

https://dspace.org/

An assessment of infant feeding knowledge, attitude and intended practice of women delivering at Chris Hani Baragwanath hospital

Kennedy, Yollande P

2016

http://hdl.handle.net/10539/22316

Downloaded from a DSpace repository. https://dspace.org/

AN ASSESSMENT OF INFANT FEEDING KNOWLEDGE, ATTITUDE AND INTENDED PRACTICE OF WOMEN DELIVERING AT CHRIS HANI BARAGWANATH HOSPITAL

Dr. Yollande P. Kennedy
(supervisor: Prof. Y. Adam)

A Dissertation submitted to the Faculty of Health Sciences, University of the Witwatersrand, in fulfilment of the requirements for the degree of Masters of Medicine – Obstetrics and Gynaecology

Johannesburg, 11 June 2016

TABLE OF CONTENTS

	Page
Declaration	v
Acknowledgements	vi
Abstract	vii-viii
List of Tables and Figures	ix
List of Appendices	x
List of Abbreviations	xi
List of Definitions	xii-xiii

CHAPTER ONE: INTRODUCTION

1.1 General Introduction	2-3
1.2 Literature Review	4-14
1.2.1 Benefits of Breastfeeding	4-5
1.2.2 International Infant Feeding Recommendations for HIV negative mothers	5
1.2.3 Infant Feeding in the Context of HIV	5-7
1.2.4 South African National Infant Feeding Policy	9
1.2.5 Breastfeeding Practices	9-11

1.2.6 Role Players provision of Infant Feeding Information and Support 11-12

1.2.7 Factors affecting maternal decision on Infant Feeding Practice 12-14

1.2.8 Conclusion 14

1.3 Purpose of the study 14

1.4 Objectives 15

1.4.1 Primary Objectives 15

1.4.2 Secondary Objectives 15

CHAPTER TWO: METHODS

2.1 Study Design 17

2.2 Study Site 18

2.3 Study Population 18-19

2.3.1 Inclusion Criteria 19

2.3.2 Exclusion Criteria 19

2.4 Sampling Strategy 20

2.4.1 Sample size 20

2.4.2 Sample method 20

2.5 Data Collection 21-22

2.5.1 Data Collection Team 21

2.5.2 Data Collection Tools 22

2.6 Quality Control 22

2.7 Data Analysis 23

2.7.1 Data management and capturing 23

2.7.2 Statistical analysis of the data 23

2.8 Ethical Considerations 24-25

2.8.1 Ethical Review Committee 24

2.8.2 Informed consent 24

2.8.3 Participant confidentiality 24

2.9 Funding 25

CHAPTER THREE: RESULTS

3.1 Demographic Data 27-30

3.2 Antenatal Care data 30-32

3.3 Intended Infant Feeding Practices 33-35

3.4 Greatest Source of Influence 35

3.5 Maternal Knowledge 36

3.6 Breastfeeding Comfort 36-37

3.7 Infant feeding Practices at 6 Week Follow up 38-43

CHAPTER FOUR: DISCUSSION

4.1 Breastfeeding Practices	45-48
4.2 Greatest Influential Source of Information	48-49
4.3 Infant Feeding and HIV	49-50
4.4 A Description of the Study Population	50
4.5 Conclusion	51
4.6 Study Limitations	51
4.7 Study Strengths	52
REFERENCES	53-61
APPENDICES	62-81

DECLARATION

I, Dr Yollande Palesa Kennedy, hereby declare that this research report titled “An Assessment of Infant feeding Knowledge, Attitude and Practice of Women Delivering at Chris Hani Baragwanath Academic Hospital” submitted to the Department of Obstetrics and Gynecology, University of Witwatersrand, as a requirement for a Masters of Medicine Degree, is a record of original work done by myself, under the supervision and guidance of Prof. Yasmin Adam.

The information and data given in this report is authentic to the best of my knowledge.

This report will also be submitted to the College of Medicine, South Africa, as a requirement towards a qualification for the Fellowship of College of Obstetricians and Gynecologists of South Africa.



ACKNOWLEDGEMENTS

I would like to express sincere gratitude to Prof. Yasmin Adam and the Department of Obstetrics and Gynecology, Chris Hani Baragwanath Academic Hospital, for the continued support throughout this research project. Thank you to the participants in this study for entrusting me with their personal information.

A heartfelt thank you goes to my family, for their patience and support.

ABSTRACT

Infant and childhood nutrition is critical to child health and development, and inappropriate feeding practices are a threat to this. An important measure to reduce child mortality is providing adequate nutrition and exclusive breastfeeding (EBF). Maternal education on appropriate infant feeding practices forms an integral part of promoting child health.

Aim: This study is aimed at determining feeding practices of women who deliver at Chris Hani Baragwanath Academic Hospital, and understanding factors that influence maternal intended infant feeding practices.

Methods: This was a prospective co-hort study conducted between 17 April 2015 and 6 May 2015, using structured questionnaires and information obtained from antenatal records.

Results: A total of 132 participants were recruited, and 124 (93.94%) were reached for a follow up telephonic interview - with 8 participants (6.06%) lost to follow up. A majority of participants (n=86; 69.36%) were still exclusively breastfeeding their babies at 6 weeks follow up. Patient factors that were associated with EBF were unemployment (n=67; 75.28%) and parity (n=62; 78.48%) - p value< 0.05. An HIV positive status was associated with a greater percentage of mothers who were formula feeding at 6 weeks (15/19; 78.95%) - p value<0.05. The intention to EBF also positively correlated with actual EBF at six weeks (69/86; 80.23%) – p value <0.001. Other variables which were associated with EBF included the knowledge that breast milk provided sufficient nutrition for the baby until 6 months of life (p value = 0.05); as well as maternal comfort

to breastfeed in the presence of a family member (p value = 0.015). A total of 19 participants (15.32%) had introduced supplementary foods, in addition to breast milk, by 6 weeks. The most common supplementary food source introduced was formula (n=13; 68.42%).

Conclusion: Although the participants in this study were very knowledgeable in infant benefits of exclusive breastfeeding, some still chose inappropriate feeding choices. There is a need for more education with emphasis on EBF and a drive towards more appropriate infant feeding methods.

LIST OF TABLES AND FIGURES **Page**

Table 1.1: AFASS Criteria Questionnaire 8

Figure 3.1: A Sample Overview 27

Table 3.1: Demographic Data 29

Table 3.2: Age Distribution of HIV status 30

Table 3.3: A Description of Antenatal Factors 32

Table 3.4: Intended Infant feeding Practices 34

Table 3.5: Intended infant Feeding Practice per Age Group 35

Table 3.6: Knowledge if Benefits of Breastfeeding 36

Table 3.7: Maternal comfort with breastfeeding 37

Table 3.8: Infant feeding practices at 6 weeks follow up 38-39

Table 3.9: Descriptive variables by infant feeding practice at 6 weeks 40

Table 3.10: Supplementary feeding 42

LIST OF APPENDICES

- Appendix A Data Collection Sheet – Patient Questionnaire
- Appendix B Data collection sheet - Follow up telephonic interview at 6 weeks
- Appendix C Patient information sheet
- Appendix D Patient consent

ABBREVIATIONS

- AIDS = Acquired Immune Deficiency Syndrome
- AFASS = Acceptable, Feasible, Affordable, Sustainable, and Safe
- ART = Anti-retroviral Treatment
- BF = Breastfeeding
- BFHI = Baby Friendly Hospital Initiative
- CHBAH = Chris Hani Baragwanath Academic Hospital
- EBF = Exclusive Breast feeding
- HIV = Human immunodeficiency virus
- MDG = Millennium Development Goals
- MOU = Midwife Operated Unit
- PMTCT = Prevention of Mother to Child Transmission
- SA = South Africa
- DoH = Department of Health
- SADHS = South African Demographic Health Survey
- SD = Standard Deviation
- UNICEF = United Nations Children's Fund
- WHO = World Health Organization

DEFINITIONS

- Breastfeeding — Giving baby breast milk.
- Exclusive Breastfeeding — Giving baby only breast milk as a source of nutrition, with prescribed medication (which includes oral rehydration solution and vitamins) as required.
- Formula feeding — Giving baby commercial formula milk as the main source of nutrition.
- Mixed feeding — Giving baby other nutritive liquids and/or food stuff together with breast milk.
- Complementary feeding — The process of introducing non-milk foods, or nutritive liquids at a time when breast milk alone, or infant formula alone, no longer is sufficient to meet the nutritional requirements of the baby.
- Supplementary feeds — Any additional food stuff given prior to 6 months of age.
- Health care worker — A person who provides health care in a systematic way professionally to any individual in need of health care service.
- Nutritive liquids — Includes liquids that contribute to the baby's energy intake, e.g. Formula milk, animal milk, tea with sugar or milk, juice, etc.

- Partial breastfeeding — Giving baby breast milk and non-nutritive as well as nutritive liquids and/or food.

- Predominant breastfeeding — The baby's predominant source of nourishment is breast milk; however, the baby also receives liquids (such as water, juice, etc.), traditional medication, etc.

- Replacement feeding — Feeding baby who does not receive breast milk a diet that provides all the nutrients the baby needs until he/she is on a full family diet. During the first 6 months, a suitable breast milk substitute is formula milk.

CHAPTER ONE:

INTRODUCTION

1.1 GENERAL INTRODUCTION

The causes of morbidity and mortality of children under the age of 5 are multifactorial, and often relate to poor nutritional status[1, 2]. Early infant feeding practices are important in supporting child health, since nutrition plays a critical role in the health, growth and development of children. Over half of the childhood deaths can be prevented through simple affordable interventions. Breastfeeding remains an important means to reducing child morbidity and mortality in resource poor countries[1].

Human milk is constituted to provide adequate infant nutrition for the first 6 months of life[3]. Evidence has shown that the promotion of breastfeeding, particularly exclusive breastfeeding (EBF) in the first 6 months of life, can improve childhood nutrition and thus reduce child mortality[4]. In recognizing this fact, the World Health Organization (WHO) adopted the international code of marketing of breast milk substitutes in 1981. This led to the Baby-friendly Hospital Initiative (BFHI), giving birth to the 10 steps of successful breastfeeding. With this, came a recommendation made by the WHO and United Children's Fund (UNICEF) that all infants should be breastfed exclusively for the first 6 months of life, followed by introduction of nutritionally adequate and safe complimentary foods at 6 months and sustained breastfeeding for up to 2 years[5].

This was high-lighted in 2000, when 189 countries adopted the Millennium Declaration that was translated into the Millennium Development Goals, of which goal 4 was to reduce child mortality[6]. This prompted the publishing of an infant and young child feeding policy by the South African (SA) Department of Health (DoH) in 2007, which echoed the recommendations made by the WHO[7]. The DoH has made further great strides in recognizing the importance of mother and child health issues by improving access to free antenatal care, free healthcare for all children under the age of 6 years and introducing antiretroviral therapy (ART) for prevention of mother-to-child

transmission (PMTCT). These have been excellent strategies to improve women and child health and survival.

In developing SA, the battle lies in improving EBF rates and introducing the right complementary foods at the appropriate times. The country's infant feeding practices are suboptimal, with breastfeeding rates, particularly EBF, remaining low[8, 9]. The South African Demographic Health Survey (SADHS) of 2003 reported that only 11.2% of babies under 2 months of age were being exclusively breastfed[10]. This was the last national survey published by the South African Department of Health. Furthermore, a UNICEF State of the World's Children's report indicated that SA has one of the lowest EBF rates in the world, with 8% of infants being exclusively breastfed at 6 months[11]. In order to improve on infant feeding practices, we need to bridge the gap between the national infant feeding policy and actual feeding practices. Antenatal care (ANC) affords an opportunity for appropriate infant feeding education. This study will therefore explore infant feeding patterns of mothers who delivered at Chris Hani Baragwanath Academic Hospital (CHBAH), and identify factors that inform maternal infant feeding practices, in order to implement positive change in the breastfeeding rate.

A literature review was conducted, with focus on the infant feeding practices of mothers and the factors that influence these practices. The following questions are examined:

- What are the benefits of breastfeeding?
- What are the current recommended infant feeding practices?
- What are the current infant feeding practices?
- Who are the key role players in providing infant feeding information and support?
- What are the factors affecting maternal decision on infant feeding practice?

1.2 LITERATURE REVIEW

1.2.1 Benefits of Breastfeeding

Breastfeeding has long been recognized as an optimal method of infant feeding, owing to its nutritional benefits that contribute to promoting infant growth, immunity and cognitive development[12, 13]. Child health benefits attributed to breast milk include protection against infections such as infective diarrhea, respiratory infections, otitis media, and necrotizing enterocolitis[14]. Breastfeeding alone is estimated to prevent 13% of under-five child deaths in low and middle income countries across the world[15]. It is a primary strategy used to improve child survival worldwide[16]. Therefore, the promotion of EBF for the first 6 months of life is estimated to be the most effective measure to improve child health in these low income settings. This is as a result of the presence of maternal antibodies and macrophages contained in colostrum and breast milk. Early initiation of breastfeeding in the first day of life reduces the risk of child mortality, and is associated with increased breastfeeding success and the establishment of milk production[17, 18]. Early introduction of liquids and food increases the risk of infectious diseases, growth retardation and under-nutrition[19, 20]. In addition, the absence of breastfeeding carries the highest risk for pneumonia and diarrhea[1], and the added cost burden of introducing formula and other foods to an infant's diet can be heavy. Therefore, there is no advantage to introducing food before 6 months in low socio-economic communities, since breast milk ensures optimal and sufficient nutrition.

Breastfed infants are less likely to develop allergic conditions, childhood diabetes mellitus and obesity, and there is a lower incidence of sudden infant death syndrome amongst breastfed infants[14, 15]. In addition, breast milk is easily digested and efficiently used by the gut, and thus breastfed infants are less likely to develop colic and digestive

problems. Other long term advantages of breastfeeding include stronger intellectual development and lower risk of cancer[19].

Maternal benefits of breastfeeding include a reduced risk of post-partum hemorrhage, reduced incidence of the development of type 2 diabetes mellitus and breast cancer[14]. The prolonged amenorrhea induced by prolonged breastfeeding may provide a method of contraception by inhibiting ovulation. It is also economically sensible to breast feed since breast milk is readily and freely available, needing no preparation

1.2.2 International infant feeding recommendations for HIV negative mothers

The WHO describes the optimal infant feeding practice as initiating breastfeeding within the first hour of life followed by EBF for the first 6 months of life, with the introduction of appropriate and adequate complementary food at 6 months and continued breastfeeding on demand up to 2 years[21]. During periods when the infant is unable to feed from the mother's breast, it is recommended that the baby be given breast milk by means of an infant feeding tube or a cup, rather than a bottle with an artificial nipple, to avoid nipple confusion. Recognized breastfeeding practices are categorized into 3:

1. Exclusive breastfeeding – the infant receives only breast milk and prescribed medication (which includes oral rehydration solution).
2. Predominant Breastfeeding – the infant receives other liquids such as water, water-based drinks and traditional fluids in addition to breast milk.
3. Partial breastfeeding – the infant receives other liquids, non-human milk and food in addition to breast milk.

1.2.3 Infant feeding in the context of HIV

HIV mother to child transmission can occur at any time during pregnancy, during labor, or during breastfeeding. The national perinatal mother-to-child HIV transmission rate at 6 weeks post-partum is estimated at 3.5%[22]. An infant is at risk of HIV transmission for the entire duration of breastfeeding. The risk of infection depends on many factors. Maternal factors associated with high risk of HIV transmission include a high maternal viral load, recent maternal infection, advanced HIV disease, a low maternal CD_4 count, mastitis and breast abscesses. Infant factors include oral thrush and damage to the intestinal mucosa related to early introduction of fluids and food[23]. Thus mixed feeding during the first 6 months of life increases infant exposure to HIV through a compromised gut mucosal integrity. The WHO recognized this, and recommended that all HIV infected mothers exclusively breastfeed for the first 6 months of life, with introduction of complementary food at 6 months and continued breastfeeding beyond this if adequate replacement feeding is not possible[24]. All breastfeeding should be stopped once a nutritionally adequate and safe diet without breast milk can be provided. The emergence of evidence that initiation of ART in pregnant women provided added protection against mother-to-child transmission, made this recommendation feasible in reducing infant infection, particularly in low income settings. Evidence showed that early and appropriate ART combined with EBF for the first 6 months of life decreased the postnatal risk for transmission to 1%, by suppressing maternal viral load to undetectable levels[24]. The recommendation made by the WHO was then revised in 2009 to include the provision of lifelong ART to pregnant women, and antiretroviral prophylaxis to all breastfed infants.

Replacement feeding involves providing an infant, who is not receiving breast milk, with a diet that provides all the nutrients required for growth and development – usually a breast milk substitute such as commercial formula. The WHO recommends replacement feeding as an alternative option for mothers known to be HIV infected, provided they meet the criteria for the AFASS principles[24]. The AFASS principles require that the mother/family:

a) Accept not to breastfeed and thus use exclusive replacement feeding through breast milk substitutes,
b) Consider the breast milk substitute feasible given the extended family/community but also nature of work and lifestyle of the mother/family,
c) Can afford to supply enough breast milk substitute feeds for the duration the infant needs for normal growth and development,
d) Can sustain the supply of the breast milk substitute, and
e) Will maintain safe conditions for the feeds, e.g. access to safe water and sanitation.

The decision to replacement feed should therefore be made with consultation of the patient as well as close family members who will be involved in caring for the infant. There has been no universally accepted screening tool for the AFASS criteria so far, but recommended key questions can be used (see Table 1.1)[25]. According to this adaptation recommended by an international organization for mother and child health, all criteria in the replacement feeding column need to be met in order to provide adequate replacement feeding according to the AFASS criteria.

Table 1.1: Recommended key questions for assessment of AFASS criteria[25]

Question	Mothers who should be exclusively Breastfeeding	Mothers who can Replacement feed
Where do you get your drinking water?	River, stream, pond or well	Piped water at home or can buy clean water
What kind of toilet/latrine do you have?	None or pit latrine	Waterborne latrine or flush toilet
How much money can you afford for formula each month? *Amount can be calculated based on local costs*	Less than minimum required amount available for formula each month	Minimum amount required for formula each month
Do you have a refrigerator with reliable power?	No, or irregular power supply	Yes
Can you prepare each feed with boiled water and clean utensils?	No	Yes
How would you arrange night feeds?	Preparation of night feeds difficult	Preparation of night feeds possible
Does your family know you are HIV positive?	No	Yes
Is your family supportive of milk feeding and are they willing to help?	No or I don't know	Yes

1.2.4 South African National Policy

The Department of Health (DoH) adopted these recommendations into the National Infant and Young Child Policy as well as the Prevention of Mother-to-Child Transmission (PMTCT) guidelines. The current infant feeding policy strongly recommends EBF for the first 6 months of life, with introduction of safe and complementary food at 6 months for both HIV infected and non-infected mothers[26]. Continued breastfeeding is recommended for 2 years or longer for HIV negative mothers; and 12 months for HIV infected mothers. The current national PMTCT guideline provides lifelong ART to all pregnant and lactating mothers, and antiretroviral prophylaxis to all HIV exposed infants for the first 6 – 12 weeks of life, depending on maternal viral load and period of ART[27]. Replacement feeding is recommended only if the AFASS criteria is met, as above.

1.2.5 Breastfeeding Practices

Despite the well documented benefits of breastfeeding and the development of breastfeeding policies by the WHO as well as national government, breastfeeding rates in SA remain suboptimal and seem to be on the decline, particularly EBF. However, breastfeeding initiation is still common, with very high rates. The national breastfeeding initiation rates, as published in the only two SADHS reports show a decline in initiation rates between 1998 and 2003 – rates estimated to be 87% and 82% respectively[10, 28]. While the proportion of mothers who initiated breastfeeding remains relatively high, the reported number of babies that were never breastfed at all is still significant (20%) and needs improvement[10]. In smaller, regional studies conducted in Venda, Pretoria and Cape Town, the breastfeeding initiation rates were also high - 100%, 88.1% and 77%

respectively[29, 30, 31]. Compared to other developing countries, however, these breastfeeding initiation rates are still relatively low – the initiation rates in China and Nepal were reportedly 95.9% and 99.7%, respectively[32, 33].

EBF is rarely practiced in SA, and inappropriate introduction of supplementary and/or complementary foods at an early age seems to be a common practice [19, 29, 30, 34, 35, 36]. Early cessation of breastfeeding seems to be common amongst both HIV negative and HIV positive women in SA[37], and this seems to be a rule rather than the exception[38]. In 1998, the SADHS reported that only 10% of infants were EBF up to 3 months and an even lower 6.8% of infants were EBF at 6 months[28] - this increased to a dismal 8.3% by 2003[10]. A cross sectional study conducted in four provinces in SA revealed that only 12% of infants were EBF at 6 months[39]. In a local study in Limpopo, EBF rates declined from 44% at 1 month postpartum, to 10% by 3 months postpartum[20]. In a multi country cross sectional study, dubbed the MAL-ED study, the proportion of babies in the South African site that were exclusively breastfed at 1 month dropped to 29.5%[40]. A UNICEF State of the World's Children report attributed the low EBF rates in SA to the lack of understanding of the critical benefits of breastfeeding, compounded by fears of HIV transmission, among other factors[11].

Mixed feeding seems to be socially and culturally accepted, even in areas of high HIV prevalence[8]. Fluids and foods are introduced to infants as early as two to four weeks after birth[20, 30]. In a study conducted in Moretele district, North of Pretoria, mothers considered 3 months as an appropriate age for introduction of food[30]. The most common supplementary food introduced in urban areas is commercial infant cereal[20, 30]; and maize meal porridge is the major food introduced in rural and semi-rural areas[20, 30]. Both these food types are known to have little or no nutritional value to a growing infant. Even in the context of HIV/AIDS, HIV infected mothers still introduce water and food early in life[41, 42, 43]. In a study conducted in an HIV prevalent community in KwaZulu Natal, 76% of mothers practiced mixed feeding at 14 weeks postpartum[38]. This problem

is not unique to SA. A literature review of infant feeding practices in Japan revealed that it is common practice to introduce formula as early as 2 weeks if the baby does not gain weight adequately[44]. In a cross sectional study conducted in Tanzania using a questionnaire aimed at determining the knowledge on infant feeding practices among pregnant women, only 28.8% of the mothers were aware that breast milk was sufficient for development in the first 6 months of life, and only 31.3% thought 6 months was the appropriate age to start giving solids[45]. The rest of the pregnant women had the perception that babies need water after every feed and may require other supplementary feeds if express dissatisfaction.

Replacement feeding is recommended by the WHO only if acceptable, feasible, affordable, sustainable and safe (AFASS criteria) to ensure safe feeding practices[24]. An assessment done by researchers in peri-urban and rural areas of SA, revealed that South African mothers make inappropriate feeding choices[46]. They revealed that 67.4% of women who intended to formula feed did not meet the AFASS criteria. Furthermore, HIV infected mothers who formula fed reported that they breastfed when there was a shortage of formula at the healthcare facilities[43, 47]. Some of these women also used their breast as pacifiers. In addition, over-dilution to save formula milk and reduce expenses seemed to be problem[47]. Poorly understood preparation instruction due to language barrier, illiteracy and/or innumeracy was also found to be a factor in over-dilution of formula feeds[48]. Poor access to basic water and sanitation in resource poor areas also raises concern.

1.2.6 Role players in providing infant feeding information and support

Although maternal infant feeding choices are largely self-determined[8], the role of external factors, in particular, influence from health care providers, family members and peer groups cannot be ignored. There is no doubt that health care can exert a direct

impact on infant feeding choices. The important role of the health care provider has been highlighted by many research projects. Many studies have shown that counselling from a health care provider about the benefits of breastfeeding can influence maternal infant feeding choices. Most women, particularly parous women, make their infant feeding choices during the antenatal period. Women who receive personalized information about breast milk from the health care provider are more likely to initiate breastfeeding or milk expression than those who do not receive this information[49]. Breastfeeding promotional activities should thus be initiated as early as possible in the antenatal period[50]. The intervention of the BFHI program succeeded in encouraging exclusive and prolonged breastfeeding[51], and continued breastfeeding support by a health care worker is necessary even in the postnatal period. A study conducted in rural KwaZulu Natal, SA, which explored the breastfeeding knowledge among health care workers showed that there are some gaps in provider understanding of breastfeeding and HIV mother to child transmission[52]. This probably is a contributing factor to our country's suboptimal breastfeeding rates, and highlights the need for further training and development programs for healthcare providers in that area.

The utilization of influential role players in communities has also shown to have a positive impact on the promotion of breastfeeding. Furthermore, it is well documented that women who receive positive encouragement to breastfeed from their partner, their own mother or a close family relative are more likely to breastfeed. In a cross-sectional study of women attending antenatal care done by Humphreys et al, the intention to breastfeed was positively related to social support of breastfeeding. In this study, the key role players that had a positive impact on breastfeeding were family members, the baby's father and lactation consultant[53]. In another randomized control study done in Bangladesh, the authors made a recommendation that peer counsellors be incorporated in mother and child health programs in developing countries, after their study showed that peer counsellors could effectively increase initiation and duration of EBF for the first 5 months of life[54].

1.2.7 Factors affecting maternal decision on infant feeding practice

The effect of a variety of patient related factors on breastfeeding have been explored, namely age, parity, employment, ante natal class attendance, attitudes and knowledge about the benefits of breastfeeding, and previous breastfeeding experience. There is agreement in the literature that early decision on breastfeeding allows the mother psychological and physical preparation, and thus brings a positive outcome after birth[45]. A study conducted by Hoyer and Pokorn (1998) showed that the time of decision to breastfeed was important to determine the duration of breastfeeding, and that the intention to breastfeed was a good predictor of prolonged breastfeeding[55].The maternal intention to breastfeed has been identified as the single most independent positive indicator for breastfeeding initiation and duration in many other studies since then[26, 56]. Furthermore, maternal intention to breastfeed is influenced by other factors such as maternal knowledge about the benefits of breastfeeding and their attitude about breastfeeding in public[57]. The literature has shown that maternal knowledge about infant health benefits, attitude towards breastfeeding, as well as maternal comfort with breastfeeding in social setting is directly related to intention to breastfeed[58, 59]. These factors are important contributors to the intention to breastfeed. Women who are strongly motivated to breastfeed, are more likely to succeed than women with low breastfeeding expectations[60].

Another maternal factor that has been proven to positively correlate with breastfeeding intention is previous breastfeeding experience among parous women. Women that had previously successfully exclusively breastfed their other children are more likely to intend to exclusively breastfeed their current baby[53]. In addition, the MAL-ED study showed primi-parity to be a risk factor for moving to partial or no breastfeeding[40].

Sociodemographic factors that have been positively linked to breast feeding are an older age and a higher level of education[61, 62]. However, other studies have shown that demographic factors such as age and maternal level of education play no significant role in breastfeeding initiation or duration. Data from a cohort study conducted by Scott el al, presented in two studies, found no association between maternal age, ethnic background or marital status, and the initiation or duration of breastfeeding[56, 63]. In addition, they found a negative association between early return to work and breastfeeding duration. The authors went on to suggest that generous maternity leave provisions in the form of paid leave may enable women to breastfeed for longer 4periods.

1.2.8 Conclusion

It would seem that even with international intervention strategies to encourage breastfeeding, a high percentage of women still opt for alternative feeding practices, in particular, mixed feeding with the early introduction of semi-solid foods in low income settings. South Africa, in particular, struggles with high rates of poverty and unemployment. Encouragement of breastfeeding can serve as a beneficial strategy to improve household food and economic security. Little is known about breastfeeding knowledge and practices in a more urbanized population, such as Soweto, in SA. This study is aimed at determining infant feeding practices in this urban area, and understanding the factors that hamper breastfeeding among women in this area.

1.3 PURPOSE OF STUDY

In a literature search, few studies are aimed at understanding women's interpretation of the recommended infant feeding practices, in particular, recommended breastfeeding

practices in an urban population of South Africa. This study may assist in understanding the factors that influence infant feeding choices of women in an urbanized setting of South Africa, and will serve as feedback to the health care system regarding channels used to drive the message contained within the national infant feeding policy. Also, it may highlight challenges faced by women in an urban population when it comes to decision making regarding infant feeding practices.

1.4 OBJECTIVES

1.4.1 Primary objectives

- To describe maternal infant feeding practices in the first 6 weeks of life
- To assess maternal knowledge of the benefits of BF immediately post-partum
- To investigate primary source of influence in decision making regarding infant feeding

1.4.2 Secondary objectives

- To assess women's knowledge of the South African BF Guidelines
- To identify factors that inform maternal decision on the intended infant feeding practices

CHAPTER TWO:

METHODS

2.1 STUDY DESIGN

This is a prospective cohort study of a sample of women who had delivered at Chris Hani Baragwanath Academic Hospital (CHBAH) in the period from 17 April till 6 May 2015. This was a convenience sample where women were approached in the post natal wards of the hospital on the days of interview, and were provided with an explanation of the study as well as a patient information sheet (see Appendix C). Willing mothers were then given a consent form to sign upon agreeing to participate in the study, based on the understanding of the information provided (see Appendix D).

The research focused on collecting information from mothers on their infant feeding practices in the first 6 weeks of life in the form of a survey. An interview was conducted by the researcher and records from mother's antenatal attendance were used to collect the data in the first phase of the study. The second phase of the study took the form of a follow up telephonic interview at 6 weeks post-partum. The questionnaires used were formulated by the researcher, and included some open ended questions. The questions were based on literature obtained, as well as consultations with other health workers involved in maternal and child care. The questionnaire was directly translated into the mothers preferred language by a single researcher, who is able to converse in 5 out of the 11 official languages – which covered the main languages spoken by the local community.

This study design was selected because it offers the advantage of measuring desired outcomes from the selected participants, in this case determining influences on infant feeding practices of mothers at 6 weeks. Quantitative and qualitative assessment methods were use to describe outcomes. A themetic method of analysis was used to analyze open ended questions.

2.2 STUDY SITE

The study was conducted in the postnatal wards of CHBAH, a tertiary care institution in Soweto, South Africa. Soweto is an urban area south of the city of Johannesburg, which holds a rich political history of the country; and is home currently to 40% of Johannesburg residents. The 2008 census put the population of Soweto at 1.3 million. Its population is predominantly black, with all 11 of the country's official languages spoken by residents – the main linguistic groups being IsiZulu, Sesotho, Venda and Tsonga.

The maternity unit of the CHBAH is the largest maternity unit in SA, with 300 maternity beds and just over 22 000 babies delivered a year. The unit receives referrals from 56 local primary health care clinics and 6 local district and regional hospitals for secondary and tertiary care. It also receives referrals from hospitals in other provinces, such as Klerksdorp Hospital in the North West province.

2.3 STUDY POPULATION

The study population is made up of patients who delivered at CHBAH during the period 17 April – 6 May 2015. These participants were approached between day 1-6 post-delivery, with no discrimination on method of delivery. Eligibility was determined upon an inclusion and exclusion criteria.

2.3.1 Inclusion criteria:

- Mothers 18 years and above
- Mothers who were well enough to be with their babies from birth
- Mothers who had delivered singletons no less than late preterm (>35^6 gestation), with baby's weight 2500g and above
- Mothers who gave birth to normal babies, with Apgar's no less than 7 at 5 minutes and no neonatal ICU admission

2.3.2 Exclusion criteria applied:

- Mothers who had a baby with a congenital anomaly
- Mothers with severe morbidity - including prolonged high care admission, intensive care unit admission, or intubated post-delivery, with a condition that precludes BF
- Multiple pregnancies

2.4 SAMPLING STRATEGY

2.4.1 Sample size:

This was a descriptive study and a sample size calculation was not necessary. A total of 132 mothers were interviewed in the initial phase of the study; and 124 women were reached for follow up.

2.4.2 Sampling method:

This was a convenience sample, with participants recruited from the post natal wards of CHBAH. Patients in the ward were given an information sheet with details of the study, and all questioned raised were answered by the researcher. Eligibility of interested participants was then assessed using the exclusion and inclusion criteria, and eligible participants were given a consent form that states that they fully understand the terms of the study (see Appendix C).

2.5 DATA COLLECTION

2.5.1 Data collection:

All the data was collected by the primary researcher. Each participant was given a choice on preferred language of communication, and the questionnaire or parts thereof were translated in the mother's preferred language in order to facilitate understanding.

2.5.2 Data collection tools:

Data collection took the form of a researcher administered questionnaire in 2 phases. The initial phase took place in the form of a face to face interview between the participant and researcher, where a questionnaire was filled with the help of some information obtained from the mother's antenatal records (see Appendix A). The interview was conducted at the patient's bedside in the post natal wards of CHBAH. This questionnaire consisted of 7 parts:

1. Participant demographic data
2. Participant antenatal data (retrieved from antenatal records)
3. Participant delivery details
4. Participant intended infant feeding method
5. Questionnaire on participant knowledge about the benefits of breastfeeding
6. Questionnaire on participant comfort with breast feeding
7. Participant source of information regarding infant feeding practices

The second phase took place in the form of a follow up telephonic administered questionnaire 6 weeks later to assess actual infant feeding practices at that time (see Appendix B). This questionnaire focused on details around actual feeding practices of participants at 6 weeks.

2.6 QUALITY CONTROL

Literature was extensively searched before the questionnaires were formulated, and this was checked in consultation with health professionals with knowledge, understanding and experience infant feeding practices. A pilot study was then conducted, and the questionnaire was administered to 10 patients in the same wards to assess clarity of questions. Changes to the questionnaires were made based on level of satisfaction until no further changes were needed. The participants of the pilot study were not included in this study.

Only one data collector was used, and translation of the questionnaire into participants preferred language of communication was done by a single person.

2.7 DATA ANALYSIS

2.7.1 Data management and capturing:

After administration of the questionnaire, the researcher captured the data with Microsoft Excel®, and this was exported to STATA version 11 (StataCorp®, College Station, TX, USA) for analysis.

2.7.2 Statistical analysis of data:

Analysis was done using the program STATA version 11.0 from StataCorp®. Categorical variables were described using frequencies and percentages, and presented in frequency tables. Continuous variables were described using medians (with interquartile ranges) or means (with standard deviations). The age of the participants was categorized by 5 year interval.

The relationship between continuous responses was determined using the Mann Whitney test. The comparisons of categorical variables was investigated, and statistical significance was calculated using the Fisher exact test. A p-value of $p< 0.05$ represented statistical significance in hypothesis testing, and 95% confidence interval was used to describe the estimation of unknown parameters. The Fisher's exact test was used because of the small sample size.

2.8 ETHICAL CONSIDERATIONS

2.8.1 Ethical review committee:

This study was done with the approval of the Human Research Ethics Committee at the University of Witwatersrand (ref M140394). Since the study involved patients and patient records that were the property of the CHBAH, approval from the hospital CEO and the Head of Department of Obstetrics and Gynecology at the hospital was also obtained prior to the study (see Appendices F and G).

2.8.2 Informed consent:

Participation in the study was completely voluntary, and consent was obtained from the patients before the initial interview. Participants were allowed to withdraw from the study process at any time, without any repercussions. The patients recruited were provided with information sheets and clarity was provided by the researcher when questions were raised. Interested participants were then provided with a consent form, which was also explained to participants. Sufficient time was provided for reading the consent form before signing it. All participants were able to read basic English vocabulary and write. The patients were not allowed to participate in the study if consent was refused, and no data was collected before a participant signed the consent form.

2.8.3 Participant confidentiality:

In order to maintain confidentiality, the interview was conducted at the participant's bedside with curtain barriers around it. Furthermore, each participant was allocated a study number, and the questionnaire sheet only reflected the study number and data pertaining to the study, to maintain anonymity. The participant's personal identity and contact details were written on a separate form, and are known only by the primary researcher.

2.9 FUNDING

The costs that were incurred in the study were that of stationary, data collection (particularly telephone calls) and data capturing. All costs were borne by the primary researcher.

CHAPTER THREE:

RESULTS

A total of 132 participants were recruited for the study and 124 (93.94%) were reached for a follow up interview, with 8 participants (6.06%) lost to follow up (see Figure 3.1). The main reason for loss to follow up was because an incorrect contact number was provided for 5 out of the 8 participants. One participant provided a non-existing telephone number, and 2 had to be excluded from follow up because their babies had died at home in the first month of life. These mothers were offered grief counseling by the Department of Psychology at CHBAH. The total sample (n=132) will be described, and feeding patterns and type of feeds at 6weeks will be described for 124 participants.

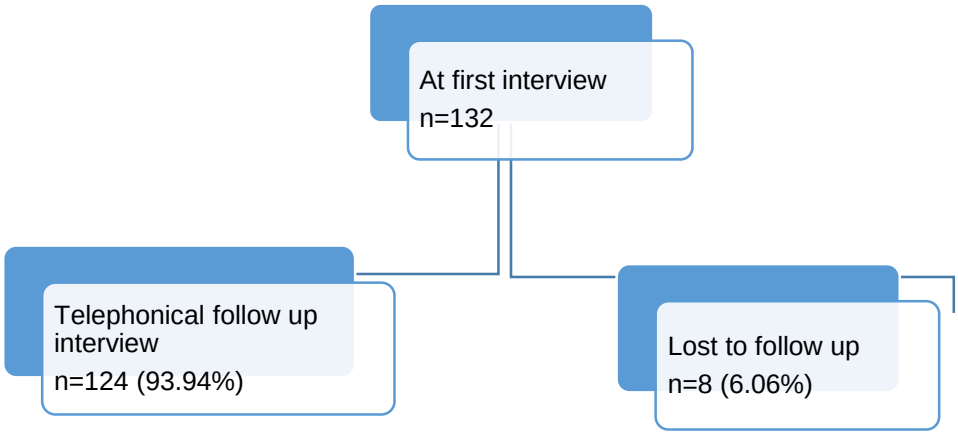


Figure 3.1: A sample overview

3.1 DEMOGRAPHIC DATA

The overall demographic data for the participants is shown in Table 3.1. The ages of the participants ranged between 18-42 years, with a mean age of 27 years (SD±5.92 years). Fifty participants (37.88%) stated the English language as their preferred language of communication. The remainder preferred to communicate in isiZulu 23.48% (n=31), Sotho (includes South Sotho, SePedi and Setswana) 21.97% (n=29), Xhosa

6.82% (n=9), Tsonga 3.03% (n=4) and other (Venda and Shona) 3.03% (n=4); while 3.79% (n=5) did not have any particular language preference.

Nine participants (6.82%) stated that they had used psychoactive substances during pregnancy. Only 1 participant (0.76%) used recreational drugs in this pregnancy. The proportion of participants who had attained some level of high school education (i.e. Grade 9 – 12) was 71.21% (n=94), and 18.18% (n=24) participants had some level of tertiary education – this includes those who were attending or graduated from a university, college, or institute of higher learning. Thirteen (9.85%) participants had attained an education level below grade 8, and only 1 (0.76%) participant did not received any formal education.

This population sample had an unemployment rate of 71.21% (n=94); with 31 (23.48%) participants employed either full-time or part-time, and 7 (5.30%) participants were still students (high-school and tertiary institution attendees). Of the group of participants who were either employed or students (n=38), 4 (10%) planned to return to work or school within the next month after delivery – more than half of these were students returning to school (3 out of 4). Only one mother was unsure of when she will return to school.

Ninety-three participants (70.45%)) listed their accommodation type as formal, with access to piped water and ablution facilities, 34 (25.76%) were living in informal settlements, and 5 (3.79%) were living in a hostel.

Table3.1: Demographic data

Variable	Frequency (n=132)	Percentage (%)
	Age Groups	
18-22 years	34	25.76%
23-27years	39	29.55%
28-32 years	33	25.00%
33-37 years	17	12.88%
38-42 years	9	6.81%
	Ethnicity	
Black	131	99.24%
Colored	1	0.76%
	Language Preference	
English	50	37.88%
IsiZulu	31	23.48%
Sotho*	29	21.97%
Xhosa	9	6.82%
Tsonga	4	3.03%
Other**	4	3.03%
Not specified	5	3.79%
	Social Habits	
Cigarettes	4	3.03%
Alcohol	4	3.03%
Cigarettes and recreational drugs	1	0.76%
	Employment status	
Employed	31	23.48%
Student	7	5.30%
Unemployed	94	71.21%
	Accommodation	
Formal	93	70.45%
Informal settlement	34	25.76%
Hostel	5	3.79%

**Sotho: includes South Sotho, sePedi and Setswana*

***Other: Venda and Shona*

Ninety three (70.45%) participants had given birth by vaginal delivery and 39 (29.55%) had a caesarean birth. The proportion of women who had caesarean sections was lower than the overall caesarean section rate of the institution (approximately 38%) because of the exclusion criteria of this study – i.e. high risk women that were ill at delivery, who make up a greater proportion of women who have caesarean sections. The HIV status of all the participants was known, and a majority of them were HIV negative (n=94; 71.21%), with 38 (28.79%) having tested HIV positive. The age group distribution of the HIV status of the participants is shown in Table 3.2. The majority who tested HIV positive belonged to the age group 33-37 years (70.59% of HIV infected mothers belonged in this age group).

Table 3.2: Age Distribution of HIV status

Age	HIV negative n94 (%)	HIV positive n38 (%)
18-22 years	30 (31.91%)	4 (10.53%)
23-27 years	29 (30.85%)	10 (26.32%)
28-32 years	22 (23.40%)	11 (28.95%)
33-37 years	5 (5.32%)	12 (31.58%)
38-42 years	8 (8.51%)	1 (2.63%)

3.2 ANTENATAL CARE DATA

Most of the participants had attended antenatal care (n=127; 96.21%), as shown in Table 3.3. In the group of participants that were booked, 97 (76.38%) had received antenatal care at a midwife obstetric unit (MOU), 10 (7.87%) at a secondary/ tertiary government health care facility, and 19 (14.96%) received mixed antenatal care – attending at both an MOU as well as secondary/tertiary health care facility. The mean

number of antenatal visits for this group of women was 5.14 (SD±2.07), with number of visits ranging between 2 and 12.

One hundred and fifteen (90.55%) of the participants who had attended antenatal care received infant feeding education, and 12 (9.45%) did not receive any information on infant feeding practices at antenatal visits. This information was based on patients recollection of antenatal information received. Those who recalled having received antenatal infant feeding education, received it in the form of group counselling sessions (n=80, 69.56%), individual counselling (n=22; 19.13%), pamphlets (n=2; 1.74%), mixed group counselling and pamphlets (n=9; 7.83%), and mixed individual and group counselling (n=2; 1.74%) - as seen in Table 3. A total of 47 (35.61%) of the participants were first time mothers, with 85 (64.39%) having had at least one previous term birth.

Table 3.3.: A description of antenatal factors

Variable	Frequency	Percentage (%)
	Antenatal care attended n=132	
Yes	127	96.21%
No	5	3.79%
	Type of antenatal care attended n=127	
Midwife Obstetric Unit (MOU)	97	76.38%
Secondary/Tertiary Health care Facility	10	7.87%
Private General Practitioner	1	0.79%
Mixed: MOU and Secondary/Tertiary care facility	19	14.96%
	Infant feeding education received at antenatal care visits n=132	
Yes	115	90.55%
No	12	9.45%
	Method of infant feeding education received n=115	
Group counseling	80	69.56%
Individual counseling	22	19.93%
Pamphlets	2	1.74%
Mixed group counseling and pamphlets	9	7.83%
Mixed group counseling and individual counseling	2	1.74%

3.3 INTENDED INFANT FEEDING PRACTICES

Table 3.4 shows the intended feeding practices of the participants post-delivery. Most participants (113, 85.61%) had initiated breastfeeding. Ninety one (68.94%) of the participants had the intention to exclusively breastfeed; and of these, 65 (71.43%) had the intention to do so for 6 months – representing 49.24% of the study population. One participant intended to predominantly breastfeed her baby, with early introduction of water. Of those participants that had the intention to breastfeed (n=113), majority (n=34; 30.10%) intended to breastfeed for 6 to 12 months. Only 27 (23.89%) participants intended to continue breastfeeding for longer than 12 months. A total of 19 participants (14.39%) intended to exclusively formula feed their baby. Majority of these were HIV positive (17 out of 19 mothers, 89.47%).

Table 3.4: Intended infant feeding practices

Variable	Frequency n=variable (%)	HIV Negative mothers n=94 (%)	HIV positive mothers n=38 (%)
	Intended feeding practice n=132		
Exclusive Breast-feeding (EBF)	91 (68.94%)	70 (74.47%)	21 (55.26%)
Formula feeding	19 (14.39%)	2 (2.13%)	17 (44.74%)
Mixed feeding	21 (15.91%)	21 (22.34%)	0 (0.00%)
Predominant breastfeeding with early introduction of water	1 (0.76%)	1 (1.06%)	0 (0.00%)
	Intended period of EBF n=91		
2 months* or less	3 (3.30%)		
Between 2 and 4 months	11 (12.09%)		
Between 4 and 6 months	5 (5.49%)		
6 months exactly	65 (71.43%)		
Unsure	7 (7.69%)		
	Intended period of continued breastfeeding n=113		
Less than 4 months	6 (5.31%)		
Between 4 and 6 months	17 (15.04%)		
Between 6 and 12 months	34 (30.10%)		
Longer than 12 months	27 (23.89%)		
For as long as my baby wants to Breastfeed	26 (23.01%)		
Unsure	3 (2.65%)		

**2months = 8 weeks*

When infant feeding choice was compared between the different age groups of the mothers, age of the mother did not have a statistical significance in choice of infant feeding method (p value 0.17), see Table 3.5.

Table 3.5: Intended feeding practice per age group

	18-22 years n=34 (%)	23-27years n=39 (%)	28-32 years n=33 (%)	33-37 years n=17 (%)	38-42 years n=9 (%)
EBF	24 (70.59%)	24 (61.54%)	24 (72.73%)	12 (70.59%)	7 (77.78%)
Formula feeding	2 (5.88%)	5 (12.82%)	6 (18.18%)	5 (29.41%)	1 (11.11%)
Mix feeding	8 (23.53%)	9 (23.08%)	3 (9.09%)	0 (0.00%)	1 (11.11%)
Predominantly breastfeeding with early introduction of water	0 (0.00%)	1 (2.56)	0 (0.00%)	0 (0.00%)	0 (0.00%)

p value = 0.17

3.4 GREATEST SOURCE OF INFLUENCE

The healthcare provider had the most influence on infant feeding choices, with 77 participants (58.33%) listing the health care provider as their most influential source in decision making. This was followed by a close relative (n=39, 29.54%) and the media (n=12; 9.09%). Two participants (1.52%) listed their peers as their most influential source, and another 2 (1.52%) mentioned that they relied on themselves to make the decision.

3.5. MATERNAL KNOWLEDGE

Although majority (68.94%) of the participants selected EBF as their intended method of feeding, only 65 (49.24%) answered the question "what do you understand by the phrase 'EBF'?" correctly. However, the population of participants in this study seemed knowledgeable in the benefits of breastfeeding – see Table 3.6.

Table 3.6: Knowledge on benefits of breastfeeding

Statement: *n=132*	Agree	Disagree	Not sure
1. Formula milk is just as good for my baby as breast milk.	20 (15.15%)	93 (70.45%)	19 (14.40%)
2. Breast milk supplies sufficient nutrition for the growth and development of my baby during the first 6 months of life	114 (86.36%)	13 (9.85%)	5 (3.79%)
3. Breast milk can protect my baby against acquiring respiratory infections.	113 (85.61%)	7 (5.30%)	12 (9.09%)
4. Breast milk reduces the chances of my baby acquiring life threatening diarrhea.	112 (84.85%)	7 (5.30%)	13 (9.85%)
5. Breastfeeding provides protection against later development of childhood obesity.	81 (61.36%)	20 (15.15%)	31 (23.48%
6. Breastfeeding allows me to bond with my baby	121 (91.67%)	5 (3.79%)	6 (4.54%)

3.6. BREASTFEEDING COMFORT

Amongst the participants who had previously given birth to a term baby (n=85), 71 (83.53%) had previous breastfeeding experience - with 64 (75.29%) having had exclusively breastfed at least one of their other children for 6 weeks and 7 (8.24%) having previous mix feeding experience. Fourteen (16.47%) of these participants only had experience in formula feeding.

A majority of the participants (n121; 91.66%) were comfortable with holding their babies when feeding. Of the 113 participants who had intended to breastfeed, 103 (78.03%) had no problems breastfeeding in the presence of close friends and family, but only 73 (55.30%) would be comfortable breastfeeding in public (see Table 3.7).

Table 3.7: Maternal breastfeeding comfort

Maternal Breastfeeding Comfort questionnaire				
Statement	*Agree*	*Disagree*	*Not sure*	*Not applicable*
I am comfortable with holding my baby during feeding n=132 (%)	121 (91.66%)	6 (4.55%)	5 (3.79%)	
I am comfortable breastfeeding in the presence of close family and friends n=113 (%)	103 (78.03%)	8 (6.06%)	2 (1.52%)	19 (14.39%)
I am comfortable breastfeeding in public n=113 (%)	73 (55.30%)	34 (25.76%)	6 (4.55%)	19 (14.39%)

3.7. Infant feeding practices at six weeks follow up

Table 3.8 shows the infant feeding practices of participants at 6 weeks. A large majority of participants (n=86; 69.36%) were still exclusively breastfeeding their babies, and fewer mothers were mix feeding (19 out of 22 who had originally intended to mix feed). Patient factors that had a positive association with exclusive breastfeeding were employment status and parity (p value< 0.05). An HIV positive status in this population group was associated with a greater percentage of mothers who were formula feeding at 6 weeks (15/19 formula feeding mothers; p value<0.05). The age of the participant, level of education and antenatal education did not produce a significant difference in infant feeding choices of this group of women at 6 weeks.

Table 3.8: Infant feeding practices at six week follow up

	EBF	Formula feeding	Mix feeding
Prevalence:			
n=124 *(%)*	86/124 *(69.36%)*	19/124 *(15.21%)*	19/124 *(15.21%)*
HIV status (p value=0.001):			
HIV positive n=36 *(%)*	19/36 *(52.78%)*	15/36 *(41.67%)*	2/36 *(5.56%)*
HIV negative n=88 *(%)*	67/88 *(76.14%)*	4/88 *(4.55%)*	17/88 *(19.32%)*
Parity (p value=0.001)			
First time mothers n=45	24/45 *(53.33%)*	7/45 *(15.56%)*	14/45 *(31.11%)*
Multiparous participants n=79	62/79 *(78.48%)*	12/79 *(15.19%)*	5/79 *(6.43%)*
Age (p value=0.188)			
18-22 years n=32	20/32 *(62.50%)*	3/32 *(9.38%)*	9/32 *(28.13%)*
23-27 years n=36	26/36 *(72.22%)*	4/36 *(11.11%)*	6/36 *(16.67%)*

Table 3.8: cont……..

	EBF	Formula feeding	Mix feeding
28-32 years n=31`	20/31 *(64.52%)*	7/31 *(22.58%)*	4/31 *(12.90%)*
33-37 years n=16	12/16 *(75.00%)*	4/16 *(25.00%)*	0/16 *(0.00%)*
38-42 years n=9	8/9 *(88.89%)*	1/9 *(11.11%)*	0/9 *(0.00%)*
Level of Education (p value=0.861)			
No formal education n=1	1/1 *(100%)*	0/1 *(0%)*	0/1 *(0%)*
Primary school level* n=12	8/12 *(66.67%)*	3/12 *(25.00%)*	1/12 *(8.33%)*
High school education level** n=87	60/87 *(68.97%)*	12/87 *(13.79%)*	15/87 *(17.24%)*
Tertiary education level*** n=24	17/24 *(70.83%)*	4/24 *(16.67%)*	3/24 *(12.50%)*
Employment status (p value=0.009)			
Student[#] n=7	3/7 *(42.86%)*	0/7 *(0%)*	4/7 *(57.14%)*
Unemployed n=89	67/89 *(75.28%)*	14/89 *(15.73%)*	8/89 *(8.99%)*
Employed n=28	16/28 *(57.14%)*	5/28 *(17.86%)*	7/28 *(25.00%)*
Infant feeding education received at antenatal care (p value=0.233)			
Yes n=110 *(%)*	75/110 (*68.18%)*	19/110 *(17.27%)*	16/110 (*14.55%)*
No[$] n=14 *(%)*	11/14 *(78.57%)*	0/14 *(0.00%)*	3/14 *(21.43%)*

**Grade 1-8*

*** grade 9-12*

****Attending or has completed course/diploma/degree at college/university*

[#]*includes high school scholar and tertiary student*

[$] *Un-booked mothers as well as mothers who were booked, but did not receive antenatal education of infant feeding practices*

When infant feeding practices of the participants at six weeks were compared to the intended feeding practices immediately post-delivery, the intention to exclusively breastfeed was directly associated with exclusive breastfeeding practices at six weeks – p value <0.001 (see Table 3.9). A majority of the participants who were exclusively breastfeeding at 6 weeks (80.23%), had the intention to exclusive breastfeed immediately post-delivery. Likewise, 15 out of 19 mothers who were formula feeding their babies at six weeks, had the intention to do so at initial interview. Therefore, in this group of woman, intended feeding practices were predictive of feeding practices at 6 weeks.

Table 3.9: Descriptive variables by feeding pattern at 6 weeks

Variable	EBF	Formula feeding	Mix feeding	P value
Intended feeding practice:	*n=86*	*n=19*	*n=19*	<0.0001
EBF	69/86 *(80.23%)*	4/19 *(21.05%)*	12/19 *(63.16%)*	
Formula feeding	3/86 *(3.49%)*	15/19 *(78.95%)*	0/19 *(0.00%)*	
Mix feeding	13/86 *(15.12%)*	0/19 *(0.00%)*	7/19 *(36.84%)*	
Predominantly breastfeed	1/86 *(1.16%)*	0/19 *(0.00%)*	0/19 *(0.00%)*	
Intended length of EBF (n-85)				1.00
2 months or less	2/85 *(2.35%)*	0/85 *(0.00%)*	0/85 *(0.00%)*	
Between 2 and 4 months	8/85 *(9.41%)*	0/85 *(0.00%)*	3/85 *(3.53%)*	
Between 4 and 6 months	4/85 *(4.71%)*	0/85 *(0.00%)*	1/85 *(1.18%)*	
6 months exactly	48/85 *(56.47%)*	3/85 *(3.53%)*	8/85 *(9.41%)*	
Unsure	7/85 *(8.24%)*	1/85 *(1.18%)*	0/85 *(0.00%)*	
What is meant by the phrase "EBF"?				0.854
Giving the baby breast only. (n=61)	43/61 *(70.49%)*	10/61 *(16.39%)*	8/61 *(13.11%)*	

Other positive predictors of exclusive breastfeeding in this population group included the knowledge that breast milk provided sufficient nutrition for the baby until 6 months of life (p value = 0.05); as well as maternal comfort to breastfeed in the presence of a family member (p value = 0.015). The knowledge of other benefits of breastfeeding did not provide significant results as an association with breastfeeding. Amongst the multiparous participants, previous breastfeeding experience also did not positively correlate with breastfeeding at 6 weeks.

A total of 19 participants (15.32%) had introduced supplementary foods, in addition to breast milk, by 6 weeks (see Table 3.10). The most common supplementary food source introduced was formula (n=13; 68.42%), followed by baby cereal (n=3; 15.79%) and maize meal (n=3; 15.79%). The most common reason given for introducing supplementary food was that baby was not getting satisfied with only breast milk (63.16%)). All these women interpreted baby's cry for hunger. Seven out of the nineteen participants (36.84%) had to return to work or school, and thus found it difficult to continue exclusively breastfeeding. The most common period of introduction of supplementary food in this sample group of mothers was 2-4 weeks (10/19; 52.63%). Two out of nineteen participants (10.53%) had introduced supplementary food at 1-2 weeks of life, and 7 (36.84%) introduced supplementary foods after 4 weeks of life.

Table 3.10: Supplementary Feeding

	Frequency (n=19)	Percentage (%)
Supplementary food choice:		
Formula milk	13	68.42%
Infant cereal	3	15.79%
Maize meal	3	15.79%
Reason for introduction of supplementary food:		
My baby is not getting satisfied with my milk	12	63.16%
I had to return to school/work/job hunting	7	36.84%
Timing of supplementary food introduction:		
Between 1-2 weeks	2	10.53%
Between 2-4 weeks	10	52.63%
Between 4-6 weeks	7	36.84%

Participants who opted to formula feeding provided a variety of reason. A total of 5 participants who had initiated breastfeeding at first interview had stopped breastfeeding altogether. Two of the five women had stopped under advisement of a health care provider after their babies fell ill – stating that “my milk made my baby sick”. Both these women were HIV positive. One mother stopped breastfeeding because she “lost interest in breastfeeding because it was hard”. Another mother interpreted her baby’s cry as dislike for the taste of her breast milk, and decided to stop; and another mother said she stopped because her breast milk production had stopped. Participants who were HIV positive and formula feeding were doing so because of fear of transmitting the HIV to their baby through breast milk, regardless of whether or not they were on antiretroviral

therapy. One mother had a Bipolar Mood Disorder, and opted to formula feed for fear of transmitting her bipolar genes through breast milk to baby.

CHAPTER FOUR: DISCUSSION

4.1 BREASTFEEDING PRACTICES

In this study, the prevalence of breastfeeding was relatively high. The breastfeeding initiation rate of 85.61% was slightly higher than the last recorded national rate (82% in 2003)[10], but lower than that of other studies done in Pretoria (88.1%) and in Venda (100%)[29, 30]. This rate, although impressive, still needs improvement. Current evidence indicates that skin-to-skin contact between mother and baby soon after birth encourages early initiation of breastfeeding; and this is a positive predictor for prolonged breastfeeding. Therefore, early initiation of breastfeeding is important for the health of the infant, as well as successful establishment and maintenance of breastfeeding. This is incorporated in the criteria for the Baby Friendly Hospital Initiative (BFHI) introduced by the WHO and adopted in all provincial hospitals that care for mother and child in

SA[17]. Because this study did no dwell on actual education practices of the hospital staff, it is difficult to speculate on whether this was practiced.

A total 84.68% participants in this study reported that they were still breastfeeding at six weeks, and 69.36% of them were exclusively breastfeeding. This rate is higher than those reported nationally as well as in other smaller regional studies in the country. This may be an overestimation, since infant feeding practices at six weeks were determined by telephonic interview, and there was no way of verifying information given. In addition, infant feeding education was provided by the researcher post initial interview, with emphasis on recommended breastfeeding practices, in the form of an interactive Q&A session, and breastfeeding supportive measures. Participants may have withheld information on other feeding practices and gave answers according to what they thought the researcher may have wanted to hear, reflecting social desirability bias.

In this study population, patient factors that were associated with breastfeeding at 6 weeks were multi-parity, unemployment, HIV negative status, and prior intention to EBF. The prior intention to breastfeed was the most important indicator of breastfeeding at 6 weeks – with a p value <0.0001. This was consistent with findings in many other studies[26, 45, 55, 56]. The participants in this study were very knowledgeable in the benefits of breastfeeding. This knowledge may have informed their intent to breastfeed, and hence, the high rate of breastfeeding at 6 weeks in this population group. The knowledge that breast milk supplied sufficient nutrition for baby in the first 6 months of life was the single most positive predictor of breastfeeding in the knowledge questionnaire. This may be because if a mother perceives her breast milk as enough, she will be more motivated to offer her baby only breast milk.

The maternal comfort with breastfeeding in the presence of others, another factor that was positively linked with maternal intent to breastfeed in other studies[56], was also

examined in this study. Even though the majority of the participants were comfortable with the way in which they held their babies during feeding, only mothers that were comfortable with breastfeeding in the presence of family members were likely to be breastfeeding at 6 weeks - p value = 0.015. This is evidence that women who receive positive support from family members are more likely to breastfeed, and thus make better infant feeding choices. Furthermore, fewer participants (55%) were comfortable with breastfeeding in public. This may be a reflection of a societal culture that frowns upon women breastfeeding in public spaces; and this has been shown to have a negative impact on continued breastfeeding[46, 47]. Changing such public perceptions and attitudes about breastfeeding could succeed in encouraging appropriate maternal breastfeeding practices. Therefore, it would be important to direct strategies on promotion, protection and support of breastfeeding towards educating family members and communities at large on the need to exclusively breastfeed for up to 6 months.

A total of 5 mothers had stopped breastfeeding at six weeks. The reasons provided by these mothers reveal a gap in breastfeeding education, particularly those mothers who had stopped breastfeeding under advice given by medical practitioners. This was consistent with findings from studies done by Shah *et al* as well as Mbwana *et al*, which indicated that breastfeeding knowledge amongst health care workers was inadequate and insufficient, despite the fact that health care facilities have adopted the baby friendly hospital initiative[45, 52]. This is a major obstacle in promoting recommended breastfeeding practices. Therefore, training on breastfeeding based on the WHO recommendations should be incorporated into nursing and medical school curricula. These measures would support and fulfill step two of the ten steps of Successful Breastfeeding Initiative.

All mothers who had never breastfed or who had discontinued breastfeeding (n=19; 15.21%) were giving formula milk as a replacement feed. The majority of the mothers were HIV positive (n15; 78.95%). Despite the correct choice of replacement food, there

are realistic concerns about the ability of mothers to consistently exclusively formula feed, particularly amongst the unemployed mothers.

Most participants received group counseling only (69.56%), and this does not provide an opportunity for individual assessment of affordability, feasibility, accessibility, sustainability and safety of continued exclusive replacement feeding - particularly HIV infected mothers who do not have the option to breastfeed when formula is no longer available. It is therefore assumed that participants in this study were not assessed appropriately according to the AFASS criteria during infant feeding education at antenatal clinics.

Nineteen participants (15.29%) had introduced some form of supplementary foods to their infants at 6 weeks. This early introduction of semi-solid foods is consistent with findings in a population study on infant feeding practices among caregivers in the Moretele district[30]. Participants in that study started giving semi-solid food to their babies between 2 and 3 months. The negative effects of early introduction of solids is an important concern for health of the infants. Similar to other studies, the most common reason for the introduction of supplementary food was the perception that the baby was not satisfied with the breast milk provided, and all these mothers interpreted the baby's cry as a signal of continued hunger[36, 45]. Future interventions should target exclusivity, beginning at antenatal care.

4.2 GREATEST INFLUENTIAL SOURCE OF INFORMATION

More than half (58.33%) of the participants selected the health care provider as the person that helped the most in making a decision on their infant feeding practice. A large majority (96.5%) of the participants in this study had attended antenatal clinic, but

not all recall receiving infant feeding education (9.45%). Even though receiving antenatal infant feeding education did not seem to make a significant difference in the exclusive breastfeeding rate for this sample of women, this is a disturbing finding since this represents a missed opportunity for early education on infant feeding practices in those women who did not receive any. Only 75 out of 110 (68.18%) mothers who received antenatal education on infant feeding practices were exclusively breastfeeding at 6 weeks; and 11 out of 14 (78.57%) of mothers who did not receive any form of infant feeding education from a health care provider before delivery were breastfeeding exclusively at 6 weeks. This correlates with findings in the study by Humphreys et al in 1995. In that study, hearing about the benefits of breastfeeding from healthcare professionals in general was not related to mother's breastfeeding intention[53]. In the group of women in that study, the attitudes and beliefs of people in women's social networks, rather than healthcare professionals, appeared to be particularly influential in the infant feeding decision. This, however, does not negate the role of the healthcare provider. In this study, 16.67% of participants who had intended to formula feed and 65% of those that had initially intended to mix feed, changed their minds after further education and support provided a healthcare worker in the postnatal ward. These participants were all exclusively breastfeeding at 6 weeks.

A significant proportion of the participants (29.54%) selected a close relative as their most influential information source of infant feeding information. These findings indicate the need for innovative strategies to incorporate influential non-health professional role players in breastfeeding education, both formally and informally, using them and training them as breastfeeding advocates to maximize on their persuasive power in affecting women's infant feeding choices. Strategies can include encouraging mothers to attend antenatal classes with a supportive family/community member/friend/partner, offering community based education about the benefits of breastfeeding and breastfeeding recommendations at community centers, using the local radio and television announcements to advertise breastfeeding benefits, and creating breastfeeding centers

where mothers can access lactation consultants whenever they face an obstacle for added advice and encouragement.

4.3 INFANT FEEDING AND HIV

Breastfeeding initiation in this group of women was not influenced by maternal HIV infection, with proportionately more HIV negative mothers (97.87%) having initiated breastfeeding at first interview than HIV infected mothers (55%). In addition, at six weeks, more (76.14%) HIV negative mothers were exclusively breastfeeding, compared to only 52.78% HIV infected mothers. Despite provision of lifelong ART to every pregnant and lactating woman, majority of the mothers who did not breastfeed expressed fear of mother to child transmission of the HIV during breastfeeding, pushing proportionately more HIV positive mothers to opt for formula feeding (n=15; 41.67%). There is a misconception that formula feeding is a better infant feeding method for babies of HIV infected mothers, without any consideration of the AFASS criteria. In order to solve this problem, all pregnant women, particularly HIV infected women, should receive appropriate personalized breastfeeding education and counseling during the antenatal period, so they can make more informed infant feeding choices.

Another fact of concern is that 2 HIV positive mothers (5.56%) had introduced maize meal to their babies while breastfeeding, because their babies were not getting satisfied with just their breast milk. Both these women were booked and had received education on infant feeding practices at antenatal care. This may be a reflection of poor communication between health care providers and patients regarding the Prevention of mother to Child Transmission guidelines and the role of ART. These mothers could have benefitted from ongoing postnatal support, as suggested by Doherty et al[23].

4.4 A DESCRIPTION OF THE STUDY POPULATION

This population group is made up of women in the age group range 18-42 years. Because this study excluded mothers under the age of 18 years, we cannot make inferences pertaining to this group. Most of the mothers in this population group self-classified themselves as black. This is due to the fact that Soweto residents are of a predominantly black race.

Ninety four (71.21%) of the mothers attained some level of high school education. This is comparable to the general female population in the country, with an estimated 72.7% having some secondary level of education between the year 2005 and 2012[60].

4.5 CONCLUSION

In this study, the proportion of women who initiated breastfeeding and that of women who continued to EBF at 6 weeks are higher than previously reported by other studies in South Africa. In addition, these women seem aware of the positive impact of breastfeeding on child-health. However, the fact that only 49.24% of the women understood the meaning of “Exclusive breastfeeding”, is an important aspect to consider. This suggests the need for more emphasis during infant feeding education, on exclusive breastfeeding. Continued individualized counseling on and support of recommended breastfeeding practices during the antenatal and postnatal periods can assist in positively influencing appropriate infant feeding choices. It is a recommendation that such counseling and education measures should also involve immediate family support structures and the community.

Furthermore, accurate counseling and support by health care providers can improve the knowledge and confidence of mothers, and therefore increase the rates of EBF. Thus, national strategies to encourage better infant feeding practices made by mothers should be aimed at ongoing healthcare provider education and training on knowledge of exclusive breastfeeding benefits and skills to promote exclusive breastfeeding.

4.6 STUDY LIMITATIONS

Due to the stipulated exclusion criteria, this study did not take into consideration the impact of severe fetal and maternal morbidity on infant feeding practices. Also, because of our age cut off of 18 years, are not able to make any inferences on infant feeding practices of adolescent mothers. Milk expression was not discussed in this study, and this may have made a difference in infant feeding practices described.

4.7 STRENGTH OF STUDY

All data was collected and captured by a single researcher, which maintained quality of data. Also, there was a small loss to follow up.

REFERENCES

REFERENCES

1. Black RE, Allen LH, Bhutta ZA, Caulfield L, de Onis M, Ezzati M, Mathers C, Rivera J. Maternal and child under nutrition: global and regional exposures and health consequences. Lancet. 2008;371:243-260.

2. World Health Organization Fact Sheet Nº 178. Children: Reducing Mortality. Available [online] http://www.who.int/mediacentre/factsheets/fs178/en/updatedseptember2013. Accessed 09/01/2014.

3. Protecting, Promoting & Supporting Breastfeeding: Special role of maternity services. WHO, Geneva 1989. Available [online] http://www.unicef.org/programme/nutrition/infantfeeding/tensteps.htm. Accessed 04/04/2013.

4. Bhutta ZA, Ahmed T, Black RE, Cousens S, Dewey K, Glugliani E, Haider BA, Kirkwood B, Morris SS, Sachdev HPS, Shekar M. What works? Interventions for maternal and child health under nutrition and survival. Lancet. 2008;371:417-440.

5. World Health Organization: Fifty-fifth World health Assembly. 16 April 2002. Available [online] http://www.apps.who.intl/gp/archive/pdf_files/WHA55/ea55.pdf. Accessed on 09/10/2013.

6. World Health Organization: Millennium Development Goals. Available [online] http://www.who.int/topics/millennium_development_goals/about/en/. Accessed on 04/04/2013.

7. National Department of Health – Republic of South Africa. Infant and young child feeding policy, 2007. DoH, Pretoria. Available [online] http://www.health-e.org.za/2013/09/20/infant-young-child-feed-policy-2013/. Accessed on 09/01/2014.

8. Band RM, Rollins NC, Coutsoudis A, Coovadia HM. Breastfeeding practices in an area of high HIV prevalence in rural South Africa. Acta Pediatrica. 2002;91:704-711.

9. Shisana O, Simbayi LC, Rehle T, Zungu K, Nqogo N, *et al*. South African National prevalence, incidence, behaviour and communication survey, 2008. Cape Town Human Science Research Council Press.

10. Department of Health Medical Health Research Council, Macro-international. South African Demographic Health Survey (SADHS). 2003. DoH 2007. Available [online] http://www.heatlthnet.org.za/publications/demographicsurvey.htm. Accessed on 10/10/2013.

11. Unicef State of the World's Children Reports. Available [online] http://www.inicef.org/gambia/SOWC_report_2014.pdf . Accessed on 09/01/2014.

12. Butte NF, Lopez-Alaecon MG, Garza C. Nutrient adequacy of exclusive breastfeeding for the term infant during the first six months of life. World Health Organization. 2002. Available [online] http://www.who.intl/nutrition/publications/infantfeeding/9241562110/en/index.html. Accessed 09/10/2013.

13. WHO Collaborative Study Team on the Role of Breastfeeding on the Prevention of Infant Mortality. Effect of breastfeeding on infant and child mortality due to infectious diseases in less developed countries: a pooled analysis. Lancet. 2000;355:451-455

14. Green RJ, Wittenberg DF. Coovadia's Pediatrics and Child Health – A manual for health professionals in developing countries. Seventh Edition. Oxford University Press Southern Africa 2014.

15. Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS. The Bellagio Child Survival Study Group. How many child deaths can we prevent this year? Lancet. 2003;362:65-71.

16. Ijumba P, Doherty T, Jackson D, Tomlinson M, Sanders D, Persson L. Socila circumstances that drive early introduction of formula milk: an explorative quality study

in a peri-urban South African community. Maternal and Child Nutrition. 2014;10:102-111.

17. World Health Organization. Evidence of the Ten Steps to Successful Breastfeeding. Geneva: WHO. 1998. Available [online]http://whqlibdoc.who.intl/publications/2004/9241591544_eng.pdf. Accessed 09/10/2013.

18. Edmond KM, Zandoh C, Quigley MA, Amenga-Etego S, Owusa-Agei S, Kirkwood BR. Delayed breastfeeding initiation increases risk of neonatal mortality. Pediatrics. 2006;117:380-386.

19. Swart R, Dhansay A. Nutrition in infants and pre-school children. In: Steyn NP, Temple N, editors. Community Nutrition Textbook for South Africa: A Rights-based approach. South African Medical Research Council. 2008;377-440.

20. Mamabolo RL, Alberts M, Mbeyane GX, Steyn NP, Nthangeni NG, *et al*. Feeding Practices and growth of infants from birth to 12 months in the central region of Limpopo Province of South Africa. Nutrition 2009;20:327-333.

21. World Health Organization. Indicators for assessing infant and young child feeding practices: Feeding counselling: A training Course. Geneva: WHO. 2007. Available [online] http://www.who.intl/maternal_child_adolescent/documents/9789241596664/en/. Accessed on 09/01/2014.

22. Goga AE, Dinh TH, Jackson DJ for the SAPMTCTE study group. Evaluation of the Effectiveness of the National Prevention of Mother-to-Child Transmission (PMTCT) Programme Measured at six weeks Postpartum in South Africa,2010. South African Medical Research Council, National Department of Health of South Africa and PEPFAR/US Centers for Disease Control and Prevention. 2012. Available [online] http://www.info.gov.za/view/downloadfileaction?id=165280. Accessed 09/01/2014.

23. Doherty T, Chopra M. HIV and infant feeding. Health Systems Trust. Available [online] http://www.hst.org.za/uploads/files/chapter13_06.pdf. Accessed 15/09/2013.

24. World Health Organization. Guidelines on HIV and Infant feeding: Principles and recommendations for infant feeding in the context of HIV and a summary of evidence. 2010. Available [online] http://www.who.int/maternal_child_adolescent/documents/9789241599535/en/. Accessed 09/01/2014.

25. Mother and Child Nutrition. Available [online] http://motherchildnutrition.org/info/afass-principles.htmlq. Accessed 15/04/2015.

26. National Department of Health. South African Infant and Young Child Feeding Policy 2013. DoH, Pretoria. Available [online] http://www.health-e.org.za/2013/09/20/infant-young-child-feed-policy-2013/. Accessed 10/10/2013.

27. National Department of Health. National Consolidated Guidelines for Prevention of Mother-to-Child Transmission of HIV (PMTCT) and the Management of HIV in Children, Adolescents and Adults.2015. Available [online] http://www.sahivsoc.org/upload/documents/ART%20Guidelines%2015052015.pdf. Accessed 20/07/2015.

28. Department of Health Medical Research Council, Macro-international. South African Demographic Health Survey (SADHS). 1998. Available [online] http://www.heatlthnet.org.za/publications/demographicsurvey.htm. Accessed on 14/04/2013

29. Mushapi LF, Mbhenyane XG, Khoza LB, Amey AKA. Infant feeding practices of mothers and the nutritional status of infants in the Vhembe District of Limpopo Province. South African Journal of Childhood Nutrition. 2008;21(2): 36-41.

30. Kruger R, Gericke GJ. A qualitative exploration of rural feeding and weaning practice, knowledge and attitudes on nutrition. Public Health Nutrition. 2002;6(2): 217-223.

31. Goosen C, McLachlan MH, Schubl C. Infant feeding practices during the first 6 months of life in a low-income area of Western Cape Province. South African Journal of Child Health. 2014;8(2):50-54.

32. Shi L, Zhang J, Wang Y, Guyer B. Breastfeeding in Rural China: Association Between Knowledge, Attitudes, and Practices. Journal of Human Lactation. 2008;24(4):377-385.

33. Ulak M, Chandyo RK, Mellander L, Shrestha PS, Strand TA. Infant feeding practices in Bhaktapur, Nepal: across-sectional, health facility based survey. International Breastfeeding Journal. 2012;7:1-8.

34. MacIntyre UE, Ruhle M. Impoverished Africa – time to re-stress the value of breastfeeding. South African Medical Journal. 1995;85(1): 4-5.

35. Zollner E, Carllier ND. Breast-feeding and weaning practices in Venda, 1990. South African Medical Journal. 1993;83: 580-583.

36. Sibeko L, Dhansay MA, Charlton KE, Johns T, Gray-Donald K. Beliefs, attitudes, and practices of breastfeeding mothers from a per urban community in South Africa. Journal of Human Lactation. 2005;21(1): 31-38.

37. Doherty T, Sanders D, Jackson D, Swanevelder S, Lombard C, Zembe W, Chopra M, Goga A, Colvin M, Fadnes LT, Engebretsen IMS, Ekstrom E, Tylleskar T. Early cessation of breastfeeding amongst women in South Africa: an area needing urgent attention to improve childhealth. BMC Pediatrics. 2012;12(105):1-10.

38. Ghuman MR, Saloojee H, Morris G. Infant feeding practices in a high prevalence rural district of KwaZulu Natal, South Africa. South African Journal of Childhood Nutrition. 2009;22(2): 74-79.

39. Siziba LP, Jerling J, Hanekom SM, Wentzel-Viljoen E. Low rates of exclusive breastfeeding are still evident in four South African provinces. South African Journal of Nutrition. 2015;28(4):170-179

40. Patil CL, Turab A, Ambikapathi R, Nesamvuni C, Chandyo RK, Bose A, Islam MM, Ahmed AMS, Olortegul MP, de Moraes ML, Caulfield LE. Early interruption of exclusive breastfeeding: results from the eight-country MAL-ED study. Journal of Health, Population and Nutrition. 2015;34:10(1-10).

41. Buskens I, Jaffe A, Mkhantshwa H. Infant feeding practices: Realities and mindsets of mothers in South Africa. AIDS Care. 2007;19(9): 1101-1109.

42. Laar SA, Govender V. Factors influencing the choices of infant feeding in NIV-positive mothers in Southern Ghana: the role of counsellors, mothers, families and socio-economic status. Journal of AIDS and HIV research. 2011;3(7): 129-137.

43. Ladzani R, Pelter K, Mlambo MG, Phaweni K. Infant feeding practices and associated factors of HIV-positive mothers at Gert Sibande, South Africa. Acta Paediatrica. 2011;100: 538-542.

44. Inoue M, Binns CW, Otsuka K, Jimba M, Matsubara M. Infant feeding practices and breastfeeding duration in Japan: A review. International Breastfeeding Journal. 2012;7:1-15.

45. Mbwana HA, Conlon C, von Hurst P. Exclusive breastfeeding: Mother's awareness and healthcare providers' practices during antenatal visits in Mvomero, Tanzania. International Journal of Nutrition and Metabolism. 2013;5(3):40-49.

46. Doherty T, Chopra M. Counselling on infant feeding choices: some practical realities from South Africa. Field exchange issue 29. Available [online] http://faxennonline.net/29/counselling.aspx. Accessed on 15/09/2013

47. Thairu LN, Pelto GH, Rollins NC, Bland RM, Ntshangase N. Sociocultural influences on infant feeding decisions among HIV-infected women in rural KwaZulu-Natal, South Africa. Maternal and Child Nutrition 2005;1: 2-10.

48. Faber M, Oelofse A, Kriek JA, Benade AJS. Breastfeeding and complementary feeding practices in low socio-economic urban area. South African Journal of food Science and Nutrition 1997;9:43-51.

49. Miracle DJ, Meier PP, Bennett PA. Mother's decision to change from formula to mother's milk for very-low-birth-weight infants. Journal of Obstetrics, Gynecologic & Neonatal Nursing 2004;33(6):692-703.

50. Miracle DJ, Fredland V. Provider encouragement of breastfeeding: efficacy and ethics. American College of Nurse-midwives 2007;52(6):545-548.

51. Kramer MS *et al*. Promotion of breastfeeding intervention trial (PROBIT): A randomised trial in the republic of Belarus. Journal of American Medical Association 2001;85(4):413-420.

52. Shah S, Rollins NC, Bland R. Breastfeeding knowledge among health workers in rural South Africa. Journal of Tropical Pediatrics 2005;51:33-38.

53. Humphreys AS, Thompson NJ, Miner KR. Intention to Breastfeed in Low-Income Pregnant Women: The Role of Social Support and Previous Experience. BIRTH. September 1998;25:169-174.

54. Haider R, Ashworth A, Kabir I, Huttly SRA. Effect of community-based peer counsellors on exclusive breastfeeding practices in Dhaka, Bangladesh: a randomized control trial. The Lancet. November 2000;356:1643-1647.

55. Hoyer S, Pokorn MD. The influence of various factors on breastfeeding in Slovenia. Journal of Advanced Nursing. June 1998;27(6):1250-1256.

56. Scott JA, Binns CW, Oddy WH, Graham KI. Predictors of Breastfeeding Duration: Evidence from a Cohort Study. Pediatrics. October 2005;117:646-655.

57. Dewey K. Pan American Health Organisation. Guiding principles for complementary feeding of the breastfed child. World Health Organisation. 2003. Available [online] http://www.who.intl/maternal_child_adolescent/documents.a85622/en/index.html. Accessed 11/09/2013.

58. De La Mora A, Russel DW. The Iowa infant feeding attitude scale: analysis of reliability and validity. Journal of Applied Social Psychology 1999;29(11):2362-2380.

59. Stuebe AM, Bonuck K. What Predicts Intent to Breastfeed Exclusively? Breastfeeding Knowledge, Attitudes, and Beliefs in a Diverse Urban Population. Breastfeeding Medicine Journal 2011;6(6):413-420.

60. Donath SM, Amir LH, ALSPAC Study Team. The relationship between maternal smoking and breastfeeding duration after adjustment for maternal infant feeding intention. Acta Paediatrica 2004;93:1514-1518**.**

61. Nolan L, Goel V. Sociodemographic factors related to breastfeeding in Ontario: results from the Ontario Health Survey. Can J Public Health. 1995;86:309-312.

62.Clement MS, Mitchell EA, Wright SP, Esmail A, Jones DR, Ford RPK. Influences on breastfeeding in southeast England. Acta Paediatr. 1997;86:51-56.

63. Scott J, Oddy W, Binns C, Graham K. Temporal changes in the determinants of breastfeeding initiations. Birth. 2006;33:37-45.

64. United Nation Development Program: Human Development Report. Available [online] http://www.hdr.undp.org/table4:genderinequality Accessed 16/06/2015.

APPENDICES

Study Number:	

Appendix A: First Interview

Section A: Patient Demographics

1. Age

2. Ethnicity

Black	
White	
Colored	
Indian or Asian	

3. Preferred language

……..

4. Social Habits during pregnancy

Alcohol use	
Cigarette smoke	
Illicit drug use	

Not Applicable	

5. What is the highest grade at school that you have passed?

……

……

6. What is the highest level of education that you have achieved?

……

……

……

7. Employment status:

Employed full-time	
Employed part-time	
Unemployed	
Just left work	
Student	

8. When do you intend to return to work / school?

Within 1 month (4 weeks)	
After 2 months (8 weeks)	

After 4 months	

Not applicable. Specify.

……

……...

9. Accommodation type

Shack	
Hostel	
Formal	

Section B: Antenatal factors (most information obtained from antenatal card)

1. Antenatal clinic attended

Yes	
No	

2. Type of antenatal care received

MOU / Level1	
Secondary/Tertiary Health care Centre	
Mixed MOU and Secondary/ Tertiary	

Care Centre	
Private GP	
Private obstetrician	

3. Gravidity

……

4. Parity

……..

5. Pregnancy losses

……
……
……

6. Number of antenatal clinic visits

……

7. Any chronic illness during this pregnancy? Includes Hypertension, Epilepsy, Diabetes, asthma, HIV, thyroid disease, other. Specify.

……
……
……..

8. Were you given any information on BF at your antenatal care visits?

…….

If yes, how were you given this information? Choose from options below.

Individual/one on one counselling received?	

Group counselling received?	
Pamphlets received?	
Other? Specify.	

Section C: Delivery

1. When did you deliver your baby?

…… day/s ago

2. How was your baby born?

Vaginal Delivery	
Caesarean Section	

3. What were the circumstances surrounding the delivery of your baby?

Elective (includes induction of labor)	
Emergency (includes spontaneous labor)	

Section D: Intended Infant Feeding Practice

1. How do you intend on feeding your baby for now?

Only giving breast milk on demand, and nothing else (including water)	
Only formula milk	
Mixed Feeding, giving both breast milk and formula milk	
Other	

Specify other

……
……

2. How long do you intend only breastfeeding on demand? Only applies if option chosen in above question.

2 months (8 weeks) or less	
Longer than 2 months, but under 4 months	
Longer than 4 months, but less than 6 month	
6 months exactly	

Not applicable	

3. How long do you intend on continuing to breast feed your baby? Applies only if you are planning to breastfeed your baby.

Less than 4 months	
Between 4 – 6 months	
Between 6 -12 months	
Longer than 12 months	
For as long as my baby wants to be breastfed	
Other. Specify.	

Section E: Maternal Knowledge about Benefits of Breastfeeding

1. What do you understand by the phrase “Exclusive breast feeding”?

……
……
……..

2. Formula Milk is as good for my baby as breast milk.

Agree	

Disagree	
Not sure	

3. Breast milk supplies sufficient nutrition for the growth and development of my baby during the first 6 months of life.

Agree	
Disagree	
Not sure	

4. Breast milk can protect my baby from acquiring respiratory infections.

Agree	
Disagree	
Not sure	

5. Breast milk reduces the chances of my baby acquiring life threatening diarrhea.

Agree	
Disagree	
Not sure	

6. Breastfeeding provides protection against later development of childhood obesity.

Agree	
Disagree	
Not Sure	

7. Breastfeeding my baby allows me to bond with my baby.

Agree	
Disagree	
Not sure	

8. I believe that my current chronic medication will affect my baby.

Agree	
Disagree	
Not sure	
Not applicable	

9. I believe my current chronic illness will be transferred to my baby if I breastfeed.

Agree	
Disagree	
Not sure	
Not applicable	

Section F: Maternal Comfort with Breastfeeding

1. How were your other children fed?

All Exclusively Breastfed for 6 weeks or less	
All Exclusively Breastfed for 6 – 12 weeks	
All Exclusively Breastfed longer than 12 weeks, but shorter than 6 months	
All Formula Feeding	
All Mixed feeding	
Not applicable	

Other	

Specify other:

……

……

……

……

2. I am able to comfortably hold my baby while feeding.

Agree	
Disagree	
Not sure	

3. I am comfortable with breastfeeding in the presence of close friends and relatives.

Agree	
Disagree	
Not sure	
Not applicable	

4. I am comfortable with breastfeeding in public.

Agree	
Disagree	
Not sure	
Not applicable	

Section G: Source of Information

1. Who is your major source of influence regarding your decision on infant feeding practice?

Health Care Provider	
Close Relative – includes parent, grandparent, guardian, sibling, spouse	
Media – includes magazines, newspapers, information pamphlets, television, radio	
Peers – includes friends, colleagues, fellow students	

2. The information provided to me regarding infant feeding practices during my antenatal care was:

Clear/understandable				
Sufficient/ enough	Yes		no	
Not applicable				

3. If selected “no” to any of the options in the above question, how would u suggest the messages regarding infant feeding practices be communicated better?

……
……
……

Study number:	

Appendix B: Follow up telephonic interview

1. Are you still BF?

Yes	
No	

2. If no, when did you stop BF?

Less than 1 week post delivery	
Between 1 -2 weeks post delivery	
Between 2-4 weeks post delivery	
Between 4-6 weeks post delivery	
Not applicable	

3. Are you giving your baby any other form of feeds, besides breast milk?

……
……

4. If yes, what are you giving?

……
……
……

5. When did you start introducing other food stuff to your baby's diet?

Less than 1 week post delivery	
Between 1-2 weeks post delivery	
Between 2-4 weeks post delivery	
Between 4 -6 weeks post delivery	
Not applicable	

6. Why did you start giving your baby other food stuff?

……

……

……..

Appendix C: Patient Information Sheet

Good day.

My name is Dr. Y.P. Kennedy. I am conducting a research titled “An assessment of infant feeding knowledge, attitude and intended practice of women delivering at Chris Hani Baragwanath Academic Hospital”. I would like to invite you to be part of this study because you have just had your baby and by now have decided on how you will be feeding your baby. Before you decide to be in the study, you can discuss it with anyone that you are comfortable with or you can ask me any questions that you have on the study now or later.

Purpose of the study

My purpose is to understand how mothers decide on what they will feed their babies and why they decide on either bottle feeding with formula milk or breastfeeding. This research project is performed as a requirement toward my MMed degree in the department of Obstetrics and Gynecology.

How this study will be conducted

I will use a questionnaire to ask you some questions about yourself, your antenatal care, the delivery and how you intend to feed your baby. I will also like your permission to look at your medical records to see what clinic you have attended, what was done at your antenatal visits, and obtain any medical information I might need.

I would also like to ask your permission to phone you about how the feeding is going in about 6 weeks.

Voluntary participation

Your decision to be part of this study is entirely voluntary. Whether you participate or not will not interfere with your treatment in the hospital. You can also decide at any time that you do not want to answer any more questions; and you can withdraw from this study anytime you feel like.

Risks and benefits of participating in the study

There are no risks, or benefits to being in the study. You will also not be paid for your participation in the study.

Confidentiality

The information collected in this study will be confidential. I will not write any information with which you might be identified. No personal information will be shared or included in the final report of the study.

Who to contact with any questions you might have with regards to the study

You can ask me any questions that you have now; or call me on 082 730 5730 with any question you might have regarding the study at a later stage. If you have any questions about the ethics of this study, you may contact Prof. Cleaton Jones on 011 726 1234.

This study has been undertaken with the permission of the CEO of Chris Hani Baragwanath Hospital, the HOD of the Department of Obstetrics and Gynecology and the Human Research and Ethics Committee (HREC) of the University of Witwatersrand.

For any further information and clarity regarding the ethical nature of this study, you are welcome to contact the HREC as follows:

HREC (Medical) Chairperson: Prof. P Cleaton-Jones, Tell 011 7172302

Email – peter.cleaton-jones@wits.ac.za

Secretariat: - Ms. Z Ndlovu, Tell 011 717 2302

Email – Zanele.ndlovu@wits.ac.za

- Ms. A Keshav, Tell 011 717 2700

Email – anisa.keshav@wits.ac.za

DR. Y.P. Kennedy, Obs & Gynae Registrar

Appendix D: Patient Consent

I, ……., have had the terms of this research project explained to me, and fully understand them. I hereby consent to being a voluntary participant in the study.

Signature of Participant ……..

Signature of Researcher ……

I agree to be called phoned by Dr. Kennedy in 6 weeks to answer a few questions on my chosen method of feeding. Dr. Kennedy may phone me during the following times:

……..

Signature of Participant …….

Signature of Researcher ……..

Date:……

R14/49 Dr Yollande Palesa Kennedy

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M140394

NAME: (Principal Investigator)	Dr Yollande Palesa Kennedy
DEPARTMENT:	Obstetrics and Gynaecology Chris Hani Baragwanath Academic Hospital
PROJECT TITLE:	An Assessment if Infant Feeding Knowledge, Attitudes and Intended Practice of Women Delivering at Chris Hani Baragwanath Academic Hospital
DATE CONSIDERED:	28/03/2014
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Dr Yasmin Adam
APPROVED BY:	Professor P Cleaton-Jones, Co-Chairperson, HREC (Medical)
DATE OF APPROVAL:	23/05/2014

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Secretary in Room 10004, 10th floor, Senate House, University.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report.**

Principal Investigator Signature _____ Date _____

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES