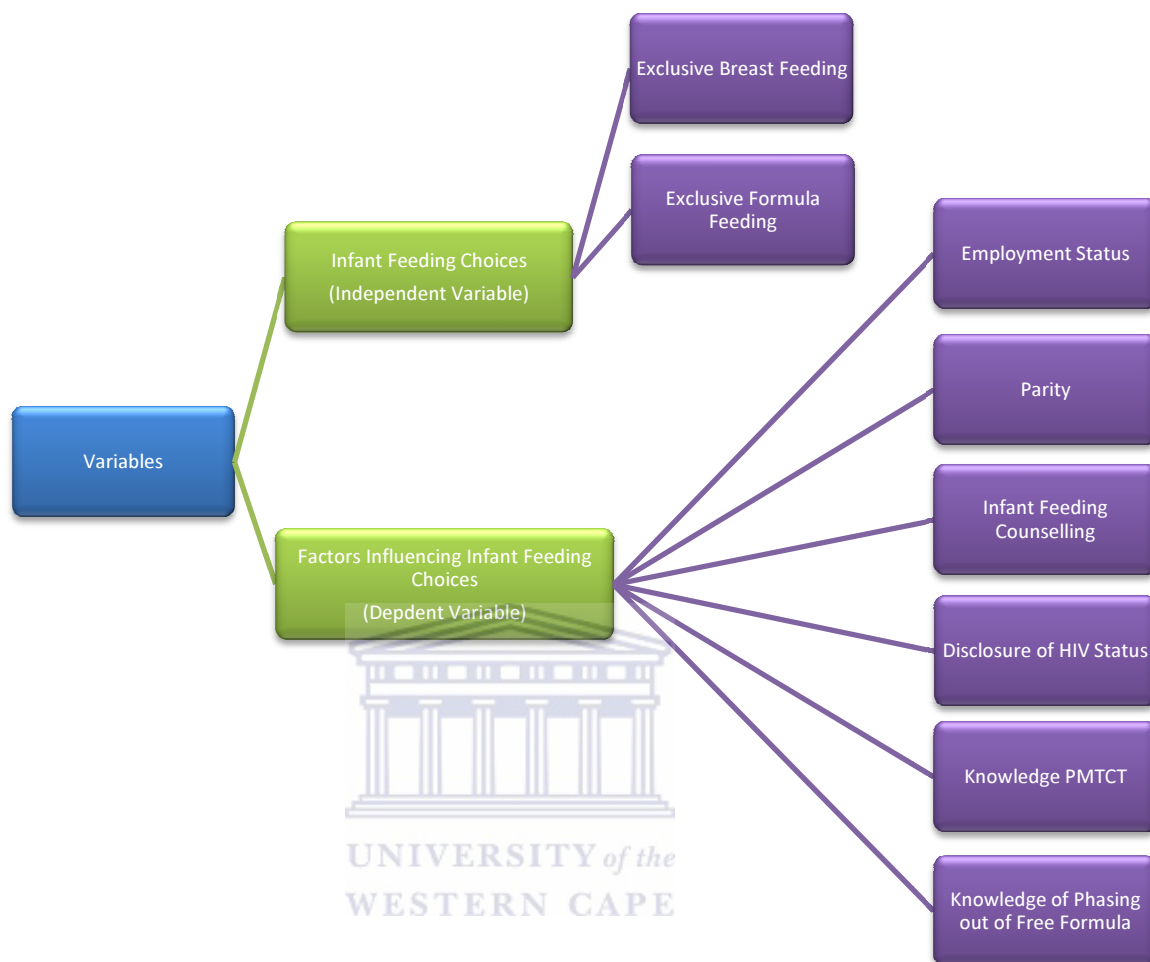


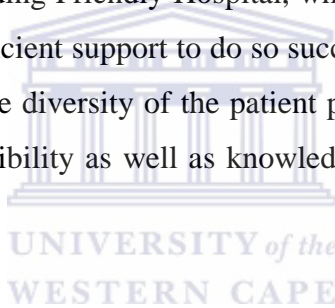
Figure 3.1.: Variables

3.3. Study Setting

The study setting of this study was a level two regional hospital located in the Metro Region of the Cape Town Health District, Western Cape Province. The hospital is a secondary hospital, providing only maternity care. This secondary hospital provides obstetrical care to at ‘risk patients’. These at ‘risk patients’ are identified by clinical protocols which include, but is not exclusive to, hypertensive patients, high risk previous obstetric history patients, previous caesarean section and/or those patients

who require a caesarean section in this pregnancy. As a secondary hospital, this level two hospital is the referral hospital for the three MOU's located in the Gugulethu, Khayelitsha and Mitchells Plain areas and will be referred to as MOU A, B and C. An affiliated MOU, to be referred to as MOU D for the rest of the report, which is a semi-private unit on the property of the level two hospital which provides a service to area patients who are low risk and to a small number of clients, was included in this study.

The obstetrical bed status is 110 with a delivery rate in the region of 900 per month. On average, according to labour ward statistical information for 2011, 180 HIV positive mothers are discharged from the hospital within a given month. The institution is a Breast Feeding Friendly Hospital, which would provide a mother who chooses to breastfeed sufficient support to do so successfully. The sample setting was selected on the basis of the diversity of the patient population due to the diversity of its feeder areas, its accessibility as well as knowledge of the sample setting through working there.



Infant feeding counselling is offered to all mothers at the first antenatal booking visit. Targeted advice is provided at booking for mothers with known or newly diagnosed HIV positive status. The HIV positive mother is normally asked what her infant feeding choice is at booking and this is indicated on her antenatal card. At every subsequent visit she should receive more infant feeding counselling. The mothers who participated in this study would not necessarily have received their infant feeding counselling at the level two hospital, but would most likely have received it at their place of booking or primary antenatal health care facility. During the data collection process, the participants were asked to indicate at which primary health care facility they had received their infant feeding counselling.

3.4. Sampling

A sample is defined by Brink et al. (2006) as a section of a whole to participate in a research study. Sampling refers to the process by which the researcher selects the sample from a population. The intention of sampling is to represent the entire population by obtaining information about one's phenomena from a small section, i.e. the sample.

3.4.1. Study Population

The study population included all HIV positive mothers upon discharge from the level two hospital, who had made an infant feeding choice.

Inclusion criteria: HIV positive mothers from MOU D (affiliated MOU) and the level two hospital, who were being discharged from the property of the level two hospital with a live infant and who were 18 years or older.

Exclusion criteria: HIV negative mothers or mothers of unknown HIV status. Also excluded were mothers having had a stillborn baby or who were being discharged without their infant for whatever reason. These reasons may include, but are not limited to, admission of the neonate into the nursery. HIV positive mothers younger than 18 years of age and HIV positive mothers who have elected to practise mixed feeding.

The rationale of choosing the selected inclusion criteria was the following. The mothers to be interviewed were chosen at discharge as all information and choices regarding her infant feeding choice should by then be confirmed through implementation. The participants needed to be over 18 years of age in order to be able to consent to the study. However, younger participants would require consent from a

parent or guardian, as due to the sensitivity of the HIV nature of the study, the risk of disclosure was too great, considering the risk benefit ratio.

3.4.2. Sample Size

According to Parahoo (1997), representativeness will increase with a sample of 50 and above. The sample size for this study was set at 100 participants. The sample size was decided on as it is a round number. The sample size of 100 allows for a margin of error of +/-10%, which is an adequate margin of error for this study (American Statistical Association, 1998).

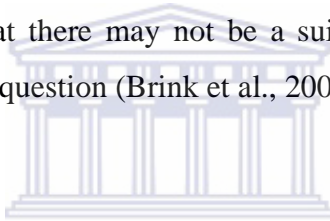
3.4.3. Sampling Technique and Procedure

The study adopted a non-probability sampling method, determining the sample with consecutive sampling. A non-probability consecutive sampling method was decided upon, as there was a constraint with regard to the period of time in which data could be collected in view of the imminent phasing out of free formula in April 2012. The limitation of using a non-probability sampling method is that there may be a possibility that the sample does not represent the entire population accurately. Consequently the results cannot be used as a generalisation pertaining to the entire population (Castillo, 2009).

Consecutive sampling is very similar to the more common convenience sampling, by accepting all accessible participants as part of the sample. This technique is considered to be the best of all non-probability samples; as it includes all available participants, it makes the sample a better representation of the entire population (Castillo, 2009). In this study all mothers who conformed to the inclusion criteria, who were discharged during the allocated data collection days, were thus included in this study.

3.5. Data Collection Tool

The data collection tool took the form of a questionnaire (Appendix G), which was administered by the researcher herself. A questionnaire is ideal for self-reporting in this type of study. Questionnaires are easily administered and scored by the researcher. This questionnaire focused on sets of close-ended questions. Easier and broad questions were asked at the beginning to set the participant at ease, with more specific, intimidating as well as challenging questions being posed towards the end of the questionnaire (Brink et al., 2006). The advantages of questionnaires include that they can be conducted quickly, the format remains constant and is thus not subjected to the interviewer's mood, and the questionnaire is easily tested for reliability and validity. The disadvantages include that participants may provide the more socially acceptable answer and that there may not be a suitable response that a participant wants to give to particular question (Brink et al., 2006).



For the main focus of this study, being the infant feeding choices, the questionnaire was adapted from a previously employed questionnaire used in a published study conducted in Gert Sibande (Ladzani et al., 2010). Gert Sibande's much larger sample size (n=815) focused on infant feeding practices, with only a small component of the study focusing on the initial infant feeding choice of the HIV positive mother. It is the smaller component and further literature reviewed in Chapter 2 that assisted in the adaptation and formulation of the questionnaire.

The tool was then reviewed by a visiting statistical expert from an international university, who made suggestions that assisted in the direction of the questions thus ensuring that the answers would meet the intended objectives of this study. A clinician expert specialising in PMTCT then reviewed the data collection tool and

deemed it sound, although suggesting the inclusion of questions regarding the imminent phasing out of free formula.

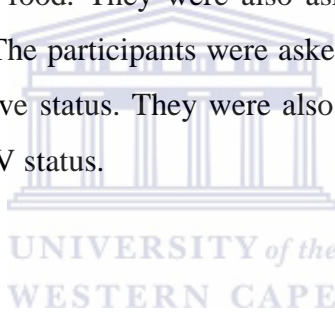
3.5.1. Construction of the Questionnaire

The questionnaire included the following questions (for greater detail see Appendix G). Demographic information was collected including age, race, nationality, level of education, relationship status and employment. Employment was used as a potential factor influencing infant feeding choices. The participants were asked about the number of live babies they had to establish if they were primigravidas or multigravida. Further questions were asked regarding the current delivery method, PMTCT programme and period of antiretroviral treatment. A section was dedicated to multigravidae, while the primigravidae would omit this section. The section focused on the HIV status during the previous pregnancy and the infant feeding choice for the previous most recent live baby. Participants who reported to have been HIV positive during their previous pregnancy were asked whether they had received infant feeding counselling for their HIV related status and if so in which year that was.

Participants were asked whether they had chosen to exclusively breast feed or formula feed. While there was an option for mixed feeding, the single mother who chose this option was excluded from the study as it fell within the exclusion criteria. This met the first objective of the study. The participants were further asked if they had received any advice in making their infant feeding decision and if so, from whom they had received the most advice. Formula feeders were asked if they would buy formula if it was not provided free. All participants were asked whether the retraction of free formula would make their infant feeding choice easier or more difficult, with an option for neither, easier or more challenging. Participants were asked whether

they had been informed that free formula was being retracted. The participants were asked if they received infant feeding counselling antenatally and where. They were asked if they received post-natal counselling, whether they were comfortable with the chosen feeding choice (particularly as it had been practised even if just briefly), and whether they felt it was their own choice to make.

The participants were asked questions regarding infant feeding and PMTCT. Their answers were scored, thereby giving the researcher a knowledge score. The knowledge score was based on questions about infant feeding options, MTCT of breastfeeding, formula feeding dangers, mixed feeding, exclusive feeding and introduction of additional food. They were also asked if they had any unanswered infant feeding questions. The participants were asked to whom, if anybody, they had disclosed their HIV positive status. They were also asked whether or not they were scared to disclose their HIV status.

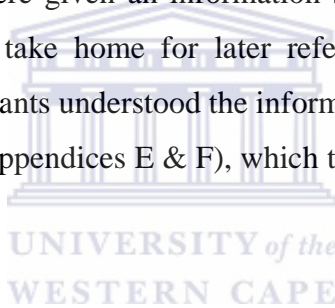


3.6. Data Collection Process

After ethical clearance was gained from the University of the Western Cape, the researcher informed and gained ethical acceptance from the Research Board of the level two hospital. With regard to the four individual wards in which the study would take place, ward managers and staff were briefed about the study and their cooperation was obtained.

The data collection process was conducted over a six week period in January and February 2012. The data was collected during shifts, correlating with the researcher's off-days. This equated to three periods of two weeks cycles whereby data was being collected on every day of the week intermittently, i.e. Monday through to Sunday.

In the morning of the days of data collection, the researcher would audit all of the postnatal patients' folders that were earmarked for discharge. This was done to establish the HIV status of the mother. Those who were positive were assessed to ensure that they met the inclusion criteria of this study. It was then confirmed that the mothers were scheduled for discharge. All the mothers who met the inclusion criteria were enrolled in the study. The participants were directed to a private room individually, not far from their discharging ward, where the researcher presented them with an information session. If the mother did not feel comfortable speaking in English or Afrikaans, a hospital appointed trained Xhosa translator was used to ensure all participants understood and were given accurate information. The information session emphasised confidentiality, anonymity and autonomy of the study. The participants were given an information sheet in either English or Xhosa (Appendices C & D) to take home for later reference. Once the researcher had confirmed that the participants understood the information, they were asked to sign an informed consent sheet (Appendices E & F), which the researcher kept as evidence of ethical practice.

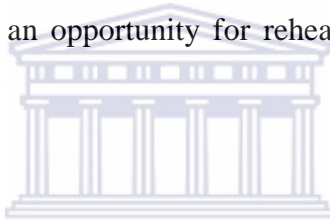


The participants were asked the questions, from the questionnaire, by the researcher herself, in order to ensure that there was no missing data. The fact that the researcher collected the data throughout the study also enhanced reliability. When the Xhosa translator was used, the questions were put to the participants in English and then translated into Xhosa. The translator would receive the answer from the participant in Xhosa and then translate the answer back into English. This made the data collection process easier for the researcher who could make full use of the translator, instead of having to deal with a tool in Xhosa that the researcher would not be able to interpret. The researcher allocated a number to each participant, and their names were not placed on the questionnaires. The researcher kept a private list with names of participants and their corresponding true identities under lock and key.

The raw data was checked for completeness. Some of the demographic data that was collected from the participants' folders was missing, and the researcher drew these folders from records and managed to have no missing data. The data was coded and then captured using the Statistical Package for the Social Sciences (SPSS) 20.0 data sheets during the data collection process.

3.7. Pilot Study

A pilot study is a method of improving a study's reliability. This is accomplished by piloting the data collection tool, in this instance the questionnaire, in order to refine the questions and ensure that ambiguity is avoided and questions remain focused. The pilot study also serves as an opportunity for rehearsal of data analysis and coding (Alston & Bowles, 2003).



The pilot study was conducted in December 2011. Initially, the pilot study included ten pilot participants. However, the questionnaire was revised three times after minor alterations were made to ensure reliability.

The pilot study allowed the researcher to establish ward processes and discharge procedures from all four of the possible discharge areas. The questionnaire was also adapted, as the flow was not as smooth as initially thought. All questions pertaining to multipare were included in one section of the questionnaire, thereby allowing primigravidae to ignore that section. The need for a Xhosa translator was identified and the information sheet and informed consent form were translated into Xhosa.

The process of analysis of the pilot study allowed for the adding of not-applicable responses to the questionnaire, allowing for the capturing of discreet missing values.

3.8. Data Analysis

The data was initially captured using SPSS version 20.0. The SPSS was installed on an Acer Aspire 5333 Laptop, which was manufactured in South Africa. The raw data was double entered and discrepancies were resolved so that the data was free of data entry errors. The levels of statistical analysis include descriptive and inferential analysis.

The researcher used SPSS for basic descriptive analysis, e.g. mode, mean and descriptive numerical statistics. A descriptive quantitative design seeks to analyse the data in a manner that reduces the information to display and showcase the main features of each variable (Hall & Hall, 2004). The graphic display of the data can assist readers to understand the findings in a more simple and accurate manner. With appropriate graphics it is possible for the reader to interrogate the research findings further (Brink et al., 2006). The tabulation instrument in Microsoft Word was used to create tables, pie and bar graphs. Statistical Analysis Software (SAS) composed a box-plot to better represent the knowledge scores, i.e. mode, mean and median. The most appropriate visual means was selected to represent the findings and used for representation in Chapter 4.

The data was then given to an expert statistician who analysed the more complex inferential statistics, as well as verifying the previously mentioned basic statistical processes conducted by the researcher. This was done using SAS. SAS was used to create the single box-plot that was used in Chapter 3. Inferential data analysis was used to determine whether the differences that were found between the data sets were genuine or by chance. The Chi-square test is a statistical test of significance. It is used to measure the association between variables at either nominal or ordinal levels and the relation between them (Alston & Bowels, 2003). The Chi-square test in this

study was used inferentially to establish whether the association between the two data sets of the dependent variables - exclusive breastfeeding and exclusive formula feeding - is genuine or due to chance. For this study 0.05 was an acceptable level of significance; this suggests that the results will be flawed in five out of the 100 participants.

The analysis converted and condensed the collected and sorted data into an organised, visual representation, thereby giving meaning for the readers of the final report (Brink et al., 2006).

3.9. Validity and Reliability

Validity is concerned with how well the instrument represents all the components of the variables being measured (Brink et al., 2006). The questionnaire was adapted from a previously conducted questionnaire that was used for data collection of a published study (Ladzani et al., 2010). Face validity was enhanced by the review of the tool by the statistical expert. The content validity was verified by the expert clinician in PMTCT.

Reliability is concerned with the ability of the data collection tool to measure the same results each time it is administered. This will be improved through the use of the same interviewer, being the researcher herself, to administer the tool and by doing a pilot study (Neuman, 2006). The Xhosa translator was also briefed at length about the study but, more importantly, about translating intended questions verbatim into Xhosa as well as the replied answer verbatim back.

The pilot study also enhanced validity and reliability. During the pilot study, the tool was summarised thereby increasing the face validity, and it was used to train the Xhosa translator, thereby encouraging reliability.

3.10. Ethical Considerations

The researcher has taken care to meet the ethical standards through the following means: informed consent, providing participants with a choice of participation in the study, analysis of the risk-benefit ratio, and ethical review by two ethics review boards (Brink et al., 2006). The research proposal was presented to the Ethical Committee of the University of the Western Cape, and was approved by the Committee after two alterations (Appendix A). Written permission was requested from the Medical Research Board and the Medical Superintendent of the level two hospital, to allow the researcher to conduct interviews among the sample population. Permission was granted by the level two hospital after the proposal was presented at the monthly research meeting (Appendix B).

Participants were initially selected through the Retroviral Disease codes in their folders, which indicated their HIV status, while ensuring anonymity. The selected participants were called individually to a private room where their confidentiality was maintained. An information sheet was given to all participants explaining the purpose of the study and what would be asked of them in order to participate (Appendix C & D). Written informed consent was obtained from the participants (Appendix E & F). Confidentiality was ensured throughout the study by the use of codes to represent the participants and not their names. The master sheet with the correlation of names and numbers was kept under lock and key. This was of particular importance as the HIV status of these women is often a very socially sensitive issue and needs to be treated as such. Autonomy was explained to the participant, so that they understood that they could withdraw from the study at any point and the withdrawal would in no way affect the continuation of their care.

The risk-benefit ratio was discussed with participants during the information session by using an extensive information sheet. The known risk for this study was the potential emotional disturbance it might cause to the participants. When this occurred

the researcher ensured social worker referral was in place at the patient's earliest convenience. This did occur once during the data collection process, with a mother who had very recently lost her husband, and the mother was immediately referred to the social worker for ongoing support. No further known risks are known. Although there is no benefit for the patient directly, the increase in knowledge would be beneficial for their future pregnancies and for other mothers faced with the same dilemma. It was decided that the facilities will not be referred to by name in this research report. This is in an effort to preserve the facilities' reputation, in particular in the case of any negative findings. However when the findings are used for feedback purposes and for development of service provision the names of the facilities will be disclosed.

3.11. Conclusion

In this chapter the most appropriate research methodology proposed for this study was discussed. The researcher identified literature that has been interrogated to support the chosen data collection process, pilot study, validity and reliability. The data collection tool was adapted from a tool that was used in a previously published study (Ladzani et al., 2010). The ethical consideration related to academic and institutional ethical approval, as well as the rights of the person was discussed.

In chapter 4 the findings of this study will be presented.

Chapter Four

Results

4.1. Introduction

This chapter consists of a presentation of the study results. Discussion of these results will be reserved for Chapter 5. The results are presented with the intent of achieving the study's aim, which was to describe the specified factors influencing infant feeding choices of mothers at a level two hospital.

A total of 100 (n=100) interview questionnaires were completed by willing participants. Six potential participants either refused or could not be included in the study. Three of them declined after the information session because they felt they did not want to be part of the study. One stated, while filling out the questionnaire, that she intended to practise mixed feeding. As mixed feeding is one of the exclusion criteria, her questionnaire was excluded from the study. One started the session by answering the questions but had an emotional breakdown due to a very recent spousal death. This person was referred immediately to the social worker for support. The sixth potential participant absconded from the hospital before the opportunity was for an interview. The overall response rate was 94.3% (100/106), which is considered a high response rate. All 100 questionnaires were filled out completely and subsequently there was no missing data.

4.2. Demographic Data

The majority of HIV positive mothers (61%, n=61) fell in the 19-29 year old age group. The mean age of the sample was 29 years old. The majority of the sample 96% (n=96) were African, the remaining 4% (n=4) were Coloured. Of all the participants, 97% (n=97) were South African nationals. These demographics have been summarised in table 4.1.

Variable	Category	Frequency (n)	Percentage
Age	19-29 years old	61	61%
	30-39 years old	36	36%
	40-49 years old	3	3%
Race	African	96	96%
	Coloured	4	4%
Nationality	South African	97	97%
	Non-South African	3	3%

Table 4.1.: Age, Race and Nationality (sample size n=100).

The participants reported that 84% (n=84) were either married or in a self-defined relationship, while the other 16% (n=16) said they were not in a relationship, thus single.

All the participants reported to have at least obtained a primary level of education. The education levels of participants were reported as follows. Five percent (n=5) had a primary level of education, 87% (n=87) had a secondary level of education and 8% (n=8) reported to have a tertiary level of education. Of the participants, 36% (n=36) had passed grade 12. As one can deduce from the above information, all of the participants were literate.

The remainder of the demographic data will be discussed under the specified factors influencing the infant feeding choices of HIV positive mothers.

4.3. HIV Positive Mothers' Infant Feeding Choice

The first objective of this study was to determine the feeding choice of HIV positive mothers. Of all the participants 54% (n=54) had chosen to exclusively breastfeed and the other 46% (n=46) had decided to exclusively formula feed (see figure 4.1.). Mothers practising mixed feeding were excluded from this study, as indicated in the exclusion criteria listed in Chapter 3.

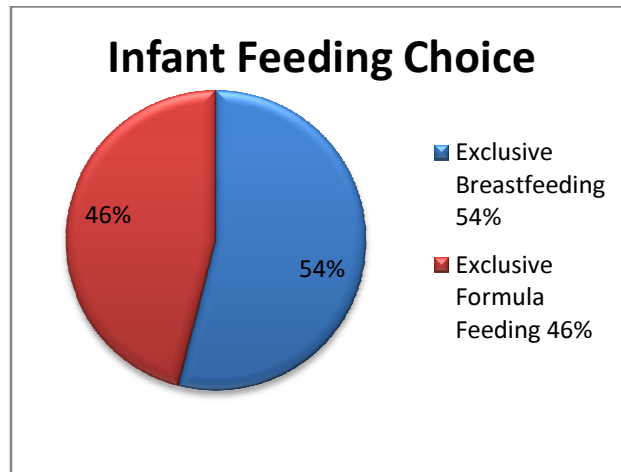


Figure 4.1.: Infant Feeding Choice

4.4. Specified Factors Influencing Infant Feeding Choices

The second objective of the study was to determine the specified factors that were thought to potentially affect mothers' infant feeding choices, which included her employment status, parity, infant feeding counselling, disclosure of HIV status, knowledge of PMTCT and knowledge of phasing out of free formula.

4.4.1. Employment Status

The researcher selected the socio-economic characteristic of income as it specifically lends itself to one of the AFASS criteria, i.e. the affordability to continue the formula feeding method after free formula is no longer provided. The participants were asked if they had a form of employment. Thirty-four percent (n=34) said they were employed and 66% (n=66) reported that they were unemployed at that moment. The unemployed participants (n=66) were asked if there was any other form of income in their household. Of these, 70% (46/66) reported that they had another form of income. That equates to 80% (n=80) of the participants having either their own or another form of household income.

Of the 20% (n=20) of the participants who had no form of income, eight (40%) chose to exclusively formula feed. The clinical significance of this finding will be discussed in Chapter 5.

According to the Chi-square test there was not a significant difference ($p=0.54$) between the participants' infant feeding choices and whether mothers did or did not have a form of income in their household.

4.4.2. Obstetric History

Regarding the participants' delivery history, 56% (n=56) reported having had a normal vertex delivery and 44% (n=44) having had a caesarean section. This is in keeping with the level two hospital's normal caesarean section rate.

The focus of obstetric history was the comparison of HIV positive mothers who had previously delivered a live infant (multigravida) and those who had just had their first live infant (primigravida). Table 2 summarises the number of children born to each participant. The participants reported that 31% (n=31) were primigravidae and the remaining 69% (n=69) were multigravidae.

Number of Children Born Alive	Frequency (n)	Percentage
One	31	31%
Two	32	32%
Three	28	28%
Four	6	6%
Five	3	3%

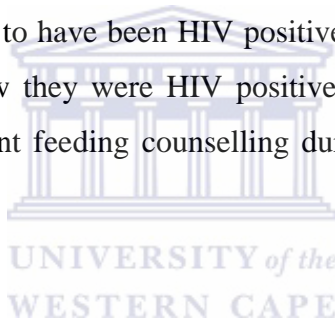
Table 4.2.: Number of Children Born Alive to All Participants

The researcher will provide some baseline data of the multipara previous pregnancy/pregnancies, as they would have made previous infant feeding choices. This makes the multigravidae comparable to primigravidae who have never had the opportunity to make an infant feeding choice.

4.4.2.1. Multiparas

The mothers who had previously had babies provided the following information regarding their HIV status during their previous feeding choice/s. Of the 69 participants who previously had had a live infant born to them, 52% (36/65) had previously exclusively breastfed, 43% (30/65) had formula fed and 4% (3/65) had mixed fed.

The multiparas were questioned about their HIV status at the time of their most recent previous pregnancy. Of the multipara participants (n=69) who had previously delivered a live infant, 68% (47/69) tested HIV negative, 7% (5/69) were untested and 25% (17/69) reported to have been HIV positive in their previous pregnancy. Of the participants who knew they were HIV positive during their last pregnancy, all reported to have had infant feeding counselling during that pregnancy between the years 2005 and 2010.



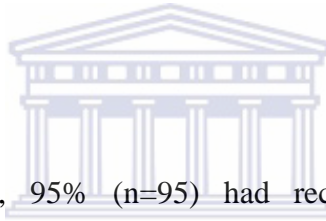
4.4.2.2. Differentiation of Primigravidae and Multigravidae

The researcher felt that in the case of first time mothers with no previous infant feeding experience, this would tend to lead these mothers more towards the newly implemented clinical guidelines. Of the 31% (n=31) HIV positive primigravidae, 45% (14) chose to exclusively formula feed and 55% (n=17) chose to exclusively breastfeed. Of the multiparas, 46% (n=32) decided to exclusively formula feed, while the other 54% (n=37) decided to exclusively breastfeed. As one can see, the distribution of formula feeders and breast feeders is very similar when comparing primigravidae and the multigravidae.

According to the Chi-square test the proportion of mothers who chose to exclusively breastfeed or exclusively formula feed was not statistically significantly different between multiparas and primigravidae ($p=0.91$).

4.4.3. Health Care Providers and Infant Feeding Counselling

A vast majority of participants 98% ($n=98$) had enrolled in the PMTCT programme. Of all the participants, 21% ($n=21$) were on lifelong HAART, 59% ($n=59$) had started antiretroviral medication before 28 weeks, 18% ($n=18$) had commenced antiretroviral medication after 28 weeks and the remaining 2% ($n=2$) were not on any antiretroviral medication. Being enrolled in the PMTCT programme should involve infant feeding counselling.



Of the 100 participants, 95% ($n=95$) had received antenatal infant feeding counselling. It is clinically of concern that 5% ($n=5$) reported not to have had any infant feeding counselling. However, 2% ($n=2$) were not on PMTCT so possibly they were not available for infant feeding counselling. The participants were asked where they primarily received their infant feeding counselling. Their responses are illustrated in figure 4.2.

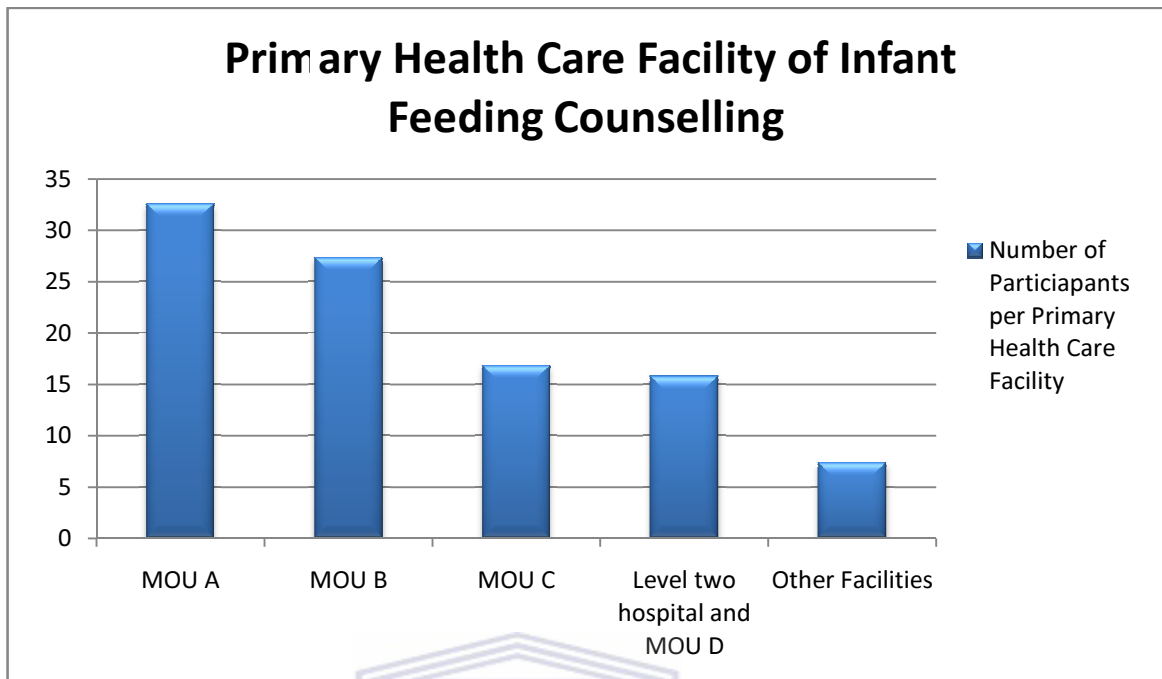


Figure 4.2.: Primary Facility of Infant Feeding Counselling

As illustrated in figure 4.2., the highest number of mothers (n= 31) had received counselling at MOU A, followed by MOU B (n=26), MOU C (n=16) and the level two hospital (n=15), while the remaining participants (n=7) had received their primary infant feeding counselling at a combination of other facilities.

What was of clinical interest, however, was that most of the participants expressed relatively similar and low formula feeding rates in relation to where they had received their primary infant feeding counselling; i.e. MOU A - 45% (n=10), MOU B - 38% (n=11), level two hospital and MOU D - 40% (n=6) and other facilities - 43% (n=3). However MOU C had a much higher formula feeding rate of 69% (11 out of 16).

The sample size was possibly insufficient to provide statistical significance, according to the Chi-square test (p=0.38).

The participants were asked whether they had received any advice in making their infant feeding choice; 64% (n=64) reported that they had received advice. Of the participants who said they had received advice the vast majority 87.5% (n=56) reported that the person who gave them the most advice was their health care provider. The remainder (12.5% or n=8) mentioned that they had received advice from their mother, sibling, partner or a friend. These summarised in figure 4.3.

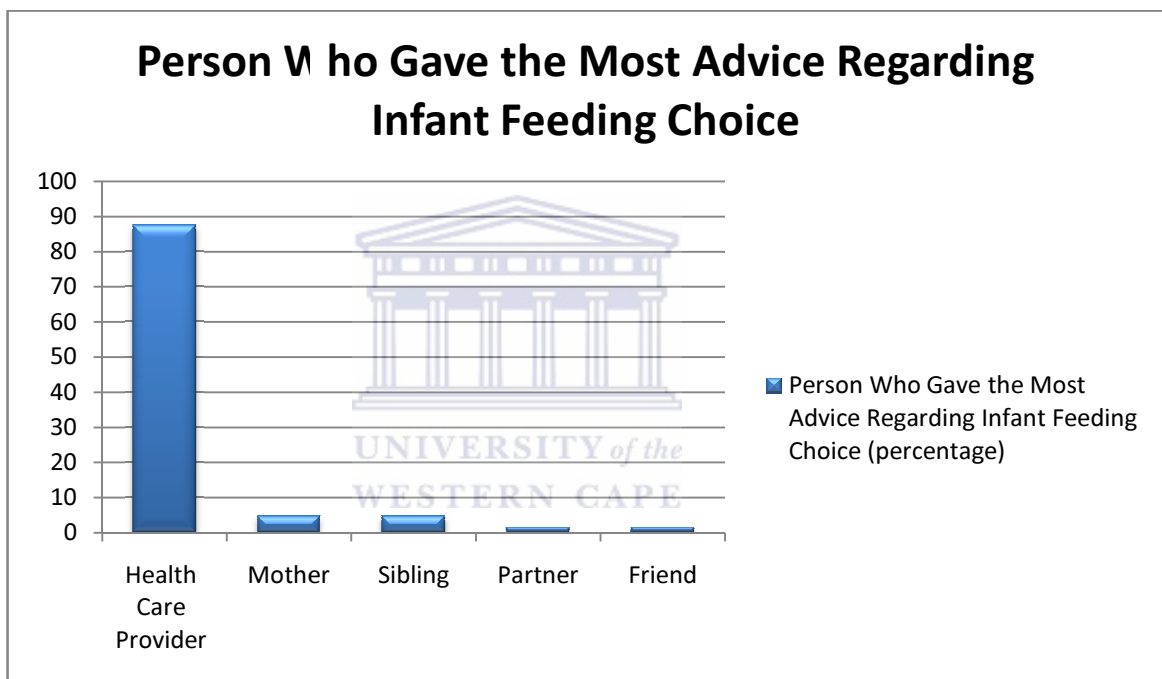


Figure 4.3.: Advice of Infant Feeding Choice

The vast majority of participants (98% n=98) reported that they felt they had the freedom of choice to choose their infant feeding choice. The participants were asked whether they felt comfortable with their chosen infant feeding choice, to which 96% (n=96) indicated they were satisfied.

Post-natal infant feeding counselling was reported to be inadequate, with only 38% (n=38) of participants having received such counselling. This has clinical significance and will be discussed in Chapter 5.

4.4.4. Disclosure of HIV Status

Disclosure was thought to be a factor in influencing mothers' infant feeding choice, as disclosure and non-disclosure would influence the environment in which the participant would practise her infant feeding choice. The non-disclosure rate for all participants was 7% (n=7). The disclosure rate is illustrated in figure 4.4. with the y-axis representing the number of people disclosed to.

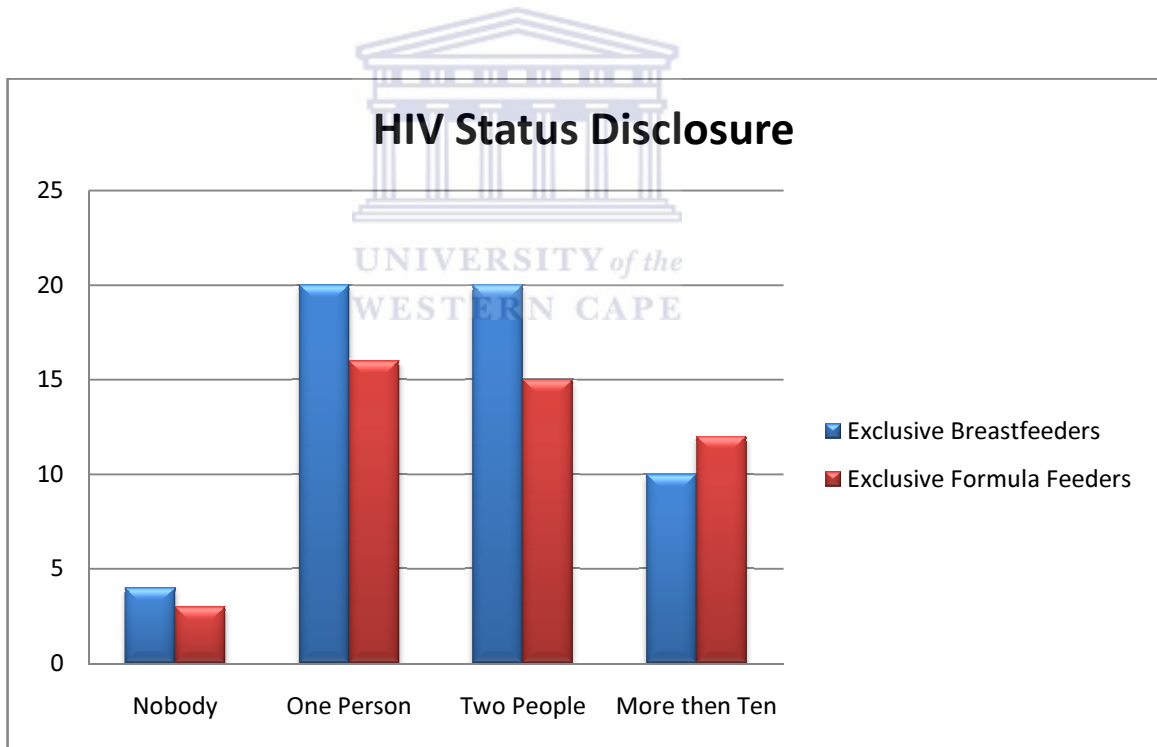


Figure 4.4.: Disclosure of HIV Status

The overall disclosure rate - that is disclosure to any single or multiple person - was 93% (n=93). This proportion was the same for both HIV positive mothers choosing exclusive breastfeeding 93% (50/54) and for those choosing exclusive formula feeding 93% (43/46).

However there seems to be a distinction in the trends of disclosure as illustrated in figure 4.4. The participants who chose to exclusively breastfeed disclosed to a fewer number of people, with disclosure to a single person (n=20) and two people (n=20) being higher than the visibly fewer (n=10) participants disclosing to more than 10 people. Among participants who chose exclusive formula feeding, disclosure in terms of number of people appeared to be more evenly distributed: disclosure to a single person (n=16), to two people (n=15) and to more than ten people (n=12).

The differences in the proportions making each type of feeding choice were not significant across disclosure categories according to the Chi-square test (p= 0.84).

4.4.5. Knowledge of MTCT and Infant Feeding

The second last section of the questionnaire was structured to establish a knowledge score for each participant. Knowledge of PMTCT and infant feeding options and practices were investigated. The scores were allocated per complete fact on PMTCT and infant feeding knowledge, as table 4.2. depicts.

Question Relating To	Score for Correct Answer
Available Feeding Options	1
MTCT of Breast Feeding	1
Dangers of Formula Feeding	0.5
An Example of Dangers of Formula Feeding	0.5
Mixed Feedings Safety	1
Age to Introduce Food	1
Definition of an Exclusive Feeding Choice	1
Total Score	6

Table 4.2.: Allocation of Knowledge Scores



The average knowledge score for breast feeders was 4.33 and for formula feeders 4.45. There was a slightly higher mean knowledge score in the formula feeding group than in the breastfeeders' group, but based on the Wilcoxon Rank Sum test, the differences were not significant ($p=0.45$).

The knowledge scores have been illustrated with the use of a box-plot (see figure 4.5.).

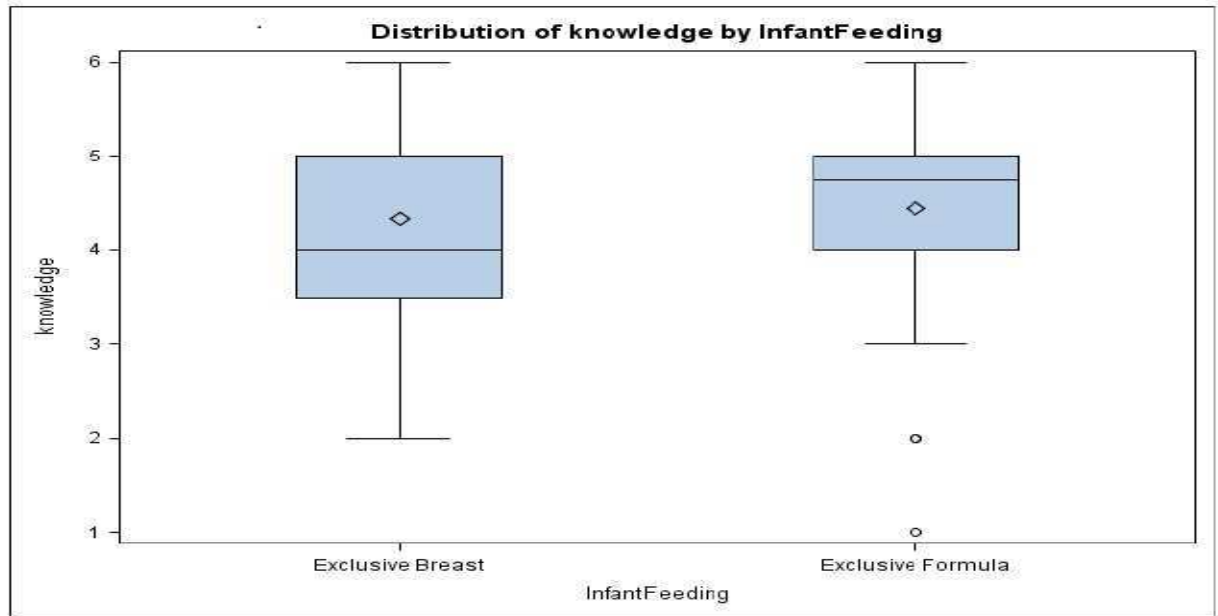


Figure 4.5.: Boxplot Depicting Distribution of Knowledge Score

4.4.6 Knowledge of the Phasing out of Free Formula

The HIV positive mothers currently qualify for free formula if they decide to exclusively formula feed. This is in the process of being withdrawn and will be discussed in chapter 5. Awareness that the free formula was being revoked was considered to be a factor that could influence HIV mothers' infant feeding choices, having a close association with the first factor, being income.

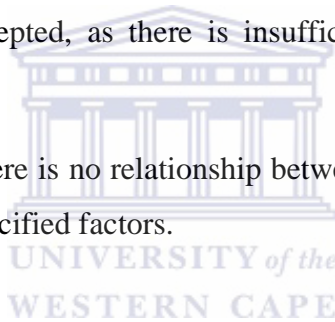
Of all the participants, 63% (n=63) reported to have known that free formula was in the process of being withdrawn, while 37% (n=37) reported not to know. All HIV positive mothers should have been informed about this change, as this information is crucial for those who have opted to formula feed. Of the participants who did not know that free formula was being withdrawn, 50% (n=18) had chosen to exclusively formula feed.

The differences between mothers knowing about the withdrawing of free formula was statistically not significant according to a Chi-square test ($p=0.59$). This has clinical significance for the participants choosing formula feeding and will be discussed in Chapter 5.

4.5. Hypothesis Testing

The study's findings were not statistically significant according to the Chi-square test. The Chi-square was testing for any relationship between the bivariate, being the infant feeding choice (the dependent variable and other specified factors (independent variables) influencing the HIV positive mothers' infant feeding choice. Thus the null hypothesis has to be accepted, as there is insufficient evidence to reject the null hypothesis.

Null hypothesis (H_0): There is no relationship between HIV positive mothers' infant feeding choice and the specified factors.



4.6. Conclusion

The null hypothesis was accepted, as no statistical significance was found in this study according to the Chi-square test. Thus there was no relationship proven between the specified factors and the HIV positive mothers' infant feeding choice.

However, there were points of clinical significance, including participants having no form of income and still opting to breastfeed, primary health care infant counselling discrepancies, lack of postnatal counselling and lack of knowledge of certain PMTCT aspects, but most specifically not knowing the phasing out of free formula would occur in 2012.

This will be discussed in the following chapter, along with relevant literature and recommendations.

Chapter 5

Discussion, Recommendations and Conclusion

5.1. Introduction

In Chapter 4 the results of that study were presented. Chapter 5 will compare this study's finding with those of published literature. The sample's demographic data and participants' infant feeding choices found in this study will be discussed in the context of the current literature. The specified factors influencing infant feeding choices will then be discussed in view of recent study findings. After the discussion the researcher will make recommendations based on the findings of this study.

5.2. Characteristics of the Study Population

The sample setting was in the Western Cape Province. According to the 3rd National Antenatal Sentinel HIV and Syphilis Prevalence Survey in South Africa (Department of Health, 2010), the most recent survey done in the Western Cape Province showed that among 15 – 49 year old women, there was an overall HIV prevalence of 16.9%, which represents an increase from the 15.3% prevalence rate recorded in 2007. The Cape Metropole carried the heaviest burden of HIV prevalence, with more than 70% of the HIV infected pregnant women located in this area. The demographic setting was thought to be different to that of the most recently published study. Specifically unique racial demography was evident in the Census 2001 finding, according to which the population breakdown in the Western Cape was African (26.7%), Coloured (53.9%), Indian (1%) and White (18.4%) (Statistics South Africa, 2005). The Western Cape has a far larger Coloured population than the other provinces.

The most recent published study on infant feeding choices in South Africa was conducted in Gert Sibande in Mpumalanga Province (Ladzani et al., 2010). The Mpumalanga study found a higher HIV prevalence rate (34.7%) than that of the Western Cape's 16.9% (Department of Health, 2010). The Gert Sibande study used a much larger sample (n=815) and focused on infant feeding practices, with only a small component of the study focusing on the initial infant feeding choice of the HIV positive mother. The Gert Sibande study data collection tool was used in the development of this study's tool. The racial demographics of Mpumalanga in the 2001 Census were dramatically different, with the composition as follows - African (85.7%), Coloured (0.8%), Indian (0.5%) and White (12.6%) (Statistics South Africa, 2005).

The demographics between this study and the Gert Sibande study should have been considerably different, in view of the different racial demographics. However, the racial demographics in both studies were similar with African mothers comprising 96% of the sample in this study and 98.8% in the Gert Sibande study (Ladzani et al., 2010). The dominant African demographic of this study could be attributed to the referral facilities; as MOU A and B in this study provide a service to a predominantly African population and they contributed 57% of the sample. A national HIV prevalence survey also identified African women aged 20-34 years as the most at risk population, with a prevalence of 32.7% in 2008 (Shisana, Simbayi, Zuma, Jooste, Pillay-van-Wyk et al., 2009).

The mean age of this study discussed here was 28.6 years of age, whereas the Gert Sibande Study had a mean age of 27.7 years, thus making the study samples similar in terms of mean age and racial demographics. The samples did differ with respect to relationship status, with this study reporting only 16% being single, whereas in the Gert Sibande study, 67% were reported to have been single (Ladzani et al., 2010).

The sample of this study was reasonably well educated, with 87% having received a secondary level of education. Thirty eight percent had passed grade 12 and 8% had a tertiary level of education. As one can deduce from this information, the large majority of the sample was literate. In the Gert Sibande study, 62.3% had received a grade 10 to 12 level of education and 4.5% were reported to have had no schooling (Ladzani et al., 2010). According to Grossman, Fitzsimmons, Larsen-Alexander, Sachs and Harter (1990), higher educated mothers are more likely to choose breastfeeding. In this study, mothers who had achieved a grade 12 or higher level of education portrayed this, with 44.4% (24/54) of the participants choosing to exclusively breastfeed in comparison with the 26.0% (12/46) exclusive formula feeding mothers.

5.3. Infant Feeding Choices

The study displays a slightly more exclusive breastfeeding orientation, which was reported as the exclusive choice by 54% (n=54) of mothers, while exclusive formula feeding was reported by 46% (n=46). This orientation is in keeping with the 2011 infant feeding statistics for the level two hospital, as supplied by a professional nurse (personal communication, 30 March 2012). In the course of 2011, exclusive breastfeeding slowly gains momentum each quarter: from 35% in the first quarter (January to March), to 43% in April to June, 45% in July to September and lastly and impressively, to 57% in October to December. This figure is similar to the prevailing exclusive breastfeeding findings in this study.

This study showed the predominance of breastfeeding among 54% of mothers. This is not only beneficial for the mothers and their infants, but also indicates that the damage of the initial formula led PMTCT interventions is gradually being undone. However, an almost even split is not nearly good enough, following the call for a

single infant feeding strategy of exclusive breastfeeding, as called for by WHO (Doherty et al., 2011).

As discussed in the literature review, South Africa's general population has a very low exclusive breastfeeding prevalence; 25.7% in 2008 (Department of Health, Medical Research Council & Measure DHS, 2002). The researcher could not access national or provincial statistics on HIV positive mothers' infant feeding choices, which is a concern. It was possible to find research outcomes of previous studies conducted in South Africa. The Good Start study was conducted in 2002 to 2003 in three areas of South Africa, namely Paarl, Rietvlei and Umlazi, with a sample size of 665 HIV positive mothers and 218 HIV negative mothers. Of the HIV positive mothers participating in the study, 47.3% had chosen antenatally to exclusively formula feed, 47.9% had chosen antenatally to exclusively breastfeed and 4.3% had decided antenatally to mixed feed (Goga, Doherty, Jackson, Sanders, Colvin et al., 2012). A more recent study conducted in 2008 in Mpumalanga with a small sample size (33 participants) showed that 50% of mothers had chosen exclusive formula feeding, 27% had chosen exclusive breastfeeding and 23% had chosen to mixed feed. The level of mixed feeding in this study is of concern, and it does however represent the low exclusivity rate at which breastfeeding is practised in South Africa with only 23% exclusively breastfeeding (Ukpe, Blitz, Hugo & Theledi, 2009). In the Gert Sibande study exclusive breastfeeding was established at 35.6%, exclusive formula feeding at 60% and mixed feeding at 12.4%, thus finding a predominance of formula feeding (Ladzani et al., 2010).

5.4. Factors influencing HIV Positive Mothers' Infant Feeding Choices

In this study no statistical significance was found according to the Chi-square test. However a number of clinical significance findings will be discussed with the support of relevant literature.

As stated previously, the socio-economic factor income was chosen as the characteristic influencing the decision of infant feeding choice, as it lends itself to the AFASS criteria. If the participant did not have a form of household income, she would not be able to afford to buy formula feed for her infant. The vast majority 80% (n=80) of participants had either their own or another form of income. The 20% who were unemployed and had no other form of income were of particular importance to the researcher, as they did not meet the basic requirement of affordability to continue formula feeding after free formula is no longer provided by the public health care facility (World Health Organization, 2007). Of the 20 participants who had no form of household income, eight had opted to formula feed, therefore 40% of the unemployed participants could and would not meet the AFASS criteria but were nevertheless practising exclusive formula feeding. Formula feeding, despite not meeting the AFASS criteria, is not unique to this study. The Gert Sibande study found that a clinic's supply of free formula was erratic, leaving mothers who could not afford to buy formula little option but to mix feed, thus not meeting the AFASS criteria (Ladzani et al., 2010).

This discussion is even more relevant in view of the consideration that formula will no longer be provided free of charge from health care facilities as of April 2012 (Middleton, 2012). In this study, 37% of the participants had not been informed about the phasing out of free formula, and half of these (n=18) had selected formula feeding. Had they known at the time of delivery that in two to three months' time

they would be not receiving the formula feed for free, it may have informed their infant feeding choice by assisting them to assess their ability to comply with the AFASS criteria. Previous studies have shown that the decision on infant feeding is more likely to be an inappropriate choice, when formula is available free of charge (Doherty, Chopra, Jackson, Goga, Colvin & Persson, 2007).

The most clinical significant finding of this study was the participants' infant feeding counselling implications, i.e. the place of primary counselling, lack of postnatal counselling and the knowledge possibly acquired through this counselling. Most participants' primary infant feeding counselling facilities had low exclusive formula feeding rates; these ranged between 38% and 45%.

MOU C was identified as having a far higher exclusive formula feeding rate of 69%. When one reflects on the facilities' quarterly infant feeding choices, this is not an isolated finding of this study. The infant feeding choices for this facility had a formula feeding rates of 85%, 50%, 62.3% and 65.7% respectively over the four quarters of 2011 according to the facility's director (personal communication, 20 April 2012).

The clinical PMTCT expert identified this MOU as one where the counselling initiatives were directed towards the phasing out of free formula, but most importantly, the re-orientation to a more exclusive infant breastfeeding strategy had not as yet been commenced.

Previous studies have indicated a significant factor that influences infant feeding choices is the influence of the health care worker (Chisenga et al., 2011), which

would come in the form of counselling or advice. In the Gert Sibande study, mixed messages were identified as a hindrance to an exclusive decision-making process with the maternity ward staff encouraging breastfeeding and the primary care facilities providing free formula (Ladzani et al., 2010). This study found that of the 64% who accepted advice, 87.5% received that advice from a health care provider. This makes the health care providers the ideal vehicle for the promotion of the new exclusive breastfeeding single strategy infant feeding choice.

A lack of postnatal counselling was identified in this study with only 38% of participants having received postnatal infant feeding counselling. Although infant feeding practice is beyond the scope of this study, postnatal counselling is crucial in the transition from infant feeding choice to infant feeding practice. This was a significant finding in the Gert Sibande study, with 14.7% not receiving infant feeding counselling within 72 hours of delivery (Ladzani et al., 2010).

The participants in this study reported that 95% had received infant feeding counselling antenatally. The knowledge score of the participants, knowledge gained hopefully during infant feeding counselling, showed little significance with the exclusive formula feeders showing slightly higher mean scores of 4.45 and breast feeders scoring a mean of 4.33. What was clinically significant was that of the exclusive formula feeders, 54.3% could not identify that there was any danger with formula feeding. In the Gert Sibande study, 93% of participants said they had received information regarding the dangers of formula feeding. In this study 44% of participants knew that HIV could be transmitted via breastfeeding. Of the breast feeders, 38.8% knew that there was a risk of transmission but still opted to breastfeed. The Gert Sibande study reported that 94.8% of participants knew that HIV could be transmitted via breastfeeding. The researcher deduced that the knowledge gap displayed by participants in this study regarding the transmission of HIV via breast

milk was due to the counselling that they had received. The participants of this study did explained that they were counselled, that there was an extremely low possibility of HIV transmission via breastfeeding, if the infant or HIV positive mother was taking the prescribed ART's, this has been found to be accurate in the Kesho Bora Study (WHO, 2010).

The participants' HIV disclosure rate was 93% amongst both exclusive breast feeders and formula feeders. The trends of disclosure were slightly different, with the breast feeders disclosing to fewer people and formula feeders disclosing to more people. This may be linked to findings from the previous literature; with more people knowing one's status and the mothers choosing formula feeding may have felt more comfortable doing so with more than just their immediate family knowing their HIV status. However, the disclosure rate remains high which may be indicative of the sample being relatively highly educated and thus more likely to be confident as well as having a high level of self determination: thus they were more likely to disclose their status.

Previous studies have shown strong links to non-disclosure of HIV status and infant feeding practices. However, this study focusing on the initial infant feeding choice showed no change in decision with exclusive formula feeders and exclusive breast feeders both having a disclosure rate of 93%. In a Tanzanian study the researchers identified the need for great confidence and self-determination to disclose their HIV status, with particular stigma surrounding HIV (Leshabari, Blystad & Moland, 2007). In the Gert Sibande study the researchers observed that disclosure of the mother's HIV status may have led to a decision of formula feeding, which was considered the most appropriate feeding option at the time. HIV positive mothers who had disclosed could then practise their formula feeding choice regardless of the HIV stigma related to formula feeding (Ladzani et al.,2010). Doherty et al. (2007) identified a link

between early disclosure and significantly higher rates of mothers intending to formula feed.

Incidental findings from the sample selected for the study were that 78% (n=78) were diagnosed HIV positive for the first time in this current pregnancy. Of the multigravidae, 47 participants tested negative in their most recent pregnancy, five were untested and 31 were primigravidae.

5.5. Summary of Discussion

The initial objectives of the study were met, by establishing the infant feeding choices of the sampled participants. The researcher did not achieve the required statistical significance, according to the Chi-square test, to reject the null hypothesis, thus there was no relationship between the bivariate data, i.e. there is no relationship between HIV positive mothers' infant feeding choice and the specified factors. Thus the second objective was not statistically significantly met. However, clinically significant findings were discussed, including supportive literature including economic status discrepancies with relation to the AFASS criteria, infant feeding counselling and influence of health care providers, and the lack of postnatal counselling.

When reflecting on the rationale of this study the researcher acknowledges a broader understanding of the initial infant feeding choices made by HIV positive mothers. The findings of the study provide some insight about the significance of infant feeding counselling services. Practitioners at grassroots level are not always aware of the implications of policy changes related to the preferred infant feeding choice and the researcher undertakes to follow this up with some recommendations to

practitioners. Suffice to say that adequate preparation needs to happen before the implementation of policy changes with regards to PMTCT. The research outcomes do not only provide baseline data but it is assumed that eventually the institution and the HIV positive mothers will benefit from the clinically significant findings of the study.

5.6. Limitations of the Study

The limitations of this study include the exclusion of minors from the study. This was taken into consideration, but the researcher could not confidently and honestly acquire informed consent from the minor's parents or guardians without the potential of disclosure of the minor's HIV status, which would have been unethical. The study relies on self-reporting which is a source of bias. Only HIV positive mothers making use of maternity care (booking) could have been included in the study.

The researcher excluded mothers with infants admitted to the nursery, as such mothers were not a true reflection of most HIV positive mothers, as they often receive more support and targeted advice regarding the infant feeding choice for their sick infants. Mothers who had delivered a still-born baby were also excluded from the study. The researcher had time limitations as to the duration of data collection, which needed to occur during January and February to allow for analysis and compilation of this report. There were also limited resources, not allowing for any allocation or training of additional data collectors.

5.7. Recommendations

The recommendations are presented with implications for infant feeding, policy, health information and further research.

5.7.1. Implications for Infant Feeding

Firstly, the government needs a national database of HIV positive mothers' infant feeding choices. Without this, as it currently stands, it is very difficult to ascertain what the impact of the PMTCT efforts have been on infant feeding practices. Findings from previous studies do give an indication of a movement towards exclusive breastfeeding. However, due to the significant differences between study settings, the use of differing methodology and the dissimilar resources and interventions relating to PMTCT, it is difficult to monitor trends and relationships. In one of the referral MOUs, MOU B in this study, an increase in breastfeeding was noted, with a change from 60.7% in the first quarter of 2011 to 81.1% in the fourth quarter (personal communication, 26 April 2012). This followed an intervention done by a non-government organisation. The intervention was not documented or researched. With a national database these dramatic changes would immediately be identified and further investigated.

The broad recommendation of this study is the implementation of the single infant feeding strategy, which has now become the national call as of April 2012 (Middleton, 2012).

5.7.2. Implications for Policy

The recommendation of exclusive breastfeeding, as the single infant feeding option needs to be monitored closely, with interventions supporting exclusive breastfeeding. This intervention can not only be met through initial infant feeding counselling

efforts, but HIV positive mothers need to be supported particularly during implementation of exclusive breastfeeding and sustainability for the first 12 months after having given birth. This is possible through the interventions such as breastfeeding support groups, lactation consultation and breast milk banking. Such interventions could take a national call for single clear exclusive breastfeeding as the single infant feeding strategy for all mothers in South Africa from intention to implementation. This requires the addressing of women's health in a broader definition of health that promotes a woman's ability for greater self-determination and confidence in her decision-making skills as well as the implementation of her chosen infant feeding choice, whatever it may be.

5.7.3. Implication for Health Information

This study, although done on a small scale, raised the concern of infant feeding counselling. The research proposes all infant feeding counselling facilities should review their AFASS criteria counselling in view of the phasing out of free formula. The one formula feeding dominant MOU, MOU C, would benefit from interventions towards a more exclusive breastfeeding approach. This requires intensive counselling and up-skilling of all health care workers, including lay counsellors, towards the orientation of the single exclusive breastfeeding infant feeding strategy. A review of interventions of postnatal infant feeding counselling at the level two hospital should include the involvement of the nursing staff, as the researcher found this particularly an issue over weekends when the lay PMTCT counsellors were not on duty and the participants were not given postnatal counselling. Postnatal counselling is crucial as discussed previously with the progression from an infant feeding choice to the actual infant feeding practice.

Information regarding the retraction of formula feeding has not yet reached grass roots level. The Department of Health has released a brochure that explains the phasing out of free formula and the promotion of breastfeeding. This brochure should have been circulating prior to 1 April 2012, but was still not in circulation at the time of writing the research report. These brochures are designed to reach the grass roots level, and focus needs to be placed on the distribution of health care information so that it actually does reach the grass roots level and is not merely published on the Department of Health website (Department of Health, 2012).

5.7.4. Implication for Research

This study provides base line data prior to the phasing out of free formula and with the PMTCT Guidelines of 2010 in implementation. It is proposed that subsequent study should be undertaken in 12 to 18 months after the phasing out of free infant feeding formula. This would provide the needed monitoring of infant feeding choices following changes in and progress of PMTCT efforts.

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5.8. Conclusion

The study has contributed to the body of knowledge around infant feeding choices, particularly during the period between changing interventions following new guidelines. The inconsistency of counselling can have implications for infant feeding practises and lead to mixed feeding. Thus the recommendations offered by the research are fundamental for the provision of a sound PMTCT effort.

This study has given the researcher the opportunity to gain research skills that may not have gained if an alternative research topic had been chosen. The challenges that HIV positive mothers face with the ever-changing PMTCT interventions were of real concern to the researcher and assisted with the identification of research questions. The literature in this field, in particular the policy documents were changing during the course of the research process. However, the data for the study was collected prior to the implementation of new infant feeding guidelines. The data analysis process provided the researcher with new skills to analyse, interpret and display numerical data and writing the research report tested academic writing competencies.

I can honestly say that this study has changed my thought process and is making research a way of life. From a novice researcher, I can proudly say, this is not the end of my research journey.

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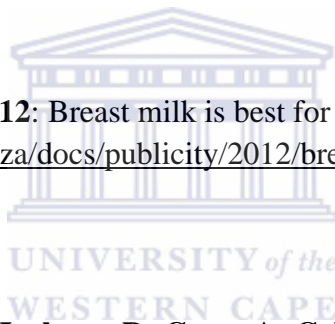
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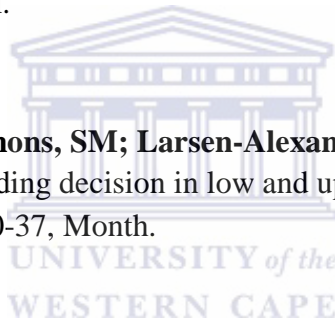
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Appendix A: University of the Western Cape Higher Degrees Ethical Approval



OFFICE OF THE DEAN DEPARTMENT OF RESEARCH DEVELOPMENT

27 October 2011

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape has approved the methodology and ethics of the following research project by:
Ms JJ Morgan (School of Nursing)

Research Project: Factors influencing the infant feeding choices of
HIV mothers at a level two hospital in Cape
Town.

Registration no: 11/9/13

UNIVERSITY of the
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*Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape*

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A place of quality,
a place to grow, from hope
to action through knowledge

Appendix B: Research Committee of the Level Two Hospital Ethical Clearance



Western Cape
Government
Health

COMPONENT: Department of Obstetrics

REFERENCE: Research

ENQUIRIES: Prof. Sue Fawcus

DATE: 23 November 2011

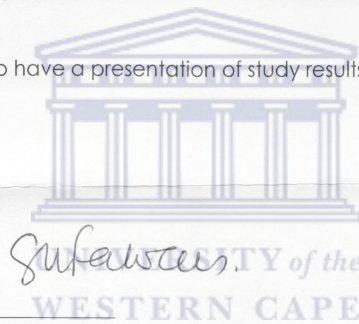
Dear Sr. Morgan

Re: Research Study-Factors Influencing infant feeding choices of HIV mothers at a level two hospital in Cape Town.

Permission is granted by the MMH research committee to conduct your research at this institution.

We will be interested to have a presentation of study results after completion.

Thank You



Professor S.R. Fawcus (MBBS FRCOG)
Head Obstetric MMH
Associate/Professor
Department: Obstetrics/ Gynaecology
University of Cape Town

12 Hornsey Road, Mowbray, 7700
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Appendix C: Information Sheet (English)

Participants Information Sheet



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Jenna Jessie Morgan
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7538
+27 84 589 0115
Jennajessiemorgan@gmail.com

Study Title: Factors influencing the infant feeding choices of HIV positive mothers at a level two hospital in Cape Town.

What is this study about?

This is a research project being conducted by Jenna Jessie Morgan at the University of the Western Cape. We are inviting you to participate in this research project because you have had to make a decision on how to feed your baby. The purpose of this research project is to assist health care workers to understand what where the reasons you choose your infant feeding choice.

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

You will be asked to come to a private room close to the discharge area. You will be helped to fill out a questionnaire about your infant feeding choice, which should not take longer than 10 minutes.

Would my participation in this study be kept confidential?

We will do our best to keep your personal information confidential. To help protect your confidentiality, this is an anonymous study and will not contain information that may personally identify you. Some demographic information was obtained from your patient record file but your name was not used neither was your folder number. This research project involves the completion of a survey. The surveys will be kept in a secure cabinet kept under lock and key, with only the researcher having access.

If we write a report or article about this research project, your identity will be protected to the maximum extent possible.

What are the risks of this research?

There is a minor risk of emotional stress with the subject matter of HIV been discussed. If you find you need counselling please contact the researcher and she will organise it.

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 the knowledge and perceptions of HIV positive mothers about infant feeding. We hope that, in the future, other people might benefit from this study through improved understanding of the circumstances or context in which HIV positive mothers make decisions about infant feeding.

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.

Is any assistance available if I am negatively affected by participating in this study?

If a participant feels the need for counselling, it will be the researchers' responsibility to make an appointment with a relevant counsellor for the participant.

What if I have questions?

This research is being conducted by Jenna Jessie Morgan of the Department of Nursing at the University of the Western Cape. If you have any questions about the research study itself, please the researcher her contact details are on the top of the previous page.

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:

Dean of the Faculty of Community and Health Sciences:

Professor R. Mpfu
University of the Western Cape
Private Bag X17
Bellville 7535
021 959 2631
rmpofu@uwc.ac.za

Head of Department:

Professor T. Khanyile
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tkhanyile@uwc.ac.za

Supervisor:

Dr Jeggels
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This research has been approved by the University of the Western Cape's Senate Research Committee and Ethics Committee.

Appendix D: Information Sheet (Xhosa)

Iphepha lolwazi lomthathi-nxaxheba



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Jennajessiemorgan@gmail.com

Isihloko sophando: Imiba ephembelela kukhetho lokondliwa kweentsana zabazali abanesandulela sikaGawulayo kwizibhedlele zomgangatho wesibini eKapa.

Olu phando lungantoni?

Olu phando luqhutywa nguJenna Jessie Morgan kwiYunivesithi yaseNtshona Koloni. Siyakumema ukuba uthathe inxaxheba kolu phando kuba unyanzeleke ukuba uthathe isigqibo ngendlela yokondla usana lwakho. Injongo yolu phando kukunceda abasebenzi bezempilo ukuqonda ukuba ibeyintoni izizathu zokukhetha olu hlobo ulukhethileyo lokondla usana lwakho.

Ndakucelwa ukuba ndenze ntoni ukuba ndiyavuma ukuthatha inxaxheba?

Uya kucelwa ukuba uye kwigumbi labucala kufuphi nendawo enikhutshwa kuyo apha esibhedlele. Uya kuncediswa ukuzalisa uxwebhu lwemibuzo malunga nohlobo olukhethileyo lokondla usana lwakho, olungasayi kuthatha ngaphezu kwemizuzu elishumi yexesha lakho.

Ingaba ukuthatha kwam inxaxheba kolu phando kogcinwa kuyimfihlo?

Sakwenza konke esinako ukugcina iinkcukacha zakho ziyimfihlo. Ukuzama ukukhusela le mfihlo, olu phando alunakuba nagama lakho, nazinkcukacha zinokusetyenziselwa ukwazi ukuba ungubani na. Olunye ulwazi malunga nokubhala nokufunda ngamanani abantu abagulayo bendawo ethile luthatyathwe kumqulu wezigulana kodwa igama nenombolo yefolda yakho azisetyenziswanga. Olu phando luquka ukwenziwa kovavanyo. Olo vavanyo luyakugcinwa khuselekileyo kwikhabhathi etshixwayo enokuvulwa ngumphandi kuphela.

Ukuba sibhala ingxelo okanye inqaku malunga nolu phando, ulwazi lokuba ungubani luyakukhuselwa lufihlwe ngangoko sinako.

Yintoni ubungozi bolu phando?

Kukho ukukhathazeka okungephi kuba kuthethwa ngemiba enxulumene nesandulela sikaGawulayo. Ukuba ufuna amacebo okumelana nale meko nceda udibane nomphandi uya kukuququzelela oko.

Luyini uncedo lolu phando?

Olu phando alwenzelwanga ukunceda wena buqu, kodwa iziphumo zalo zinganceda umphengululi ukuba afunde banzi malunga nolwazi nokuqonda koomama abanesandulela sikaGawulayo nangokondliwa kweentsana zabo. Siyathemba ukuba, kwixa elizayo, abanye abantu bangancedeka kolu phando ngokuphucuka kokuqondwa kweemeko okanye indawo abakuyo oomama abanesandulela sikaGawulayo ekuthatheni kwabo isigqibo malunga nokondla iintsana zabo.

Ndinyanzelekile ukuba ndibe kolu phando kwaye ndingarhoxa nanini na?

Ukuthatha kwakho inxaxheba kolu phando kuqhutywa kukuzithandela. Ungakhetha ukungathathi nxaxheba xa ukungafuni. Ukuba ugqibe ukuba mawuthathe inxaxheba kolu phando, ungarhoxa nanini na xa ufuna. Ukuba ugqiba ekubeni mawungathathi nxaxheba kolu phando okanye ukhethe ukurhoxa nakweliphi na ixesha lophando, awusayi kohlwaywa okanye uphulukane nalo naluphi na uncedo onelungelo lalo.

Ingaba kukho uncedo na ukuba ukuthatha kwam inxaxheba kolu phando kundiphethe kakubi?

Ukuba umthathi-nxaxheba uziva efuna iingcebiso, iyakuba luxanduva lomphandi ukwenzela umthathi-nxaxheba idinga nomcebisi ofanelekileyo.

Ukuba ndinemibuzo?

Olu phando luqhutywa nguJenna Jessie Morgan weSebe lokOnga kwiYinivesithi yaseNtshona Koloni. Ukuba uneemibuzo malunga nolu phando, nceda uthethe nomphandi okanye naye buqu iinkcukacha zakhe zisemantla ephapha elidlulileyo.

Ukuba uneemibuzo malunga nolu phando, kwaye ufuna ukwazi amalungelo akho njengomthathi-nxaxheba kolu phando okanye uneengxaki ohlangabene nazo ezinxulumene nolu phando, nceda uqhakamshelane nomnye kwaba balandelayo:

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Olu phando lwamkelwe libhunga lokuqingqa imithetho yophando nekomiti yemikhwa esesikweni yeYunivesithi yaseNtshona Koloni.



Appendix E: Informed Consent (English)

INFORMED CONSENT



UNIVERSITY of the WESTERN CAPE

Jenna Jessie Morgan
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Title of Research Project:

Factors influencing the infant feeding choices of HIV positive mothers at a level two hospital in Cape Town.

The study has been described to me in language that I understand and I freely and voluntarily agree to participate. My questions about the study have been answered. I understand that my identity will not be disclosed and that I may withdraw from the study without giving a reason at any time and this will not negatively affect me in any way.

Participant's name
Participant's signature
Witness name
Witness signature
Date

Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact the study coordinator:

Dr J Jeggels
University of the Western Cape
Private Bag X17, Belville 7535
Telephone: (021)959- 2278
Fax: (021)959-2679
Email: jjeggels@uwc.ac.za

Appendix F: Consent Form (Xhosa)

Imvume eyazisiweyo



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IFOMU YESIVUMO

Isihloko sophando:

Imiba ephembelela kukhetho lokondliwa kweentsana zabazali abanesandulela sikaGawulayo kwizibhedlele zomgangatho wesibini eKapa.

Olu phando ndiluchazelwe ngolwimi endilugqondayo kwaye ndiyavuma ukuthatha inxaxheba ngokuthanda kwam ndinganyanzelwanga mntu. Imibuzo yam malunga nolu phando iphendulwe. Ndiyaqonda ukuba akusayi kwaziswa ukuba ndingubani kanye kwaye ndingarhoxa kolu phando ndinganikanga zizathu nanini na ndifuna njalo kwaye oko akusayi kundichaphazela ngendlela embi nanini na nakweyiphi imeko.

Igama lomthathi-nxaxheba

Isandla somthathi-nxaxheba

Igama lengqina

Isandla sengqina

Umhla

Ukuba uneemibuzo emalunga nolu phando okanye unqwenela ukuxela iingxaki ohlangabezane nazo ezimalunga nolu phando, nceda uqhakamshelane nomlungelelanisi wophando:

Igama lomlungelelanisi wophando:

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Appendix G: Data Collection Tool

Data Collection Tool: Questionnaire

Date Delivery:

Date of Interview :

Ward :

Questionnaire Number _____

Please fill in the numerical value, date or mark with an x where indicated.

Section A: Socio-demographic characteristics

1. What is your age in years?

2. What race do you consider yourself?

€ African

€ White

€ Coloured

€ Indian

€ Other

3. Are you a South African Citizen?

€ Yes

€ No



4. What level of education have you reached?

€ No Schooling

€ Up to St1/gr3

€ Std2-std3/gr4-gr5

€ Std 4-std5/gr6-gr7

€ Std6-std7/gr8-gr9

€ Std8/gr10

€ Std9/gr11

€ Std10/matric

€ Diploma/Occupational Certificate

€ First Degree

€ Higher Degree

€ Other.....

5. Are you and the father of the baby still in a relationship?

- € Yes, in a relationship
- € NO, not in a relationship
- € Other.....

6. What is your Employment Status?

- € Employed (If yes skip to question 8)
- € Unemployed

7. Have you got another form of income if unemployed?

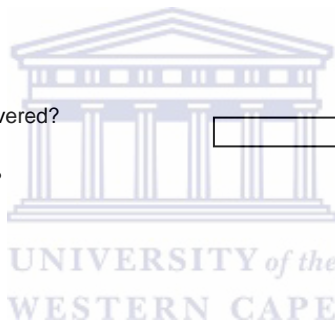
- € Yes
- € No

Section B: Obstetric History

8. How many alive babies have you delivered?

9. How did you deliver this baby/babies?

- € Normal Vertex Delivery
- € Caesarean Section



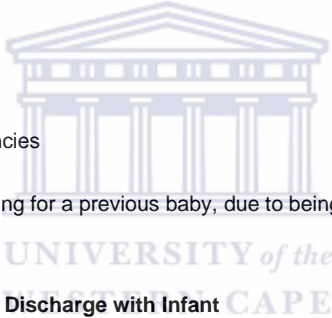
10. Were you enrolled in PMTCT with this pregnancy?

- € Yes
- € No

11. When did you start ART's?

- € Been on HAART prior to pregnancy
- € Started before 28 wks
- € Started at or after 28wks
- € Was not on ART's

Section C: Previous Obstetric History and Infant Feeding Practices (Skip Section C if participant is a primigravida)

12. Were you diagnosed with HIV in any previous pregnancies?
- € Yes, tested positive in last pregnancy
 - € No, tested negative in last pregnancy
 - € Untested
13. How did you feed your most recent previous baby?
- € Exclusive breastfeeding
 - € Exclusive formula feeding
 - € Mixed feeding
14. Have you ever received infant feeding counselling with a previous pregnancy due to having been HIV positive?
- € Yes
 - € No
 - € HIV negative in previous pregnancies
15. If you received infant feeding counselling for a previous baby, due to being HIV positive, in which year did you **first** receive counselling?
- 
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Section D : Current Infant Feeding Choice on Discharge with Infant

16. What is your current infant feeding choice?
- € Exclusive breastfeeding
 - € Exclusive formula feeding
 - € Mixed Feeding
17. Did you receive advice in making your infant feeding choice?
- € Yes
 - € No (If No, skip to question #11)

18. If you did receive advice, who was the person from whom you received the most advice regarding your infant feeding choice?

- Health care professionals
- Partner
- Mother
- Sibling/Family member
- Friends
- Other
- Not applicable (Answered "No" for Question 9)

19. If exclusive formula feeding, would you still formula feed if you were not given any free formula from the clinic and you had to buy it yourself?

- Yes
- No

20. If free formula was not made available by health care providers would it have made your infant feeding choice easier or difficult?

- Easier
- Difficult
- Neither easier nor more difficult



21. Where you told that the government plan to stop providing free formula later this year?

- Yes
- No

Section E: Health Service Usage and Infant Feeding Counselling

22. Did you receive infant feeding counselling in this pregnancy?

- Yes
- No (If No, skip to question 22.)

23. At which health care setting did you primarily receive infant feeding counselling?

- Khayletisha MOU (Site B)
- Mitchells Plain MOU
- Gugulethu MOU
- Mowbray Maternity Hospital
- Not Applicable (no counselling)
- LABU as a low risk government patient
- LABU as a private patient
- BANC site at a CHC
- Other.....

24. Did you receive counselling on infant feeding options within 72hours of delivery?

€ Yes

€ No

25. Are you comfortable with your chosen feeding choice?

€ Yes

€ No

26. Do you feel you had the freedom to choose **your own** infant feeding method?

€ Yes

€ No

Section F: Questions Regarding infant feeding and PMTCT

27. What infant feeding options are available to all HIV positive mothers?

€ Exclusive breastfeeding

€ Exclusive formula feeding

€ Mixed feeding

€ Other.....



28. Can a HIV positive woman infect her baby during breastfeeding?

€ Yes

€ No

€ Unsure

29. Are there any dangers or problems with formula feeding?

€ Yes

€ No (If No, skip to question 29.)

€ Unsure

30. What type of problems are there with formula? (Tick all that apply)

- Expensive
- Access to clean, boiled and cooled water
- Need for equipment e.g. fridge, kettle
- Danger of diarrheal diseases
- Other and relevant.....
- Unsure
- Not Applicable

31. Is mixed feeding a safe feeding method?

- Yes
- No
- Unsure

32. At what age is it acceptable to introduce other types of feed and stop exclusively formula or exclusively breastfeeding?

- 6 months
- Any other answer besides 6 months

33. **An exclusive** feeding choice is one that you can either formula feed or breast feed as long as you don't do both at the same time?

- True**
- False**



34. Do you still have unanswered questions regarding your infants feeding choice?

- Yes
- No

Section G: HIV disclosure

35. Who have you disclosed your HIV status to?

- Partner
- Mother
- Sibling/Family Member
- Friend
- More than Ten people
- Nobody

36. Are you scared to disclose your HIV status?

€ Yes

€ No

€ Not Applicable

