DETERMINANTS CONTRIBUTING TO EXCLUSIVE BREASTFEEDING IN HIV-INFECTED MOTHERS OF INFANTS AGED 0-6 MONTHS WHO ATTEND AN NGO HEALTH CENTRE IN ELANDSDOORN VILLAGE

by

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for the degree of

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SUPERVISOR: PROF PR RISENGA

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DECLARATION

I declare that **DETERMINANTS CONTRIBUTING TO EXCLUSIVE BREASTFEEDING IN HIV-INFECTED MOTHERS OF INFANTS AGED 0-6 MONTHS WHO ATTEND AN NGO HEALTH CENTRE IN ELANDSDOORN VILLAGE** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted before for any other degree at any other institution.

21 November 2016

..... **.....**

SIGNATURE **DATE**

Katlego Thabo Mohlajoa

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ABSTRACT

Introduction

Breastfeeding is particularly important in resource-poor regions of the world, where limited access to clean water increases the risk of diarrhoeal disease if replacement feeding is used. However, human immunodeficiency virus type 1 (HIV-1) is transmitted through human milk.

Purpose of the study

The purpose of this study was to describe the determinants contributing to exclusive breastfeeding in HIV-infected mothers of infants aged 0 to 6 months who attend an NGO Health Centre in Elandsdoorn Village.

Methods

A quantitative research approach using a non-experimental cross-sectional study was undertaken to conduct this study. A self-reported study questionnaire was used to collect data from study participants. Purposive sampling was used to sample 75 mothers from 18 to 45 years of age who were HIV-positive. SPSS version 23 was used to analyse the data.

Results

The study results indicated that there are determinants contributing to exclusive breastfeeding and a need to establish a more comprehensive approach to educating pregnant women on reproductive health issues, and exclusive breastfeeding in

particular. Factors contributing to low levels of exclusive breastfeeding included breast problems, societal influence, maternal health concerns, insufficient support, fear of stigmatisation, and babies' health concerns. This caused mothers to discontinue exclusive breastfeeding.

Conclusions

The intention of this study was to reveal the determinants of exclusive breastfeeding affecting mothers who are HIV-infected and breastfeeding their infants.

Keywords

Exclusive breastfeeding; HIV; resource limited setting; rural area; quantitative.

ACKNOWLEDGEMENTS

I am thankful to the Father of my Lord Jesus Christ, Almighty God, the One who made it possible for me to get a head start in life. To God be the glory and honour.

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Dedication

In memory of my father who passed on before he could see the great work God has done in my life.

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ACRONYMS

AFASS	Acceptable, Feasible, Affordable, Sustainable and Safe: the criteria to provide infants with replacement feeding.
AIDS	Acquired Immune Deficiency Syndrome: the last stage of HIV-disease progression.
ANC	Antenatal Care: health care interventions for pregnant women.
ANOVA	Analysis of Variance: a collection of statistical methods used to analyse the differences among group means and their associated procedures.
ART	Antiretroviral Therapy: care given to patients who are have been diagnosed with or exposed to HIV infection.
ARVs	Antiretroviral Drugs: drugs provided for the suppression of HIV in the human body.
AZT	Zidovudine: one of the earliest ARV drugs available for viral suppression of HIV replication.
CD4	Cluster of Differentiation 4: a component of the immune system which is targeted by HIV.
CDC	Centers for Disease Control and Prevention: a United States public health institute at the forefront of reducing the impact of disease burden in countries worst affected by diseases.
DALYs	Disability-Adjusted Life Years: lost years of healthy life, i.e. one DALY equals one lost year of healthy life.
DOH	Department of Health: a government department dealing with health issues in South Africa and related issues across its borders.
EBF	Exclusive Breastfeeding: a process whereby an infant is fed with breastmilk only for a specified period of time which is usually 6 months or less.
EBFR	Exclusive Breastfeeding Rate: the number of women exclusively breastfeeding in a given population.
EFV	Efavirenz: is a non-nucleoside reverse transcriptase inhibitor, a type of an ARV that blocks the enzyme reverse transcriptase from replicating inside the CD4 cell.
FDC	Fixed-dose Combination: any number of drugs combined as a single drug usually in tablet form.
FTC	Emtricitabine: is a nucleoside reverse transcriptase inhibitor, an ARV capable of suppressing HIV replication and is suitable for adult use.
HAART	Highly Active Antiretroviral Therapy/Treatment: drugs designed to effectively suppress HIV.

CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

The benefits of breastfeeding are well recognised and include significantly decreased infant morbidity and mortality rates by providing optimal nutrition, protecting babies against common childhood infections such as gastrointestinal and respiratory infections, and by promoting child spacing (Shearer 2008:1046).

According to Shearer (2008:1046), breastfeeding is particularly important in resource-poor regions of the world, where limited access to clean water increases the risk of diarrhoeal disease if replacement feeding is used. However, human immunodeficiency virus type 1 (HIV-1) is transmitted through human milk, leading to the dilemma of increased use of replacement feeding in resource-poor settings, although protecting the infant against HIV-1 infection could also place the infant at risk of mortality from other infections (Shearer 2008:1046).

Moland, De Paoli, Sellen, Van Esterik, Leshabari and Blystad (2010:2) argue that the issue of infant feeding has been particularly challenging in a PMTCT context because the options available, breastfeeding or not breastfeeding, both involve risks to child health and survival. How to weigh the benefits of breastfeeding against the risk of HIV infection is an issue that has been vigorously debated.

Globally, about 300 000 babies become infected with HIV through breast milk each year, while at the same time 1.5 million children die each year if the woman opt not to breastfeed (Bekere, Garoma & Beyene 2014:37). Cai, Wardlow and Brown (2012:4) assert that trend data indicates the prevalence of exclusive breastfeeding among infants younger than six months in developing countries increased form 33% in 1995 to 39% in 2010, and more modest improvements were observed in South Asia from 40% in 1995 to 48% in 2010.

Bekere et al (2014:38) observed that in most African countries exclusive breastfeeding for 6 months followed by rapid cessation is heavily promoted among HIV-positive women. Though HIV transmission through breastfeeding is pervasive in Sub-Saharan Africa, mixed feeding is also a predominant form of infant feeding as a result of a combination of traditional, economic conditions and cultural norms.

Furthermore, Bekere et al (2013:38), explain that almost all HIV-positive women in the Sub-Saharan region choose exclusive but due to little information and lack of practical support, the majority end up with mixed feeding resulting in high rates of postnatal HIV transmission.

According to Goga, Doherty, Jackson, Sanders, Colvin, Chopra and Kuhn (2012:10), HIV-negative South African women receive ambiguous feeding messages due to the following factors: (i) Child health care providers may not have received standardised training on feeding in the context of HIV, (ii) The promotion of commercial infant formula feeding as part of the Protein Energy Malnutrition scheme. (iii) The Code of Marketing of Breastmilk Substitutes was not legalised when the PMTCT programme was inititated in 2002, (iv) The infant feeding counselling is the weakest link in the routine child health programme.

However, Goga et al (2012:11) acknowledges that HIV-positive women, on the other hand, received the necessary clarification on infant feeding practices from trained PMTCT counsellors. The authors further mention that the South African poor infant feeding habits are systemic. In the same breath the Tshwane Declaration for Support of Breastfeeding recommended the removal of free commercial infant formula as part of the PMTCT programme and the promotion of exclusive breastfeeding to optimise child survival.

Against the backdrop of antiretroviral therapy (ART), HIV-infected breastfeeding mothers stand a chance of protecting their babies against vertical transmission of HIV on the one hand through exclusive breastfeeding, and providing optimum nutrition for their children on the other. This is attributable to viral suppression of the AIDS causing organism (Shearer 2008:1046).

1.2 BACKGROUND INFORMATION ABOUT THE RESEARCH PROBLEM

The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommend that exclusive breastfeeding should be continued for six months (180 days). The term exclusive breastfeeding is used when all fluid, energy, and nutrients are provided by breast milk, with the possible exception of small amounts of medicinal supplements (Brown, Dewey & Allen 1998:3).

In South Africa one of the goals of the Integrated Nutrition Programme (INP) is to enable all women to breastfeed their children exclusively during the first six months after birth, and thereafter to continue breastfeeding in addition to the introduction of appropriate complementary foods up to 24 months of age (Department of Health: INP for South Africa 2002:47).

Read (2003:1196) mentions that in developing societies such as South Africa breastfeeding are always seen as the norm. However, there is public health concern around HIV-transmission by HIV-infected mothers through breastfeeding, and this has sharpened a continuing debate on this issue. Read (2003:1196) also elaborates that at the same time there are serious concerns of diarrhoeal disease that causes death in HIV-exposed infants who are fed with milk formulas prepared by mixing milk powder with locally accessed water, which is almost always contaminated by sewage in impoverished communities.

Both alternatives are very extreme – breastfeeding and formula feeding – and expose infants to HIV-infection or recurring bacterial diarrhoea, dehydration, and possibly death (Read 2003:1196).

The short- and long-term benefits of breastfeeding have been well documented for both the mother and her infant (Coutsoudis, Kwaan & Thomson 2010:1163). In the short-term, breastfeeding decreases maternal postpartum blood loss, and promotes bonding between mother and child. For the mother, the long-term effect is that it is associated with a decrease in the risk in breast and ovarian cancer, gestational weight gain, diabetes mellitus type 2, and myocardial infarction, among others. The benefits for infants include the reduction of morbidity, improved child growth, and survival. It also prevents infectious diseases and reduces childhood obesity and fatal diseases such as

leukaemia and sudden-death syndrome (Ip, Chung, Raman, Trikalinos & Lau 2009:517-530). The protective effects of human breast milk are due in part to its optimal nutritional composition, and it typically provides most of the protein and energy needs of infants with nutrients such as vitamins A, C, and B-12, as well as folate and copper (Gibson, Ferguson & Lehrfeld 1998:764-770).

Babies visiting the clinic at six weeks are tested for HIV using the PCR test. The clinic has 100% success rate on the initial PCR test, i.e., the six-week test. This is contrary to the 18-month antibody test results where an average of 5% of the babies who tested negative at six weeks, test HIV positive. Their mothers are either on short-course ART or are enrolled in the HAART programme, receiving chronic treatment for HIV. The rural community of Elandsdoorn Village in Limpopo Province has to date not been the focus of a study on exclusively breastfeeding mothers who are infected with HIV. However, there is well-documented evidence that exclusive breastfeeding is the most effective and preventive intervention to reduce early-childhood mortality. Optimum breastfeeding practices have the potential to prevent 1.4 million deaths every year among children under the age of five (UNICEF 2010:6). And hence this study aims to understand "the determinants contributing to exclusive breastfeeding in HIV-infected mothers of infants aged 0 to 6 months who attend an NGO Health Centre in Elandsdoorn Village."

For the majority of women in resource-poor countries, the tragic reality is that there is no choice but to breastfeed their babies; thus breastfeeding remains a significant mode of contracting HIV in infants. However, exclusive breastfeeding is rarely a norm in African settings as it is culturally appropriate and often expected to introduce simple foods and liquids along with breast milk very early in an infant's life (Buchanan & Cunningham 2009:497-507).

Tampa-Myaah and Kumi-Kyerere (2013:5), in their findings relating to the determinants of exclusive breastfeeding, indicate that mothers and relatives usually give infants water and/or other liquid concoctions as a way of quenching infants' perceived thirst, as a way of culturally welcoming them into the world. Another determinant of these findings is the place of delivery: 49% of mothers who delivered at home or in government hospital tend to exclusively breastfeed. However, babies who were considered large at birth were breastfed as compared to those born small, who received milk formula.

The study can be of significant benefit to improve HIV-care and support programmes in terms of establishing determinants of exclusive breastfeeding in HIV positive mothers. A better understanding of the challenges these mothers are facing can yield to improved interventions by the healthcare system.

1.3 RESEARCH PROBLEM

In Limpopo Province, HIV-infection was associated with the greatest proportion of childhood deaths. The under-five mortality rate was 49.1 per 1000 (SAHR 2010:66). Child mortality is a reflection of the health status of children and a surrogate marker of the quality of health care in any society (SAHR 2010:60). Even though mothers are given infant feeding counselling in health care settings, the challenges they face may be a barrier to implementing what they have learned from healthcare professionals. The entry point in the PMTCT programme in our facility is HIV-counselling and -testing, and subsequently mothers receive education as a supportive means of care. In a resource-poor setting, it is imperative to establish how HIV-positive mothers are contributing to ensuring that vertical transmission of HIV is being prevented. Another aspect to consider is the appropriate support these mothers are getting from the healthcare providers attending to their needs at clinic level. HIV-infected pregnant mothers receive health education and are counselled on exclusive breastfeeding to promote the PMTCT. HIV-counselling and testing (HCT) are provided by trained counsellors, and these procedures are immediately followed by testing HIV-infected mothers to determine their CD4 cell count. The counselling sessions – which include infant feeding and adherence counselling – continue until the mothers deliver their babies thus enhancing the survival of their children despite the negative HIV-status of the mothers (Tempelman, Slabbert, Gosling & Vermeer 2011:128).

The study is therefore relevant in order to describe the determinants of exclusive breastfeeding among HIV-positive mothers in a rural setting.

1.3.1 Rationale

Du Plessis, Peer, Honikman and English (2016:109) affirm that recent global evidence shows that breastfeeding does benefit both mothers and babies in rich and poor nations. Furthermore, evidence suggests that concerted efforts to scale up

breastfeeding interventions, policies and programmes can bring about rapid change which creates an enabling environment to practice breastfeeding and positively impacting future health of mothers and their children.

Du Plessis et al (2016:111) said the benefits of breastfeeding are increasingly emphasised throughout the world in scientific literature. During pregnancy most women express the desire to breastfeed. It has to be established what influences women to not breastfeed or to stop breastfeeding in the early postpartum period.

In 2008, South Africa was classified as one of the 36 countries with the highest global prevalence of unsatisfactory birth outcomes like intra-uterine growth restriction, childhood stunting and underweight (SANDH 2013a).

Du Plessis et al (2016:119) add that a review of the literature on breastfeeding in South Africa suggests that exclusive breastfeeding practices have stagnated at around 8% for age six months. Much still needs to be done to improve exclusive and continued breastfeeding rates in the country.

The importance of measuring the determinants of exclusive breastfeeding cannot not be underestimated in the South African context.

1.4 AIM OF THE STUDY

The aim of the study is to describe the determinants of exclusive breastfeeding among HIV-positive mothers in a rural setting.

1.4.1 Research purpose

The purpose of this study is to understand the determinants contributing to exclusive breastfeeding in HIV-infected mothers of infants aged 0 to 6 months who attend an NGO Health Centre in Elandsdoorn Village. The finding will inform the health workers' interventions during their relationship with mothers who are HIV-positive, nursing infants under six months of age.

1.4.2 Research objectives

From the research topic: “The determinants contributing to exclusive breastfeeding in HIV infected mothers of infants aged 0 to 6 months who attend an NGO Health Centre in Elandsdoorn Village,” the following research objectives were decided upon:

- Describe the determinants of exclusive breastfeeding for HIV-positive mothers during the first six months of life.
- Describe the barriers experienced by HIV-infected mothers to exclusively breastfeed their infants during the first six months of life.

1.5 SIGNIFICANCE OF THE STUDY

The findings will inform the health workers’ interventions during their relationship with mothers who are HIV-positive who have nursing infants under six months of age; breast milk is key to a child’s development as it plays a major role in nutrition, health, and development for both HIV-infected and HIV-negative infants. It is the ideal nourishment for infant survival and development. When infants are breastfed for the first six months of their lives, the immune system is stimulated thus protecting them against diseases such diarrhoea and respiratory infections, which are considered two of the major causes of child mortality in the developing world (UNICEF 2006:4).

Furthermore, exclusive breastfeeding is one of the strategies recommended for developing countries in the prevention of mother-to-child transmission of HIV after delivery (WHO 2009:32). Exclusive breastfeeding for up to six months is associated with a three- to four-times decreased risk of HIV-transmission as compared to mixed feeding. In contrast, replacement feeding is viewed as an impractical strategy for infant feeding because of the high cost involved in supplementary feeds, and the lack of clean water in under-resourced settings, primarily developed countries (UNICEF 2011-2012:56).

The purpose of this study is to influence infant feeding practices by encouraging both health professionals and HIV-infected mothers to focus on a joint effort to ensure infants receive the optimal benefits of breast milk, and to reduce HIV-transmission rates postnatally through mixed-feeding practices. Infants who are exclusively breastfed can benefit from the good nutritional value of breast milk, and simultaneously avert the risk

of infection. The study will strive to reinforce infant feeding lessons for HIV-infected mothers, and promote the formation of future support groups.

1.6 DEFINITIONS OF TERMS

1.6.1 Exclusive breastfeeding

WHO (2010:4) defines exclusive breastfeeding as the process of giving only breast milk to the infant from ages 0 to 6 months, excluding water and all other types of food. This definition is endorsed by this study.

1.6.2 Formula feeding

WHO (2009:4) defines formula feeding as the process whereby the infant is given powdered milk prepared with hot water. This study will use this definition as explained here.

1.6.3 HIV-exposed infants

WHO (2009:4) describes the HIV-exposed infant as one who is born to an HIV-infected mother. This definition is upheld in this research.

1.6.4 Mixed feeding

Abiona, Onayade, Ijadunola, Obiajunwa, Aina and Thairu (2006:136) explain mixed feeding as the process of breastfeeding combined with other foods in-between breastfeeding sessions, such as cereals, soft porridge, etc. This research supports this definition.

1.6.5 Pre-lacteal feeding

Abiona et al (2009:136) define pre-lacteal feeding as a method whereby the infant is fed any other foods or liquids before ingesting the first breast milk from the mother. This definition is maintained in this study.

1.6.6 Replacement feeding

Saka (2013:11) explains replacement feeding as the process of feeding a child, who is not receiving any breast milk, a liquid diet that provides all the nutrients needed for its growth until solids are introduced. This definition is upheld in this study.

1.6.7 Vertical HIV-transmission

Young et al (2011:225) define vertical HIV-transmission as a term that is interchangeably used with mother-to-child HIV-transmission, and the term is used as such in this research.

1.7 RESEARCH DESIGN AND METHOD

A quantitative research approach was undertaken to conduct this study, which is defined as the investigation of phenomena that lend themselves to precise measurement and quantification, often involving a rigorous and controlled design (Polit & Beck 2010:739). This design was used to determine how breastfeeding mothers are affected by several factors in their endeavours to exclusively breastfeed their infants.

The research method used was a non-experimental, cross-sectional study: A cross-sectional study is nonrecurrent in nature and is done at a specific point in time. In this type of research, all the information on a specific topic is collected at the same time from the same participants. This investigation is limited to a given time period to determine the status of the phenomena, or a description of the relationships among phenomena, at a fixed point in time (Brink, Van der Walt & Van Rensburg 2015:101).

The research method constitutes the population, sample, sampling method, data-collection method, data analysis, validity as well as reliability, all of which are upheld in the study.

1.7.1 Population

The population comprised of HIV-infected mothers, 18 to 45 years of age, with infants aged 0 to 6 months at the time of the study.

Inclusion criteria

HIV-infected mothers who have infants aged 0 to 6 months.

Exclusion criteria

HIV-infected mothers who are very sick, including those who are mentally ill. HIV-infected mothers who brought their sick infants for consultation.

1.7.2 Sample and sampling method

The subset of the population will be selected and included in the study to help answer the research questions. The study described a state or situation using a cross-sectional design, and this description was generated from the questionnaire (Flick 2011:83). It included HIV-infected mothers of infants aged 0 to 6 months who visited the clinic for follow-up visits. Data was collected using a survey questionnaire for mothers who attended the clinic after delivery.

Sampling technique

The sampling technique of choice used was purposive, non-probability sampling. This method was employed based on the researcher's judgement regarding participants who were willing to take part in the study at the selected NGO health centre. The health centre was chosen on the basis of its HIV/AIDS/TB programmes for maternal and child care.

Sample size

The sample consisted of 75 HIV-infected mothers who visited the NGO clinic from the beginning of June 2015 to the end of August 2015 eligible according to the inclusion criteria described above, and formed part of the target population. Mothers were selected as they came to the clinic for their postnatal care visits.

1.7.3 Data collection

A quantitative data-collection method was used to collect data from participants, and to generate generalisable findings of the research. A self-reported research questionnaire was used to collect data from study participants. This method enhanced the description and exploration of determinants of exclusive breastfeeding in HIV-positive mothers.

1.7.3.1 Data-collection process

The data-collection tool was presented to the statistician for validation and restructuring. A five-point Likert scale was included in the instrument to test the mothers' knowledge of breastfeeding issues. Data was collected at an NGO clinic from the beginning of June 2015 to the end of August 2015. The data-collection instrument used was a self-designed survey questionnaire. The questionnaire used to collect data contained several sections for demography, socio-economic, breastfeeding history, etc.

1.7.4 Data analysis

The analysis of data was performed through the expertise of an experienced statistician, using SPSS version 23 and Microsoft Excel for graphical presentations and the associated statistical figures. Descriptive statistics were used to summarise demographic data in the questionnaires. Data was analysed by a statistician using computer software and edited for accuracy, then coded afterwards. It was analysed to comply with the principles of completeness and consistency.

1.7.5 Validity and reliability

It is explained in more detail in Chapter 3.

1.7.6 Population

This was the general population of all HIV-positive mothers who gave birth in the previous six months, residing in Elandsdoorn Village.

1.7.7 Study design

The research was a cross-sectional design which used a quantitative method in data collection by using a questionnaire. A subset of the population was selected to assist the researcher in answering the research questions. The information was collected at only one point in time and no follow-up was done.

1.8 ETHICAL CONSIDERATIONS

Permission to conduct the study was obtained from the University of South Africa (UNISA), Department of Health Studies, Higher Degrees Committee (Annexure A). Upon receipt of ethical clearance, a formal letter was written and submitted to all relevant institutions (Annexure B). Written permission was granted by the CEO and COO of the health facility to conduct the research (Annexure C). All major ethical issues affecting this study were observed as presented below.

1.8.1 Protecting the rights of the participants

Non-maleficence

The researcher complied with the principle of non-maleficence to minimise harm to the participants and to prevent emotional or physical discomfort. Participation in the study was strictly voluntary. The researcher refrained from doing any harm to participants and outlined that there was no part of the survey that would cause emotional discomfort to the participants. Questions did not infringe on the emotional wellbeing of participants nor invade their personal liberty.

Beneficence

Beneficence implies that the researcher minimised harm by ensuring that participants are in the presence of the counsellor who clarified misunderstandings the participants experienced. The benefit to the participant was that her views on exclusive breastfeeding will influence interventions in the PMTCT programme and by filling in the questionnaire participants ensured that their views would make a difference in the outlook of PMTCT interventions in future.

Justice

The right to fair treatment and privacy of participants was observed by not intruding on the participants' personal lives, and their selection into the study was fair. They were included in the study based on the inclusion criteria. Questions were designed not to be intrusive or infringe on aspects the participants considered as private and personal.

Self-determination

The participants were afforded the dignity to be respected as human beings and the right to self-determination thus enabling them to conduct themselves as autonomous agents. The inclusion in the study was authenticated by the participants' signatures. Participants were not coerced in any way to participate in the study. Their right to choose was upheld.

Managing discomfort

The focus of this study was on HIV-positive mothers. All participants were given the assurance that should they at any time, in any way, feel uncomfortable talking about the subject matter – i.e. their HIV status – they were free to terminate their participation without prejudice and that, if necessary, they could be referred for counselling. The mothers were not stigmatised nor prejudiced during the selection process.

1.8.2 Informed consent

The purpose of the study was clearly explained to all the participants before they were given the option whether or not to take part in the study. The researcher and his assistant approached the participants during their health-talk sessions and introduced the research topic and the purpose of the study to them. Before commencement of the study prospective participants who were interested in participating in the study received a consent form which they could sign when they consulted with the PMTCT counsellor (the assistant) in the privacy of her consultation room. The participants were offered an opportunity to ask questions and seek clarity before signing the consent form. Informed consent means that participants should have adequate information about the research, comprehend that information, and have the ability to consent to or decline participation

voluntarily (Polit & Beck 2010:157). They were reminded that participation was voluntary and that if they felt they were no longer interested in being part of the research they could withdraw without having to explain their actions and without any consequences. The questionnaire (Annexure E) was completed after the participants consented to be part of the study. All participants who took part in this study have signed the consent form (Annexure D).

1.8.3 Confidentiality and anonymity

In order to ensure that confidentiality and anonymity were maintained the researcher adhered to the following: confidentiality procedures put in place which guaranteed that participants had the right to expect that data they provided would be kept in strict confidence. The participants were verbally reassured that the information they provided would not be shared with any other party not involved in this research, and such information cannot be linked to any individual who participated in the research. In addition to this a confidentiality clause in annexure D was read to participants and further explained were clarity was sought. For this reason, anonymity was the most secure means to ensure confidentiality. The research team was not able to link the participants to their data. The responses to questionnaires were anonymous as questionnaires were numbered during data coding process.

(i) *Unauthorised access*: data was protected from unauthorised persons by maintaining a secure link from the participants to the researcher and then to the statistician. The statistician received primary/raw data electronically. The completed survey questionnaires were locked away in the cottage where the researcher was the only person having access to.

(ii) *Sensitive data:* information pertaining to sexual orientation or sexual behaviour of participants was not disclosed to third parties and participants were reassured thereof. The participants were informed that they have the right to withhold information and were not obliged or bound to disclose it if they felt uncomfortable sharing it.

(iii) *Protection of participants' identity:* the survey questionnaire was structured such that it did not accommodate space for the participants' name or field that could

link any participant to their questionnaire. The participant's identity was not revealed in the questionnaire.

(iv) *Privacy:* the participants' privacy was protected because they completed the questionnaire in the safety of the counsellor's consultation room where no one knew whether they participated in the study or not.

1.8.4 Research misconduct

Research misconduct constitutes fabrication, falsification or plagiarism in proposing, performing or reviewing research, or in reporting research results. Fabrication involves inventing data or study results, manipulating research material, equipment or processes; it also involves omitting or changing data or distorting results to the extent that the research could not be accurately represented in reports (Polit & Beck 2012:169). The researcher avoided any form of scientific dishonesty by transcribing truthfully the recorded information on the questionnaire into the data-recording template designed by the statistician. The statistician entered the collected data into the SPSS computer software for analysis.

1.9 SCOPE OF THE STUDY

The proposed research was conducted in the NGO clinic in Elandsdoorn Village in Limpopo Province. The scope of the study's focal point was HIV-infected mothers who visited the rural-based NGO clinic after the delivery of their infants, i.e., when infants are between 0 and 6 months of age. The study was based on a self-report questionnaire.

1.10 SUMMARY OF CHAPTERS

This study consists of five chapters, which are as follows:

Chapter 1 covers the orientation to the study, the background of the study, and how it was developed. Included here are the title of the research, the research problem, and research objectives.

Chapter 2 entails the literature review and the topics covered by other researchers in the field of exclusive breastfeeding and its determinants and barriers.

Chapter 3 covers the research design chosen for the study. The chapter has details of the research setting, research design and validity and reliability of the study.

Chapter 4 focuses on data analysis and interpretation; the findings are presented graphically and statistically.

Chapter 5 concentrates on the conclusions drawn from the study. This chapter presents an overview of the study, summary, and interpretations of the results and recommendations.

1.11 CONCLUSION

This chapter outlined the key aspects of the research in reference to the pertinent issues affecting HIV positive mothers and the dilemma of breastfeeding and running the risk of infecting their babies with HIV or on the other hand to not breastfeed and deprive their babies the essential nutrients necessary for growth in the first few months of life.

Furthermore chapter 1 introduces breastfeeding obstacles facing the South Africa in terms of non-improvement in breastfeeding rates. The terms associated with infant feeding practices and used in this report were defined.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter focused on the orientation of the research and looked at aspects of research methodology and techniques to be used. However, it becomes necessary to find out how other researchers approached this subject and what their findings were, therefore this chapter is based on literature review of quantitative studies conducted on this research topic. It will describe reviewed literature, breast milk composition and its benefits, myths about breastfeeding and breastfeeding practices, constraints and motivators of breastfeeding, HIV disclosure and mental health aspects associated with breastfeeding.

The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommend that exclusive breastfeeding should be continued for six months (180 days). The term exclusive breastfeeding denotes all fluids and nutrients provided exclusively by breast milk, with the possible exception of small amounts of medicinal supplements (Brown et al 1998:3).

In South Africa one of the goals of the Integrated Nutrition Programme (INP) is to enable all women to breastfeed their children exclusively during the first six months of life, and thereafter to continue breastfeeding in addition to the introduction of appropriate complementary foods up to the age of 24 months of (Department of Health: INP for South Africa 2002:47).

Shearer (2008:1046) mentions that the benefits of breastfeeding are well recognised and include significantly decreased infant morbidity and mortality rates by providing optimal nutrition, by protecting babies against common childhood infections such as gastrointestinal and respiratory infections, and by promoting child spacing.

According to Shearer (2008:1046) breastfeeding is particularly important in resource-poor regions of the world, where limited access to clean water increases the risk of

diarrhoeal disease if replacement feeding is used. However, human immunodeficiency virus type 1 (HIV-1) is transmitted through breast milk, leading to the dilemma, especially in resource-poor settings, of the increased use of replacement feeding which, although protecting the infant against HIV-1 infection, could place the infant at risk of other possibly fatal infections.

Read (2003:1196) says in developing societies, breastfeeding is always the norm. However, there is a public health concern over HIV-transmission with breastfeeding by HIV-infected mothers, and this issue has intensified continuing debate. At the same time there are serious concerns of diarrhoeal disease that causes death in HIV-exposed infants who are fed with milk formulas prepared by mixing milk powder with local water which, in impoverished communities, is almost always contaminated with sewage.

Thus the two extreme alternatives, namely breastfeeding and formula feeding, expose infants to either HIV-infection or recurring bacterial diarrhoea, dehydration, and possibly death (Read 2003:1196).

According to Koima (2013:10), globally, the estimated number of children younger than 15 years of age living with HIV increased from 1.6 million in 2001 to 2.5 million in 2009. Almost 90% of these children live in sub-Saharan Africa. In the year 2008, there were 280 000 children who died due to AIDS-related diseases across the globe. However, access to PMTCT services has increased thus decreasing the number of infants born with HIV.

2.2 REVIEWED LITERATURE ON EXCLUSIVE BREASTFEEDING

Previous studies on the determinants of exclusive breastfeeding in both rural and urban settings have been reviewed. Goosen, McLachlan and Schübl (2014:51-53), Shearer (2008:1046) and Read (2003:1196) in the reviewed literature covered aspects such as cultural practices influencing exclusive breastfeeding, benefits of breastfeeding, influence of societal and economic trends on a breastfeeding mother, and the level of family and educational influence on the nursing mother’s decision to breastfeed exclusively. Furthermore, this study discusses infant feeding practices in the context of vertical transmission of HIV using both theoretical and empirical literature to cover key aspects of this phenomenon.

2.2.1 Quantitative studies on exclusive breastfeeding

A descriptive cross-sectional study conducted in the Western Cape detailed findings related to exclusive breastfeeding in a low-income setting. Goosen et al (2014:53) said the objective of this study was to provide a detailed description of the infant feeding practices in a low-income community during the first six months of life. Participants interviewed were the biological mothers of the infants. The age range of the mothers was 15 to 45 years, and that of the infants < 1 to 5 months. Two-thirds (66%; n=93) of the infants were younger than three months. Eighty-one percent (n=112) of the participants were unmarried, and 60% (n=84) lived without a male partner or husband. Ninety-one percent (n=127) had obtained a high school qualification or higher, and 73% (n=102) were unemployed. Most mothers (96%) had given birth in a government health facility (n=135).

The breastfeeding initiation rate from this study was 77% and is lower than the rates observed in other developing countries (95%). Goosen et al (2014:53) highlights the national rate in 2008 was 88%. Most of the mothers who discontinued breastfeeding did so before their infants were three months of age (Goosen et al 2014:51-53).

Setegn, Belachew, Gerbaba, Deribe, Deribew and Biadgilign (2012:5) said the total of 668 mother-infant pairs were included in a quantitative study in Ethiopia to assess the factors associated with exclusive breastfeeding practices. The study revealed that the prevalence of breastfeeding practices for infants younger than six months was 71%. This finding was on average similar to countries such as Jordan (77%), Madagascar (70%), Zambia (74%), Ghana (79%), and Bolivia (65%). The majority (89%) of infants younger than two months were breastfed exclusively, but between ages four and five months the percentage dropped to 17%.

In addition to this the study highlighted a significant difference between employed and unemployed mothers with regard to exclusive breastfeeding, with percentages of 33% and 73% respectively. This revealed that unemployment of mothers is a predictor of exclusive breastfeeding (Setegn et al 2012:5).

Goosen et al (2014:51-53) and Mahdu, Chowdary and Mashti (2009:243-245) are of the view that there are similar findings on decreased exclusive breastfeeding rates (EBFR) among infants over the age of four months.

Mothers experience challenges when it comes to maintaining the practice of exclusive breastfeeding. This is also confirmed by a Nigerian study of 184 mothers which indicated that EBFR were very low at 32% despite the high level of knowledge of exclusive breastfeeding (Uchendu, Ikefuno & Emodi 2009:18). This is indicative of other factors associated with this feeding practice which may be at play. Ninety-five women cited the following reasons for non-compliance to exclusive breastfeeding:

- Family opposition – mainly from grandmothers.
- Insufficient breast milk.
- Perception that the baby is not gaining weight.

A comparison of demographic characteristics relating to the two EBFR extremes showed that mothers who provided 100% exclusive breastfeeding (EBF) had fewer children, were from the upper and middle socio-economic classes, and had a higher level of education (Uchendu et al 2009:18). These findings are in line with the observations of Onasoga, Afolayan and Oladimeij (2012:1314) that educated women are more aware of their health problems; they also know more about the availability of health services and use this information more effectively that those who are less educated.

In another Nigerian study comprising a sample of 200 women, a high level (94%) of awareness of breastfeeding was observed (Agunbiade & Ogunleye 2012:4). The number of mothers who intended to breastfeed their babies for up to a year stood at 73%. However, only 19% of the 136 mothers whose infants were younger than six months practised breastfeeding exclusively. Breastfeeding initiated immediately after birth rated 45% and 29% of these mothers who started doing so within the first two hours after the birth of their babies. The length of breastfeeding per feed was not recorded for 35% of the mothers who took part in this study (Agunbiade & Ogunleye 2012:4). In a study conducted in West Oromia, Ethiopia, mothers indicated that they were aware of the benefits of colostrum, and they knew that HIV-transmission to the baby is possible during breastfeeding. The mothers who had a secondary school

qualification were 11.5 times more knowledgeable than those with lesser educational levels (Bekere et al 2014:42).

According to several studies conducted in different areas, as stipulated above, there are different determinants to exclusive breastfeeding in different contexts, and it is clear that there was a need to identify the determinants of exclusive breastfeeding in Elandsdoorn Village. Notably, there are demands placed on breastfeeding mothers not only by their immediate families and society, but also by the health care system, and those who are employed. Expectations are also high from family and community members thus influencing the mother's decision regarding her choice to breastfeed.

Cai et al (2012:3-5) report that the prevalence of exclusive breastfeeding among infants younger than six months in developing countries increased from 33% in 1995 to 39% in 2010. This tendency was significant in most regions of the developing world, but the greatest improvement was observed in West and Central Africa where exclusive breastfeeding more than doubled from 12% in 1995 to 28% in 2010. The eastern and southern parts of Africa also experienced improvements, from 35% in 1995 to 47% in 2010 (Cai et al 2012:3-5).

In other settings involving infant and young child feeding practices, an improvement of more than 20% suggests that the increase was primarily due to reductions in suboptimal feeding practices such as water consumption, non-water substitutes such as juice, and formula feeds. Even though considerable improvements have been made in some regions of the developing world, the prevalence of exclusive breastfeeding remains unacceptably low (Cai et al 2012:4).

Lazarus, Struthers and Violari (2013:2) observed that exclusivity in breastfeeding is of critical importance, especially when given with other supportive therapeutic interventions to ensure that infants are not exposed to HIV during exclusive breastfeeding. One way of ensuring this is to provide antiretroviral therapy to both mother and child. Despite this, mixed-feeding practices are the order of the day.

Lazarus et al (2013:2) acknowledges that in Southern Africa, though cultural pressures to exclusively breastfeed are apparent, this practice is not the norm. Lazarus et al (2013:2) continues to say that in the South African context, a number of studies have

reported fairly widespread use of formula in the general population, especially among HIV-positive mothers: 27% of all mothers in a clinic sample and 23% in a community sample, and many still opt for or are obliged to formula-feed their babies, and this includes HIV-positive mothers.

Siziba, Jerling, Hanekom and Wentzel-Viljoen (2015:176) said exclusive breastfeeding rates decreased and were very low at six months of age. This finding concurs with the findings of Goosen et al (2014:53) in a study conducted in Worcester, an urban area in the Western Cape Province of South Africa. It was noted that a 77% rate was lower than the rate of 95% in other developing countries and most of the mothers who stopped breastfeeding did so before the age of 3 months.

Goosen (2013:19) highlights the importance of continuity in the provision of infant feeding counselling for mothers which affects them, the lack of culturally sensitive tools, inadequate training of healthcare professionals in infant feeding and the very busy antenatal clinics challenge the efficacy of counselling in urban areas. Thirty eight percent (n=21) of mothers reported a lack of breastfeeding knowledge and experience as a barrier to choosing breastfeeding as a feeding option.

2.2.2 Breast milk composition and how it helps the infant

Weiner and Weiner (2011:2) say that breastfeeding plays a major role in children's nutrition, their health and physiological development regardless of their mothers' HIV-status. WHO (2009:9) stipulate that breast milk is the ideal nourishment for the baby's survival and growth. According to Anyanwu, Ezeonu, Ezeanosike and Okike (2014:55), the optimal breastfeeding practices include exclusive breastfeeding (EBF) for six months, and continuing thereafter with complementary feeding for two years.

The WHO (2009:9) reflected that breast milk contains all the nutrients an infant needs in the first six months of life. These include fat, carbohydrates, proteins, vitamins, minerals, and water. Breast milk is easily and efficiently utilised by the digestive system – the baby's digestive tract absorbs almost every particle of the milk. According to Neupane, Kiragu and Kandel (2014:1), breast milk also contains bioactive factors that augment the infant's immature immune system, providing protection against infection, and other factors that help digestion and absorption of nutrients:

- *Fats:* it makes up 3.5 g of 100 ml of milk, which is half the energy content of the milk. The fat is secreted in small droplets and the amount accumulates as the baby is continuously fed, i.e., as the feed progresses the fat content is increased in the milk. As a result the *hindmilk* which is secreted at the end is rich in fat and looks creamy white, while the *foremilk* is bluish grey in colour and contains less fat (WHO 2009:9).
- *Carbohydrates:* the main carbohydrate is the special milk-sugar lactose, a dissacharide which is an important source of energy. It amounts to 7 g per 100 ml which is in excess of that found in most other sources of milk. Another component is oligosaccharides, which provide important protection against infections by preventing bacteria from attaching to mucosal surfaces (WHO 2009:9).
- *Protein:* the concentration is much lower than in animal milk. It is 0.9g per 100ml of breast milk. A good measure to avoid overloading an infant's immature kidneys (WHO 2009:9).
- *Vitamins and minerals:* with the exception of vitamin D, the infants receive minerals from the breast milk. The infant needs exposure to sunlight to generate endogenous vitamin D. Iron and zinc are present in relatively low concentrations, but their bioavailability and absorption are high (WHO 2009:9).
- *Anti-infective agents:* there are many factors in breast milk to protect the infant against infections. The following are some of the important components offering protection (WHO 2009:9):
    - Immunoglobulin: coats the intestinal mucosa to prevent bacteria from entering cells.
    - White cells: destroy micro-organisms.
    - Lactoferrins: kills viruses, bacteria, and fungi.
- *Other bioactive factors:*
    - Bile-salt-stimulated lipase: facilitates complete digestion of fat once it reaches the small intestine. Fat in artificial milk is not digested completely.
    - Epidermal growth factor: it targets the lining of the small intestine to be fully developed, and also ensures that the retina and nerves mature normal (WHO 2009:9).

2.2.3 Benefits of breastfeeding

The benefits of breastfeeding include the following:

i. *For infants*
   - Provides adequate water for hydration.
   - Provides superior nutrition for optimum growth.
   - Protects against bacterial infections such as diarrhoea through transference of antibodies present in breast milk. Infections may be caused by contaminated formula, other liquids, and foods.
   - Reduces overall neonatal mortality by 20% when initiated early.
   - Promotes bonding and development.
   - Results in better cognitive development and IQ than formula-fed children.
   - Lowers the risk of chronic conditions like diabetes, heart disease and obesity, among others, as compared with formula-fed infants.

ii. *For mothers*
   - Early initiation is instrumental in helping the uterus to contract, expelling the placenta, and reducing bleeding.
   - Helps mothers to return to their pre-pregnancy weight by lowering their body mass index.
   - Lowers the risk of pre-menopausal breast and ovarian cancer.
   - May delay return of fertility.
   - Breast milk is at the right temperature and readily available.

iii. *For society*
   - Lowers family food and health expenditures.
   - Decreases workforce absence due to decreased infant and maternal illness.
   - Bridges the divide between marginalised/vulnerable and privileged groups.

   (UNICEF 2011-2012:12)

According to Agunbiade and Ogunleye (2012:1), the technique of exclusive breastfeeding is a superior form of infant feeding. The benefits of breast milk are impressive and well documented. Goosen et al (2014:50) observe that the needy and privileged mothers both have the advantage of providing their infants with nutritious breast milk and the practice of exclusive breastfeeding can improve the nutritional

status of infants in resource-poor settings, notably rural areas. It surpasses mixed feeding because it does not expose the baby to HIV-transmission.

2.2.4 Myths around breastfeeding

UNICEF (2011-2012:12) indicates that there are several myths which still exist among people in different areas, and thus the need to conduct research in order to address and improve breastfeeding practices in communities. Common myths are the following:

- Colostrum should be discarded.
- Colostrum is dirty.
- Colostrum is yellow because it has been in the breast too long and it is bad.
- A baby should not be suckled until the “white milk” comes in.
- A sick infant should be given only rice water.
- Breast milk is not adequate for babies and therefore they need other foods and milk.
- Breast milk is too thin.
- Babies need water.
- Babies need to receive traditional teas and medicines.
- Bottle feeding is harmless and hygienic.
- Babies in industrialised or middle-income countries can safely be fed water or formula together with breast milk because the risks of contamination and diarrhoea are minimal.
- A mother who is angry or frightened should not breastfeed.
- A mother who is pregnant should not breastfeed.
- Mothers cannot eat or drink certain foods during breastfeeding.
- A mother who is ill should not breastfeed (UNICEF 2011-2012:12).

2.2.5 Breastfeeding practices

The United States health authorities recognise that previous research work suggests that initiation of breastfeeding may be more frequent among urban women than those from the rural communities, with percentages of 59% and 49% respectively (Flower, Willoughby, Cadigan, Perrin & Randolph 2008:2). In rural communities, shared

characteristics might have a direct impact on a woman's decision in infant feeding. These aspects include geographic isolation, few economic resources, and limited access to health care services. Flower et al (2008:2) say despite these differences, breastfeeding in rural communities has rarely been studied. Rural families differ in many important aspects from their urban counterparts: they are more likely to be poor, without medical aid facilities and have limited access to health facilities, especially hospital-based services.

Bekere et al (2014:37) note that disparities in demographics and health services might be expected to create a distinct pattern of influences upon breastfeeding decisions in rural communities thereby women in resource poor settings will opt for exclusive breastfeeding as a cost effective feeding option.

Due to the lack of research in breastfeeding practices among women in rural areas, it is unknown whether the factors that influence breastfeeding initiation and continuation are similar to or distinct from those observed among urban women (Flower et al 2008:2).

A study by Mahdu et al (2009:243-245) investigated demographic variables, breastfeeding and newborn care practices in rural India, and noted that breastfeeding practices seem to be influenced largely by the beliefs of the community, which are further affected by social, cultural, and economic factors. About 52% of the women in that study were illiterate, and 55% belonged to a low to medium socio-economic class. The majority of the mothers (69%) were housewives and 22% were unemployed. Among the mothers (53%) who weaned their infants after exclusively breastfeeding them for six months, cow's milk was the infants' next feed (28%). Mothers who consulted private doctors weaned their babies early as opposed to those who attended government facilities. Forty percent of the mothers who consulted private doctors breastfed exclusively for six months and 60% weaned their babies. The reasons they offered were insufficient milk, influence of their mothers-in-laws, and information from neighbours. The information to start weaning was obtained from doctors (42%), mothers-in-law (21%), and neighbours (37%).

2.2.6 Constraints and motivators to exclusive breastfeeding

Saka (2012:7) mentions in a study conducted in Dar es Salaam that breastfeeding was perceived as essential to the infant's health because it strengthens the physical and spiritual bond between mother and child. Exclusive breastfeeding was considered essential but demanding, and only a small number of mothers (19%) were able to practise exclusive breastfeeding. According to Agunbiade and Ogunleye (2012:1), the following factors were considered major constraints to breastfeeding because of the perception that babies continued to be hungry after being breastfed (29%), maternal health problems (26%), fear of babies becoming addicted to breast milk (26%), pressure from mothers-in-law (25%), pains in the breast (25%), and the need to return to work (24%).

Saka (2012:17) mentions that it is difficult to practise exclusive breastfeeding unless its value is known to community members, especially family members. Young mothers find it more difficult to practise exclusive breastfeeding as they depend on the advice of their family members when it comes to infant feeding. It becomes especially significant when young mothers depend on their families financially. Exclusive breastfeeding correlates with the age of the mother; thus mature and experienced mothers are more likely to practise exclusive breastfeeding, as compared to their younger counterparts. Another perception among HIV-positive mothers is that exclusive breastfeeding may increase the progression of HIV. The other perception is that mothers are concerned that they have inadequate breast milk (Saka 2012:17).

In a Ghanaian study to determine barriers to exclusive breastfeeding in pre-urban breastfeeding mothers, it was discovered that supposed milk insufficiency, family pressure, breast problems, and maternal employment were mentioned as constraints to the practice. In a study covering three Latin American countries, notably Brazil, Honduras, and Mexico, the risk of disease resulting from poor sanitation, readily available breast milk soon after birth, and the high cost of infant formula milk were identified as motivators of exclusive breastfeeding. This is coupled with factors such as lower socio-economic status, prior planning on exclusive breastfeeding duration, maternal unemployment, hospital delivery that promotes exclusive breastfeeding, and having baby girls (Otoo, Lartey & Perez-Escamilla 2009:34).

A study conducted in India discovered that mothers inferred that the main reason for bottle feeding their babies was inadequate breast milk (65%). Other reasons cited were poor weight gain (7.4%), inability to breastfeed (12%), and that bottle feeding is more nutritious than breastfeeding (12%). The study further stated that among children who were exclusively breastfed, 63% did not have any episodes of illness. Only 26% of breastfed children had one to three episodes of illness, and 11% had more than three episodes. To the contrary, among those who had not been exclusively breastfed, 41% had one to three episodes of illness and 27% of them had more than three episodes of illness. This is evidence that exclusive breastfeeding offers protection to the baby as it helps to combat diseases by increasing the immunity of the children (Radhakrishnan & Balamuruga 2012:66).

In developing countries, the rate of exclusive breastfeeding for infants younger than six months is only 37%, and there has been little progress since the early 1990s. It is estimated that globally children who are not breastfed exclusively are roughly 32 million. The following challenges have been identified as the main constraints to exclusive breastfeeding:

- Complacency, which may be one of the biggest threats to optimal infant feeding.
- The promotion of breast milk substitutes on a very large scale.
- A belief that infants need water in addition to breast milk.
- The issue of breastfeeding and HIV-transmission.
- Lack of support for breastfeeding at home, in the community, in health care facilities, and in workplaces (e.g. policies for maternity leave and worksite facilities for breastfeeding), linked to the perception that behaviour change is difficult or even impossible to achieve.
- Lack of commitment and resources for behaviour change programmes to support optimum breastfeeding.
- Poor understanding of the role of breastfeeding in advancing human and health rights.

  (UNICEF 2011-2012:12).

2.2.7 HIV and disclosure: implications for exclusive breastfeeding

A study conducted by Kafulafula, Hutchinson, Gennaro, Guttmacher and Chirwa (2013:1418) in Malawi revealed that participants acknowledged that failure to disclose their HIV-status may lead to their inability to breastfeed exclusively. It would be difficult for a mother to exclusively breastfeed if she failed to inform her significant other that she was HIV-positive. Consequently, such a mother may not receive appropriate support should she opt for exclusive breastfeeding (Kafulafula et al 2013:1418).

Onono, Cohen, Jerop, Bukusi and Turan (2014:390) reported that findings from a rural Kenyan study showed that women who were HIV-positive and had disclosed their status were nearly three times more likely to exclusively breastfeed than women who were HIV-negative or did not know their HIV-status.

Onono et al (2014:390) further state that, the study revealed disclosure of HIV-status is a complex issue which bears significant psychosocial, cultural, and economic ramifications; there were also high rates of anticipated male partner stigma and fear of negative male partner reactions, which included gender-based violence during pregnancy and postpartum period. This is subsequent to an associated lack of disclosure of a mother's HIV-positive status.

Al-Mutjaba, Sam-Agudu and Khatri (2016:75) state that HIV disclosure to the partner or family members gives the woman support to practice exclusive breastfeeding, whilst non-disclosure was associated with the practice of mixed feeding during the first six months of life. Onono et al (2014:390) mention that disclosure may help a pregnant HIV-positive mother to adhere with ease to the WHO four-pronged approach to PMTCT, which according to Kennedy, Haberlen, Amin, Baggaley and Narasimhan (2015:2) and Onono et al (2014:390) entails:

- Negotiation of safer sex and behaviour change.
- Uptake of contraception to avoid future unwanted pregnancies.
- Uptake of PMTCT preventative strategies such as antiretroviral prophylaxis and exclusive breastfeeding.
- Access to HIV-care and treatment for HIV-infected women, their infants and families.

Without disclosure it is challenging for the woman to take medication without being noticed, and she may opt out of the PMTCT preventative programme and strategies such as hospital delivery, exclusive breastfeeding, etc (Onono et al 2014:390).

Kennedy et al (2015:2) acknowledge that disclosure is a challenge to HIV positive mothers as it can attract violence and fear to mothers, however, it can have good outcomes in the context of PMTCT programmes.

2.2.8 Infant feeding practices and associated impact of non-exclusive breastfeeding

Tamiru and Mohammed (2013:122) state that globally, 60% of infants and young child deaths are due to inappropriate infant feeding practices and infectious diseases, and two-thirds of these deaths are attributable to sub-optimal breastfeeding practices. Poor nutrition is not always attributed to a lack of food, but can be due to a lack of knowledge of optimal feeding practices and the poor quality of food (Tamiru & Mohammed 2013:122).

Sub-optimal feeding practices can decrease the full absorption of nutrients from breast milk and increase the risk of diarrhoea and acute respiratory infections. Non-exclusive breastfeeding, which is means not breastfeeding exclusively, is believed to be responsible for 10% of the disease burden, 10% of the 44 million Disability Adjusted Life Years (DALYs) and 1.4 million child deaths. Infant and Young Child Feeding Practices (IYCF), if not practised well, can result in long-term impact associated with poor academic performance, decreased productivity, impaired cognitive and social development among children under the age of five (Egata, Berhane & Worku 2013:4).

The WHO recommends two feeding options for HIV-exposed infants, which are exclusive breastfeeding or replacement feeding (WHO 2010):

i. *Exclusive breastfeeding:* it means to breastfeed infants for the first six months of life, and introducing appropriate complementary food while continuing breastfeeding for the first 12 months of life.
ii. *Replacement feeding*: it is the process of feeding a child who is not receiving any breast milk a diet that provides all the nutrients the child needs until the child is

fully fed on family food. It is the only effective way of preventing vertical transmission of HIV after birth, but only if it is acceptable, feasible, affordable, sustainable, and safe (AFASS). Nonetheless, when AFASS criteria cannot be met, mothers should breastfeed exclusively and avoid mixed feeding (WHO 2010).

An Ethiopian study revealed that children who were non-exclusively breastfed had mothers with a rural background and lower educational levels at 89.3% and 88.5% respectively. The rate of non-exclusive breastfeeding was higher at 34% among children of mothers who had less access to a health facility compared with the rate of exclusive breastfeeding. Non-exclusive breastfeeding was common (64%) among children whose mothers had little knowledge of IYCF as compared to exclusively breastfed children (Egata et al 2013:4).

2.2.9 Mixed feeding practices and its impact on vertical transmission of HIV

WHO (2014:4) highlights that in the absence of antiretroviral (ARV) therapeutic prophylaxis, mixed feeding can significantly increase the risk of HIV-transmission, and it is important for mothers and pregnant women to be encouraged to undergo counselling on infant feeding practices. However, there are no clear guidelines on the issue of mixed feeding in the absence of prophylactic ARV treatment.

Nduati, Grace, Mbori-Ngacha, Richardson, Overbaugh, Mwatha, Ndinya-Achola, Bwayo, Onyango, Hughes and Kreiss (2000:1169) posit that there is a 44% chance of preventing mother-to-child transmission of HIV by avoiding breastfeeding. Looking at this finding it can be concluded that avoiding breastfeeding could reduce mother-to-child transmission of HIV. However, formula feeding in the Sub-Saharan region is not affordable to most people.

The main driver of mother-to-child transmission is maternal viral load. Although *in-utero* infection has been observed from 12 weeks gestation, it is likely that the majority occur in the last two weeks of pregnancy. It is estimated that 28% of seroconversion occurs late in pregnancy or during breastfeeding. However, testing sexual partners of HIV negative pregnant mothers and breastfeeding women may further prevent new infections (Cotton & Rabie 2014:1).

The rate of vertical transmission of HIV can be influenced by the pattern of breastfeeding as exclusive breastfeeding for up to six months can minimise infection up to four-fold. It was found that the protective effect of breastfeeding is the strongest in the first six months of an infant's life. The survival benefit for a breastfed infant is almost six times (WHO 2006).

Lazarus et al (2013:3) indicate that the South African 2010 PMTCT evaluation report recommends increasing rates of infant feeding counselling to improve feeding practices, but these recommendations fail to take into account the fact that health workers have quite recently been required to promote formula feeding.

Many have thoroughly internalised the view that HIV-positive women should not breastfeed, a view also held by some HIV-positive women, their families, and communities. Health workers may be uncertain how to respond to mothers who insist on formula feeding to accommodate issues such as employment or other reasons for their absence from home (Lazarus et al 2013:3).

In 2010 and 2012, WHO made a series of updates to PMTCT guidelines, which includes infant feeding recommendations. The organisation recommends this option for countries that have chosen breastfeeding and ARV interventions as their national strategy (Buessler, Kone, Robinson, Bakor & Sentura 2014:5).

Nor, Ahlberg, Doherty, Zembe, Jackson and Ekstro'm (2011:3) state that mixed feeding practices may stem from beliefs that breast milk is not nutritious enough to satisfy infants, that supplementing breast milk with formula or other foods and by reducing the amount of breast milk consumed by the infant will reduce the likelihood of HIV-transmission.

The advice of health workers discouraging mixed feeding tends to be disregarded not only because it is often directive but also because it contradicts conventional wisdom and fails to engage with what women think and do. The consequence is that alternative practices, such as early supplementary feeding of infants, are largely hidden from health workers (Nor et al 2011:3).

Lazarus et al (2013:2) assert that in any event, to expect counselling alone to resolve the issue of mixed feeding would be naive. Many mothers introduce liquids or semi-solids from a very young age. They are acting on their own perceptions and understanding of what is best for their babies, as well as responding to normative pressures based on lay understandings of their immediate family and the community in which they are embedded.

2.2.10 Mental health and exclusive breastfeeding

Factors such as economic dependence appear to influence how susceptible women are to societal and family pressures regarding infant feeding practices. Concerns about HIV-related stigma influence infant feeding practices. Strictly avoiding mixed feeding practice may be construed as divulging a mother's HIV-status and expose her to stigmatisation. Thus anticipated or direct stigma may encourage mothers to mix-feed their babies (Lazarus et al 2013:2).

Cuca, Onono, Bukusi and Turan (2012:1173) said that pregnant women who are HIV-positive are particularly prone to psychological distress, even to the extent of suicidal ideation, especially in Sub-Saharan settings where there is stigma and discrimination associated with HIV/AIDS.

Studies done in Angola and Zambia have established that women who discover their HIV-status while pregnant are more likely than others to develop affective disorders, especially depression and other somatic disorders than those who do not have HIV or those who knew their HIV-status before pregnancy (Cuca et al 2012:1173).

Cuca et al (2013:1173) report that women who are HIV-positive were three times more likely to exhibit postnatal depression than their counterparts. Internalised HIV-related stigma is highly associated with postpartum depression in HIV-positive women. The correlation between mental health issues and exclusive breastfeeding has been cited by other studies within the field of HIV and AIDS.

As the disease affects the cognitive aspect of mothers they are likely to find it difficult to adapt to best practices of infant breastfeeding and affect the mothers adherence to

prevention of mother-to-child transmission of HIV according to Dow, Dube, Pence and Van Rie (2014:362).

According to Hailemariam (2015:137), HIV-positive mothers are faced with psychosocial problems like anxiety, depression and stigma because of the virus in their blood, which becomes a double burden to them during pregnancy and after birth.

HIV-positive women have to make difficult decisions whether or not to expose their infants to the virus or put their infants at risk of developing malnutrition and other infectious diseases if they do not choose breastfeeding (Flower 2008:359-361).

A study conducted in Ethiopia by Hailemariam (2015:135) shows that 60% of HIV-positive child bearing mothers scored high on the anxiety and depression interview questions. These mothers feared being stigmatised during their pregnancy and after giving birth.

People living with HIV who had more resources in the form of income and education are more able to give positive meaning to their HIV-positive status, use problem-focused coping strategies and report a higher quality of life (Kotze, Visser, Makin, Sikkema & Forsyth 2013:8).

According to Kapetanovic, Dass-Brailsford, Nora and Talisman (2014:12) besides being infected with HIV, pregnant women from low to middle income countries have to contend with many other issues that may undergird psychiatric or psychological conditions. These issues include a combination of poor socioeconomic conditions, lack of access to healthcare and to a certain extent cultural practices and gender inequalities.

A study conducted in rural Angola found that being diagnosed with HIV is likely to lead to poor mental health in pregnant women, however married women appeared to experience less emotional stress (Bernatsky, Souza & De Jong 2007:676).

Onono et al (2014:394) mention that the prevalence of postpartum depression, in a study conducted in rural Kenya, was 10.4% (*n=29).* HIV-positive status was associated

with high levels of probable postpartum depression ($p<0.001$): however, postpartum depression was not associated with exclusive breastfeeding practice.

2.3 CONCLUSION

In spite of the well-recognised importance of exclusive breastfeeding, the practice is not widespread in the developing world. Sub-optimal breastfeeding practices are responsible for more than 11 million child deaths annually and even more striking levels of child morbidity (Black, Allen, Bhutta, Caulfield, De Onis, Ezzati, Mathers & Rivera 2008:243-260).

The general messages disseminated (within NCG and the health facility) as top-down directives are not sufficiently adequate to change entrenched views in communities and among health workers about appropriate feeding practices for infants in general, and those whose mothers are HIV-positive in particular.

The views that mothers who are HIV-positive should not breastfeed cannot disappear overnight, especially given the complexity of breastfeeding and the risk of vertical HIV-transmission. Since feeding intentions and practices are influenced by and negotiated between the mother and her significant other, there is a need to understand the ways in which women and their families interpret guidance on exclusive breastfeeding, and in particular mixed feeding.

This should include exploring and engaging with normative views about babies' nutritional needs, and the adequacy of breast milk to meet those needs, as well as patterns of feeding as these appear to contribute to the early supplementation of breast milk and formula (Lazarus et al 2013:3).

Cai et al (2012:4) posit that child nutrition programmes worldwide continue to require investment and commitment to improve infant feeding practices in order to have maximum impact on children's lives.

Whatever the policies for PMTCT may be, and in particular those concerning best breastfeeding practices, the psychosocial needs of a pregnant HIV-positive woman must be met. The high incidence of anticipated stigma, intimate partner violence,

postpartum depression, and the low prevalence of disclosure of HIV-positive status provide evidence of the need for health care workers and counsellors to receive capacity building to improve skills required to empower women to choose the best infant feeding practices in the era of HIV (Onono et al 2014:16).

According to Read (2003:1196) in the developing societies, breastfeeding is always taken as the norm. However, there is a public health concern over HIV-transmission with breastfeeding by HIV-infected mothers which has sharpened continuing debate.

At the same time there are serious concerns of diarrhoeal disease that causes death in HIV-exposed infants who are fed with milk formulas prepared by mixing milk powder with local water, which is almost always contaminated by sewage in impoverished communities. Thus the extreme alternatives – breastfeeding and formula feeding – expose the infants to HIV-infection or recurring bacterial diarrhoea, dehydration, and death.

It is of concern that mothers of babies younger than six months are seemingly not breastfeeding their babies exclusively. The health system needs to scale up education on the importance of breastfeeding and how it can be of benefit to infants' health.

The mixed feeding of infants poses a risk to their health. Regardless of how good solids are perceived to be, these cannot be advocated for babies whose bodies are still undergoing developmental changes. Our professional obligations are to ensure that mothers know how crucial it is for their babies to receive natural milk from their mothers' breasts. Shearer (2008:1046) affirms that mixed feeding has a potential to cause diarrhoea and can contribute significantly to infant malnutrition and possible death. There are many factors that influence a mother's ability to optimally feed her infant, which can include, among others, a lack of education about the benefits of breastfeeding, and a culture of mixed feeding where breast milk is thought to be inadequate. This perception can cost a life.

Breastfed infants who also received solids were significantly more prone to infections than exclusively breastfed children, as were infants who at 12 weeks received both breast and formula milk. Review of the South African HIV Epidemic (2011:83) mentions

that the cumulative three-month mortality rate in exclusively breastfed infants was as low as 6.1% as compared to 15.1% in infants on replacement feeding.

It is evident that maintaining exclusive breastfeeding needs a supportive environment. The role of other structures cannot be over-emphasised. Structures such as family networks, a public health system, and society are crucial to an individual purporting to exclusively breastfeed. The determinants of exclusive breastfeeding need to be understood by health professionals in order to provide appropriate support for mothers who opt to exclusively breastfeed their infants. This also includes the perceptions of mothers regarding HIV-exposure to their babies, views held by society regarding exclusive breastfeeding in particular, and public opinion on infant feeding practices.

CHAPTER 3

RESEARCH DESIGN AND METHOD

3.1 INTRODUCTION

As discussed in the previous chapter the literature reviewed focused on aspects linked to exclusive breastfeeding. These include cultural practices influencing exclusive breastfeeding, the benefits of breastfeeding, and the societal influence on mothers who are breastfeeding and the economical trends breastfeeding mothers find themselves in. Also quantitative studies dealing with exclusive breastfeeding both locally and internationally were looked into to assist in shaping the direction of this study.

This chapter outlines the research design and methodology used in this study. It also describes the geographical location of the study, the population, and the sample. Furthermore, a description of the data-collection tool and the methods to maintain reliability and validity, are discussed.

3.1.1 The research setting

The research was conducted in the settlement situated at Elandsdoorn, rural community in Limpopo Province. Elandsdoorn is part of the Elias Motsoaledi local municipality. Elias Motsoaledi falls under Sekhukhune District, which is sub-divided into five local municipalities. Statistics South Africa Report (2012:48) estimated the population of Elias Motsoaledi to be 249 363 as projected in the 2011 census with a growth rate of 1.18% per annum. SSAR (2012:47-52) further elaborates that Elandsdoorn's estimated population is 12 941. About 97.9% of the population is of African descent, with the other population groups comprising the remaining 2.1%. The municipality borders Makhuduthamaga local municipality in the south, Ephraim Mogale local municipality in the west, Greater Tubatse and Fetakgomo local municipalities in the east. Elias Motsoaledi is situated about 180 kilometres (km) from Polokwane in the north, 135 km from Pretoria in the south and 150 km from Nelspruit in the east. It is the third smallest of the five local municipalities in Sekhukhune District, constituting 27.7% of the area covering 3 668 km² of the district's 13 264 km². SSAR (2012:47-52) confirms that the

municipality of Elias Motsoaledi has 30 wards and is predominantly rural with about 62 settlements, the majority of which are villages.

Elias Motsoaledi sub-district has 15 fixed government clinics which are supported by three mobile clinics in a predominantly rural setting, and is serviced by two district hospitals. The nearest district hospital to NMC is called Philadelphia and the other one is Groblersdal Hospital which is 35km further: both of them are level-1 hospitals. There are two tertiary hospitals in Polokwane, namely Mankweng and Polokwane Complex used for specialised care and laboratory diagnostic purposes.

The sub-district has the highest recorded number of early in-patient neonatal deaths per 1 000 live births, at 14.42 per 1 000 during the 2014/2015 financial year (District Health Information System 2015:1).

The health delivery service in Elandsdoorn is mainly curative, preventive, and promotive provided by the two available health facilities, one of which is a non-governmental organisation (NGO) and the other a primary healthcare structure managed by the Department of Health (DoH).

The study was conducted at one Medical Centre (NMC), an NGO health facility. The centre aims to simulate the Rural Development Plan (RAP) to articulate health service delivery in areas with limited resources. It has a catchment area of a 25 km radius within the Dennilton area, which is an integral part of Elias Motsoaledi municipality. The facility has over 3 500 patients who are actively on antiretroviral therapy (ART). The medical centre was accredited by the DoH to provide highly active antiretroviral treatment (HAART) in 2009.

This includes the prevention of a mother-to-child (PMTCT) programme offered at the antenatal care (ANC) and labour/maternity departments. Also offered in these departments is the preliminary diagnosis of the human immunodeficiency virus (HIV) to exposed infants through the polymerase chain reaction (PCR) test at birth or at age 6 and 10 weeks.

The study will influence how HIV and associated conditions are identified through screening, and the manner in which mothers are assisted in the PMTCT programme,

during screening procedures, notably the cluster of differentiation 4 (CD 4) cell count, viral load check, and care associated with or relevant to the diagnostic findings. Rural mothers can be adequately supported when health workers are aware of the challenges they face in practising exclusive breastfeeding.

Mothers in the PMTCT programme are mainly on the fixed-dose combination (FDC) drug which comprises Tenofovir (TDF), Emtricitabine (FTC), and Efavirenz (EFV). The combination drug assumes the acronym (TFE). Those who are failing on this first-line regimen are put on either the second-line regimen or mixed regimen containing zidovudine (AZT) or nevirapine (NVP). SAATG (2013:10) outlines the regimens for HIV positive women which are given to pregnant women who tested HIV-positive as a life-long intervention to suppress the replication of HIV, with the projected outcome that their infants would be born HIV-negative. The expectant mothers receive this medication regardless of their CD4 count.

3.2 RESEARCH DESIGN

A quantitative research approach was undertaken to conduct this study, which is defined as the investigation of phenomena that lend themselves to precise measurement and quantification, often involving a rigorous and controlled design (Polit & Beck 2010:739).

This research was a non-experimental, cross-sectional study and the subset of the population selected and included in the study was to help answer these research questions:

- What are the determinants of exclusive breastfeeding for HIV-positive mothers during the first six months of life?
- What are the barriers experienced by HIV-infected mothers to exclusively breastfeed their infants in the first six months of life?

3.2.1 Non-experimental

According to Brink et al (2012), the non-experimental approach covers other kinds of research in which manipulation of the independent variable is impossible, not to mention

inappropriate. One of the most practical classifications of non-experimental research is based on the purpose of research. This approach was deemed appropriate for this research.

3.2.2 Cross-sectional

A cross-sectional descriptive design was the methodology used in this study. A cross-sectional study is nonrecurrent in nature, and is done at a specific point in time. In this type of research, all the information on a specific topic is collected at the same time from the same participants. This type of study is limited to a given time period to determine the status of the phenomena, or to a description of the relationships among phenomena, at a fixed point in time (Brink et al 2015:101). This method was used to collect data at one point to determine the prevalence of determinants influencing exclusive breastfeeding of infants by HIV-positive mothers. It was beneficial for the research in that it is a quick, cheap, convenient, and easy way of collecting information for administrative purposes. The participants completed the questionnaire on their own without the influence of the research team members. The entire population of HIV-infected mothers who are breastfeeding their babies from 0 to 6 months of age was selected to answer the research questions for this study. The duration of the study was over a three-month period, from the beginning of June, 2015 to the end of August, 2015.

3.2.3 Population

A population is the aggregate or totality of all objects to be studied with some common defining characteristics (Polit & Beck 2012:738). The group of persons or objects of interest to the researcher were those who met the predetermined criteria (Brink et al 2015:131), namely HIV-positive breastfeeding mothers who had babies between the ages 0 and 6 months and who lived in Elandsdoorn Village. These mothers visit the clinic for their postnatal consultations where the babies are tested for PCR at 6 weeks, 10 weeks, and 18 months because they were considered to be at risk of HIV-infection as a result of their mothers' HIV-status.

3.2.4 Sample and sampling method

3.2.4.1 Sampling

Sampling is the process of selecting a portion of the population to represent the entire population (Polit & Beck 2010:742). Purposive sampling was conducted to recruit a sample of 75 participants. It is sometimes called judgemental sampling, which is a non-probability sampling technique based on the judgement of the researcher regarding participants or objects that are typical or representative of the study phenomena or who are especially knowledgeable about the questions at hand (Brink et al 2015:141). The researcher selected participants based on his personal judgement as to who would be most informative and suitable for this study (Polit & Beck 2010:739). The sample of this study, was a subset of the population of mothers who were breastfeeding within the community of Elandsdoorn, comprised those selected to participate in the study who were HIV-positive and had babies aged 6 months or less (Polit & Beck 2012:742). The sample for this research consisted of mothers between ages 18 and 45 who were HIV-positive and had infants aged 0 to 6 months. Participants included in the study were not coerced in any manner, and they participated voluntarily.

This technique was employed at the selected NGO health centre, which was chosen on the basis of its capability to provide the community with the necessary health care services which are in line with the objectives of the HIV/AIDS/STI strategic plan. This includes programmes for maternal and child care.

3.2.4.2 Data collection

A self-reported research questionnaire was used to collect data from study participants. Mothers were selected as they came to the clinic for their postnatal care visits, based on inclusion criteria. The information was collected at only one point in time and no follow-up was conducted. The language used for collecting data was English. Personal and social information was collected from data sources. The procedures included the following: one trained PMTCT counsellor distributed the questionnaires to participants and supervised them during the completion of the questionnaires. The researcher was overseeing the process by checking completed questionnaires for any errors, and responded to questions emanating from the participants.

3.2.4.3 Development and testing of the data-collection instrument

The initial questionnaire developed by the researcher was modified with the assistance of the statistician in order to observe the research objectives stipulated above. The questionnaire was tested by the statistician for inaccuracies, consistency and ambiguity, and recommendations were made to enable the researcher to elicit information that would answer the research questions. The questions were designed to allow mothers to express their thoughts on the issues related to exclusive breastfeeding. A five-point Likert scale was recommended by the statistician for this purpose, and it covered aspects on knowledge and determinants associated with exclusive breastfeeding.

The study questionnaire was developed to obtain information in order to address the following research questions:

- What are the determinants of exclusive breastfeeding for HIV-positive mothers during the first six months of life?
- What are the barriers experienced by HIV-infected mothers to exclusively breastfeed their infants in the first six months of life?

3.2.4.4 Characteristics of the data-collection instrument

The following elements involving the data-collection instrument were considered with the assistance of the statistician:

- The precision of the data-collection instrument.
- Heterogeneity of the population.
- Incidence of the type of participant in the population (Brink et al 2015:144).

Data was collected using a self-reported survey questionnaire for HIV-positive mothers attending the clinic after delivery. The data-collection instrument included these essential components:

It has an opening paragraph outlining the instructions to both the researcher and the study participants.

SECTION A – it deals with the participant's demographic information such as age, marital status, educational level, place of residence, religion, parity, age of last-born child, home language, and nationality.

SECTION B – economic factors are outlined here. The participant's current employment status, the employment status of the husband or partner, travelling expenses to and from the health facility during antenatal care, and the monthly household income are all explored in this section.

SECTION C – it involves the participant's obstetric history. Issues such as previous pregnancies, normal (vaginal) live deliveries, live Caesarean section deliveries, and any miscarriages the participant had, the number of stillbirths, medical problems or complications during the current baby's pregnancy are tabulated here.

SECTIONS D and E – embedded in these sections is the 5-point Likert scale questions ranging from strongly agree to strongly disagree.

SECTION D – assesses the barriers to exclusive breastfeeding experienced by mothers.

SECTION E – measures the mother's infant feeding practices.

SECTION F – evaluates the mother's knowledge of exclusive breastfeeding requiring a true/false response. It is further sub-divided into two sections, namely questions on:

- Mother-to-child transmission.
- Exclusive breastfeeding.

The data for this research was collected from the beginning of June, 2015 until the end of August, 2015 at NMC.

3.2.4.5 Data analysis

The analysis of data was done through the expertise of an experienced statistician using SPSS Version 23 and Microsoft Excel for graphical presentations and the

associated statistical figures. Descriptive statistics was used to summarise demographic data in the questionnaires. Data was edited for accuracy, and then coded. It was analysed to comply with principles of completeness and consistency. A multivariate analysis was used to determine proportions of HIV-infected mothers who practise exclusive breastfeeding, mothers who mixed-feed, those who opt for replacement feeding and other types of infant feeding, the barriers they experience to exclusive breastfeeding, and the knowledge they have relating to exclusive breastfeeding practices. The association between the independent and dependent variables was also measured and analysed. The descriptive statistics assisted the researcher to summarise the overall tendencies in the data, provide an assessment of how varied the scores are, and provide insight into where one score stands in comparisons with others (Plano Clark & Creswell 2010:372)**.**

3.3 VALIDITY AND RELIABILITY

According to Heale and Twycross (2015:66), validity is defined as the extent to which a concept is accurately measured in a quantitative study. This is done in order to ensure that the study findings are of good quality. Data quality is a very critical aspect in both quantitative and qualitative research. The findings obtained from quantitative data should reflect the truth as accurately as possible as presented by the participants. The data quality of quantitative research can be evaluated by assessing the validity and reliability of the tools (Heale & Twycross 2015:66).

3.3.1 Internal and external validity of the study

3.3.1.1 Internal validity

Internal validity is applicable in experimental or quasi-experimental research: it is the degree to which it can be inferred that the experimental intervention (independent variable), rather than uncontrolled, extraneous factors, is responsible for the observed effects (Polit & Beck 2010:731).

The content of the survey questions was based on the findings of the literature review and the major input from the statistician to line up with the research questions. The consistency of administering the questionnaire ensured content validity as the

counsellor who has expertise in exclusive breastfeeding and the prevention of vertical transmission was an official appointed to distribute the questionnaires to study participants. The language was simple and clear to enable participants to respond without difficulty to asked questions. The instructions given to subjects were not ambiguous, and enabled subjects to complete the questionnaires with ease.

Questionnaires were completed in the same room, in the presence of the counsellor and the researcher, and completed ones were collected by the counsellor. There was no opportunity for participants to answer the questionnaire by proxy.

The research is a non-experimental, cross-sectional, descriptive study. The statistician assisted in giving guidance on the data-collection instrument to be used in the survey to ensure that data collected could be interpreted with ease. The role of a statistician was very important in ensuring that the instrument was evaluated to make corrections, clarifications, and highlight omissions to enhance the quality of data to be collected. This also made it possible for the instrument to be accurate and true.

3.3.1.2 External validity

The external validity refers to the degree to which study results can be generalised to settings or samples other than the one studied. Such aspects include populations, settings, time, and outcomes. Purposive sampling was used to select participants for the research. This method uses the researchers' knowledge of the population to select sample members (Polit & Beck 2010:279).

The researcher decided purposefully to select HIV-positive mothers who were judged to be typical of the population, or particularly knowledgeable about exclusive breastfeeding issues affecting HIV-infected mothers.

The dropout rate from participants was avoided by supporting the process with the assistance of a qualified counsellor during the process of completing the questionnaires by participants, in order to ensure that the study would be generalisable to the entire population. Only one participant did not complete her questionnaire. If this percentage increased, the external validity would decline (Grove, Burns & Gray 2013:202).

A concept map was designed to enhance the data-collection process from a particular subset of the population. The illustration below depicts the concept mapping used during the research.

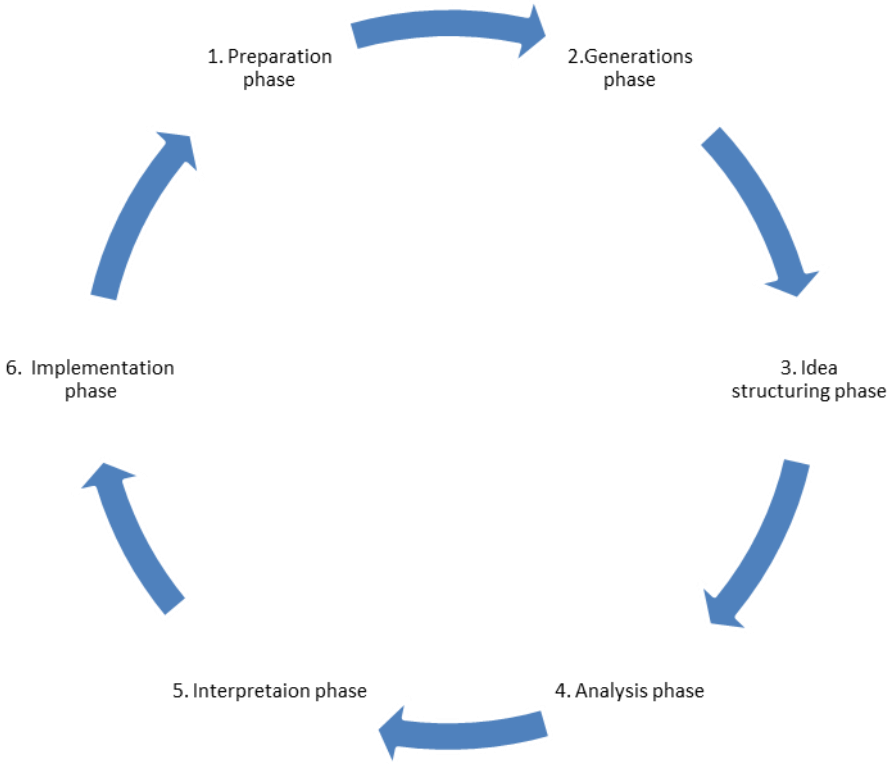

Figure 3.1: A concept map

i. **Preparation phase** – to begin with, this phase was used to initiate the scene for the research and as a key initial phase. This is a stage where the study was planned and an outline developed for the research team to follow, and how the research was to unfold throughout. All the necessary resources where pulled together to give the study enough support to forge ahead. The intellectual capacity needed for this study was determined during this phase by drawing out the necessary human capital to fulfil the desired objectives of the study.

ii. **Generation phase** – steps of brainstorming sessions for the development of the data-collection tool. The session generated ideas related to the study in a random pattern, including themes about exclusive breastfeeding and issues related to this beneficial feeding option. The following threats to external validity were explored:

- *Sample characteristics* – the extent to which the sample was able to represent the entire population from which it is drawn, namely the HIV-infected mothers who are breastfeeding their babies aged 0 to 6 months in

the community of Elandsdoorn. A purposive sampling method was employed to select participants to be part of this study. These were HIV-positive mothers who had babies aged 0 to 6 months, attending post-natal care at NMC.

- *Stimulus characteristics and settings* – the unique factors involved during the data-collection process might influence the research. These could be brought about by the research team influencing the manner in which participants respond to the questions asked in the survey questionnaire, and the environment (in this case the clinic setting) where the participants were situated when answering the questionnaire. This might influence how the participants respond to the questionnaire. However, the research results were not planned in any way as each individual participant had her own questionnaire to respond to, and no member of the research team answered on her behalf.

iii. **Idea-structuring phase** – ideas where streamlined to suit the research objectives and answer research questions. The first questionnaire designed was not able to elicit responses which answered the research questions. The statistician assisted and gave guidance in the development of the survey questionnaire to obtain the required responses to answer the research questions adequately and appropriately, and also to measure the mothers' knowledge of exclusive breastfeeding.

iv. **Analysis phase** – making sense of the ideas that were streamlined and making statements that could be used effectively in the questionnaire. The feasibility of implementing the questionnaire was discussed to assess and evaluate any possible language barriers when the research team and participants interacted during the data-collection process.

v. **Interpretation phase** – understanding what statements would mean to the participants and whether they could perhaps be interpreted differently by them. To avoid other parties interpreting the survey statements differently, the statements were simplified to be homogenous in order to minimise overt ambiguity. The survey questions were tested to assess whether they would be understood differently by other parties or whether their meaning would remain the same and draw out the desired results.

vi. **Implementation phase** – during this phase the research was undertaken using the mapping concept as a framework to guide, develop, refine, and put into

operation the research data-collection tool in order to display its outcomes. The research assistant was also trained during this phase for the effective collection of data.

3.3.1.3 Reliability

Reliability is related to the consistency of a measure (Heale & Twycross 2015:66) administered at different times to the same individuals. For this study, the reliability of the data was maintained by evaluating the data-collection tool with the help of the statistician. The questionnaire was tested by the statistician for inaccuracies, consistency and ambiguity, and recommendations were made to enable the researcher to elicit the information that would answer the research questions. Reliability measures undertaken are clearly presented in Chapter 4 of this study.

3.3.1.4 Ethical issues

Ethics is defined as a system of moral values that is concerned with the degree to which research procedures adhere to professional, legal, and social obligations to the study participants (Polit & Beck 2010:727).

Ethical clearance for this study was granted by UNISA's Ethics Committee and the permission to recruit participants on the premises of NCG was authorised by the senior management of the organisation.

This study was rendered ethical by considering the principles of beneficence, respect for human dignity, and justice for the participants. Beneficence imposed upon the researcher the responsibility to minimise harm and maximise the benefits of the study by ensuring that participation in the study was voluntary without inflicting emotional or physical discomfort to the participants. During the design of the questionnaire the researcher consciously ensured that questions that would intimidate the participants or intrude their private life.

The participants were afforded the dignity to be respected as human beings; they had the right to self-determination thus making them able to control their responses as autonomous agents. The participants were given the power to choose whether they

want to be part of the research or not. They determined on their own whether or not to participate in the study. Participants were not in any way coerced during their recruitment.

The right to fair treatment and privacy was observed by not intruding on the subjects' personal lives; hence written consent was required from the participants before their involvement in the research commenced. Participants who were not keen to participate were not prejudiced in any way. Their right not to be involved was respected.

The research assistant was trained to uphold this ethical requirement. The researcher trained his assistant to adhere to the requirements, and to assist participants in completing the questionnaire. The assistant is a highly trained PMTCT counsellor and has several years' experience working in the community of Elandsdoorn. The researcher and his assistant approached the study participants during their health-talk sessions and introduced the research topic and the purpose of the study to them. Those who indicated an interested in participating received a consent form which they could sign when they consulted with the PMTCT counsellor (the assistant) in the privacy of her consultation room. Details regarding ethical considerations were presented in Chapter 1 of the study.

3.4 LIMITATIONS OF THE STUDY

The study was able to achieve its objectives, however, it had its own limitations. The following were identified as the limitations experienced during the study: (i). The NGO does not reach all the nursing mothers in Elandsdoorn and therefore there is a potential of selection bias because there might be women in the group of interest that are not attending NMC. (ii). There were limited language barriers experienced by participants when administering this questionnaire. The research assistant clarified such misunderstandings from the participants.

3.5 CONCLUSION

This chapter addressed the research design and methodology used for this study. Chapter 4 presents the findings of the study related to the determinants of exclusive breastfeeding among HIV-infected mothers who have babies aged 0 to 6 months.

CHAPTER 4

ANALYSIS AND PRESENTATION OF DATA

4.1 INTRODUCTION

Chapter 3 dealt with where the research was conducted – which was a rural community of Elandsdoorn Village in the province of Limpopo. A survey questionnaire was the data collection tool utilised to investigate the determinants of exclusive breastfeeding in HIV positive mothers. A non-experimental cross-sectional research approach was used for this purpose.

This chapter aims to present the results of the cross-sectional study. The purpose of the study was to explore the determinants contributing to exclusive breastfeeding in HIV-infected mothers of infants aged 0 to 6 months, who attend an NGO health centre in Elandsdoorn Village. The objectives of the study were two-pronged. Firstly, to describe the determinants of exclusive breastfeeding for HIV-positive mothers during the first six months of life and secondly, to describe the barriers experienced by HIV-infected mothers to exclusively breastfeed their infants in the first six months of life.

This chapter begins with a discussion of the reliability of the survey instrument. The chapter then proceeds with the descriptive profile of the variables and the validity of the instrument using exploratory factor analysis in order to achieve data reduction, followed by a presentation and discussion of the factor structures that emerged. The descriptive statistics of the composite variables will be discussed. A comparative analysis using independent t-tests and ANOVA will be done to determine how the views differ by social demographic variables and economic factors. The correlation analysis then follows to determine how the composite variables are related. The chapter culminates in a summary of the study.

These hypotheses to be tested are presented in Table 4.1.

The empirical results based on the cross-sectional survey undertaken are presented in the following sections.

Table 4.1: Hypotheses to be tested		
Hypothesis 1	H_0:	Exclusive breastfeeding do not impact on access to health information.
	H_1:	Exclusive breastfeeding impact on access to health information.
Hypothesis 2	H_0:	Exclusive breastfeeding do not impact on barriers to exclusive breastfeeding
	H_1:	Exclusive breastfeeding impact on barriers to exclusive breastfeeding
Hypothesis 3	H_0:	Exclusive breastfeeding do not impact on infant breastfeeding practices
	H_1:	Exclusive breastfeeding impact on infant breastfeeding practices,
Hypothesis 4	H_0:	Exclusive breastfeeding do not impact on knowledge of exclusive breastfeeding
	H_1:	Exclusive breastfeeding impact on knowledge of exclusive breastfeeding,
Hypothesis 5	H_0:	There is no statistically significant correlation between "*score on access to health information," "barriers to exclusive breastfeeding,"* "*infant feeding practices*" and *"knowledge of exclusive breastfeeding"*
	H_1:	There is a statistically significant correlation between "*score on access to health information," "barriers to exclusive breastfeeding,"* "*infant feeding practices*" and *"knowledge of exclusive breastfeeding"*

4.2 DATA MANAGEMENT AND ANALYSIS

The study population for the research comprised HIV-infected mothers aged 18 to 45 years, with infants aged 0 to 6 months at the time of the study; all mothers who met the inclusion criteria were included in the study. All the selected respondents who matched the eligibility criteria agreed to participate in the study, giving a 100% response rate. The data was collected using a self-administered questionnaire and analysed with the help of a statistician.

The data was analysed using the Statistical Package for the Social Sciences (SPSS) version 23. The reliability and validity of the instrument were measured using Cronbach's alpha and exploratory factor analysis. No item had low reliability and thus all

items were retained. Descriptive statistics in the form of frequencies, proportions, means, standard deviation, skewness, and kurtosis were used to describe the patterns and trends in the data set.

Composite variables were created using two approaches. For the Likert type questions, composite variables were created using averages. For yes-or-no responses, composite variables were created by recording 1 (one) as yes, and any other response (missing or no) as 0 (zero). For the questions determining knowledge of issues of exclusive breastfeeding, 1 was given to the correct option and 0 to an incorrect option and any other response including those who did not response. The composite variable for the yes/no questions and the knowledge questions was obtained from a summary of the data to give the score for the construct. A high score characterised high levels on health information and knowledge of infant feeding.

Independent t-tests were conducted to determine whether socio-demographical variables with two categories differed, whilst one-way ANOVA was used to determine the difference in the composite variables by socio-demographic variables with more than two categories. Pearson's correlation analysis was used to measure the extent of the relationship between variables. The statistical analysis will be presented in the next sections.

4.3 RELIABILITY OF THE INSTRUMENT

Cronbach's alpha was used to determine the internal consistency of the instrument. The internal consistency is the extent to which all the items within a single instrument yield similar results (Leedy & Ormrod 2010:93). A high Cronbach value signifies that the items are measuring the underlying (or latent) construct. The following rules of thumb apply, namely that ≥ 0.9=excellent, ≥ 0.8=good, ≥ 0.7=acceptable, ≥ 0.6=questionable, ≥ 0.5=poor, and < 0.5=unacceptable. The lower limit is 0.7 and it may decrease to 0.6 in exploratory research. In this research, 0.7 was used as an acceptable level. The reliability is given in the following table:

Table 4.2: Reliability results of the instrument			
Aspect	**Number of items**	**Cronbach's alpha**	**Acceptable level**
All variables	64	0.723	Acceptable

The overall reliability of the instrument was 0.723, which is acceptable. It can therefore be concluded that the instrument was reliable.

4.4 DESCRIPTIVE STATISTICS

The patterns and trends of the data with regard to the descriptive statistics will be presented. The sample characterises economic factors, breastfeeding history and current status, barriers to exclusive breastfeeding, infant feeding practices, and knowledge of exclusive breastfeeding.

4.4.1 Sample characteristics

A total of 75 HIV-infected mothers aged 18 to 45 years with infants aged 0 to 6 months participated in the study. This section presents the analysis of the socio-demographics of the mother. The information is shown in Table 4.3.

Table 4.3: Socio-demographic characteristics of the sample			
Variable	**Category**	**Frequency**	**%**
Age	Less than 25 years	21	28.0
	25 – 29 years	16	21.3
	30 – 34 yeas	15	20.0
	35 – 39 years	13	17.3
	40 years and above	10	13.3
	Total	**75**	**100.0**
Marital status	Married	14	18.7
	Divorced /widowed	9	12.0
	Cohabiting	11	14.7
	Single	41	54.7
	Total	**75**	**100.0**
Highest academic qualification	Below Standard 10/Grade 12 (Matric)	20	26.7
	Standard 10/Grade 12 (Matric)	30	40.0
	Tertiary education	25	33.3
	Total	**75**	**100.0**

Table 4.3: Socio-demographic characteristics of the sample			
Variable	**Category**	**Frequency**	**%**
Person one live with	Spouse/partner	25	33.3
	Parents	28	37.3
	Relative	8	10.7
	Alone	14	18.7
	Total	**75**	**100.0**
Religion	Christianity	55	73.3
	Islam	1	1.3
	African traditional belief	19	25.3
	Total	**75**	**100.0**
Number of children	None	14	18.7
	One	14	18.7
	Two	30	40.0
	Three	11	14.7
	Four and above	6	8.0
	Total	**75**	**100.0**
Age of last child	Less than a year	20	26.7
	3 – 4 years	16	21.3
	5 – 6 years	14	18.7
	7 years and above	11	14.7
	Not applicable	14	18.7
	Total	**75**	**100.0**
Home language	Nguni speakers	43	57.3
	Sotho speakers	26	34.7
	Other	6	8.0
	Total	75	8.9
Nationality	South African	73	97.3
	Swazi	2	2.7
	Total	**75**	**100.0**

All the participants disclosed their age. About half the respondents (49.3%; n=37) were younger than 30 years, whilst 20% (n=15) were aged between 30 and 34. Thus one can conclude that close to 70% of the respondents were mothers aged younger than 35 years. This is the recommended age for a woman to give birth without too many risks. It was observed that 13.3% (n=10) of the mothers were 40 years of age and older thus exposing themselves to risk during pregnancy. Such women are closely assessed during antenatal and delivery; however, it was not asked if they experienced any problems during pregnancy and labour. Studies reveal that participants could be as young as 15 years and the oldest 45 years. This observation was mentioned in the second chapter of this study.

In terms of marital status, the majority of the respondents, that is 54.7% (n=41), were single whilst 8.7% (n=14) were married. Close to 15% (n=11) of the respondents were cohabiting and 12% (n=9) were either divorced or widowed. It can be concluded that the majority of the mothers were not married; they were either single or cohabiting with their male partners. This implies that single mothers may not have been supported by their partners during the breastfeeding period. There were 12% (n=9) of mothers from a sample of 75 participants who were widowed due to their husbands HIV-related deaths, or divorced because they disclosed their HIV-status. Though disclosure can be a supportive structure, it can also lead to discord in intimate relationships. Furthermore, disclosure of HIV-status is a complex issue bearing significant psychosocial, cultural and economic ramifications, as well as high rates of anticipated male partner stigma and fear of negative male partner reactions, which includes gender-based violence during pregnancy and the postpartum period (Onono et al 2014:390).

In terms of highest education attained, 26.7% (n=20) of the women did not have Grade 12 whilst 40.0% (n=30) had Grade 12, and 33.3% (n=25) had a tertiary qualification. The composition of the 26.7% who did not have Grade 12 was that about 5.3% (n=4) of the sample did not have any education, 2.7% (n=2) had Standard 8/Grade 10 and below and 18.7% had Standard 9/Grade 11. According to Statistics South Africa (2011:38), it is reported that 38.0% of females had Grade 12/Standard 10 compared to 21.8% of females who had a higher qualification. In this study, on the other hand, mothers with tertiary qualifications had mostly attained certificates and diplomas; only one person had a degree.

In terms of living arrangements, 37.3% (n=28) were living with their parents, 33.3% (n=25) were living with their spouses/partners, 18.7% (n=14) were living alone, and 10.7% (n=8) were living with a relative. One can conclude that close to 70% were living with either their spouses/partners or their parents. The mothers living with their partners may have been well supported during pregnancy and post-delivery of their babies. This may imply that the mothers may have discussed issues of disclosure about their HIV-status and the infant feeding option to exclusively breastfeed their babies.

Of the 75 participants, the majority of the women, 73.3% (n=55), were Christians whilst 25.3% (n=19) indicated that their religion was African traditional belief; 1.3% (n=1) were

Islamic. The community of Elandsdoorn is characteristically a Christian community with more than six active churches.

Only 18.7% (n=14) did not have a preceding child whilst an equal proportion had one child. About 40% (n=30) had two children and 14.7% (n=11) had three children. Only 8% (n=6) had more than three children. Thus the majority of the mothers had only two or three children. Mothers with other children may have gained experience in breastfeeding.

In terms of age of last-born children, the highest proportion was 26.7% (n=20) with the age of the last-born child being less than a year, followed by 21.3% (n=16) with the age of the last-born child being three to four years. An equal proportion of 18.7% (n=14) show the age of the last-born child as being five to six years; the same proportion did not have any prior children. Close to 15% (n=14) are those with children older than seven years of age.

The main languages from those who participated in the study were Sepedi, isiZulu, and isiNdebele. The data was divided into Nguni speakers, Sotho speakers, and others. The Nguni languages spoken were isiZulu, isiNdebele, and isiSwati who comprised 57.3% (n=43) of the participants. The Sotho languages spoken by the community were Sepedi and Setswana, which comprised 34.7% (n=26) of the participants. Only 8% (n=6) were Xitsonga, Tshivenda, or Urdu speakers. This is a reflection of a diversified community. The majority of the respondents (97.3%; n=73) indicated that they were South Africans, and only 2.7% (n=2) were from Swaziland.

4.4.2 Economic factors

The respondents were asked information on their economic background, their employment status, the employment status of their spouses/partners, the cost of travel to the ANC clinic, and household income. The results are presented in the following sections.

In terms of current employment status, the highest proportion of the respondents, 44% (n=33), were unemployed as indicated in Table 4.4.

Table 4.4: Employment status of respondents			
Employment status	**Frequency**	**%**	**Rank**
Unemployed	33	44.0	1
Employed full-time	20	26.7	2
Employed part-time	6	8.0	4
Self-employed	16	21.3	3
Total	**75**	**100.0**	

Only 26.7% (n=20) were employed on a full-time basis. It can be concluded that most of the women do not have full-time jobs. The largest proportion, that is, 44.0% (n=33), were not employed, and it was not established if they were receiving a social grant from the state or not. Those who were self-employed numbered less than a quarter of the entire sample.

In terms of the employment status of husbands/partners, 40% (n=30) indicated it as not applicable. The information is shown in Table 4.5.

Table 4.5: Employment status of spouse/partner			
Employment status	**Frequency**	**%**	**Rank**
Unemployed	11	14.7	3
Employed full-time	20	26.7	2
Employed part-time	9	12.0	4
Self-employed	5	6.7	5
Not applicable	30	40.0	1
Total	**75**	**100.0**	

The composition of the 40% (n=30) who indicated not applicable consisted of 26.7% (n=20) who were single, 12% (9) who were divorced/widowed and 1.3% (1) who was married. The married one maybe the result that, either she is no longer staying with the husband or they are separated. In addition, 13.3% (n=10) of the single women reported that either their partners were employed full-time (n=7), employed part-time (n=2) and self-employed (n=1). *It can be concluded that of those with spouses, the highest proportion of spouses*/partners were in full employment as evidenced by the fact that of the 18.7% (n= 14)) who were married, 16% (n=1)12 were employed full time and 1.3% (n=1) was self-employed.

Figure 4.1 gives a diagrammatic comparative analysis of the employment status of the mothers and their partners.

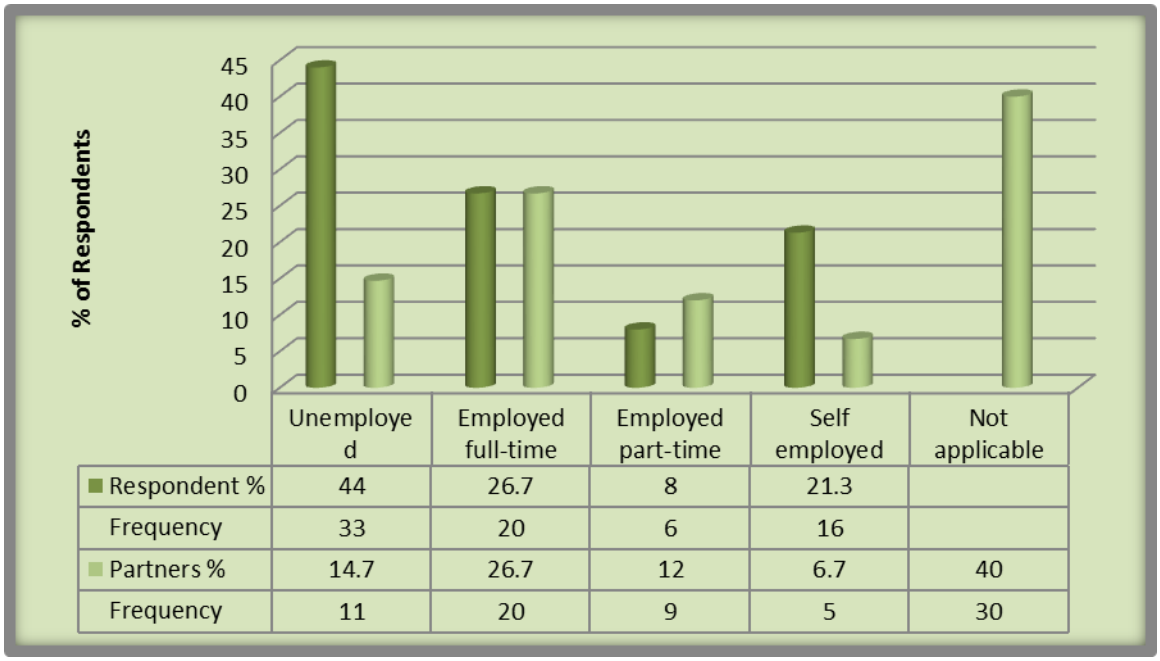

Figure 4.1: Distribution of respondents by employment status

There seemed to be an equal proportion of respondents and partners who were fully employed, as evidenced by the proportion of 26.7%. The proportion of respondents who were unemployed was higher than that of partners who were unemployed. The implication is that mothers in this proportion had adequate financial support from their partners. They were also employed and in a position to support themselves.

In terms of transport cost to the antenatal care clinic, close to half the respondents, (48.0%; n=36), walk to the clinic, whilst 29.2% (n=22) spend more than R30 and 10.7% spend less than R20 in transport cost to travel to and from the clinic, as shown in Table.4.6.

Table 4.6: Distribution of respondents by cost of travel to clinic

Cost	Frequency	%	Rank
Nothing, I walk to the clinic	36	48.0	1
Less than R20	8	10.7	3
R21 – R25	5	6.7	4
R26 – R30	4	5.3%	5
R31 and more	22	29.3	2
Total	**75**	**100.0**	

Thus the cost of travel to and from the clinic is not a barrier since the majority of the women do not have high transport costs. The majority of mothers live within the clinic's reach, as portrayed in Table 4.6. They optimise on antenatal clinic attendance and constitute an 18.7% difference to the participants who pay more than R31 to travel to the clinic. It implies mothers viewed their antenatal visit as an important aspect of their health care.

A total of 73 respondents indicated their household income. The majority of the respondents, 57.5% (n=42), earned no more than R4 000, as shown in Table 4.7.

Table 4.7: Distribution of respondents by household income

Cost	Frequency	%	Rank
R501 – R1 000	2	2.7	4
R1 001 – R1 500	13	17.8	3
R1 501 – R4 000	27	37.0	2
More than R4 000	31	42.5	1
Total	**73**	**100.0**	

About 42.5% (n=31) of the respondents earn more than R4 000 household income per month. It can be observed that not much was being earned by the respondents. This implies that mothers may not be able afford certain needs for their babies and those of their households. If mothers decide to opt for formula-feeding for their babies they may not be able to afford it as the cost of formula milk is high and it must be replenished often. The formula milk may not be sustainable consistently overtime due to cost. Twenty percent (n=15) from the sample of 73 mothers earned a maximum of R1 500 per month which may not be enough to cover basic needs such as electricity, food, and transport costs**.**

4.4.3 Breastfeeding history and current status

This section describes the breastfeeding history and current status of the respondents by looking at whether they have breastfed their babies and if not, what they used in replacing breast milk, when they started to introduce extra foods, and when they stopped breastfeeding and health information on breastfeeding. The information was vital in determining patterns and trends in exclusive breastfeeding.

There were 55 valid responses with regard to whether they had ever breastfed their previous baby. The largest proportion of mothers was 70.9% (n=39) and they indicated that they had breastfed their babies, whilst 29.1% (n=16) indicated that they did not breastfeed their babies. For the 39 who breastfed their babies, 97.4% (38) indicated that they breastfed for more than four months, whilst only 2.6% (n=1) breastfed for less than one month. The majority of mothers from this sample of 70.9% indicated that they breastfed their babies for more than four months as opposed to other studies, mentioned in Chapter 2, which revealed that from four months onwards the rate of breastfeeding dropped drastically. The mothers may be knowledgeable hence the commitment to breastfeed their babies for more than four months.

The breastfeeding initiation rate from a study conducted in the Western Cape was 77% and is lower than the rates observed in developing countries (95%). The national rate in 2008 was 88%. Most of the mothers who discontinued breastfeeding their infants did so before their infants were three months of age (Goosen et al 2014:51-53).

The 16 mothers who did not breastfeed their baby gave the following reasons, tabulated in Table 4.8.

Table 4.8: Distribution of respondents by reasons they did not breastfeed baby

Cost	Frequency	%	Rank
Going back to work	6	37.5	1
Breast milk not enough	3	18.8	3
Cracked nipples	4	25.0	2
Baby refused to suckle	3	18.8	3
Total	**16**	**100.0**	

The highest proportion of 37.5% (n=6) gave the reason that the mother was returning to work, whilst 25% (n=4) indicated that they had cracked nipples. An equal proportion of 18.8% indicated that their breast milk was not enough, or the baby refused to suckle.

In terms of whether one is currently breastfeeding the child, there were 74 valid responses. About 52.7% (n=39) indicated that they were no longer breastfeeding, whilst 47.3% (n=35) indicated that they were still breastfeeding. All those who were not breastfeeding their children indicated that they were currently giving their babies formula milk to replace breast milk. Of the 35 mothers still breastfeeding their children, 67.6%

(n=23) indicated that they started breastfeeding immediately after giving birth, whilst 32.4% (n=11) indicated that they started breastfeeding within an hour after giving birth. According to Njeri (2012:76) going back to work is a determinant of exclusive breastfeeding. Working mothers are not likely to breastfeed as the demands of work are high and the time spent at home with their babies becomes inadequate. The employed mothers were in the majority, according to Table 4.8, and it is mentioned that with employment breastfeeding decreases. Therefore, going back to work can be a predictor of exclusive breastfeeding.

Breast problems are a very common determinant of exclusive breastfeeding, according to literature. In a Ghanaian study to determine the barriers of exclusive breastfeeding in pre-urban breastfeeding mothers, it was discovered that "... breast problems and maternal employment were mentioned as constraints to the practice" (Otoo et al 2009:34).

The results from this study are slightly different to those of the Nigerian study, which mentions that an average level of breastfeeding initiation immediately after birth was 45%, and 29% within the first two hours after birth (Agunbiade & Ogunleye 2012:4).

In terms of giving the baby other foods, 74 mothers responded to the question. About 85.1% (n=63) indicated that they were giving the babies other foods, whilst 14.9% (n=11) indicated that they were not giving their babies other foods. Those giving their babies other foods indicated who gave them the advice. The information is shown in Figure 4.2.

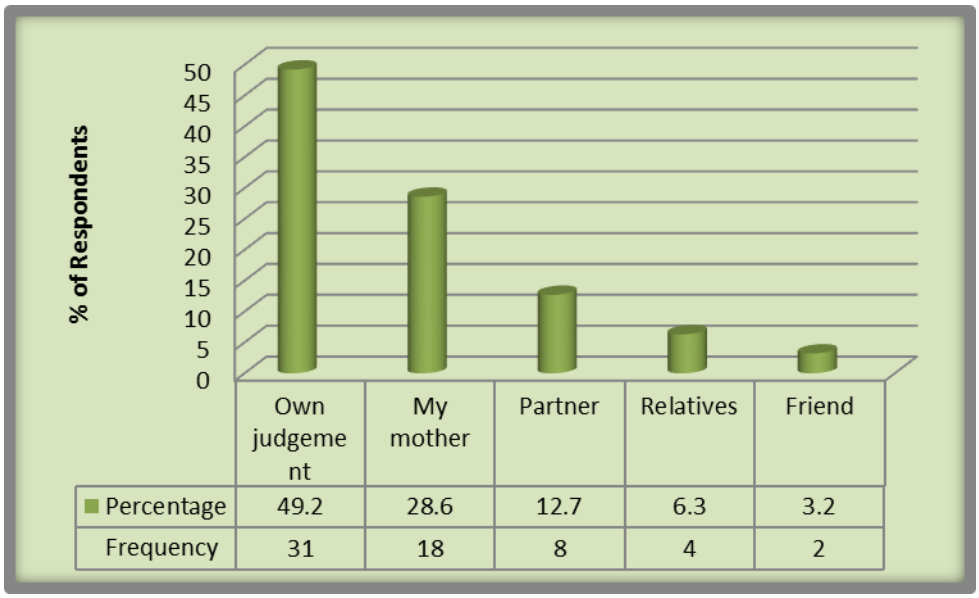

Figure 4.2: Distribution of respondents by those who advised mother to give other foods

It can be observed that close to half the respondents, that is 49.2% (n=31), used their own judgement, whilst 28.6% (n=18) were advised by their mothers, and 12.7% (n=8) were advised by their partners. The rest received advice from friends or relatives. Forty percent breastfed exclusively for six months and 60% weaned their babies earlier. They mentioned reasons such as insufficient milk, mothers-in-laws' influence, and information from neighbours. The information to start weaning was obtained from doctors (42%), mothers-in-law (21%), and the remaining 37% from neighbours. Most mothers in those studies did not seem to make their own judgements to wean their babies.

A study by Mahdu et al (2009:243-245) investigated demographic variables, breastfeeding, and newborn care practices in rural India and noted that breastfeeding practices seemed to be influenced largely by the beliefs of the community, which were further affected by social, cultural, and economic factors. Mothers who consulted private doctors weaned their babies early as opposed to those who attended government facilities.

In terms of when they started to introduce extra foods to the last-born child, a total of 67 mothers responded to the question, as shown Figure 4.3.

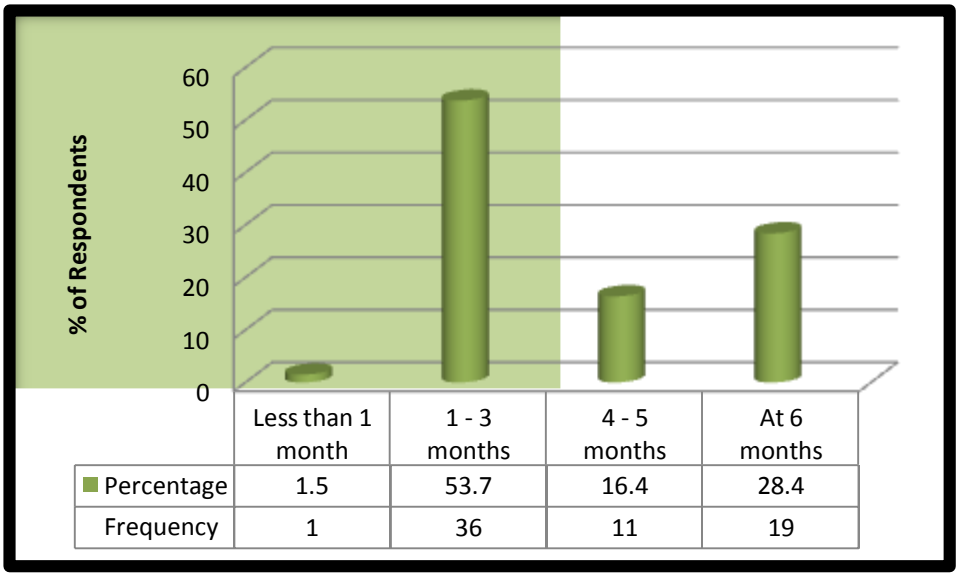

Figure 4.3: Distribution of respondents in terms of when they introduced extra foods

Close to half the mothers, i.e. 53.7% (n=36), indicated that it was between one and three months, whilst 28.4% (n=19) indicated that it was at six months, and 16.4% (n=11) said it was between four and five months. Thus close to 30% of respondents only introduced extra foods to their babies at the recommended time of six months. Literature revealed that the prevalence of breastfeeding practice for infants younger than six months was 71%, an indication that exclusive breastfeeding practice poses a challenge to mothers.

For those respondents not breastfeeding at that time, 10 gave the time they stopped breastfeeding. About 40% (n=4) indicated that it was when they were more than four months old, 30% (n=3) indicated that it was when the babies were younger than one month, and an equal proportion indicated that it was when they were two months old. An Indian study showed that 40% of mothers breastfed their babies exclusively for six months, whilst 60% weaned their babies prematurely, stating reasons such as insufficient milk, influence of mothers-in-law, and information obtained from neighbours.

All 37 respondents who answered the question as to whether they gave their babies anything before starting to breastfeed after giving birth indicated that they did not give the last-born baby anything before starting to breastfeed. Health care workers might have been of great influence to the mothers' decision not to give any pre-lacteal feeds to their babies. However, mothers were not asked what informed their choice.

This is not in line with findings from other studies. An Ethiopian research study discovered that 76% of mothers introduced other foods before the babies could receive their first taste of breast milk (Egata et al 2014:13). Pre-lacteal comparative feeding statistics varied from setting to setting. In Tanzania, pre-lacteal feeding was discouraged and one study found that only 1% of pre-lacteal feeds was given, which consisted mainly of water (Mgongo, Mosha, Msuya & Stray-Pedersen 2013:6). Paradoxically, in Kenyan and Indian studies the infants who were given pre-lacteal feeding were only 42% and 19% of the sample respectively (Njeri 2012:42; Mahdu et al 2009:243-245).

A total of 39 respondents indicated that their babies suckled without difficulty. A higher proportion, 94.9% (n=37), indicated that their babies breastfed without difficulty, and only 5.1% (n=2) indicated that their babies had difficulty breastfeeding. The subject of whether or not the infant is able to suckle properly during the first few hours after birth has not been intensively explored by researchers. In fact, it has rarely been studied, especially in rural settings.

In a South African study, it was revealed that most of the mothers who discontinued breastfeeding their infants did so before their infants were three months of age (Goosen et al 2014:51-53). The influence of mothers-in-law and neighbours' information amounted to 21% and 37% respectively (Mahdu et al 2009:243-245).

The variables whether one currently breastfeed their child, given the baby other foods and liquids and when the mother introduced extra foods or drinks including water to the baby were used to determine whether the baby was exclusively breast feed. The results are shown in Figure 4.4.

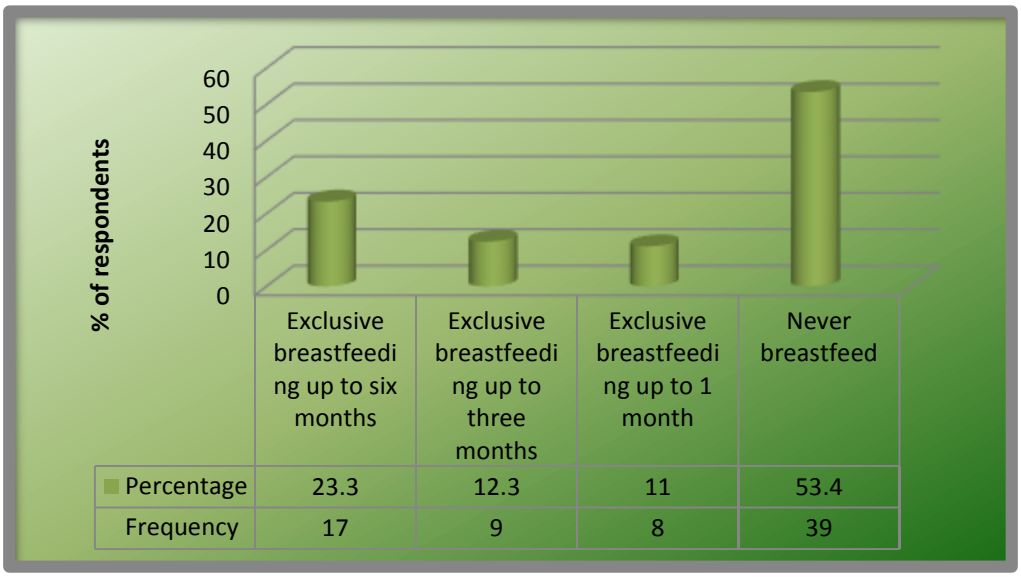

Figure 4.4: Exclusive breastfeeding status

A total of 73 respondents managed to answer all three questions. The majority of the respondents never breastfeed their current baby and 23.3% (n=17) did exclusive breastfeeding up to six months. It can be observed that most of the mothers did not breastfeed and those who breastfeed, the largest proportion did exclusive breastfeeding up to six months. Thus the findings in this study reveal that 23.3% of mothers practiced exclusive breastfeeding up to six months. According to Agunbiade and Ogunleye (2012:1) only a small proportion of mothers (19%) was able to practise exclusive breastfeeding.

4.4.4 Health information on infant feeding

The respondents were asked various questions on health information. Their responses are shown in Table 4.9.

Table 4.9: Health information			
Tools	**Level of acknowledgement**		**Rank**
	Yes	**No**	
Q27. Did you receive counselling on infant feeding options when pregnant with this current baby?	100.0% (75)	-	1
Q29. Did the health worker demonstrate how the baby should latch on the breast?	98.7% (74)	1.3% (1)	2
Q30. Can the information prepare you well before starting to breastfeed?	98.7% (74)	1.3% (1)	2
Q28. Did the information you received on infant feeding options influenced your decisions on breastfeeding this current baby?	97.3% (73)	2.7% (2)	4
Q31. Would you recommend this information to other mothers to help them in breastfeeding decisions?	94.7% (71)	5.3% (4)	5

All aspects on health information had acknowledgement levels of well above 90%. All respondents received counselling on infant breastfeeding options when they were pregnant with the current baby. Health workers demonstrated to them how the baby should be placed at the breast to facilitate comfortable and easy suckling. These mothers confirmed that the information they received enabled them to be well equipped for breastfeeding; they also indicated that the information they received on infant breastfeeding options influenced their decisions on breastfeeding the current baby, and that they would recommend the information to other mothers to help them with decisions regarding breastfeeding. Accessibility to health facilities enhances the mothers' knowledge of health-related issues and information on exclusive breastfeeding. Reviewed literature indicates that non-exclusive breastfeeding in infants under six months of age is associated with less maternal access to a health facility. Children of mothers who had little access to a health facility were found to be nearly three times more likely not to be exclusively breastfed, compared to their peers. Furthermore, health literacy may be enhanced by health information given by health workers during the mothers' antenatal visits.

4.4.5 Barriers to exclusive breastfeeding

The respondents were asked to indicate their level of agreement on whether certain aspects constitute barriers to exclusive breastfeeding. There were 14 statements. The scale was a Likert scale in which strongly disagree to strongly agree were given scores from 1 to 5. Thus a higher mean of more than 3.5 indicated that the respondents were in agreement, a mean of 2.5 to 3.49 indicated that there were neutral and a mean below 2.5 indicated that they disagreed. The mean was used to rank the aspects. The information is shown in Table 4.10.

Table 4.10: Level of agreement on barriers to exclusive breastfeeding

Statement	Level of agreement					Mean
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	
+	60.0% (45)	37.3% (28)	1.3% (1)	-	1.3% (1)	4.55
Q32a). Traditional or religious structures can influence decision to exclusively breastfeed.	41.3% (31)	50.7% (38)	1.3% (1)	6.7% (5)	-	4.27
Q32d). When the mother has tuberculosis she cannot breastfeed her baby.	1.4% (1)	13.5% (10)	58.1% (43)	25.7% (19)	1.4% (1)	2.88
Q32h). I had to return to work.	23.0% (17)	4.1% (3)	4.1% (3)	68.9% (51)	-	2.81
Q32i). Breastfeeding is a tiring exercise for me.	9.3% (7)	21.3% (16)	5.3% (4)	61.3% (46)	2.7% (2)	2.73
Q32b). Partner is not supportive towards exclusive breastfeeding of the baby.	6.8% (5)	4.1% (3)	40.5% (30)	43.2% (32)	5.4% (4)	2.64
Q32f). I experienced painful breasts.	8.0% (6)	5.3% (4)	6.7% (5)	72.0% (54)	8.0% (6)	2.33
Q32l). I was experiencing weight loss.	1.3% (1)	9.3% (7)	6.7% (5)	82.7% (62)	-	2.29
Q32g). I was unable to make enough milk to satisfy the baby.	5.3% (4)	1.3% (1)	6.7% (5)	84.0% (63)	2.7% (2)	2.23

Table 4.10: Level of agreement on barriers to exclusive breastfeeding						
Statement	**Level of agreement**					**Mean**
	Strongly agree	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**	
Q32c). Mother-in-law pressurised me to wean the baby.	1.3% (1)	-	12.0% (9)	80.0% (60)	6.7% (5)	2.09
Q32n). I was not feeding well.	1.3% (1)	5.3% (4)	1.3% (1)	81.3% (61)	10.7% (8)	2.05
Q32m). My baby was not gaining enough weight.	-	1.3% (1)	5.3% (4)	86.7% (65)	6.7% (5)	2.01
Q32o). My community will isolate me if I exclusively breastfeed.	-	1.3% (1)	10.7% (8)	76.0% (57)	12.0% (9)	2.01
Q32j). My neighbours pressured me to wean the baby.	-	-	5.3% (4)	84.0% (63)	10.7% (8)	1.95
Q32k). The baby refused breast milk.	-	-	9.3% (7)	74.7% (56)	16.0% (12)	1.93

More than 90% of the respondents were in agreement that *"the baby can be addicted to breast milk if he/she breastfeeds for 6 months exclusively*" and "t*raditional or religious structures can influence decision to exclusively breastfeed*" were barriers to exclusive breastfeeding. However, the majority of the respondents, that is 58.1%, were not sure whether "w*when the mother has tuberculosis she cannot breastfeed her baby"* was a barrier to exclusive breastfeeding. Thus respondents tend to have mixed feelings on whether tuberculosis may be transmitted to their babies during breastfeeding if they were ill from the disease. Though rare, it affected mothers' choice to optimally breastfeed their babies, although no details from the mothers were obtained regarding TB. May be the mothers' health influenced their decision whether or not to breastfeed.

The majority of the respondents disagreed that the following aspects were barriers to exclusive breastfeeding:

- Q32j). My neighbours pressured me to wean the baby (94.7%).
- Q32m). My baby was not gaining enough weight (93.3%).
- Q32n). I was not feeding well (92.0%).
- Q32k). The baby refused breast milk (90.7**%**).

- Q32o). My community will isolate me if I exclusively breastfeed (88.0%).
- Q32c). Mother-in-law pressurised me to wean the baby (86.7%).
- Q32g). I was unable to make enough milk to satisfy the baby (86.7%).
- Q32l). I was experiencing weight loss (82.7%).
- Q32f). I experienced painful breasts (80.0%).
- Q32h). I had to return to work (68.9%).
- Q32i). Breastfeeding is a tiring exercise for me (64.0%).

Though mothers did experience some kind of pressure regarding breastfeeding, it was noted that the majority, as illustrated above, disagreed with some of the commonest factors that influenced exclusive breastfeeding, according to other studies conducted on the subject.

Literature reveals that exclusive breastfeeding was considered essential but demanding, and the findings are from a Nigerian research study which also revealed the following as major constraints to breastfeeding: fear of babies becoming addicted to breast milk (26%); pressure from mothers-in-law (25%); and the need for the mother to return to work (24%) (Agunbiade & Ogunleye 2012:1). However, in a Kenyan study young mothers found it more difficult to practise exclusive breastfeeding as they depended on social structures such as the advice of their family members when it comes to infant feeding (Saka 2012:17). Therefore, it shows that structures within the society have a role to play in the everyday lives of people living in such environments. This was among the factors influencing mothers to discontinue breastfeeding.

Twenty-six percent of mothers stopped breastfeeding their babies, according to a study conducted by Agunbiade and Ogunleye (2012:1). A similar study in Ghana intended to determine barriers to exclusive breastfeeding, and it was indicated that breast problems were mentioned as constraints to the practice (Otoo et al 2009:34).

Cross tabulations were done to determine whether barriers differed by exclusive breastfeeding status. Table 4.11 gives the results of the proportions.

Table 4.11: Level of agreement on barriers to exclusive breastfeeding by exclusive breastfeeding status				
Statement	**% in Agreement**			
	EBF up to 6 months	**EBF up to 3 months**	**EBF up to 1 month**	**Never breastfed**
Q32e). The baby can be addicted to breast milk if he/she breastfeeds for 6 months exclusively.	100.0%	100.0%	100.0%	94.9%
Q32a). Traditional or religious structures can influence decision to exclusively breastfeed.	100.0%	100.0%	100.0%	87.2%
	% in Disagreement			
Q32d). When the mother has tuberculosis she cannot breastfeed her baby.	6.3%	22.2%	37.5%	35.9%
Q32h). I had to return to work.	100.0%	100.0%	62.5%	51.3%
Q32i). Breastfeeding is a tiring exercise for me.	88.2%	88.9%	25.0%	56.4%
Q32b). Partner is not supportive towards exclusive breastfeeding of the baby.	35.3%	100.0%	62.5%	39.5%
Q32f). I experienced painful breasts.	100.0%	100.0%	87.5%	64.1%
Q32l). I was experiencing weight loss.	94.1%	100.0%	25.0%	84.6%
Q32g). I was unable to make enough milk to satisfy the baby.	100.0%	88.9%	87.5%	79.5%
Q32c). Mother-in-law pressurised me to wean the baby.	100.0%	77.8%	75.0%	84.6%
Q32n). I was not feeding well.	100.0%	100.0%	50.0%	94.9%
Q32m). My baby was not gaining enough weight.	100.0%	100.0%	87.5%	89.7%
Q32o). My community will isolate me if I exclusively breastfeed.	100.0%	100.0%	62.5%	87.2%
Q32j). My neighbours pressured me to wean the baby.	100.0%	100.0%	75.0%	94.9%
Q32k). The baby refused breast milk.	100.0%	100.0%	100.0%	82.1%

All levels of exclusive breastfeeding had similar views in all aspects except those who breastfeed up to a month who differed in three aspects with the others. Those who did exclusive breastfeeding up to 1 month were in agreement to the aspects that "*breastfeeding is a tiring exercise for me*", "*I was experiencing weight loss*" and "*I was not feeling well*". Thus the barriers experienced by those who breastfeed for a month were that it was a tiring exercise, they had weight loss and they were not feeling well.

4.4.6 Infant feeding practices

The respondents were asked to indicate the level of extent on issues of infant feeding practices. Thirteen statements were presented to the participants, the responses to which were ranked (based on the mean) and divided into five levels of importance scored from 1 to 5 where 1 was not any extent at all, 2 to a little extent, 3 to some extent, 4 to a great extent and 5 to a very large extent. The information is illustrated in Table 4.12.

Table 4.12: Level of extent on infant feeding practices

Statement	Level of extent					Mean
	To a very large extent	To a large extent	To some extent	To a little extent	Not to any extent at all	
Q33h). It important for mothers to know how the baby should attach to the breast.	88.0% (66)	10.7% (8)	1.3% (1)	-	-	4.87
Q33l). Counselling on infant feeding options helps mothers make better choices.	74.3% (55)	23.0% (17)	1.4% (1)	1.4% (1)	-	4.70
Q33i). The baby should be breastfed when they demand so.	70.7% (53)	21.3% (16)	8.0% (6)	-	-	4.63
Q33f). The baby should be breastfed immediately after birth.	50.0% (37)	45.9% (34)	2.7% (2)	1.4% (1)	-	4.45
Q33b). Colostrum is a suitable feed for the baby.	18.7% (14)	50.7% (38)	6.7% (5)	10.7% (8)	13.3% (10)	3.51
Q33m). Breast milk alone is sufficient for the baby for up to 6 months.	28.4% (21)	10.8% (8)	40.5% (30)	17.6% (13)	2.7% (2)	3.45
Q33j). Wet nursing can benefit your baby when you are not available to breastfeed them.	20.3% (15)	6.8% (5)	44.6% (33)	17.6% (13)	10.8% (8)	3.08

Table 4.12: Level of extent on infant feeding practices						
Statement	**Level of extent**					**Mean**
	To a very large extent	**To a large extent**	**To some extent**	**To a little extent**	**Not to any extent at all**	
Q33d). Liquids like juice and water are a good supplement to exclusive breastfeeding.	-	32.0% (24)	41.3% (31)	9.3% (7)	17.3% (13)	2.88
Q33c). Soft porridge can be introduced in-between breastfeeds.	1.4% (1)	32.9% (24)	31.5% (23)	19.2% (14)	15.1% (11)	2.86
Q33k). Mixed feeding is likely to increase the infant mortality rate.	8.1% (6)	18.9% (14)	28.4% (21)	36.5% (27)	8.1% (6)	2.82
Q33g). If milk is not coming out of the breast then solids can be given to the baby.	-	4.1% (3)	52.7% (39)	27.0% (20)	16.2% (12)	2.45
Q33e). The baby can start eating solids within the first month of life.	-	8.1% (6)	20.3% (15)	23.0% (17)	48.6% (36)	1.88
Q33a). Pre-lacteal feeding is recommended after the baby's birth.	2.7% (2)	4.0% (3)	13.3% (10)	30.7% (23)	49.3% (37)	1.80

Fifty percent of the respondents agreed that the following aspects occur to a large extent:

- Q33h). It's important for mothers to know how the baby should attach to the breast (98.7%).
- Q33l). Counselling on infant feeding options helps mothers make better choices (97.3%).
- Q33f). The baby should be breastfed immediately after birth (95.9%).
- Q33i). The baby should be breastfed when they demand so (92.0%).
- Q33b). Colostrum is a suitable feed for the baby (69.3%).

However, it was not asked how they acquired the ability to perform such good practice in exclusive breastfeeding.

About 52.7% of the respondents indicated that, to some extent, if milk flow was insufficient, solid food could be given to the baby. On the other hand, about 71.6% indicated, to a small extent, that the baby can start taking solids within the first month of life; and also 80%, to a small extent, indicated that pre-lacteal feeding is recommended

after the baby's birth. In certain instances, literature mentions that 65% of mothers inferred that the main reason for bottle feeding their babies was inadequate breast milk, and 12% of mothers claimed their babies were unable to breastfeed (suckle), and that pre-lacteal feeding was practised by 76% of the mothers who were not exclusively breastfeeding their babies (Radhakrishnan & Balamuruga 2012:66; Egata et al 2013:4).

The cross tabulations were done to determine whether infant feeding practices differed by exclusive breastfeeding status. Table 4.13 gives the results of the proportions.

Table 4.13: Level of extent on infant feeding practices by exclusive breastfeeding status

Statement	Level of extent			
	EBF 6 months	EBF3 months	EBF1 month	Never breastfed
Q33h). It important for mothers to know how the baby should attach to the breast.	94.1%	100.0%	100.0%	100.0%
Q33l). Counselling on infant feeding options helps mothers make better choices.	100.0%	100.0%	87.5%	97.4%
Q33i). The baby should be breastfed when they demand so.	100.0%	100.0%	100.0%	84.6%
Q33f). The baby should be breastfed immediately after birth.	100.0%	100.0%	100.0%	92.3%
Q33b). Colostrum is a suitable feed for the baby.	35.3%	77.8%	100.0%	74.4%
Q33m). Breast milk alone is sufficient for the baby for up to 6 months.	47.1%	33.3%	25.0%	39.5%
Q33j). Wet nursing can benefit your baby when you are not available to breastfeed them.	52.9%	33.3%	0.0%	21.1%
Q33d). Liquids like juice and water are a good supplement to exclusive breastfeeding.	76.5%	33.3%	0.0%	20.5%
Q33c). Soft porridge can be introduced in-between breastfeeds.	76.5%	33.3%	28.6%	18.4%
Q33k). Mixed feeding is likely to increase the infant mortality rate.	29.4%	11.1%	12.5%	28.9%

Table 4.13: Level of extent on infant feeding practices by exclusive breastfeeding status				
Statement	**Level of extent**			
	EBF 6 months	**EBF3 months**	**EBF1 month**	**Never breastfed**
Q33g). If milk is not coming out of the breast then solids can be given to the baby.	0.0%	11.1%	0.0%	5.1%
Q33e). The baby can start eating solids within the first month of life.	0.0%	0.0%	12.5%	13.2%
Q33a). Pre-lacteal feeding is recommended after the baby's birth.	5.9%	22.2%	0.0%	5.1%

All levels of exclusive breastfeeding were in agreement that the following practices were being done:

- Q33h). It important for mothers to know how the baby should attach to the breast
- Q33l). Counselling on infant feeding options helps mothers make better choices
- Q33i). The baby should be breastfed when they demand so
- Q33f). The baby should be breastfed immediately after birth

The respondents who did exclusive breastfeeding up to six months were the only ones who had the majority of the respondents agreeing to the extent of the following infant feeding practices:

- Q33j). Wet nursing can benefit your baby when you are not available to breastfeed them
- Q33d). Liquids like juice and water are a good supplement to exclusive breastfeeding
- Q33c). Soft porridge can be introduced in-between breastfeeds

However, there was the only group that was in disagreement that Q33b). Colostrum is a suitable feed for the baby.

4.4.7 Knowledge of mother-to-child transmission and exclusive breastfeeding

The respondents were asked questions to determine their level of knowledge of HIV/AIDS issues as they relate to exclusive breastfeeding. The questions were divided into two sections. The first section consisted of 10 items testing their knowledge of mother-to-child transmission, while the other section consisted of 17 items asking questions on knowledge of exclusive breastfeeding. As mentioned in the methodology section, a score of 1 (one) was given to the correct answer to a true-or-false knowledge statement, and 0 (zero) to an incorrect response or no response. Thus the highest score for knowledge of mother-to-child transmission was 10, whilst for exclusive breastfeeding it was 17. The overall highest possible score was 27 points.

4.4.7.1 Knowledge of mother-to-child transmission

The analysis of the results revealed that the knowledge score of the respondents on the section mother-to-child transmission indicated two aspects where the level of knowledge was below 50%. The information as shown in Table 4.14 gives the results of the knowledge proportions.

Table 4.14: Knowledge of mother-to-child transmission

Statement	% Correctly judged as true or false
Q34a). HIV-testing is important for the health of the mother and the unborn baby (T).	97.3
Q34f). The best time for an HIV-infected pregnant woman to be enrolled in the PMTCT programme is at the beginning of antenatal care (T).	97.3
Q34h). ARV drugs are the best treatment in preventing unborn babies from being infected by HIV (T).	97.3
Q34j). Antenatal care is very important to the pregnant woman as it ensures the wellbeing of the mother and the baby (T).	97.3%
Q34i). It is important for the partner to test to minimise the risk of HIV-reinfection (T).	96.0
Q34g). Early booking for antenatal check-ups is not necessary for the mother and unborn child if the mother is HIV-positive (F).	92.0
Q34e). It benefits the baby to take formula and breast milk at the same time (F).	69.3
Q34d). It is not safe to exclusively breastfeed as HIV will always be transmitted to the baby (F).	68.0
Q34c). HIV cannot be transmitted to the baby during delivery (F).	41.3
Q34b). An HIV-positive mother can transmit the virus to the baby during pregnancy (T).	20.0
(T)=statement is true; (F)=statement is false	

Sixty percent of all participants indicated some knowledge of all the aspects relating to the section mother-to-child transmission. Only 41.3% knew that HIV could be transmitted to the baby during delivery, and 20% that an HIV-positive mother could transmit the virus to her baby during pregnancy. The level of education correlated with the woman's ability to find a solution to her health problems. An educated woman is more aware of health issues and the availability of health services, and this information is utilised more effectively compared to women who are not educated (Onasoga et al 2012:1314). Thus there is a greater need to educate the respondents in terms of transmission of HIV during pregnancy and/or delivery. By intensifying health education ensures that mothers are knowledgeable about HIV-related information such as the risk of transmission of the virus to the baby during pregnancy, delivery, or breastfeeding. Other studies illustrate that mothers nursing their infants do have knowledge of how HIV is transmitted. The major task faced by health care professionals is to intensify information giving sessions to cover a variety of aspects on HIV-transmission. This will also assist mothers not to rely on the lay understanding of family and community (Lazarus 2013:2).

Table 4.15: Knowledge of mother-to-child transmission by exclusive breastfeeding status

Statement	% Correctly judged as true or false			
	EBF 6 months	EBF 3 months	EBF 1 month	Never breastfed
Q34a). HIV-testing is important for the health of the mother and the unborn baby (T).	100.0	100.0	87.5	97.4
Q34f). The best time for an HIV-infected pregnant woman to be enrolled in the PMTCT programme is at the beginning of antenatal care (T).	100.0	100.0	87.5	97.4
Q34h). ARV drugs are the best treatment in preventing unborn babies from being infected by HIV (T).	100.0	88.9	87.5	100.0
Q34j). Antenatal care is very important to the pregnant woman as it ensures the wellbeing of the mother and the baby (T).	100.0	88.9	87.5	100.0
Q34i). It is important for the partner to test to minimise the risk of HIV-reinfection (T).	100.0	88.9	87.5	97.4
Q34g). Early booking for antenatal check-ups is not necessary for the mother and unborn child if the mother is HIV-positive (F).	88.2	100.0	75.0	94.9
Q34e). It benefits the baby to take formula and breast milk at the same time (F).	64.7	100.0	75.0	66.7

Table 4.15: Knowledge of mother-to-child transmission by exclusive breastfeeding status				
Statement	**% Correctly judged as true or false**			
	EBF 6 months	**EBF 3 months**	**EBF 1 month**	**Never breastfed**
Q34d). It is not safe to exclusively breastfeed as HIV will always be transmitted to the baby (F).	94.1	100.0	87.5	46.2
Q34c). HIV cannot be transmitted to the baby during delivery (F).	23.5	33.3	75.0	46.2
Q34b). An HIV-positive mother can transmit the virus to the baby during pregnancy (T).	23.5	33.3	0.0	17.9
(T)=statement is true; (F)=statement is false				

The majority of those who never breastfeed got the statement "*Q34d). It is not safe to exclusively breastfeed as HIV will always be transmitted to the baby (F*)" incorrect, that is, they felt the statement was true. In addition those who did exclusive breastfeed were the only one with the majority of respondents (75%) who got the statement correct, that is, they disagreed that HIV cannot be transmitted to the baby during delivery. The majority of all levels of exclusive breastfeeding got the statement *"Q34b). An HIV-positive mother can transmit the virus to the baby during pregnancy (T)"* incorrect.

The score of this section was added and the minimum value of the knowledge score; the minimum value was 1 and the maximum value was 10. The aim was to determine whether the respondents were knowledgeable on issues on mother to child transmission. A score of at least 5 indicated that the respondents knowledgeable on the aspects. The distribution of the scores is shown in Table 4.16.

Table 4.16: Summary statistics for knowledge score on mother-to-child transmission	
Summary statistics	**Score**
Mean	7.76
Median	8
Mode	8
Standard deviation	1.3837
Skewness	-2.73
Kurtosis	14.02
Maximum	10
Minimum	0
Range	10
Coefficient of variation	17.83%

The score ranged from 0 to 10. It means there were some individuals who did not manage to get an aspect correct, whilst there were individuals who got all the aspects correct. The average score was 7.76 with a standard deviation of 8, giving a coefficient of variation of 17.83%. One can conclude that on average the respondents had knowledge of mother–to-child transmission, with a reading of 8 out of 10. This is also supported by the median and mode of 8. About 68.26% (± one standard deviation from the mean) of the respondents had a knowledge score from 6.38 to 9.14. The ratio of the standard deviation to the mean was 1:65, indicating large variability. The histogram and box plots are shown in Figure 4.5.

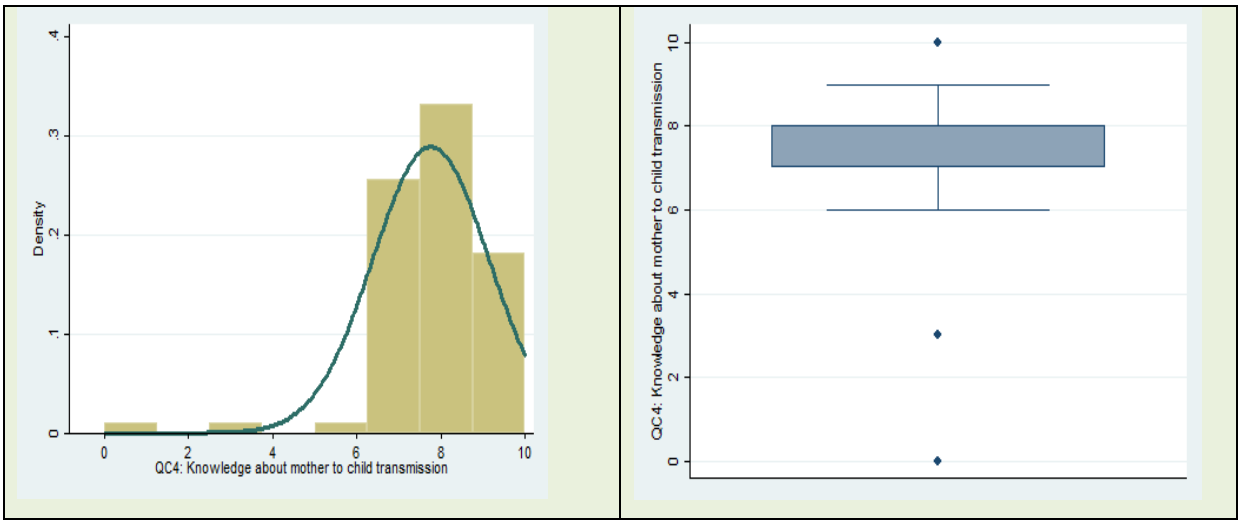

Figure 4.5: Histogram and box plot showing knowledge score on mother-to-child transmission

The histogram and the box plot show that the data is negatively skewed as evidenced by few respondents who got low marks. The box plot shows that there are two outliers to the left and one to the right. The majority of the scores are at least 8. The median was 8, thus at least 50% of the respondents got a score of 8 out of 10. Looking at the box plot it can be observed that 25% got a score of not more than 7. A test of normality was done. The Shapiro Wilk test gave a p-value of 0.000 indicating that the data was not normally distributed since the p-value > 0.05 indicating that it was highly significant. In conclusion, one can agree that the majority of the respondents were knowledgeable about issues of mother-to-child transmission of HIV. The participants were exposed to good counselling at facility level, and it shows that they were implementing all that they had learned. As literature states that it is difficult to practise exclusive breastfeeding unless its value is known to the community, especially family members (Saka 2012:17).

4.4.7.2 Knowledge of exclusive breastfeeding

There were seventeen statements and the aanalysis of the results revealed that the knowledge score of the respondents on the section exclusive breastfeeding showed seven aspects out of seventeen aspects where the level of knowledge was above 50%. The information as shown in Table 4.17 gives the results of the knowledge proportions.

Table 4.17: Knowledge of exclusive breastfeeding	
Statement	**% Correctly judged as true or false**
Q35a) Breast milk sometimes provides the newborn baby with adequate nutrition to protect against infections (T).	97.3
Q35i). It is recommended to exclusively breastfeed the baby for the first 6 months of life (T).	97.3
Q35k). Breastfeeding is cheaper than formula milk (T).	97.3
Q35g). Exclusive breastfeeding has lasting nutritional benefits for the baby (T).	96.0
Q35p). A mother who drinks alcohol must not breastfeed her baby (T).	90.7
Q35d). Complimentary foods must not be introduced after 6 months of exclusive breastfeeding (F).	81.3
Q35c). A baby may be infected through breast milk if the mother is HIV-positive (T).	57.3
Q35j). Breastfed babies are rarely constipated (T).	33.3
Q35m). Breastfeeding is more convenient than bottle feeding (T).	32.0
Q35e). Disclosure of HIV-status can help the mother to breastfeed exclusively (T).	26.7
Q35h). Exclusive breastfeeding is the best option for HIV exposed babies (T).	24.0
Q35b). Exclusive breastfeeding minimises HIV-infection risk in breastfeeding (T).	20.0
Q35f). HIV-positive mothers can introduce other foods to the baby gradually while they are still breastfeeding (F).	10.7
Q35q). Breastfeeding helps the uterus to contract thus reducing and controlling postpartum bleeding (T).	8.0
Q35n). Breast milk is digested more easily than formula milk (T).	4.0
Q35l). Infants who are breastfed exclusively tend to walk and talk faster than bottle fed babies (T).	2.7
Q35o). The babies that are breastfed are healthier than the ones who are formula-fed (T).	1.3
T=statement is true; F=statement is false	

Responses to only 7 out of the 17 statements indicated that the majority of the respondents were knowledgeable about exclusive breastfeeding. More than 80% of the respondents were knowledgeable that breast milk provides the new-born baby with

adequate nutrition to protect against infections, and that exclusive breastfeeding should be practised for the first six months of the baby's life. Also, breastfeeding is cheaper than formula milk; exclusive breastfeeding has lasting nutritional benefits for the baby; a mother should not drink alcohol whilst breastfeeding; and complementary food can be introduced after six months. However, close to 60% knew that a baby may be infected through breast milk if the mother is HIV-positive.

On the other aspects, fewer than 35% were shown to be knowledgeable about the issue. Less than 20% of the respondents knew that HIV-positive mothers cannot introduce other foods to the baby gradually while they are still breastfeeding, and that breastfeeding helps the uterus to contract thus reducing and controlling postpartum bleeding. Breast milk is digested more easily than formula milk; infants who are breastfed exclusively tend to walk and talk earlier than bottle-fed babies, and babies who are breastfed are healthier than those who are formula-fed. This is a cause for concern since only 1 out of 75 women is more knowledgeable about these aspects. The reviewed literature identified that many mothers introduce liquids or semi-solids from a very young age. They are acting on their own perceptions and understanding of what is best for their babies, as well as responding to normative pressures based on lay understandings of their immediate family and the community in which they are embedded. Factors such as economic dependence appear to influence how susceptible women are to societal and family pressures regarding infant feeding practice. This is also a misconstrued assumption that breast milk is not adequate for th3.e baby and that they therefore need other foods and milk to keep them satisfied for longer periods of time (Lazarus et al 2013:2; UNICEF 2011-2012:12).

Table 4.18: Knowledge of exclusive breastfeeding by exclusive breastfeeding status

Statement	% Correctly judged as true or false			
	Exclusive breastfeeding up to six months	Exclusive breastfeeding up to three months	Exclusive breastfeeding up to 1 Month	Never breastfeed
Q35a) Breast milk sometimes provides the newborn baby with adequate nutrition to protect against infections (T).	100.0%	88.9%	87.5%	100.0%
Q35i). It is recommended to exclusively breastfeed the baby for the first 6 months of life (T).	100.0%	88.9%	87.5%	100.0%

Table 4.18: Knowledge of exclusive breastfeeding by exclusive breastfeeding status				
Statement	**% Correctly judged as true or false**			
	Exclusive breastfeeding up to six months	**Exclusive breastfeeding up to three months**	**Exclusive breastfeeding up to 1 Month**	**Never breastfeed**
Q35k). Breastfeeding is cheaper than formula milk (T).	100.0	88.9	87.5	100.0
Q35g). Exclusive breastfeeding has lasting nutritional benefits for the baby (T).	100.0	77.8	87.5	100.0
Q35p). A mother who drinks alcohol must not breastfeed her baby (T).	94.1	100.0	75.0	89.7
Q35d). Complimentary foods must not be introduced after 6 months of exclusive breastfeeding (F).	94.1	55.6	87.5	79.5
Q35c). A baby may be infected through breast milk if the mother is HIV-positive (T).	35.3	66.7	0.0	76.9
Q35j). Breastfed babies are rarely constipated (T).	35.3	66.7	12.5	30.8
Q35m). Breastfeeding is more convenient than bottle feeding (T).	35.3	22.2	50.0	25.6
Q35e). Disclosure of HIV-status can help the mother to breastfeed exclusively (T).	41.2	22.2	0.0	28.2
Q35h). Exclusive breastfeeding is the best option for HIV exposed babies (T).	47.1	22.2	62.5	5.1
Q35b). Exclusive breastfeeding minimises HIV-infection risk in breastfeeding (T).	35.3	66.7	12.5	5.1
Q35f). HIV-positive mothers can introduce other foods to the baby gradually while they are still breastfeeding (F).	0.0	11.1	25.0	10.3
Q35q). Breastfeeding helps the uterus to contract thus reducing and controlling postpartum bleeding (T).	17.6	0.0	0.0	7.7

Table 4.18: Knowledge of exclusive breastfeeding by exclusive breastfeeding status				
Statement	**% Correctly judged as true or false**			
	Exclusive breastfeeding up to six months	**Exclusive breastfeeding up to three months**	**Exclusive breastfeeding up to 1 Month**	**Never breastfeed**
Q35n). Breast milk is digested more easily than formula milk (T).	0.0	0.0	0.0	5.1
Q35l). Infants who are breastfed exclusively tend to walk and talk faster than bottle fed babies (T).	5.9	0.0	0.0	2.6
Q35o). The babies that are breastfed are healthier than the ones who are formula-fed (T).	0.0	0.0	12.5	0.0
(T)=statement is true; (F)=statement is false				

Those who did exclusive breastfeeding up to 3 months where the only ones with the majority who got the following statements correct:

- Q35c). A baby may be infected through breast milk if the mother is HIV-positive (T).
- Q35j). Breastfed babies are rarely constipated (T).
- Q35b). Exclusive breastfeeding minimises HIV-infection risk in breastfeeding (T).

On the other hand those who did exclusive breastfeeding up to 1 month got the following statements correct:

- Q35m). Breastfeeding is more convenient than bottle feeding (T).
- Q35h). Exclusive breastfeeding is the best option for HIV exposed babies (T).

A composite variable was obtained and the total score was supposed to be 17 and the composite variable showed that the minimum value was 0 and the maximum value 13, as shown in Table 4.19. None of the respondents had all the aspects correct.

Table 4.19: Summary statistics for knowledge score on exclusive breastfeeding	
Summary statistics	**Score**
Mean	7.8
Median	8
Mode	8
Standard deviation	2.0860
Skewness	-.516
Kurtosis	3.415
Maximum	13
Minimum	0
Range	13
Coefficient of variation	26.74%

None of the participants was able to get all aspects correct. The mean, median, and mode were 7.8, 8, and 8 respectively. Thus on average respondents did not get half of the aspects on exclusive breastfeeding correct. The scores ranged from 0 to 13. The standard deviation was 2.086. About 68.26% of the respondents had scores from 7.71 to 9.89. The ratio of the standard deviation to the mean was 1:4, indicating insignificant variability. The histogram and box plots are shown in Figure 4.6.

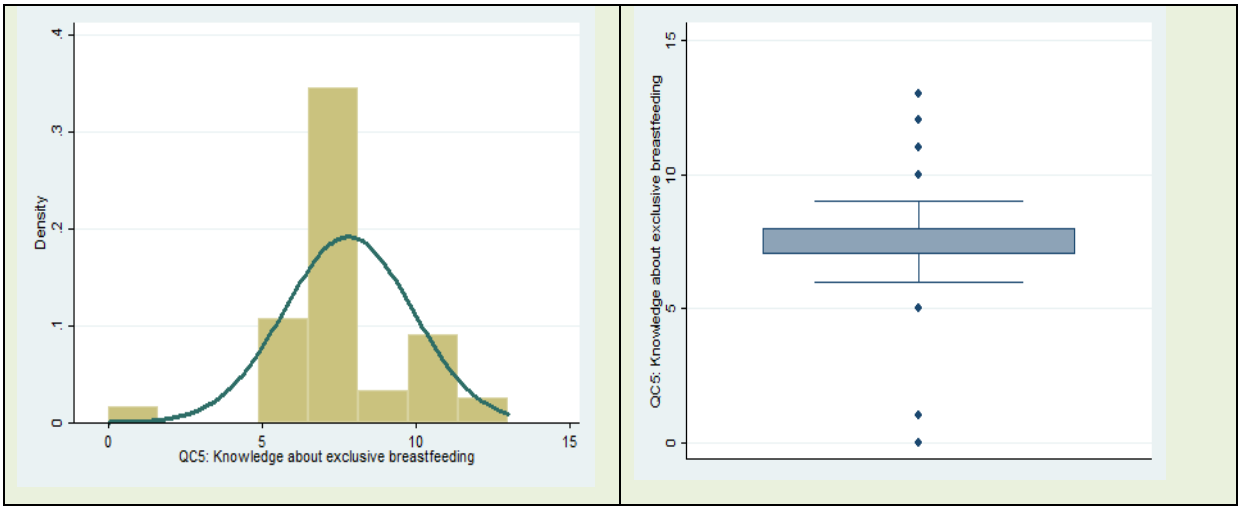

Figure 4.6: Histogram and box plot showing a negatively skewed data of knowledge score on exclusive breastfeeding

The histogram and the box plot show that the data is negatively skewed. The box plot shows that there are three outliers to the left and 4 outliers to the right. The histogram has the highest peak at 8 indicating that the largest proportion of respondents got a mark of 8 out 17. The Shapiro Wilk test gave a p-value of 0.000 indicating that the data was not normally distributed since the p-value < .05 showed that it was highly

significant. It can be agreed that the majority of the respondents were not knowledgeable about issues of exclusive breastfeeding. Information dissemination during ANC consultation was not optimally received, and mothers did not experience the benefits of information giving. Therefore, other information giving methods need to be considered to ensure that learning takes place during the ANC information giving sessions and consultation.

Some studies show that mothers who are HIV-positive knew the issues around exclusive breastfeeding. The advice of health workers discouraging mixed feeding tends to be disregarded not only because it is often directive but also because it contradicts conventional wisdom and fails to engage with what women think and do. The consequence is that women's alternative practices such as early supplementary feeding of infants remain largely hidden from health workers (Nor et al 2011:3).

4.4.7.3 Overall score on knowledge of mother-to-child transmission and exclusive breastfeeding

There were a total of 27 items measuring knowledge of mother-to-child transmission, and exclusive breastfeeding. The scores ranged from 0 to 23, as shown in Table 4.20.

Table 4.20: Summary statistics for knowledge score on mother to child transmission and exclusive breastfeeding

Summary statistics	Score
Mean	15.56
Median	15
Mode	15
Standard deviation	2.969
Skewness	-7.702
Kurtosis	10.025
Maximum	23
Minimum	0
Range	3
Coefficient of variation	19.09%

The mean was 15.56 with a standard deviation of 2.969 giving a coefficient of variation of 19.09%. Thus on the combined score there is insignificant variability. On average the respondents got 16 items out of 27 correct. The ratio of the standard deviation to the

mean was 1:5, indicating a slightly larger variability. The histogram and box plots show that data is slightly negatively skewed, as shown in Figure 4.6.

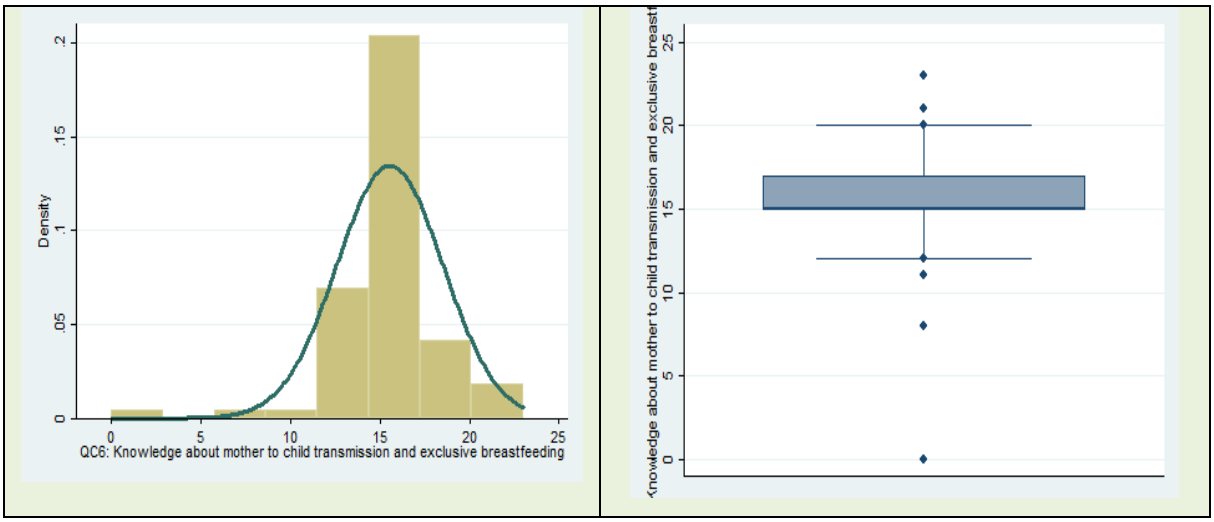

Figure 4.7: Histogram and box plot showing knowledge score on exclusive breastfeeding

The box plot has outliers on both sides of the distribution. There were few respondents who got most of the items correct. The highest peak was at 15 indicating that the largest proportion got a score of 15 out of 27. The test of normality gave a p-value of 0.000 indicating that the data was not normally distributed since the p-value > 0.05. This was highly significant. In conclusion, one can agree that the overall majority of the respondents were partially knowledgeable about issues of mother-to-child transmission and exclusive breastfeeding.

The threat of exclusively breastfeeding to a baby while the mother is HIV-infected is very real, and it takes more than courage to choose what is best for the baby's nutrition. The reviewed literature signifies that with the high level of breastfeeding awareness, it was important to understand the factors that helped the respondents' arrive at the decision to breastfeed their babies (Agunbiade & Ogunleye 2012:5).

4.5 MEASURING VALIDITY OF INSTRUMENT USING EXPLORATORY FACTOR ANALYSIS

The validity of the instrument was measured using factor analysis. The essential purpose of factor analysis is to describe, if possible, the covariance relationships among variables in terms of a few underlying, but unobservable, random quantities called factors (Johnson & Wichern 2014:481). In this case, factor analysis was performed to

summarise patterns of correlations among observed variables, to reduce a large number of observed variables to a smaller number of factors (Tabachnick & Fidell 2014:660). Thus a set of highly inter-correlated measured variables was grouped into distinct factors. The factor analysis showed variables that were closely related.

The method used was the principal component analysis with a direct oblique rotation. The appropriateness of the factor analysis was determined using the Bartlett Test of Sphericity and Kaiser-Meyer Olkin (KMO). The Bartlett Test of Sphericity is a statistical test that measures the overall significance of all correlations within a correlation matrix (Hair, Black, Babin & Anderson 2014). The authors further indicated that the significance of the test indicates that the correlation matrix has significant correlations among at least some of the variables, that is, there is sufficient correlation. A 5% level of significance was used and a p-value less than 0.05 indicate that there the Bartlett test of Sphericity is significant and thus there is sufficient correlation. The KMO is a measure of sampling adequacy that quantifies the degree of inter-correlations among the variables and it ranges from 0 to 1 (Tabachnick & Fidell 2014; Hair et al 2014). The measure can be interpreted with the following guidelines: 0.80 or above, meritorious; 0.70 or above, middling; 0.60 or above, mediocre; 0.50 or above, miserable; and below 0.5, unacceptable and a KMO with a value of 0.50 and above is considered suitable for factor analysis (Hair et al 2014).

As mentioned earlier, factor analysis groups variables which are highly correlated into a factor; and one of the most important factors is to understand how much of a variable's variance is shared with other variables in that factor. Communality is the proportion of variance accounted for by a factor in a factor. The communalities should be above 0.5, or most of the variables should have communalities above 0.6. The factor solution is robust if the amount of variance explained is at least 50%.

The factor solution will be presented for the dimensions; barriers to exclusive breastfeeding and infant feeding habits. The 5% level of significance was used.

4.5.1 Factor analysis on barriers to exclusive breastfeeding

The variables *"traditional or religious structures can influence decision to exclusively breastfeed," "the baby can be addicted to breast milk if he/she breastfeeds for 6 months*

exclusively," "I had to return to work" and *"the baby refused breast milk"* were dropped from the analysis due to insignificant factors and cross loadings. The factor analysis resulted in a measure of sampling adequacy, that is, a KMO of 0.525 which is above 0.05 and a significant Bartlett Test of Sphericity as evidenced by a chi-square value of 144.291 with a p-value of 0.000. Thus the solution was appropriate for factor analysis and the communalities ranged from 0.444 to 0.856. One of the communalities had a value of 0.444, and the rest were above 0.6. The factor solution resulted in a five-factor solution, as shown in Table 4.21.

Table 4.21: Barriers to exclusive breastfeeding

Factors and observed variables	Loadings	Eigen values	% of variance
Factor 1: Breast problems		2.352	21.38
Q32g). I was unable to make enough milk to satisfy the baby (*R).	0.804		
Q32f). I experienced painful breasts (*R).	0.637		
Q32l). I was experiencing weight loss (*R).	0.637		
Factor 2: Societal influence		1.766	16.05
Q32c). Mother-in-law pressurised me to wean the baby (*R).	0.869		
Q32j). My neighbours pressured me to wean the baby (*R).	0.664		
Factor 3: Maternal health concerns		1.364	12.40
Q32d). When the mother has tuberculosis she cannot breastfeed her baby (*R).	0.910		
Q32n). I was not feeding well (*R).	-0.734		
Factor 4: Insufficient support		1.135	10.32
Q32i). Breastfeeding is a tiring exercise for me (*R).	0.712		
Q32b). Partner is not supportive towards exclusive breastfeeding of the baby (*R).	0.704		
Factor 5: Fear of stigmatisation and baby's health concerns		1.040	9.45
Q32o). My community will isolate me if I exclusively breastfeed (*R).	0.911		
Q32m). My baby was not gaining enough weight (*R).	0.577		
Total variance explained			**69.60**

The five factors had Eigen values of 2.352, 1.766, 1.364, 1.15, and 1.040 accounting for total variances of 21.38%, 16.05%, 12.40%, 10.32%, and 9.45% respectively. Overall, the variables accounted for 69.60% of the total variance. The first factor was named "*breast problems.*" The main reason was mothers faced difficulties in breastfeeding,

especially if their babies did not suckle properly thus causing painful and cracked nipples, making it difficult for the mothers to continue breastfeeding. Mothers also perceived that they did not produce adequate breast milk for their babies. Literature has it on record that mothers opt to wean their babies due to the factors mentioned above.

The second factor was "*societal influence*" where mothers are pressurised by internal and external value systems such as being pressured by mothers-in-law to wean their babies even before the six-month period has lapsed, and this is reinforced by neighbours and other community members. This is an external sphere of influence which will shape how mothers make decisions regarding the nutritional choices for their infants.

The third factor was *"maternal health concerns"* where mothers mentioned that they would not risk their babies' health if they have a disease that could be fatal to the baby. In such instances the mothers weaned their babies prematurely.

The fourth factor was *"insufficient support."* Mothers who are employed need to return to work and interrupt their commitment to breastfeed exclusively. They are also expected to carry on with other household chores when they return from work. This adds to the maternal obligation of breastfeeding after all the household chores and occupational responsibilities have been seen to. Hence the practice of breastfeeding is considered to be a tiring exercise. Their partners are not pulling their weight to ensure that adequate support is given to the breastfeeding mothers.

Lastly, the *"fear of stigmatisation and baby's health concerns"* was a factor with a variance of 9.45%. The mothers' decision to not exclusively breastfeed was affected by how the community feels and responds to mothers who are practising exclusive breastfeeding. The fear of being stigmatised influenced the feeding option chosen by the mothers. Another variable tied to this factor is the babies' lack of gaining weight. Literature demonstrated that mothers face challenges in their quest to exclusively breastfeed their babies. This caused mothers to discontinue exclusive breastfeeding.

4.5.2 Factor analysis on infant feeding habits

The principal component analysis with a direct oblimin rotation gave a three-factor solution. The variables *"the baby can start eating solids within the first month of life," "the baby should be breastfed immediately after birth,"* and "*if milk is not coming out of the breast then solids can be given to the baby*" were dropped from the analysis due to cross-loadings and insignificant loadings. The factor solution had a Bartlett's Test of Sphericity with a p-value=0.000 leading to the rejection of the null hypothesis for lack of sufficient correlation between variables. The KMO measure of sampling adequacy was 0.650 indicating that the correlations were adequate for factor analysis. Most of the communalities were above 0.6. The factor solution is shown in Table 4.22.

Table 4.22: Infant feeding habits

Factors and observed variables	Loadings	Eigen-values	% of variance
Factor 1: Non-exclusive breastfeeding		3.202	19.25
Q33c). Soft porridge can be introduced in-between breastfeeds (*R).	0.933		
Q33d). Liquids like juice and water are a good supplement to exclusive breastfeeding (*R).	0.924		
Q33j). Wet nursing can benefit your baby when you are not available to breastfeed them (*R).	0.785		
Q33b). Colostrum is a suitable feed for the baby.	0.623		
Factor 2: Mixed feeding practices		2.052	35.57
Q33a). Pre-lacteal feeding is recommended after the baby's birth (*R).	0.780		
Q33k). Mixed feeding is likely to increase the infant mortality rate.	-0.766		
Q33i). The baby should be breastfed when they demand so.	0.690		
Factor 3: Health information		1.599	17.77
Q33l). Counselling on infant feeding options helps mothers make better choices.	0.823		
Q33h). It is important for mothers to know how the baby should attach to the breast.	0.696		
Total variance explained			**67.86**

The first factor was named *"non-exclusive breastfeeding*" with an Eigen value of 3.202, contributing 19.25% of the total variance. It was named as such based on variables Q33c) and Q33d) as both have high loadings. These variables share a similar pattern

for the "*non-exclusive breastfeeding"* factor. The variables contributing to non-exclusive breastfeeding are listed with loadings that range from 0.623 to 0.933 in value.

The second factor was named "*mixed feeding"* with an Eigen value of 2.052, contributing 35.57% of the total variance. It has the highest variance and indicates that mixed feeding was practiced by mothers in this study. The variable Q33a) has a correlation of 0.780 with the second factor and this is considered a strong association, hence the factor is called *"mixed feeding".* The second factor is important because it affects the safe feeding method of exclusive breastfeeding in cases of HIV infected mothers and it is capable of exacerbating vertical transmission of the virus.

The third factor was named *"health information"* with an Eigen value of 1.599, contributing 17.77% of the total variance. The factor explains the overall variance observed in the following variables: (i). counselling on infant feeding options helps mothers make better choices, (ii). it is important for mothers to know how the baby should attach to the breast. The variable Q33l) has a strong association with factor 3 with a correlation of 0.823. This factor is therefore called *"health information"* based on this variance as counselling is an education tool in the PMTCT programme. The dissemination of information in a breastfeeding context can influence the life expectancy of an infant. The manner in which information is perceived and how it was presented impacts the practices in infant feeding.

All factors have eigen values >1 which illustrates the variance experienced by the different variables. The three factors explain more variance in infant feeding habits**.**

4.6 DETERMINING DIFFERENCES IN GROUPS USING ANOVA BY EXCLUSIVE BREASTFEEDING STATUS

The analysis of variance was used to determine whether differences existed between exclusive breastfeeding statuses. The Analysis of Variance (ANOVA) is an inferential method used to test the equality of three or more population means (Sullivan 2010:679). The test assumes that the observations should be randomly selected, independent, come from a normal distribution, and have equal variances across groups (homogeneity of variance). The sample was randomly selected, and the central limit theorem was applied; thus independence and normality were met. The test of homogeneity of

variance indicated that all groups had similar variances; thus the assumption of equal variances was met. The Turkey-B post-hoc analysis test was used to determine where the differences lay in all significant tests.

Confidence interval error bars were used to show the difference. Overlapping of confidence interval error bars showed that the groups were the same, and non-overlapping showed that the groups were different.

The null hypothesis to be tested was

- H_o: The means are equal
- H_1: At least one of the pairs of means were different

The 5% level of significance was used to perform the test and where the p-value < .05 means the null hypothesis of equal means across all groups was rejected. The rejection of the null hypothesis resulted in at least one pair of means being different.

4.6.1 ANOVA test to determine differences in means of access to health information by exclusive breastfeeding status

The access to health scores had possible values that ranged from 0 to 5. In this case all groups had means of 5 or close to 5. All level of exclusive breastfeeding had access to health information on infant feeding. The p-value was greater than .05 and thus the means were not significantly different from each other as shown in Table 4.23.

Table 4.23: ANOVA test for difference between means of access to health information by exclusive breastfeeding status

Dimension	Group	Mean	F-square Value	P-value	Decision
Health information on infant feeding practices	Exclusive breastfeeding up to six Months	5.000	1.075	0.366	Do not reject the null hypothesis
	Exclusive breastfeeding up to three Months	5.000			
	Exclusive breastfeeding up to one month	5.000			
	Never breastfeed	4.7949			

** p<.05 and ** p<.01*

The finds shows that all the respondents had access to health information on infant feeding.

4.6.2 ANOVA test to determine differences in means of barriers to exclusive breastfeeding by exclusive breastfeeding status

In terms of barriers to exclusive breast feeding, the test resulted in a p-value less than 0.05, and thus the null hypothesis of equal means was rejected as shown in Table 4.24.

Table 4.24: ANOVA test for difference between means of barriers to exclusive breastfeeding by exclusive breastfeeding status

Dimension	Group	Mean	F-square Value	P-value	Decision
Barriers to exclusive breastfeeding	Exclusive breastfeeding up to six Months	3.5728	13.097**	p<0.001	Reject the null hypothesis
	Exclusive breastfeeding up to three Months	3.6037			
	Exclusive breastfeeding up to one month	3.1667			
	Never breastfeed	3.3512			

** p<.05 and ** p<.01*

The dimension "*barriers to exclusive breastfeeding*" resulted in an ANOVA test that gave an F=13.097 with a p-value < 0.001, leading to the rejection of the null hypothesis of equal means. The Tukey B post-hoc analysis resulted in three groups, as indicated in Table 4.25.

Table 4.25: Homogeneous groups of barriers to exclusive breastfeeding by exclusive breastfeeding status				
Tukey B[a,b]				
Q17b. The baby was exclusively breastfed:	**N**	**Subset for alpha=0.05**		
		1	**2**	**3**
Exclusive breastfeeding up to 1 month	8	3.1667		
Never breastfeed	39		3.3512	
Exclusive breastfeeding up to six months	17			3.5728
Exclusive breastfeeding up to three months	9			3.6037

Those who did exclusive breastfeeding up to 1 month had the lowest mean of 3.1667, whilst those who did eexclusive breastfeeding up to three months had the highest mean of 3.6037. Looking at the means one can conclude that those who did exclusive breastfeeding up to 3 months and those who did breastfeeding up to six months were in agreement that the aspects were barriers to exclusive breast feeding. The major error bars are shown in Figure 4.7.

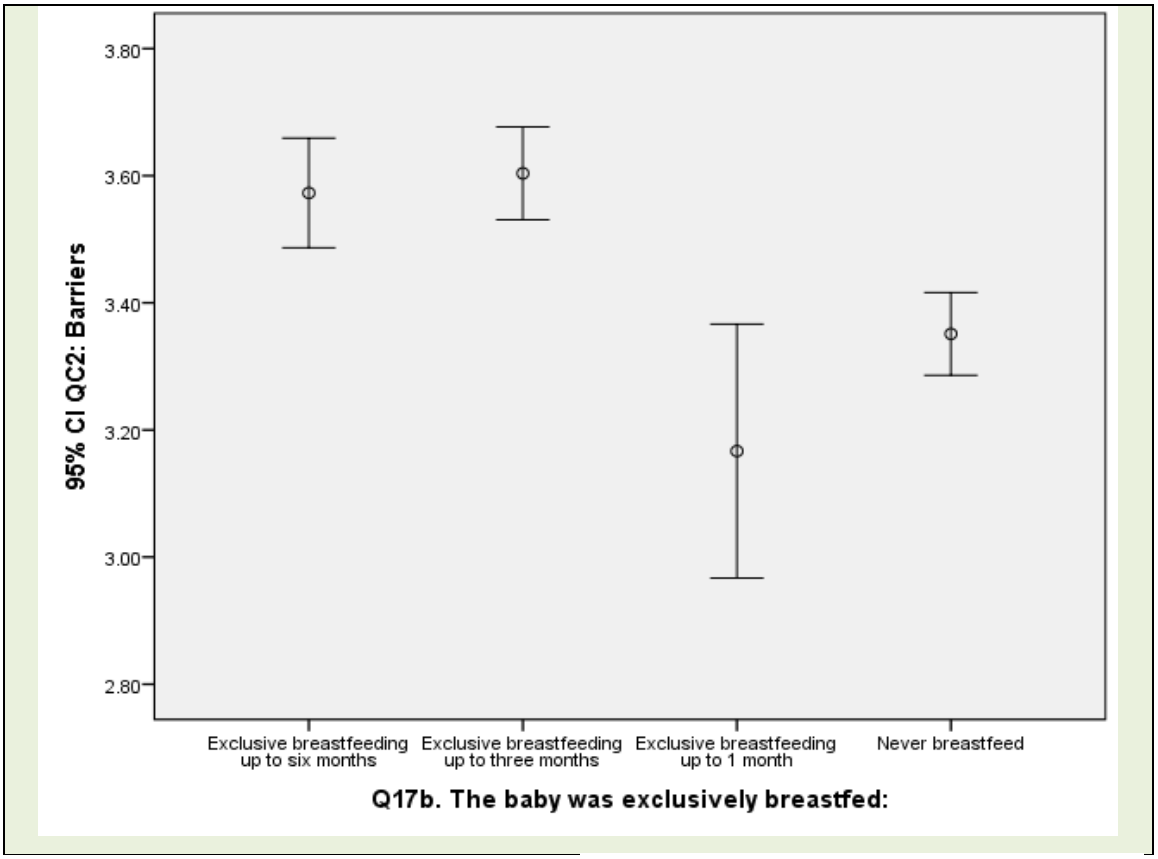

Figure 4.8: Confidence interval error bar of barriers to exclusive breastfeeding by exclusive breastfeeding status

The groups who did exclusive breastfeeding up to 3 months and up to six months were in agreement that the aspects were barriers to exclusive breastfeeding. There is some overlap between those who did exclusive breastfeeding up to 1 month and those that never breastfeed. Thus the difference is between those who breastfeed from one month to six months to those who breastfeed up to one month to never breastfed. The bars also showed that there was a large variability of those who did exclusive breastfeeding up to one month. One can conclude that those who did exclusive breastfeeding for more than a month seem to be experiencing barriers to exclusive breastfeeding...

4.6.3 ANOVA test to determine differences in means of infant feeding practices by exclusive breastfeeding status

All means were greater than 3.5 indicating that the respondents acknowledged experiencing the infant feeding practices. The p-value was 0.023 and thus the means were significantly different from each other as shown in Table 4.26.

Table 4.26: ANOVA test for difference between means of infant feeding practices by exclusive breastfeeding status

Dimension	Group	Mean	F-square Value	P-value	Decision
Infant feeding practices	Exclusive breastfeeding up to six months	3.6493	3.365*	0.023	Reject the null hypothesis
	Exclusive breastfeeding up to three months	3.8632			
	Exclusive breastfeeding up to one month	4.0594			
	Never breastfeed	3.8135			

** p<.05 and ** p<.01*

Looking at Table 4.26 the F-value=3.365 with a p-value less than 0.023. Since the p-value=0.023 was below 0.05, the null hypothesis of equal means was rejected and thus indicates the difference in infant feeding practices by exclusive breastfeeding status. The Tukey-B post hoc test gave rise to two homogeneous groups.

Table 4.27: Homogeneous groups of infant feeding practices by exclusive breastfeeding status			
Tukey B[a,b]			
Q17b. The baby was exclusively breastfed:	N	Subset for alpha=0.05	
		1	2
Exclusive breastfeeding up to six months	17	3.6493	
Never breastfeed	39	3.8135	3.8135
Exclusive breastfeeding up to three months	9	3.8632	3.8632
Exclusive breastfeeding up to 1 month	8		4.0594

Looking at Table 4.27, it can be concluded that all means were close to 4, indicating that the respondents were in agreement that the infant feeding practices were being experience to a great extent. The depth of agreement is the one that differed. The lowest mean was 3.6493 from those who did exclusive breastfeeding up to six months and the highest mean was 4.0594 from those who did exclusive breastfeeding up to one month. Those who did exclusive breastfeeding up to six months seem to differ significantly with those who did breastfeeding up to one month as evidenced by the non-overlapping of the confidence interval error bars in Figure 4.8.

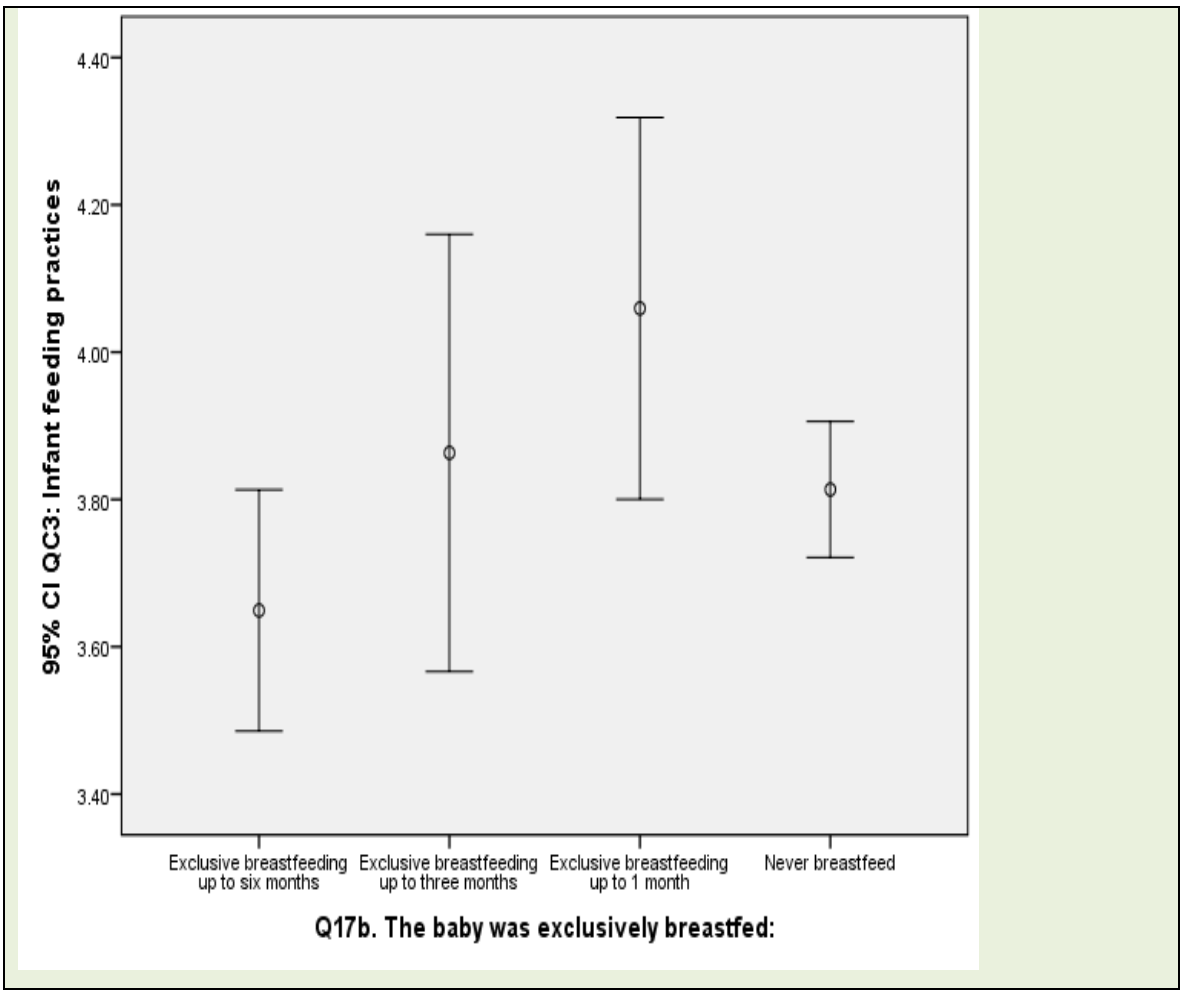

Figure 4.9: Confidence interval error bar of ratings of infant breastfeeding practices by exclusive breastfeeding practices

Those who did exclusive breastfeeding up to one month were more in agreement as compared to those who did exclusive breastfeeding up to six months.

4.6.4 ANOVA test to determine differences in means of knowledge about mother to child transmission by exclusive breastfeeding status

There were ten statements measuring knowledge on mother-to-child transmission. The average scores ranged from 7.6 to 8.3 as shown in Table 4.28.

Table 4.28: ANOVA test for difference between means of knowledge about mother to child transmission by exclusive breastfeeding status					
Dimension	**Group**	**Mean**	**F-square Value**	**P-value**	**Decision**
Knowledge about mother to child transmission	Exclusive breastfeeding up to six months	7.9412	0.775	0.512	Do not reject the null hypothesis
	Exclusive breastfeeding up to three months	8.3333			
	Exclusive breastfeeding up to one month	7.5000			
	Never breastfeed	7.6410			
* *p<.05 and* ** *p<.01*					

The dimension "*Knowledge about mother to child transmission*" gave an F-value=0.775 with a p-value of 0.512. Since 0.512 is more than 0.05, the null hypothesis of equal means was not rejected at the 5% level of significance. Thus the knowledge about mother-to-child transmission is all the same regardless of exclusive breastfeeding status.

4.6.5 ANOVA test to determine differences in means of knowledge about exclusive breastfeeding by exclusive breastfeeding status

There were 17 statements on knowledge about exclusive breastfeeding resulting in the total possible score being 17 for those who knew all the statements. The test resulted in an F-value of 1.049 with a p-value of 0.377 since 0.377 is greater than 0.05, the null hypothesis of equal means was not rejected. The test is shown in Table 4.29.

Table 4.29: ANOVA test for difference between means of knowledge about exclusive breastfeeding by exclusive breastfeeding status					
Dimension	**Group**	**Mean**	**F-square Value**	**P-value**	**Decision**
Knowledge about exclusive breastfeeding	Exclusive breastfeeding up to six months	8.4118	1.049	0.377	Do not reject the null hypothesis
	Exclusive breastfeeding up to three months	7.7778			
	Exclusive breastfeeding up to one month	6.8750			
	Never breastfeed	7.6667			
* *p<.05 and* ** *p<.01*					

The lowest mean of 6.875 was of those who did exclusive breast feeding up to one month, whilst those who did exclusive breastfeeding up to six months had the highest mean of 8.4118. The results showed that knowledge on exclusive feeding was not related to exclusive breastfeeding status. The results also showed that all the means were below 8.5 indicating that on the average all the respondents were not knowledgeable on aspects on exclusive breastfeeding since they did not attain the expected mean of at least 8.5.

4.6.6 ANOVA test to determine differences in means of knowledge about mother to child transmission and exclusive breastfeeding by exclusive breastfeeding status

All knowledge statements were combined together to give a total possible value of 27 statements. The means ranged from 14.3750 to 16.3539 as shown in Table 4.30.

Table 4.30: ANOVA test for difference between means of knowledge about mother-to-child transmission and exclusive breastfeeding by exclusive breastfeeding status					
Dimension	**Group**	**Mean**	**F-square Value**	**P-value**	**Decision**
Knowledge about mother-to-child transmission and exclusive breastfeeding	Exclusive breastfeeding up to six months	16.3529	1.002	0.397	Do not reject the null hypothesis
	Exclusive breastfeeding up to three months	16.1111			
	Exclusive breastfeeding up to one month	14.3750			
	Never breastfeed	15.3077			
* *p<.05 and* ** *p<.01*					

The dimension *"Knowledge about mother-to-child transmission and exclusive breastfeeding"* gave an F=1.002 with a p-value=0.397 leading to the non-rejection of the null hypothesis of equal means. Overall respondents tend to be knowledge on the aspects since all means were greater than 13.5. In conclusion one can conclude that knowledge level was not related to exclusive breastfeeding status of the respondent.

4.7 MEASURING EXTENT OF THE RELATIONSHIP BETWEEN DIMENSIONS USING PEARSON'S CORRELATION ANALYSIS

The purpose of this section was to determine the relationship between "*score on access to health information," "barriers to exclusive breastfeeding,"* "*infant feeding practices,*" and *"knowledge of about exclusive breastfeeding."* The Pearson correlation coefficient was used to measure the association between the variables. The correlation coefficient is a measure of the strength and the direction of a linear relationship between two variables (Larson & Farber 2012). According to Hair et al (2014), the correlation coefficient indicates the strength of the association between two metric variables where a + or - indicates the direction of the relationship. The value ranges from -1 to 1.

Cohen (1988) came up with the following rules of thumb to determine the extent of the relationship between variables: The guidelines are, if r=0.10 – 0.29 then there is a low effect (low correlation); r=0.30 – 0.49 has a medium effect (moderate correlation) and r=0.50 – 0.99 has a large effect (strong correlation). The 5% level of significance was

used to conduct the test and the p-value approach was used to decide whether to reject or not to reject the null hypothesis. A p-value < 0.05 resulted in the rejection of the null hypothesis because of the lack of correlation between the variables.

The correlation analysis was done to determine which of the dimensions were related, that is, were associated. A p-value < 0 .01 would signify a highly significant relationship. The results of the correlations are shown in Table 4.31.

Table 4.31: Pearson correlation coefficients of dimensions

Item	1	2	3	4	5	6
1. Health information on infant feeding	-					
2. Barriers	0.235*	-				
3. Infant feeding practices	-0.170	-0.210	-			
4. Knowledge of mother to child transmission	0.088	0. 408**	0.102	-		
5. Knowledge of exclusive breastfeeding	-0.019	0.279*	-0.097	0.442 **	-	
6. Knowledge of mother to child transmission and exclusive breastfeeding	0.028	0.386**	-0.021	0.776**	0.908**	-

** p<.05 and ** p<.01*

The score on health information on infant breastfeeding had a low or weak positive significant correlation with barriers to exclusive breastfeeding (r=0.235; p=0.042). The correlation had a low effect. Thus high agreement levels in barriers to exclusive breastfeeding are associated with high scores on health information on infant feeding. However, the correlation is weak and statistically significant.

Barriers to exclusive breastfeeding had a moderate positive significant correlation with knowledge of mother-to-child transmission (r=0.408; p < 0.001), a weak positive significant correlation with knowledge of exclusive breastfeeding (r=0.279; p=0.015) and a moderate overall knowledge score on mother-to-child transmission and exclusive breastfeeding (r=0.388; p < 0.001). The effects were medium effect and low effect respectively. Thus those who are more in agreement with barriers to exclusive

breastfeeding tend to be more knowledgeable about aspects of mother-to-child transmission and exclusive breastfeeding.

The knowledge score on issues of mother-to-child transmission had a significant moderate positive correlation with a knowledge score about exclusive breastfeeding ($r=0.442$; $p < 0.442$) and overall knowledge score on mother-to-child transmission and exclusive breastfeeding ($r=0.776$; $p < 0.001$). The magnitudes of the correlations were medium effect and large effect respectively. It can be concluded that respondents that are likely to be knowledgeable about issues on mother-to-child transmission are also knowledgeable about issues of exclusive breastfeeding. The knowledge score on issues on mother-to-child transmission had a strong positive relationship with overall knowledge score on mother-to-child transmission and exclusive breastfeeding since it was one of the dimensions that made up the score. It also applies to the correlation between knowledge of exclusive breastfeeding and overall knowledge score on mother-to-child transmission and exclusive breastfeeding, as evidenced by $r=0.908$ and $p < 0.001$.

4.8 SUMMARY OF THE FINDINGS

This chapter presented, analysed, interpreted, and discussed the results of the study using descriptive and inferential statistics.

The data presented here was collected using a self-administered questionnaire and the analysis was conducted by the statistician. The instrument used was measured for reliability through the Cronbach's alpha and the factor analysis. The Likert's scale implemented during the study measured composite variables which were created using averages.

The sample characteristics had the following measurements in frequency and percentage respectively of the total variables for age, marital status, highest academic qualification, person one live with, religion, number of children, age of last child, home language, and nationality 75 (100.0%).

Nearly half the number of participants (49.3%; n=37) were below the age of 30 years. The age group between 30 and 34 made 20% of the group. The mothers who were above 40 years of age represented a small percentage of the sample at 13%.

Single mothers were the larger group of this sample at 54.7% (n=41) and only 8.7% (n=14) were married as compared to 15% (n=11) of mothers who are cohabiting.

Unemployment affected 44% (n=33) of the participants, however 8.0% of the mothers were having part-time work. The partners' unemployment status stood at 14.7%. The proportion of respondents without employment was higher as compared to those of partners who were also not employed.

Transport cost for commuting to the clinic was higher at R31 or more for 29.3% of the participants and the majority of them 48.0% (n=36) lived within the clinic's radius. Most participants walk to the clinic while only 29.2% (n=22) spend over R30 travelling expenses.

The valid responses regarding whether mothers had breastfed their previous baby were 55 in number. The largest proportion mothers was 70.9% (n=39). From this proportion 97.4% (n=38) indicated that their babies were breasted for more than four months. Only 29.1% (n=16) of the mothers indicated that their babies were not breastfed, in contrast to 2.6% (n=1) who breastfed for less than one month.

From the distribution of respondents by reasons they did not breastfeed their baby, going back to work had the largest proportion of 37.5% (n=6). Cracked nipples was also a factor for not continuing with breastfeeding and its proportion was 25.0% (n=4); 18.8% (n=3) of the mothers indicated that their breast milk was inadequate and the same proportion mentioned that the baby refused to suckle.

Seventy four mothers responded to the question of giving their babies other foods. Mothers who used their own judgement to give their babies other foods comprised 49.2% (n=31) and those advised by their mothers were 28.6% (n=18). Sixty percent of those who weaned their babies before the age of six months mentioned that insufficient milk, influence of mothers-in-law and information from neighbours were reasons influencing their decision to wean their babies.

Health information aspects achieved acknowledgement levels of over 90%. The participants received counselling on infant feeding options when still attending antenatal clinic while pregnant with their current baby. During antenatal classes they acquired skills on how the baby should latch on the mothers' breast.

A five point Likert scale on barriers to exclusive breastfeeding was used to determine the barriers of exclusive breastfeeding. It had a mean to rank all the aspects. The mothers responded to 14 statements with the following level of agreement: strongly agree, agree, neutral, disagree and strongly disagree. The mean ranged from 4.55 to 1.93 and the majority of the respondents disagreed with eleven statements mentioned as barriers to exclusive breastfeeding.

The mean for the level of extent on infant feeding had a mean from 3.51 to 1.80 and the level of extent ranged from: to a very large extent, to a large extent, to some extent, to a little extent and not to any extent at all. About 98% of respondents agreed that it's important for mothers to have knowledge of how their babies should attach to the breast during breastfeeding.

The knowledge of mother-to-child transmission was tested and the analysis revealed that these questioned were judged correctly as true by the respondents: HIV testing is important for the health of the mother and the unborn baby (97.3%), ARV drugs are the best treatment in preventing unborn babies from being infected by HIV (97.3%), and antenatal care is very important to the pregnant woman as it ensures the wellbeing of the mother and baby (97.3%). Knowledge about exclusive breastfeeding was also measured using ANOVA test and the test results had a p-value of 0.377 and the null hypothesis was not rejected. It can be concluded that knowledge level was not related to exclusive breastfeeding status of the respondent.

The next chapter will be focusing on the conclusion of this research.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The purpose of chapter 4 was to explore the results obtained from data collection. It basically summarises the study by focusing on the descriptive profile of the variables and the validity of the instrument used. This is done through exploratory factor analysis. It also centres on data analysis and its presentation, thus looking at descriptive statistics of the composite variables.

Chapter 5 sketches out the findings derived from the study which was conducted in rural Elandsdoorn pertaining to the determinants of exclusive breastfeeding among HIV-positive mothers who have infants aged from 0 to 6 months attending an NGO clinic in this village. The conclusions of this research are based on the purpose, research questions, and results of the study. The implications of this study and the ensuing recommendations are explained.

5.2 OVERVIEW OF THE STUDY

This research was a non-experimental cross-sectional, quantitative study. The researcher used a structured survey questionnaire to help answer the research questions. The sample was selected using a purposive sampling technique and it comprised 75 participants. The participants of the study were HIV-positive mothers who had infants aged 0 to 6 months. The data was collected by means of a closed-ended questionnaire, compiled in English.

A statistician was enlisted to analyse the data collected from the study participants. The analysis comprised frequencies in tables and a variety of graphical presentations. The statistician coded the data for this research.

The research team comprised a trained counsellor in PMTCT and the researcher. The mothers who participated in the study consented voluntarily with the understanding that there would be no compensation for their participation.

5.3 SUMMARY AND INTEPRETATION OF THE RESEARCH FINDINGS

The categorical interpretation of the findings of this research is set out below. These sections are in response to the research topic: “The determinants contributing to exclusive breastfeeding in HIV-infected mothers of infants aged 0 to 6 months who attend an NGO Health Centre in Elandsdoorn Village.”

The research highlighted determinants contributing to exclusive breastfeeding and a need to establish a more comprehensive approach to educating pregnant women on reproductive health issues, and exclusive breastfeeding in particular. The findings from the research covered these aspects of the research objectives, which were derived from the research topic: (i) To describe the barriers experienced by HIV-infected mothers to exclusively breastfeed their infants in the first six months of life; (ii) To describe the proportion of HIV-infected mothers who exclusively breastfed their infants after being counselled on infant feeding; and (iii) To describe the determinants of exclusive breastfeeding for HIV-positive mothers during the first six months of life.

5.3.1 Barriers experienced by HIV-infected mothers

Over 90% of the respondents were in agreement that *“Q32e). The baby can be addicted to breast milk if he/she breastfeeds for 6 months exclusively*” and “Q32a). *Traditional or religious structures can influence decision to exclusively breastfeed*” were barriers to exclusive breastfeeding. About 97% of mothers (n=73) agreed that the baby can be addicted to breast milk. This assumption is probably due to lack of adequate information regarding breastfeeding and related health topics. A close second were 92% of the sample mothers (n=69) who were in agreement that traditional or religious structures do influence their choice to breastfeed exclusively. This highlights the importance of educating communities over a broad spectrum regarding health information.

5.3.2 Proportion of HIV-infected mothers who practise exclusive breastfeeding

The majority of mothers were able to respond correctly to 7 out of 10 aspects on exclusive breastfeeding. More than 80% of the respondents were more knowledgeable that breast milk provides the newborn baby with adequate nutrition to protect against infections, exclusive breastfeeding should be practised for the first six months of the baby's life, breastfeeding is cheaper than formula milk, exclusive breastfeeding has lasting nutritional benefits for the baby, a mother should not drink alcohol whilst breastfeeding, and that complementary foods can be introduced after six months. However, close to 60% knew that a baby may be infected through breast milk if the mother is HIV-positive.

Fewer than 20% of the respondents knew that HIV-positive mothers cannot introduce other foods to the baby gradually while they are still breastfeeding, that breastfeeding helps the uterus to contract thus reducing and controlling postpartum bleeding, breast milk is digested more easily than formula milk, infants who are breastfed exclusively tend to walk and talk earlier than bottle-fed babies, and that the babies who are breastfed are healthier than the ones who are formula-fed. Only 1 out of 75 women was more knowledgeable about aspects relating to mother-to-child transmission of HIV.

More than 52% (n=39) of mothers indicated that they were no longer breastfeeding their babies, whilst 47.3% (n=35) indicated that they were still breastfeeding their babies. All of those mothers who were not breastfeeding indicated that they were currently giving their children formula milk to replace breast milk. Of the 35 mothers still breastfeeding their children, 67.6% (n=23) indicated that they immediately breastfed after giving birth, whilst 32.4% (n=11) indicated that they started breastfeeding within an hour after giving birth.

5.3.3 Factors influencing exclusive breastfeeding

The five factors showed Eigenvalues of 2.352, 1.766, 1.364, 1.15, and 1.040 and accounting for total variances of 21.38%, 16.05%, 12.40%, 10.32%, and 9.45% respectively. Overall, the variables accounted for 69.60% of the total variance.

The first factor was "*breast problems.*" Mothers reported that they faced difficulty in the course of breastfeeding, especially if their babies did not suckle properly thus causing painful, cracked nipples making it difficult for the mothers to continue breastfeeding their babies with ease. Mothers also perceived that they did not produce adequate breast milk for their babies.

The second factor was "*societal influence.*" Mothers were pressurised by internal and external value systems such as the influence of mothers-in-law, neighbours, and other community members to wean their babies before the six-month period has lapsed.

The third factor was *"maternal health concerns."* Mothers mentioned that they would not risk their babies' health if they had a disease that could be fatal to the baby. In such instances the mothers weaned their babies prematurely.

The fourth factor was *"insufficient support."* Mothers who were employed needed to return to work and interrupt their commitment to breastfeed exclusively. They were also expected to carry on with other household chores when they return home from work. Hence the practice of breastfeeding was considered a tiring exercise.

Lastly, the *"fear of stigmatisation and baby's health concerns"* was a factor with a variance of 9.45%. The mothers' decision not to exclusively breastfeed was affected by how the community feels and responds to mothers who practice exclusive breastfeeding. The fear of being stigmatised influenced mothers' choice of feeding options. Another variable tied to this factor was the perceived inability of the baby to gain weight. This caused mothers to discontinue exclusive breastfeeding.

5.3.4 Socio-demographic data

Close to half the respondents (49.3%; n=37) were younger than 30, whilst 20% (n=15) were aged between 30 and 34. It can be concluded that close to 70% of the respondents were mothers younger than 35. This is the recommended age for a woman to give birth without too many risks. It was observed that 13.3% (n=10) of the mothers were older than 40, which would predispose them to risk during pregnancy.

In terms of marital status, the majority of the respondents, 54.7% (n=41), were single, whilst 8.7% (n=14) were married. About 15% (n=11) of the respondents were cohabiting, and 12% (n=9) were either divorced or widowed. The single mothers were in the majority, 54.7% (n=41), which implied that they were either living apart from their partners or with their relatives. The mothers' supportive network could have been affected because their partners were not part of their babies' early developmental phase.

Mothers had some level of education which would enable them to arrive at credible choices for their infant feeding options.

5.3.5 Economic factors

Only 26.7% (n=20) were employed on a full-time basis. This is a small proportion of mothers who had full-time jobs. It can therefore be concluded that most of the women in this study were not employed full-time. The majority, 44.0% (n=33), were not employed and it was not established whether or not they were receiving a social grant from the state. Less than a quarter of the entire sample was self-employed.

The cost of travel to and from the clinic did not seem to be a barrier since the majority of the women did not have high transport costs as they lived in close proximity to the clinic. They were therefore able to optimise on antenatal clinic attendance, in contrast to the participants (18.7% difference) who had to pay more than R31 in transport fees to visit the clinic.

There seemed to be an equal proportion (26.7%) of respondents and partners who were fully employed. The proportion of respondents who were unemployed was higher than that of partners who were unemployed. The implication is that mothers in this category received adequate financial support from their partners.

5.3.6 Breastfeeding history and current status

On this aspect, the study highlighted that the largest proportion of mothers, 70.9% (n=39), breastfed their babies, whilst 29.1% (n=16) did not. For the 39 mothers who breastfed their babies, 97.4% (n=38) indicated that they breastfed for more than four

months, whilst only 2.6% (n=1) breastfed for less than one month. From this sample 39% of mothers indicated that they breastfed their babies for more than four months as opposed to other studies, mentioned in Chapter 2, which revealed that from four months onwards the rate of breastfeeding dropped drastically. It was concluded that mothers may be knowledgeable about issues of exclusive breastfeeding hence their commitment to breastfeed their babies for longer than four months.

The highest proportion of mothers, 37.5% (n=6), gave the reason that they had to return to their place of employment, whilst 25% (n=4) indicated that they had cracked nipples. An equal proportion, 18.8%, indicated that their breast milk was not enough, or that the baby refused to suckle. Working mothers are not likely to breastfeed for very long as the demands of work are high and the time spent at home with their babies become inadequate.

5.3.7 Infant feeding practices

The analysed data shows that about 52.7% of the respondents indicated that to some extent if the flow of milk becomes inadequate, then solids can be given to the baby. On the other hand, about 71.6% indicated that to a small extent the baby can start eating solids within the first month of life; also, 80% indicated that to a small extent pre-lacteal feeding is recommended after the baby's birth.

More than 50% of mothers agreed that the following aspects occur to a large extent: nearly 99% of mothers concurred that it is important that babies should suckle properly; 97.3% agreed that counselling on infant feeding options would enable mothers make better choices; 95.9% of mothers said the baby should be breastfed immediately after birth; 92% breastfed their babies on demand; and mothers who agreed that colostrum is a suitable feed for the baby made up 69.3% of the sample.

5.3.8 Knowledge of exclusive breastfeeding

- **Mother-to-child transmission**

The analysis of the results revealed that the knowledge score of the respondents on the section mother-to-child transmission highlighted two aspects where the level of

knowledge was below 50%. Only 41.3% of respondents knew that HIV can be transmitted to the baby during delivery. A meagre 20% of respondents believed that HIV-positive mothers can transmit the virus to their babies during pregnancy.

The score ranged from 0 to 10. It means there were individuals who did not manage to get any of the aspect correct, whilst there were individuals who got all the aspects correct. The average score was 7.76 with a standard deviation of 8 giving a coefficient of variation of 17.83%. One can conclude that on average 8 out of 10 of respondents had knowledge of mother-to-child transmission. This is also supported by the median and mode of 8. About 68.26% (± one standard deviation from the mean) of the respondents had a knowledge score ranging from 6.38 to 9.14. The ratio of the standard deviation to the mean was 1:65, indicating large variability.

- **Exclusive breastfeeding**

Seven out of ten respondents indicated that they were knowledgeable about aspects of exclusive breastfeeding. Most of the respondents, more than 80%, were more knowledgeable that breast milk sometimes provides the newborn baby with adequate nutrition to protect against infections, and that exclusive breastfeeding should be practised for the first six months of the baby's life. They conceded that breastfeeding was cheaper than formula milk, that exclusive breastfeeding has lasting nutritional benefits for the baby, a mother should not drink alcohol whilst breastfeeding, and that complementary food can be introduced after six months. However, close to 60% knew that a baby may be infected through breast milk if the mother is HIV-positive. Fewer than 35% of the mothers were knowledgeable about the issue of exclusive breastfeeding. Fewer than 20% of the respondents knew that HIV-positive mothers could not introduce other foods to the baby gradually while they were still breastfeeding; that breastfeeding helps the uterus to contract thus reducing and controlling postpartum bleeding; that breast milk is digested more easily than formula milk; infants who are breastfed exclusively tend to walk and talk earlier than bottle-fed babies; and babies who are breastfed are healthier than those who are formula-fed.

5.4 CONCLUSIONS

It can be concluded that the majority of the respondents were not knowledgeable about all aspects of exclusive breastfeeding. Information dissemination during ANC consultations was not optimally received, and mothers did not experience the benefits of information giving. Therefore, other information giving methods need to be considered to ensure that learning takes place during ANC consultations.

It is generally accepted that healthcare professionals are, to a degree, the custodians of health issues and are expected as such to share their expertise on the benefits of exclusive breastfeeding to the benefit of firstly the baby, then the mother, and lastly the community.

This intervention can greatly benefit everyone involved in the life of a child. The role played by a healthcare professional goes a long way to establishing acceptable and health-conscious behaviours within society.

5.5 RECOMMENDATIONS

An interesting aspect of research is its ability to generate new approaches in the manner in which people are utilising the health system, internally and externally. The former relates to how health institutions are proactively advancing and defining the changing face of healthcare with the assistance of health-strengthening structures. The latter aspect is associated with the end user – anyone who is being served by the health system, especially the community.

The recommendations which flow from this study cover aspects of practice, policy, and further research.

5.5.1 Practice

The study revealed that only 1 of the 75 mothers responded correctly on all the aspects of mother-to-child transmission of HIV, and that there is a risk of the mother transmitting the virus to the baby during pregnancy. This knowledge deficit requires that healthcare professionals substantially increase their efforts to ensure that adequate health

information reaches every mother during ANC visits. However, in fairness to health professionals health education is in fact provided to pregnant women when visiting the clinic, but perhaps not adequately so. There is a need to review how information is disseminated during consultations. A possible change in teaching methodology might be appropriate.

Another aspect of information dissemination that should be directed at healthcare professionals is the need to update their training in order to keep abreast of current trends and new developments around the care of HIV and AIDS patients. The training must be broad based to address the lack of knowledge so starkly evident in the majority of pregnant women and those with newborn babies. Areas to be addressed are the belief systems of the pregnant woman pertaining to breast milk, and breastfeeding in particular. The message must be emphatic that breast milk is more than adequate to keep the baby satisfied until the baby demands its next feed, and that breast milk is a naturally fortified food, rich in antibodies with optimum nutritional value.

Management of a clinic must ensure that pamphlets printed in the local languages are designed to empower mothers as they visit the facility. Such information should be designed and presented to draw the mothers' attention.

The health facility should be more partner-friendly to encourage the significant others to be involved in the breastfeeding issues of their babies. This can be achieved through the organisation's open days where the community comes to learn about services offered by the clinic over and above mother and child care services.

5.5.2 Support

The Department of Health (DoH) can be supportive to NGOs to ensure that they provide optimum health care and support in rural settings in an attempt to alleviate the burden primarily carried by the department. The impact of this facility on the surrounding community can be built upon by the government to realise its goals of accommodating the health needs of every citizen. Regular support visits can also motivate staff to do more in meeting the needs of patients and their community.

5.5.3 Further research

This study focused on determinants of exclusive breastfeeding from the mothers' perspective. Further research should be conducted to look into how partners – spouses and boyfriends – view this aspect of breastfeeding for the mothers of their children. This can influence policy on exclusive breastfeeding and dispel the myth that men take no interest in maternal and female reproductive health. When partners are involved in health issues of their significant others, a great deal of progress can be achieved. Policy makers will be able to understand the views held by male partners regarding their standpoint on exclusive breastfeeding.

5.6 CONTRIBUTIONS OF THE STUDY

The study will contribute by shedding light on gaps associated with knowledge, or lack thereof, of exclusive breastfeeding and infant feeding practices. Healthcare professionals constitute an influential element within the health system, and they can influence infant feeding practices since they possess the knowledge of healthy nutrition and development of children. The study will also assist health workers to explore new teaching methodologies that will enhance the mother's capability to obtain valuable information on breastfeeding.

Exclusive breastfeeding will be afforded its rightful place in infant feeding practices, thus helping mothers to provide optimum nutritional feeding to their children. Mothers will be drawn to the nutritional value of the practice of exclusive breastfeeding. The decision of mothers to opt for mixed feeding as an option for their babies can be positively influenced when they are empowered and understand its implications.

5.7 LIMITATIONS OF THE STUDY

The fact that the questionnaire was in English, proved to be a limitation in this study. Indigenous languages were not used because of the concern that they may distort the meanings of medical terms. Another limitation was that participants willing to take part in the study but could not read and/or write were excluded from the study.

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ANNEXURES

ANNEXURE A: Permission to conduct the study obtained UNISA, Department of Health Studies, Higher Degrees Committee

UNISA university of south africa

UNIVERSITY OF SOUTH AFRICA
Health Studies Higher Degrees Committee
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE

REC-012714-039

HSHDC/360/2014

Date:	26 November 2014	Student No:	4837-288-9
Project Title:	Determinants contributing to exclusive breastfeeding in HIV infected mothers of infants aged 0-6 months who attend an NGO Health Centre in Elandsdoorn Village.		
Researcher:	Katlego Thabo Mohlajoa		
Degree:	Masters in Public Health	Code:	ALG0779
Supervisor:	Prof PR Risenga		
Qualification:	D Cur		
Joint Supervisor:	-		

DECISION OF COMMITTEE

Approved [√] **Conditionally Approved** [ ]

Prof L Roets
p/a **CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE**

Prof MM Moleki
ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRES

ANNEXURE B: Formal letter to institutions

Katlego Mohlajoa
HAART Program Manager

ELANDSDOORN

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From: Mariette Slabbert [mailto:mariettes@ndlovu.com]
Sent: 04 June 2014 10:30 AM
To: Katlego Mohlajoa
Cc: Hugo Tempelman
Subject: Re: REQUEST FOR RESEARCH IN FULFILMENT OF A DISSERTATION

Hi Katlego
Please phone me to discuss your research design and send me the questionnaire
Regards
Mariette

On 03 Jun 2014, at 18:39, "Katlego Mohlajoa" <Katlego@ndlovumc.org> wrote:

> Good evening
>
> I am kindly requesting permission to use Ndlovu Care Group's conducive environment for my dissertation to complete my master's degree. I have duly attached a brief research set-up .
>
> Your consideration is highly appreciated.
>
> Regards
>
> <image001.jpg>
>
> <image002.jpg>
>
> <Research set up.docx>

ANNEXURE C: Permission was granted by the CEO and COO of the health facility to conduct research

Katlego Mohlajoa

Subject: FW: REQUEST FOR RESEARCH IN FULFILMENT OF A DISSERTATION

From: Mariette Slabbert [mailto:mariettes@ndlovu.com]
Sent: 05 June 2014 08:18 PM
To: Katlego Mohlajoa
Cc: Hugo Tempelman
Subject: RE: REQUEST FOR RESEARCH IN FULFILMENT OF A DISSERTATION

Hi Katlego,

All the best you have my permission.

Regards
Mariette

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From: Katlego Mohlajoa [mailto:Katlego@ndlovumc.org]
Sent: 05 June 2014 06:02 PM
To: Mariette Slabbert
Cc: Hugo Tempelman
Subject: RE: REQUEST FOR RESEARCH IN FULFILMENT OF A DISSERTATION

Dear Mariette

Here is my study questionnaire and my sample size is less than 90 participants so that it allows me to generalize as it a quantitative research.

Regards

ANNEXURE D: Consent form (English version)

CONSENT FORM (ENGLISH VERSION)

PURPOSE

You are hereby asked to participate in the research called “Determinants contributing to exclusive breastfeeding in HIV infected mothers of infants aged 0 to 6 months who attend an NGO health centre in Elandsdoorn Village”.

AIM

The aim of this study is to understand the possible barriers faced by HIV positive mothers who want to breastfeed their infants and the impact brought about by circumstances beyond their control. The finding will inform the health workers’ interventions during their relationship with mothers who are HIV positive nursing infants under 6 months of age.

CONFIDENTIALITY CLAUSE

The researcher, Katlego Thabo Mohlajoa, with student number 48372889, is a student of UNISA and will be held liable by the responsible authorities, in case, he violates any of the regulations related with research.

The study will not use your personal details like your name, occupation, and related information to cause any harm to your reputation and integrity, and such information will be stored safely during the entire process of the research.

PARTICIPANT’S STATEMENT

I,_____(name of participant), have read the contents of this form and hereby agree to be part of this study. I am aware that can withdraw at any stage of the research without reproach or any untoward consequences.

Signature: _____ Date: _____

Witness (Interviewer): _____ Date: _____

ANNEXURE E: Questionnaire survey: Infant feeding practices

RESEARCH PROJECT: "DETERMINANTS CONTRIBUTING TO EXCLUSIVE BREASTFEEDING IN HIV INFECTED MOTHERS OF INFANTS AGED 0 TO 6 MONTHS WHO ATTEND AN NGO HEALTH CENTRE IN ELANDSDOORN VILLAGE".

FOR OFFICE USE

1	2	3

INSTRUCTIONS:

Please answer all the questions as honestly as possible. The information collected for this study will be collated and analysed in order to form an accurate picture of this research project on "Determinants contributing to exclusive breastfeeding in HIV infected mothers of infants aged 0 to 6 months who attend an NGO health centre in Elandsdoorn Village". It will assist the researcher to make findings and propose recommendations to improve the Prevention of Mother to Child Transmission Programme at the centre. You do not need to identify yourself and, similarly, the researcher will uphold anonymity in that there will be no possibility of any respondent being identified or linked in any way to the research findings in the final research report. Where required please indicate your answer with a cross (X) in the appropriate box or write a response in the space provided. For the open-ended questions, please write your responses clearly and legibly in the space provided.

SECTION A: SOCIO-DEMOGRAPHIC DATA	FOR OFFICE USE ONLY
Q1. What is your age? Less than 20 – 1 20-24 – 2 25-29 – 3 30-34 – 4 35-39 – 5 40 and above – 6	4
Q2. Marital status: Married and living together – 1 Married but separated – 2 Divorced – 3 Widowed – 4 Cohabiting – 5 Single – 6	5
Q3. The highest level of education you have attained is None – 1 Standard 8/Grade 10 and below – 2 Standard 9/Grade 11 – 3 Standard 10/Grade 12 – 4 Certificate – 5 Further studies – incomplete – 6 Certificate/Diploma/other post school – completed – 7 Degree – 8 Postgraduate degree – 9	6

Q4. Who do you live with?

Spouse/Partner	1
Parents	2
Friends	3
Relative	4
Alone	5
Other (Please specify)	6

7 ☐

Q5 Religion:

Christianity	1
Islam	2
African traditional belief	3
Hinduism	4
Other (Please specify)	5

8 ☐

Q6. How many children do you have?

None	0
One	1
Two	2
Three	3
Four and above	4

9 ☐

Q7. What is the age of your last child?

Less than 1 year	1
1-2 years	2
3-4 years	3
5 -6 years	4
Seven years and above	5
Not applicable	6

10 ☐

Q8. Which language do you frequently speak at home? (choose only one)

English	1
Afrikaans	2
isiZulu	3
Sesotho	4
Xitsonga	5
isiNdebele	6
Sepedi	7
Setswana	8
siSwati	9
Tshivenda	10
isiXhosa	11
Other (Please Specify)	12

11

Q9. What is your nationality?

South African?	1
Zimbabwean	2
Swazi	3
Mosotho	4
Congolese	5
Nigerian	6
Other (Please Specify)	7

12

SECTION B: ECONOMIC FACTORS

Q10. What is your current employment status?

Unemployed	1
Employed full-time	2
Employed part-time	3
Self employed	4

13

Q11. What is the employment status of your husband/partner?

Unemployed	1
Employed full-time	2
Employed part-time	3
Self employed	4
Not applicable	5

14

Q12. How much does it cost you to travel to and from the clinic when coming for antenatal care visits?

Nothing, I walk to the clinic	1
Less than R20	2
R21 - R25	3
R26 - R30	4
R31 and more	5

15

Q13. How much is your household income in a month?

Less than R500 per month	1
R R500 – R 1000per month	2
R 1001 – R 1500 per month	3
R 1 501 – R4000 per month	4
More than R4 000	5

16

SECTION C: BREASTFEEDING HISTORY AND CURRENT STATUS	
Q14. Did you ever breastfeed your previous baby? Yes 1 No 2	17
Q15. If yes on Q14 above, for how long did you breastfeed him/her? Less than 1 month 1 2 months 2 3 months 3 4 months 4 More than 4 months 5	18

Q16. If no on Q14 above what are the reasons you did not breastfeed him/her? Going back to school 1 Going back to work 2 Breast milk not enough 3 Cracked nipples 4 Engorged breasts 5 Other 6	19
Q17. Are you currently breastfeeding this child? If yes go to Q19 below. Yes 1 No 2	20

Q18. If no to Q17 above what are you feeding your current child to replace breast milk?

Soft porridge	1
Water mixed with sugar	2
Tea	3
Formula milk	4
Other (specify)	5

21

Q19. If yes to Q17 above, when was the first time you started breastfeeding the current child after delivery?

Immediately after giving birth	1
Within the first hour	2
2 – 3 hours after birth	3
1 day after birth	4
More than 1 day after birth	5

22

Q20. Do you give the current baby other foods or liquids?

Yes	1
No	2

23

Q21. If yes to Q20 above, who advised you to give this current child other foods or liquids?

Own judgement	1
My mother	2
Partner	3
Relatives	4
Other (specify)	5

24

Q22. When did you start to introduce extra foods or drinks including water to this current child?

Less than 1 month	1
1 – 3 months	2
4 – 5 months	3
At 6 months	4

25

Q23. If your current child is not currently breastfeeding, how old was he/she when you stopped breastfeeding him/her?

Less than 1 month	1
2 months	2
3 months	3
4 months	4
More than 4 months	5

26

Q24. After birth of this current baby did you give him/her anything before starting to breastfeed?

Yes	1
No	2

27

Q25. If your current baby is not breastfeeding currently what were the reasons to stop breastfeeding him/her?

Insufficient breast milk	1
Working out of town	2
Breast problems	3
Fear of vertical transmission	4
Other (specify)	5

28 ☐

Q26. After the birth of this current baby, did he/she latch onto the breast without difficulty?

Yes	1
No	2

29 ☐

Q27. Did you receive counselling on infant feeding options when pregnant with this current baby?

Yes	1
No	2

30 ☐

Q28. Did the information you received on infant feeding options influenced your decisions on breastfeeding this current baby?

Yes	1
No	2

31 ☐

Q29. Did the health worker demonstrate how the baby should latch on the breast? Yes 1 No 2	32
Q30. Can the information prepare you well before starting to breastfeed? Yes 1 No 2	33
Q31. Would you recommend this information to other mothers to help them in breastfeeding decisions? Yes 1 No 2	34

SECTION D: BARRIERS TO EXCLUSIVE BREASTFEEDING

Q32. Please indicate your level of agreement or disagreement on the barriers to exclusive breastfeeding.

Key: (**SD**=strongly disagree, **D**=disagree, **U**=undecided, **A**=agree, **SA** =strongly agree).

BARRIERS	SD	D	U	A	SA	FOR OFFICE USE
Traditional or religious structures can influence decision to exclusively breastfeed.						35
Partner is not supportive towards exclusive breastfeeding of the baby.						36
Mother-in-law pressurised me to wean the baby.						37
When the mother has tuberculosis she cannot breastfeed her baby. (Be Specific – changed to this statement)						38
The baby can be addicted to breast milk if he/she breastfeeds for 6 months exclusively. (Give it as a statement not phrase – changed as suggested)						39
I experienced painful breasts.						40
I was unable to make enough milk to satisfy the baby.						41
I had to return to work.						42

Breastfeeding is a tiring exercise for me.						43	
My neighbours pressured me to wean the baby.						44	
The baby refused breast milk.						45	
I was experiencing weight loss.						46	
My baby was not gaining enough weight.						47	
I was not feeding well.						48	
My community will isolate me if I exclusively breastfeed.						49	

SECTION E: INFANT FEEDING PRACTICES

Q33. Please indicate your level of extent to which you view the following infant practices. Key: (**NE**=Not to an extent at all, **LE**=To a little extent, **SE**=To some extent, **LE**=To a large extent, **VLE**=To a very large extent)

NB: Changed the scale to look like this.

PRACTICES	NE	LE	SE	LE	VLE	FOR OFFICE USE

Pre-lacteal feeding is recommended after the baby's birth.						50	
Colostrum is a suitable feed for the baby.						51	
Soft porridge can be introduced in-between breastfeeds.						52	
Liquids like juice and water are a good supplement to exclusive breastfeeding.						53	
The baby can start eating solids within the first month of life.						54	
The baby should be breastfed immediately after birth.						55	
If milk is not coming out of the breast then solids can be given to the baby.						56	
It important for mothers to know how the baby should attach to the breast.						57	
The baby should be breastfed when they demand so.						58	
Wet nursing can benefit your baby when you are not available to breastfeed them.						59	
Mixed feeding is likely to increase the infant mortality rate.							

						60
Counselling on infant feeding options helps mothers make better choices.						61
Breast milk alone is sufficient for the baby for up to 6 months.						62

SECTION F: KNOWLEDGE OF EXCLUSIVE BREASTFEEDING

Q34. Please indicate (with an **X**) whether the following statements about exclusive breastfeeding are true or false.

(a) MOTHER TO CHILD TRANSMISSION	**TRUE**	**FALSE**	**I DON'T KNOW**	**FOR OFFICE USE**
HIV testing is important for the health of the mother and the unborn baby.				63
An HIV positive mother can transmit the virus to the baby during pregnancy.				64
HIV cannot be transmitted to the baby during delivery.				65
It is not safe to exclusively breastfeed as HIV will always be transmitted to the baby.				66
It benefits the baby to take formula and breast milk at the same time.				67

The best time for an HIV infected pregnant woman to be enrolled in the PMTCT programme is at the beginning of antenatal care.				68
Early booking for antenatal checkups is not necessary for the mother and unborn child the mother is HIV positive.				69
ARV drugs are the best treatment in preventing unborn babies from being infected by HIV.				70
It is important for the partner to test to minimise the risk of HIV re-infection.				71
Antenatal care is very important to the pregnant woman as it ensures the wellbeing of the mother and the baby				72
(b) EXCLUSIVE BREASTFEEDING	**TRUE**	**FALSE**	**I DON'T KNOW**	**FOR OFFICE USE**
Breast milk sometimes provides the newborn baby with adequate nutrition to protect against infections.				73
Exclusive breastfeeding minimises HIV infection risk in breastfeeding.				74
A baby may be infected through breast milk if the mother is HIV positive.				75
Complimentary foods must not be introduced after 6 months of exclusive breastfeeding.				76
Disclosure of HIV status can help the mother to breastfeed exclusively.				77

HIV positive mothers can introduce other foods to the baby gradually while they are still breastfeeding.				78
Exclusive breastfeeding has lasting nutritional benefits for the baby.				79
Exclusive breastfeeding is the best option for HIV exposed babies.				80
It is recommended to exclusively breastfeed the baby for the first 6 months of life.				81
Breastfed babies are rarely constipated.				82
Breastfeeding is cheaper than formula milk.				83
Infants who are breastfed exclusively tend to walk and talk faster than bottle fed babies.				84
Breastfeeding is more convenient than bottle feeding.				85
Breast milk is digested more easily than formula milk.				86
The babies that are breastfed are healthier than the ones who are formula-fed.				87
A mother who drinks alcohol must not breastfeed her baby.				88

Breastfeeding helps the uterus to contract thus reducing and controlling postpartum bleeding.				89

Any other comments

_____

_____

_____

_____

_____

_____

_____

THANK YOU