An investigation into the knowledge and beliefs of women in the Gilgal area (Swaziland) with regard to infant feeding practices in the context of HIV/AIDS

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An investigation into the knowledge and beliefs of women in the Gilgal area (Swaziland) with regard to infant feeding practices in the context of HIV/AIDS

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ABSTRACT

The study was conducted to describe the knowledge and beliefs of mothers regarding infant feeding practices in the context of HIV/AIDS. The mothers of infants aged 0 – 6 months attending at the Gilgal clinic in Manzini region, Swaziland were sampled for the study. This was a cross sectional descriptive survey in the quantitative paradigm. A qualitative research technique (focus groups) was used for support purposes. The aim of the study was to describe the knowledge and attitudes of the mothers with regard to infant feeding practices in the context of HIV, to describe the relationships among these three concepts, and to describe the influence of social referents on mothers' beliefs.

The research was carried out in the month of June 2006 in Swaziland. A stratified (age) and convenience (clinic attendance) sampling technique was used to select the sample from mothers and their babies attending at the Gilgal clinic. An adapted 24-h recall was used to assess infant feeding practices; questionnaires and focus group discussions were used to assess knowledge, beliefs and demographic information. Descriptive, inferential and multivariate statistics were used on the quantitative data and content analysis and ethnography on the qualitative data.

The results indicated that as much as breastfeeding is still a norm (94.5%), exclusive breastfeeding (11%) is rarely understood and practiced in this community. Focus group data revealed that the matter is complicated by the fact that some mothers fed ORT to their babies immediately after birth. Generally knowledge on HIV and infant feeding practices was high and beliefs on HIV and infant feeding were negative. Partners and nurses advice on infant feeding was most regarded by mothers. There was no significant relationship found between knowledge and attitudes. A significant relationship between knowledge and beliefs/attitudes was found in mothers who practiced predominant breastfeeding, complementary and replacement feeding. However, the relationships were weak and negative, proving the necessity to strengthen the relationship between knowledge and attitudes. There was no statistical relationship found between knowledge and attitude of mothers who practiced exclusive breastfeeding. In conclusion attitudes were dominant predictors of behavior compared to knowledge. This indicated that good

knowledge does not warrant positive attitudes and appropriate behavior. Therefore it is vital to investigate the other factors that influence attitudes in efforts to improve infant feeding. The study was successful in identifying gaps that supported the recommendations for a PMTC program focusing on nutritional aspects.

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ABBREVIATIONS

24-h recall	24 hour recall
AIDS	Acquired immune-deficiency syndrome
ANNEC	African Network for the Care of Children affected by Aids
ANOVA	Analysis of variance
BF	Breastfeeding
BT	Bottlefeeding
et al	indicates three or more authors
F (used on p93)	Females
F (used on p61)	False
HIV	Human Immuno-deficiency Virus
IBFAN	International Baby Food Action Network in Africa
KAP	Knowledge, Attitudes and practices
M	Males
Mo	Month
MTCT	Mother-To-Child Transmission
N	Sample size
N (used on pg 68-69)	No
n	Frequency
ORT	Oral Rehydration Therapy
PMTCT	Program on Mother-To-Child Transmission
Q	Questions
RNA	Ribonucleic acid
SA	South Africa
SARA	Support & Analysis & Research in Africa project
SD	Swaziland

T	True
TPB	Theory of planned behavior
TRA	Theory of reasoned action
UHT	Ultra heat treated
UNICEF	United Nations Children Fund
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNFPA	United Nations Population Fund
WHO	World Health Organization
Y	Yes

CHAPTER 1

1.1 INTRODUCTION

1.2 BACKGROUND AND SETTING

The HIV (Human Immune-deficiency Virus) prevalence continues to escalate in Southern African countries. The population of Swaziland has been extremely affected by the Human Immune-deficiency Virus/Acquired immune-deficiency Syndrome (HIV/AIDS) pandemic. The HIV prevalence rate among antenatal clients (pregnant women attending clinics), has rapidly risen from 3.9% in 1992 to 38.6% in 2002, ranking it among the top five countries in the world that is highly affected by HIV (Swaziland Ministry of Health and Social Welfare, 2003:1). In the recent study done in pregnant women attending clinics in Swaziland, the rate of infection was found to be 42.6% (Swaziland Ministry of Health and Social Welfare, 2004:32). Since the infection mostly affects individuals in the reproductive age, the incidence of Mother-To-Child Transmission (MTCT) of HIV is on the rise (Eide, Myhre, Lindbaek, Sundby, Arimi & Thior, 2006). Approximately 750 000 children acquire HIV infection mainly through mother to child transmission because of transmission through blood or body fluid contact during pregnancy, during delivery, or by breastfeeding the baby (Newel, 2006).

Breastfeeding is accountable for about one third to one half of mother-to-child transmission of HIV (Coutsoudis, 2005; Talawat, Dore, Coeur & Lallemant, 2002). Without specific interventions the rate of MTCT is approximately 15 – 20% with prolonged breastfeeding doubling the rate to 35% – 40% (Talawat *et al*, 2002; UNICEF, UNAIDS, WHO & UNFPA, 2004). Upon recognition that an HIV infected mother can transmit the virus to the infant, the World Health Assembly developed an infant feeding guideline in the context of HIV. This guideline recommended that breastfeeding be avoided completely by HIV positive mothers (IBFAN, 2002; Lathan & Greiner, 1998). After conducting intensive research on the HIV epidemic the recommendation was discovered to be flawed. The guideline had overlooked that in most African countries exclusive breastfeeding outweighs the risk of not breastfeeding. This is because there is much poverty, poor living conditions and tropical diseases in these countries. Therefore

promoting infant formula feeding to prevent HIV infection in such situations might increase infant morbidity, mortality and malnutrition. Moreover the guideline had overlooked that exclusive breastfeeding carries a lower risk of transmission of HIV from mother to child than mixed feeding. The recommendation was then reviewed to recommend the following: when replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by HIV infected mothers is recommended. Otherwise, exclusive breastfeeding is recommended during the first six months of life (Ross & Labbok, 2004; WHO, 2003).

The initial recommendation was flawed in that it aimed only at reducing HIV deaths, while inadequate attention was given to morbidity and mortality associated with not breastfeeding in different settings (Lathan & Greiner, 1998). In the African environment formula feeding has been reported to result in higher rates of morbidity and mortality, which is attributed to higher rates of infectious illness resulting from suboptimal sanitation, nutrition, and housing (Dorosko & Rollins, 2003). Moreover, other factors contributing to the high mortality are high illiteracy and economic constraints (Raisler & Cohn, 2005). Also, the recommendation was flawed in that it did not take into account the risk of transmission associated with the different breastfeeding patterns – exclusive breastfeeding and mixed feeding. Exclusive breastfeeding is defined as feeding the infant breastmilk only without supplementing it with water or other foods. Mixed feeding is defined as combining breastfeeding with feedings of water, tea, or other foods (Kakute, Ngum, Mitchell, Kroll, Forgwei, Ngwang & Meyer, 2005). A study conducted in South Africa revealed that infants whose mothers were infected with HIV and exclusively breastfed had a 19.4% risk of acquiring the virus compared to the mixed fed group which had a 26.1% risk. Compared with the artificially fed infants, the risk of transmission was the same for both the exclusive and artificially fed infants (Coutsoudis, 2005). The current recommendation clarifies that infant feeding practices are paramount in controlling the transmission of HIV infection in infants.

1.3 JUSTIFICATION OF THE STUDY AND PROBLEM STATEMENT

The impact of HIV infection on infant feeding practices necessitated attention to infant feeding practices particularly in communities where the HIV infection has reached epidemic levels. Assessment of infant feeding practice is essential prior to an intervention. Establishing the infant feeding practices would help in promoting the appropriate infant feeding option for the setting.

Infant feeding practices are influenced by the mother's level of knowledge and beliefs/attitude regarding each infant feeding method (Ogden, 2000; Wambach, 1997). An investigation of knowledge and beliefs could help in giving an explanation of the infant feeding practice adopted by the mother. Importantly, is that beliefs is a prepositional type of attitude that is defined as a relational mental state connecting a person to a proposition. There is little information available on Knowledge, Attitude and Practices (KAP) on infant feeding in Swaziland. The only KAP study on infant feeding was done in Mbabane. It is imperative to conduct a KAP study in the Manzini region as it is the mostly infected region in the country. Involvement of all women regardless of their HIV status in the study was considered vital as the study was envisaged at providing information to help in the development of a PMTC program for the whole community. Therefore, the problem identified in Swaziland is the paucity of data on infant feeding practices in the context of HIV/AIDS. Moreover, the information on the level of knowledge of mothers regarding infant feeding practices, and their beliefs/attitudes related to infant feeding practices and infant feeding decisions in the context of HIV/AIDS is scanty.

1.4 INVESTIGATION

The research was carried out in the Gilgal area, a non-urban area in the Manzini region of Swaziland. The research provided baseline information on KAP on infant feeding within the context of HIV/AIDS. The data was used for the development of a framework of a program that will be used by health care clinics and by World Vision for planning a preventative intervention program (education purposes). World Vision is a non-governmental organization that works with the community, and its policy considerations

include ensuring child survival. The mothers or caregivers of infants aged between 0 – 6 months were interviewed to obtain information on their knowledge and beliefs on infant feeding practices in the context of HIV.

The study will be represented in six parts:

CHAPTER 1: INTRODUCTION AND JUSTIFICATION

This chapter covers the background and setting and the justification for the study.

CHAPTER 2: LITERATURE REVIEW

The literature review comprises the following topics: theoretical background, background information on HIV, knowledge on infant feeding practices, beliefs on infant feeding, the relationship between knowledge and beliefs, and other factors influencing beliefs towards infant feeding

CHAPTER 3: METHODOLOGY

This chapter comprises the research aim, objectives and design, conceptual framework, conceptualization, population and sampling, measuring instruments, data collection and data analysis.

CHAPTER 4: RESULTS

This chapter presents results under the following topics: demographic information, infant feeding practices, knowledge and beliefs on infant feeding and HIV transmission.

CHAPTER 5: DISCUSSION

This chapter discusses the results under the following topics: demographic information, infant feeding practices, knowledge and beliefs on infant feeding and HIV transmission.

CHAPTER 6: EXECUTIVE SUMMARY

This chapter will be divided into three sections: executive summary, conclusion, practical implications and recommendations for further study.

CHAPTER 2 SUPPORTING LITERATURE

2.1 INTRODUCTION

The United Nations goal is to protect, promote and support optimal infant and child feeding. Proper infant feeding practices are critical for infant health and survival. Therefore research on infant feeding helps to identify strengths and weaknesses to develop comprehensive infant and young feeding guidelines. The literature in this chapter will cover the theoretical frameworks and supportive literature on knowledge, beliefs/attitudes and infant-feeding.

2. 2 CONCEPTUAL/THEORETICAL BACKGROUND

The theory of reasoned action and theory of planned behaviour are social cognition models that provide a useful framework for studying the relationship between attitudes and behaviour (see Figures 2.1 and 2.2). The two theories have been applied extensively in infant feeding research to explain behaviour (Swanson & Power, 2005; Wambach, 1997). The theory of planned behaviour is an extension of the theory of reasoned behaviour.

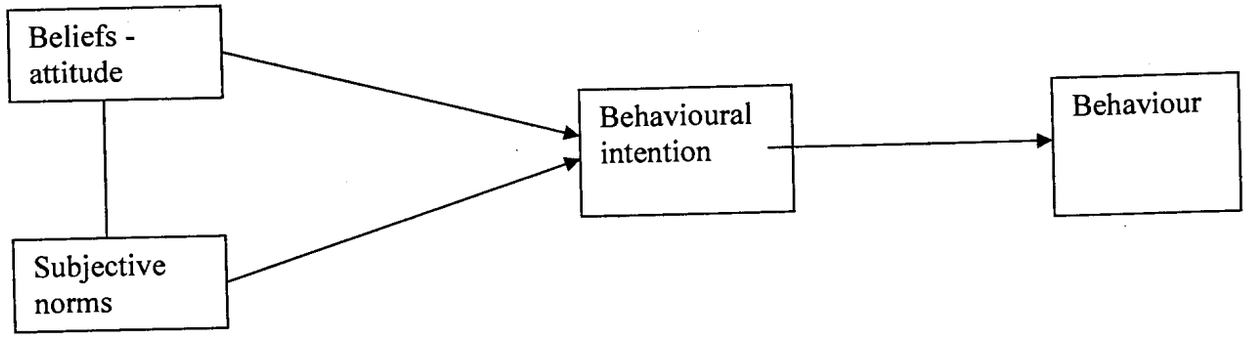

FIGURE 2.1: BASIC THEORY OF REASONED BEHAVIOUR (Baron & Byrne, 2003; Ogden, 2000).

The theory of reasoned action posits that behaviour under volitional control is best predicted by intention to perform it. Intentions are in turn, a function of attitude towards the behaviour being predicted and subjective norm. Attitudes are determined by

behavioural beliefs and evaluation of outcomes (Baron & Byrne, 2003; Goksen, 2002). Behavioural beliefs are composed of both a positive or negative evaluation of a particular behaviour. Evaluation of outcomes refers to how good or bad each outcome is (Ogden, 2000). A subjective norm is defined as perceived, social pressure to perform behaviour. Subjective norms are determined by social referents' beliefs about the behaviour and motivation to comply with social expectations of the behaviour (Ogden, 2000; Wambach, 1997). Social referents include, partner, a woman's own mother, friends, medical professionals and mother in law.

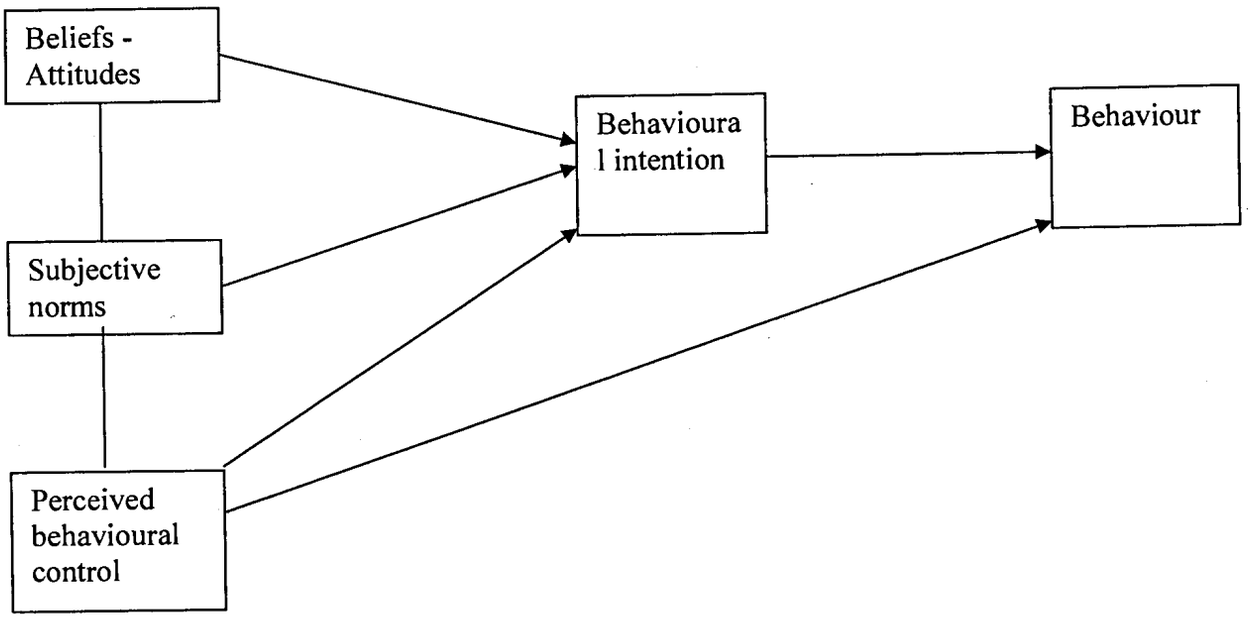

FIGURE 2.2: BASIC THEORY OF PLANNED BEHAVIOUR (Baron & Byrne, 2003; Goksen, 2002; Ogden, 2000).

Alternatively the theory of planned behaviour in figure two has behavioural control as an additional variable. The theory of planned behaviour recognizes that there is both non-volitional and volitional control over behaviour. This means that perceived behavioural control is posited to influence behaviour indirectly through intentions and also directly if it closely reflects actual control (Wambach, 1997). Perceived behavioural control is therefore determined by a belief that an individual can carry out a particular behaviour based upon a consideration of internal control factors (for example, skills, abilities,

information) and external control factors for example, obstacles, opportunities) (Ogden, 2000). However for this study only the information/knowledge component will be used to define perceived knowledge. Knowledge can directly predict health behaviours (Ogden, 2000); also it indirectly influences behaviour by influencing attitudes through encouraging a different set of beliefs among individuals. The attitude in turn affects behaviour (Worsley, 2002).

2.3 BACKGROUND INFORMATION ON HIV AND KNOWLEDGE ON INFANT FEEDING PRACTICES

Generally the recommendation for infant feeding recommended that all mothers begin introducing solid foods at 4 – 6 months. The sequence of feeding involved beginning with feeding iron-fortified cereal mixed with breastmilk, formula or water and then gradually introducing pureed vegetables and fruits (Pillitteri, 1999; Whitney & Rolfes, 2005). The recommendation has changed to emphasize feeding of breastmilk only for six months and introduction of solid foods after six months to HIV positive mothers (UNICEF *et al*, 2004).

2.3.1 HIV AND BREASTFEEDING

Breastfeeding remains the ideal mode of feeding for mothers who are infected with HIV and those who do not know their status (International Baby Food Action Network Africa (IBFAN), 2000). The recommended period for breastfeeding by HIV positive mothers is six months and for HIV negative mothers the period can be extended to two years (LINKAGES, 2004; UNICEF *et al*, 2004; WHO, 2003). Early cessation of breastfeeding is recommended as it reduces the risk of transmission by reducing the length of time that the infant is exposed to HIV through breastfeeding. However there has been a lot of discussion about the optimum time for early cessation. Some experts advocated for stopping earlier than six months, but it has been seen that stopping breastfeeding before six months in conditions of poverty carries more risk of morbidity and mortality for the infant and it is more difficult to implement. Therefore exclusive breastfeeding for the first six months is advisable. If early cessation is done by economically advantaged mothers it should be done safely and the risk of mixed feeding should be avoided (IBFAN, 2002:7).

Breastfeeding is important due to its immediate impact on child and maternal survival (Coutsoudis, 2005; UNICEF *et al*, 2000). Exclusive breastfeeding confers many nutritional and health benefits to the child. Breast milk is a hygienic source of energy, essential nutrients, and water. Most importantly, breastmilk is unlikely to be contaminated and contains immune factors that are protective, thereby decreasing infant morbidity and mortality (Kakute *et al*, 2005). Breastfeeding is recommended especially in developing countries because it is the only sustainable infant feeding option. However the benefits of breastfeeding are unlikely to be as important in developed countries where the risks of artificial feeding can be minimized (Coutsoudis, 2005; Filteau, 2003; IBFAN, 2000). The overall risk of mother to child transmission is associated with factors related to the mother and the infant (Swaziland Ministry of Health and Social Welfare, 2003:4).The risk factors are summarized below into two groups: those which have stronger supporting evidence and those with limited evidence (see Table 2.1).

TABLE 2.1: RISK FACTORS FOR BREASTFEEDING TRANSMISSION OF HIV FROM MOTHER TO CHILD (Coutsoudis, 2005)

	Strong evidence	Limited evidence
Mother	Primary infection	
	Advanced disease/low CD4 count	High breast milk viral load
	Breast health	Subclinical mastitis as evidenced by increased breast milk sodium levels
	Prolonged duration of feeding	Low maternal levels of vitamin B, C and E.
Infant	High plasma viral load	Non-exclusive breastfeeding in the first six months

The risk of Mother-To-Child Transmission (MTCT) of HIV through breastfeeding is increased if a breastfeeding mother is newly infected with HIV. The HIV viral load in the mother is increased soon after acquiring a new HIV infection; this could be either during pregnancy or while breastfeeding (Filteau, 2003; Swaziland Ministry of Health and Social Welfare, 2003; UNICEF *et al,* 2004). The risk of transmission through breastmilk among women with recent infection is about 29% (African Network for the Care of Children Affected by AIDS (ANNEC), 2004). A study conducted in Zimbabwe suggests that about 4% of women who were HIV negative when giving birth became infected in the first year postpartum, and that the risk continues into the second year. This merits attention as the majority of women still practice continued breastfeeding, thus placing the infants at risk (UNICEF *et al*, 2004).

Moreover, the HIV viral load is increased when the mother is at an advanced stage of infection (AIDS) making it highly likely to pass the virus to the infant (Swaziland Ministry of Health and Social Welfare, 2003). This is illustrated by the common observation of increased risk of transmission associated with low blood CD4 cell-count (Coutsoudis, Pillay, Spooner, Kuhn, Coovadia & The South African Vitamin A Group, 1999). In a meta analysis of data from nine Sub-Saharan African countries, the risk of postnatal occurrence of infection after four weeks of age was strongly associated with maternal CD4 cell-count: transmission increased eightfold at CD4 cell-counts lower than 200/mm, and 3.5 times at CD4 cell-counts between 200 and 500/mm, compared with the reference group of CD4 cell-count above 500/mm (UNICEF *et al,* 2004). Poor nutritional status of a mother during breastfeeding contributes to the transmission of HIV to the infant, particularly deficiencies of vitamin A, selenium and zinc (Swaziland Ministry of Health and Social Welfare, 2003; UNICEF *et al*, 2004). Limited evidence suggests that HIV-RNA (Human Immuno-deficiency Virus-Ribonucleic Acid) viral load in milk in general appears to be lower than in plasma blood, therefore the transmission risk is high in RNA viral load in plasma blood. The available data on RNA viral load in milk suggest that the RNA viral load in milk is highest immediately after birth and decreases over time (Kourtis, Butera, Ibegbu, Belec & Duerr, 2003).

Breast health is vital in preventing the mother-to-child transmission of HIV. Mastitis, cracked sore and bloody nipples, and other breast abscesses significantly increase the risk of transmitting HIV by breastmilk. However, good breastfeeding techniques can reduce the risk considerably (ANNEC, 2004). Sub-clinical mastitis shares many features with mastitis as it is more likely to occur when the milk first comes in after birth, when there is inadequate milk drainage, when there is poor attachment, less vigorous suckling by an ill infant, or during rapid weaning (UNICEF *et al*, 2004). Sub-clinical mastitis also increases the transmission risk. This is evidenced by increased levels of sodium in milk and is common in both HIV infected and uninfected mothers. Its treatment involves good breastfeeding techniques (Filteau, 2003).

Infant factors of mother to child transmission of HIV include firstly oral thrush, which damages the mucous membranes of infants and thus facilitating transmission during breastfeeding. Infant oral thrush can cause nipple thrush and fissures leading to bleeding, infections and, ultimately easier transmission of HIV. Damage of the intestinal mucous membranes can be caused by feeding the infant with cow's milk, allergic reactions to complementary foods, and infections. Therefore the infant-feeding pattern plays an important role in affecting the permeability of the infant's gut (UNICEF *et al,* 2004:14 - 15). Mixed feeding is associated with the damage of the infants gut since it is unlikely to involve hygienic food preparation practices and bacteria and other contaminants may be introduced into the gut resulting in inflammatory responses and subsequent damage to the gut. On the contrary, breastmilk contains growth factors, such as epidermal growth factor and transforming growth factor, which may enhance the maturation of the gut epithelial barrier, thus maintaining its integrity and hindering passage of the virus (Coutsoudis *et al*, 1999).

An HIV infected mother has other breastmilk options to consider if replacement feeding is not a good option under the current conditions. The options available include wet-nursing and cup feeding of expressed heat-treated milk. Wet nursing is breastfeeding by a woman who is not the infant's mother. There is a need for cautionary measures to be instituted to prevent transmission of HIV from wet nurse to child and from HIV infected

child to wet nurse before wet nursing could be widely practiced (South African Department of Health, 2000). Expressed heat-treated breastmilk is nutritionally superior to other milks. However, women need time, resources and support to express and heat-treat breastmilk. Expression and heat treatment could be a temporary solution during periods of increased risk of transmission as in cases of cracked nipples or breast abscesses, sick infants for whom the risk of replacement feeding is greater, and during transmission from exclusive breastfeeding to replacement feeding. The main drawback of heat-treated milk is that heating reduces the levels of the anti-infective factors in breastmilk. (UNICEF *et al*, 2004).

2.3.2 HIV AND BREASTMILK SUBSTITUTES

An HIV positive mother has an option of choosing replacement feeding from the birth of the infant, if breastfeeding is not a good option under the current conditions. Suitable breastmilk substitutes include commercial infant formula and animal-modified milk. However this option is unlikely to be a feasible infant feeding option for the vast majority of HIV-infected African women. It is feasible in developed countries where many HIV-infected women can quite easily provide formula as a replacement food (Filteau, 2003). Research reveals that breastmilk substitutes present a greater risk to the infant's health than breastfeeding because of the high rates of morbidity and mortality in infants (LINKAGES, 2004). The current guidelines recommend exclusive breastmilk substitute feeding by cup feeding to a mother who chooses replacement feeding. The mother should feed the infant either the commercial formula or home-modified animal milk with no breastmilk (UNICEF *et al*, 2004; WHO, 2003).

Commercial infant formula is an option for HIV positive women when the family has reliable access to sufficient quantities of properly reconstituted formula for at least six months. The family must also have the resources – water, fuel, utensils, skills, knowledge and time to prepare it correctly and hygienically (ANNEC, 2004:220). This method needs a lot of support to be done safely to avoid increased rates of infection, and there is a need for close monitoring for adequate growth (LINKAGES, 2004). Home animal-prepared formula is a reasonable option for HIV positive women in the following circumstances:

- Commercial infant feed is unaffordable and unavailable.
- A reliable supply of animal milk for at least 6 months.
- The family has resources to prepare it hygienically and according to instructions (ANNEC, 2004:220).

Home-modified animal milk needs micronutrient supplementation as animal milks contain insufficient iron, zinc and may lack vitamin A and folate (Brown, Isaacs, Murtaugh, Stang & Wooldridge, 2002; IBFAN, 2002; LINKAGES, 2004). Cup feeding should be encouraged compared to bottle-feeding in both animal and commercial feeding options as cups are easier to clean than bottles. Other appropriate breastmilk substitutes include powdered full cream milk or evaporated milk and processed/pasteurized or ultra heat treated (UHT) milk. Unmodified cow's milk, low fat cow's milk, and imitation milks are not acceptable as a major source of nutrients for infants because of their altered digestibility, increased risk of contamination, and lack of components needed for appropriate growth (Wardlaw & Kessel, 2002; Whitney & Rolfes, 2005; Wong, 1999).

Mothers maintain a right to infant feeding choice, therefore counselling is important in helping HIV positive mothers to make an informed choice about infant feeding. Counselling should include information on the risks and benefits of each method, based on local assessment, and guidance in selecting the option that best suits their circumstances. Health professionals should encourage each mother to choose an option that is most acceptable, feasible, affordable, sustainable and safe in her particular situation. Moreover, it requires deep understanding of social issues and emotional support in decisions that affect the mother and the rest of the family (Coutsoudis, 2005; Raisler & Cohn, 2005; UNICEF *et al,* 2004).

2.3.3 HIV AND COMPLEMENTARY FEEDING

From birth to six months of age, milk in some form is adequate as the only source of nutrients and energy to fulfil all the needs of the baby. At six months of age, however, breastmilk or breastmilk substitutes are no longer adequate to meet all of the infant's nutritional needs. Therefore, complementary feeding – any manufactured or locally

prepared food given to an infant as a complement to breastmilk is essential to ensure adequate nutrition and growth. All infants either exclusively breastfed or formula-fed should be introduced to solid food at 6 months of age. An infant breastfed by an HIV positive mother is better able to tolerate undiluted animal milk and a variety of semi-solid foods at six months. Therefore the options for replacement feeding become: safer, less difficult and less expensive than replacement feeding at an earlier age (LINKAGES, 2004; WHO, 2003).

The WHO (World Health Organisation) guidelines, recommend that, at six months post-partum, HIV negative mothers and those who do not know their HIV status have the option of complementary feeding combined with continued breastfeeding until two years. On the other hand, an HIV positive mother should abruptly cease breastfeeding after six months and her feeding options should include heat-treated milk combined with complementary feeding, or breast milk substitutes combined with complementary feeding. Transition from breastfeeding to replacement feeding involves brief mixed feeding. Transition involves, cup feeding of expressed breast milk between regular breastfeeds. Thereafter, one feeding at the breast is eliminated at a time once the infant accepts cup-feeding. Once transition is complete, feed only the breastmilk substitute. The transition period can take two to three days to two to three weeks, depending on the acceptance by the infant. At six months, mothers who were formula feeding from birth should continue feeding formula and begin complementary feeding (LINKAGES, 2004; Wardlaw & Kessel, 2002; Whitney & Rolfes, 2005; WHO, 2003).

In complementary feeding the mother of the infant should begin with introducing soft appropriate foods. The mother should then increase the amount of food and the number of feedings as the child gets older (Whitney & Rolfes, 2005; Williams, 2001; WHO, 2002). Gradually the mother should increase food consistency and variety as the infant gets older, adapting to the infant's requirements and abilities. At six months of age infants can eat pureed, mashed and semi-solid foods; by eight months of age mothers should give foods that the infant can eat alone, such as cut up fruit and vegetables and other finger foods. By twelve months of age most children can eat family foods. The infant should be fed with a variety of foods to ensure that nutrients are met; particularly protein, vitamin

A-rich fruits, and vegetables (such as paw paw or pumpkin) should be eaten daily. Diets with adequate fat should be provided. Mothers should avoid giving drinks with low nutrient value, such as tea, coffee and sugary drinks such as soda; give 100% pure fruit juice instead. The use of fortified foods such as iodized salt, vitamin A-enriched sugar, iron enriched maize-meal and bread should be encouraged. The mother should give vitamin-mineral supplements when animal products and/or fortified foods are not available. Good hygiene and proper handling of the food are critically important if complementary feeding is to enhance growth, development and health (LINKAGES, 2004; WHO, 2003). (See Table 2.2 for the quantities, sequence and types of food to introduce in complementary feeding (Pillitteri, 1999; Wardlaw & Kessel, 2002; Whitney & Rolfes, 2005; Williams, 2001).

TABLE 2.2 – COMPLEMENTARY FEEDING FROM SIX TO TWELVE MONTHS (Pillitteri, 1999; Wardlaw & Kessel, 2002; Whitney & Rolfes, 2005; Williams, 2001)

Age (Mo)	Food to introduce	Rationale	Feeding frequency
5 - 6	Iron fortified infant cereal mixed with breastmilk, or formula. (Begin with the least allergenic cereal such as rice, then barley, oats or corn. Wheat should be last because it's the most allergenic)	Helps prevent iron deficiency anemia; the least allergenic type of food. An easily digested food.	2 – 3 times a day
7	Vegetable (particularly mashed potatoes, butternut, peas avoid canned vegetables)	Good source of Vitamin A. Adds new texture and flavours to diet	2 – 3 times a day
8	Fruit (Applesauce, pears and bananas are usually well tolerated, serve fruit juice in a cup in moderation, avoid canned fruit)	Best source of vitamin C, good source of vitamin A. Adds new textures and flavours to diet	2 – 3 times a day

Age (Mo)	Food to introduce	Rationale	Feeding frequency
9	Meat (beef, poultry, avoid fatty meats)	Good source of protein, iron and B vitamin	3 – 4 times a day 1 – 2 times a day snack
10	Egg yolk (egg white should be introduced in small quantities towards the end of first year as it is most allergenic)	Good source of iron	3 – 4 times a day 1 – 2 times a day snack
12	Table food		3 – 4 times a day 1 – 2 times a day snack

Mo – months

2.2.4 MOTHERS' KNOWLEDGE OF INFANT FEEDING PRACTICES

In a study on mother-to-child transmission of HIV, the level of mothers' knowledge was reported to be 47.7%. Assessment of knowledge is indispensable in order to understand and explain beliefs/attitudes and behaviour. The knowledge levels vary across countries, and the level of knowledge reveals efforts exerted towards alleviating the prevalence of HIV in a country or area (Ministry of Health and Child Welfare & UNICEF Zimbabwe, 2004; Omari, Luo, Kankasa, Chipepo, Bhat & Bunn, 2003; Walter, Royce, Fernandez, Dehovitz, Ickovics & Lampe, 2001). In a study conducted in Lusaka, 85% of HIV infected mothers were knowledgeable about the risk of transmission of HIV through breastfeeding. A study conducted in four states of America found that mothers lacked basic knowledge about perinatal transmission of HIV; in particular knowledge about breastmilk transmission was reported correctly by only 60% of women (Walter *et al*, 2001). Another study conducted in Zimbabwe, showed a low level of knowledge of transmission of HIV from mother-to-child; it was found to be 17% in Makoni Region and 27% in Tshololo Region (Ministry of Health and Child Welfare & UNICEF Zimbabwe, 2004).

On general infant feeding, 98% of rural Jamaican mothers indicated satisfactory breastfeeding knowledge (Chatman, Hamisu, Salihu, Michele, Roofe, Wheatle, Henry & Jolly, 2004). Moreover, in Hong Kong 90.4% of mothers were knowledgeable about general breastfeeding practices (Kong & Lee, 2004). Other research studies have shown positive results on the mothers' knowledge of infant feeding practices by HIV positive mothers (Ministry of Health and Child Health & UNICEF Zimbabwe, 2004). A study conducted in two regions in Zimbabwe found that mothers from the Makoni and Tshololo Regions in Zimbabwe were knowledgeable about infant feeding practices by HIV positive mothers (Ministry of Health and Child Welfare & UNICEF Zimbabwe, 2004). In contrast another study conducted in the rural areas of Zimbabwe found that mothers were least knowledgeable about infant feeding practices by HIV positive mothers (54.8%) (Orne-Gliemann, Mukotekwa, Perez, Miller, Sakarovitch, Glenshaw, Engelsmann & Dabis, 2006).

2.4 BELIEFS

2.4.1 MOTHERS' BELIEFS ON INFANT FEEDING PRACTICES

The theory of planned behaviour posits that knowledge as a component of perceived behavioural control influences behaviour indirectly through beliefs/attitudes and intentions and choice of feeding practice for the infant (Worsely, 2002). A recent study on feeding attitudes among South African women reported that assumed health benefits to the infant was the major reason for breastfeeding (Galler, Harison, Ramsey, Chawla & Taylor, 2006). Other positive perceptions regarding breastfeeding are that it promotes maternal-infant bonding, it is more natural, economical, convenient, satisfying and it is more enjoyable for the mother. On the other hand, women who feed their infants formula milk believe that bottle feeding is easier, less embarrassing, more compatible with work or school, not associated with uncomfortable complications such as sore nipples, more reassuring because they can visualize the amount of milk the baby is ingesting, and easier for someone else to feed the baby when necessary (Moore & Coty, 2006).

However, in the context of HIV, several studies have been conducted in countries including Thailand, SA, and Zambia on women's attitudes towards infant feeding and

HIV (Bond, Chase & Aggleton, 2002; Kiarie, Richardson, Mbori-Ngacha, Nduati & John-Stewart, 2004; Talawat *et al*, 2002). Thai women's attitude towards breastfeeding was generally positive but in the context of HIV it was negative. Most of the mothers supported that an HIV positive mother should not breastfeed. They perceived HIV as a circumstance for a mother to not breastfeed. On the other hand, 66% of mothers expressed their fears that not breastfeeding was associated with uncovering HIV status (Talawat *et al*, 2002). In a PMTC study in Zambia and SA the mothers expressed negative views about not breastfeeding. The majority of the mothers felt that the society would not accept them if they were not breastfeeding (Thairu, Pelto, Rollins, Bland & Ntshangase, 2005; Omari *et al*, 2003). Stigma has shown to impede efforts to work effectively with mothers in reducing mother-to-child transmission of HIV (Bond *et al*, 2002). Lastly, a PMTC conducted in Zimbabwe revealed that mothers generally had positive beliefs on maternal health indicating to be sensitised on this aspect (Ministry of Health and Child Health & UNICEF Zimbabwe, 2004).

2.4.2 RELATIONSHIP BETWEEN KNOWLEDGE, BELIEFS AND BEHAVIOUR

The theory of planned behaviour describes that knowledge influences behaviour indirectly through attitudes by encouraging a different set of beliefs among individuals (Worsley, 2002). Limited literature exists on the relationship between the knowledge and attitudes in the context of HIV. Studies that have identified a positive relationship between knowledge and attitudes include a study by Kang, Song & Im (2005), who found a statistical significant relationship between breastfeeding knowledge and attitudes among Korean university students. Another study by Spear (2004) found a positive relationship between the nurses level of knowledge and attitude scores. This indicated that when nurses were knowledgeable they were positive about breastfeeding.

A positive relationship between the two concepts has been studied to result in a proper infant feeding practice in mothers. However some studies prove the opposite. A study in Thailand found that mothers who practiced replacement feeding had high knowledge on transmission of HIV through breastfeeding but had negative attitudes towards breastfeeding. This discrepancy could have resulted from the Thai infant feeding

guideline that recommended exclusive formula feeding to all mothers (Talawat *et al*, 2002). The success of infant feeding interventions depend on a clear understanding of knowledge and attitudes that facilitate or hinder the appropriate infant feeding practice (Kang *et al*, 2005).

Knowledge could directly influence behaviour as described by the theory of planned behaviour (Baron & Byrne, 2003; Goksen, 2002). A study conducted in Nairobi, Kenya, found that exclusive breastfeeding was associated with better knowledge about prevention of mother to child transmission of HIV (Kiari *et al*, 2004). Moreover, Shaker, Scott & Reid (2004) in their study found that mothers who were breastfeeding had higher knowledge and positive attitudes towards breastfeeding compared to mothers who were formula feeding. However, knowledge of MTCT does not always warrant positive behaviour as the rate of exclusive breastfeeding in Swaziland was reported to be low at 31.2% whilst the knowledge of PMTC was 47.7% (Swaziland Ministry of Health and Social Welfare, 2003). This showed that knowledge did not directly influence behaviour. Moreover, a study conducted in Jamaica found that there was no difference between mothers who practiced exclusive breastfeeding and partial breastfeeding with respect to knowledge and attitudes towards breastfeeding (Chatman *et al*, 2004).

Beliefs towards infant feeding methods are dominant predictors of infant feeding choice (Wambach, 1997). Moreover, feeding beliefs have been recognized as being stronger predictors of the choice and duration of breastfeeding (Galler *et al*, 2006). When attitudes and behaviour are measured at the same level of specificity, the ability of attitudes to predict behaviour is strong (Baron & Byrne, 2003). The theory of reasoned action and planned behaviour as explained earlier clarify the link between attitude and behaviour. Women tend to have more positive attitudes toward the feeding method of their choice (Wambach, 1997).

2.5 OTHER FACTORS INFLUENCING BELIEFS TOWARD INFANT FEEDING

2.5.1 SOCIAL SOCIETY AND PERSONAL NETWORKS

The attitudes of the social referents (partner, close family, medical professionals and friends) influence the mother's decision regarding infant feeding choice (Lawrence & Ruth, 1999:208). Many people generally harbour strong opinions regarding breastfeeding. Such opinions include evaluations of whether each infant feeding choice is good or bad for the mother and/or the infant and beliefs about the infant feeding choices such as how long women should breastfeed (Swanson & Power, 2005). More importantly, these attitudes influence the rate of success of infant feeding more negatively than positively (Lawrence & Ruth, 1999:208). For example, a study on feeding practices in Limpopo, South Africa, revealed that mothers take advice from older relatives on feeding their babies. The elders advised the mothers to start giving infants a herbal mixture early in life because they considered it as the basic traditional way of introducing food in the community (Mamabolo, Alberts, Mbenyane, Steyn, Nthangeni, Delemarre-van DeWaal & Levitt, 2004). However, Kang *et al* (2005) found that positive attitudes are more influential than negative attitudes and barriers when all are examined simultaneously. Therefore health professionals should focus on strengthening positive attitudes.

The importance of different social referents may vary in different cultures. Greek women attach greater importance to the views of medical practitioners than do women in Scotland. A mother's infant feeding attitudes and behaviour may also be influenced by what is deemed acceptable in her own culture (Li, Zhang, Scott & Binns, 2005; Swanson & Power, 2005). Health-related behaviours are never truly voluntary, they are a product of culture, and embedded in structures of society (Singh-Manoux & Marmot, 2005). Stigma and secrecy surrounding HIV/AIDS make the choice more difficult in the strong breastfeeding cultures of Africa, because bottle feeding may amount to inadvertent disclosure of her HIV-infection (Raisler & Cohn, 2005). This is evidenced in studies on PMTC conducted in Zambia; mothers cited fear of indirect disclosure of HIV status if seen to practice replacement feeding, and stigmatization of a non-breastfeeding mother as one of the reasons for continued breastfeeding (Omari *et al*, 2003). In the other study on PMTC a clear dilemma for HIV positive women was described. Not breastfeeding the baby was seen as stigmatizing, it was taken as revealing that the mother was infected; yet

women who did not breastfeed were simultaneously accused of killing the baby by not breastfeeding. In response to this, many women just pretended and continued to breastfeed as if all was well. Stigmatization, and the fears that it provokes, can impede efforts to work effectively with pregnant women in reducing HIV mother to child transmission (Bond *et al*, 2002).

Other factors such as physiological factors may have an influence on attitudes. The perceived physiological ease or difficulty of doing a particular behaviour influences attitudes. For example, early breastfeeding problems such as complaints, insufficient milk, maternal fatigue and infant difficulty with feeding may disrupt the breastfeeding process and interfere with breastfeeding goals (Berridge, McFadden, Abayomi & Topping, 2005; Wambach, 1997). The socio-economic status has been found to be influential on attitudes towards infant feeding. Breastfeeding is a sustainable option for women in most parts of the African continent because it is cheap and available compared to formula feeds (IBFAN, 2000). A study conducted in South Africa revealed that women of higher socio-economic status were likely to prefer feeding formula or other foods to exclusive breastfeeding (Filteau, 2003). In Turkey the shortened duration of breastfeeding and early introduction of complementary feeding was found to be associated with higher economic status and other factors such as education (Goksen, 2002). In most African cultures financial constraints is the major cause for the low use of replacement feeding (Kiari *et al*, 2004).

Other factors such as demographic factors are viewed as indirect determinants of a mother's choice of infant feeding (Baron & Byrne, 2003; Martens and Kue-Young, 1997). A study conducted in Uganda and Tanzania found that infant feeding practice was associated with education, age and urban residence. Women with higher education tended to breastfeed for shorter periods compared to those with lower education, and younger women were likely to breastfeed less compared to older mothers. Lastly women living in urban areas were less likely to feed up to two years (Poggensee, Schulze, Moneta, Mbezi, Baryomunsi & Harms, 2004).

Where a woman has not previously had children, social referents may be important, as she may be more likely to seek or consider others' opinions in making her initial choice, and may lack confidence in her own decision to continue breastfeeding compared to women who have already experienced breast or bottle feeding (Swanson & Power, 2005). A partner's or mother's support therefore facilitates breastfeeding (Lawrence & Ruth, 1999; Moore & Coty, 2006). Although many studies have noted the influence of the mother's husband or partner, her own mother would merit more detailed study, particularly in relation to different socio-cultural contexts. The mother's own mother is also influential on mothers' infant feeding and they differ according to socio-cultural context (Swanson & Power, 2005).

2.5.2 FATHER'S BELIEFS

Fathers have been found to be very influential on the mother's infant feeding choice. Partner's disapproval of breastfeeding has been identified as a barrier, whereas partner's support facilitates breastfeeding (Lawrence & Ruth, 1999). A woman whose husband is not supportive of breastfeeding weans early, or does not start at all. Some fathers believe that breastfeeding interferes with sexual relations and makes the breasts ugly. Other negative beliefs on breastfeeding by fathers include jealousy of the physical and emotional closeness of the nursing mother and child. The degree of jealousy may reflect how much and how happily the mothers breastfeed (Lawrence & Ruth, 1999; Moore & Coty, 2006). On the other hand some men take pride in the knowledge that their infants will be breastfed and support their wives in this effort (Lawrence & Ruth, 1999:210). The negative attitudes of fathers point to the importance of incorporating fathers in infant feeding interventions (Lawrence & Ruth, 1999; Li *et al*, 2005).

It is of interest to take into account the mothers view about the fathers influence. A study in Hong Kong found that mothers reported that most fathers wanted their babies' breastfed. On the contrary, other studies conducted in Scotland and Western Australia found a few fathers to be supportive of breastfeeding (Li *et al,* 2005; Swanson & Power, 2005). Fathers have been found to be very influential on the mothers' infant feeding choice (Lawrence & Ruth, 1999; Shaker, Scott & Reid, 2004). A study by Kong and Lee

(2004) in Hong Kong found that mothers rated fathers as the most important influencers in their infant feeding practices. Moreover, in contrast, a study conducted in KwaZulu Natal, South Africa found that the infants' grandmothers were most influential in the mother's infant feeding choice followed by nurses (Kassier *et al*, 2003).

2.5.3 MEDICAL PROFESSION

A supportive physician can influence the number of breastfeeding mothers in the practice. The knowledgeable medical and psychologic support increases the success rate of breastfeeding. In addition, the enthusiastic physician will attract patients to the practice who are already successfully breastfeeding but find their own physician unable or unwilling to support their efforts (Lawrence & Ruth, 1999:208). The adequacy of health professionals' performance in the promotion of breastfeeding has been questioned in the health sector. In a study by Moore & Coty (2006) on assessment of health professionals' (nurses and doctors) attitude and support, mothers perceived a lack of support from health professionals and receiving conflicting advice about breastfeeding from health professionals and this brought frustration and confusion. However, some studies have found nurses to be very supportive towards breastfeeding (Swanson & Power, 2004). The lack of support from health professionals merits the importance of research and intervention to improve physician's service delivery to mothers and to promote appropriate infant feeding for mothers, particularly HIV infected mothers. On the other hand the support of health professionals indicates the necessity to encourage nurses to offer continued support.

2.6 INFANT FEEDING PRACTICES OF MOTHERS

Continued breastfeeding is a norm in most African cultures (UNAIDS, 2002; UNICEF *et al,* 2004). It can extend to two years; up to 94% of infants in the world are estimated to be ever breastfed, 79% to continue at one year, and 52% at two years, with an estimated median duration of breastfeeding of 21 months (UNICEF *et al*, 2004). In a study conducted in eighteen African countries, the findings revealed that an average mother in Africa breastfeeds for 18 – 25 months (SARA project, 2001). Continued breastfeeding poses a threat to child survival if the mother is HIV-infected, as the risk of HIV

transmission is higher with extended breastfeeding duration. Moreover, continued breastfeeding has been reported to be associated with malnutrition in under-resourced countries. In a study conducted in Zambia malnutrition prevalence has been observed in infants who breastfeed beyond 12 – 18 months. This may be because complementary foods in developing countries may not be adequate in quantity (Omari *et al*, 2003). In Lusaka, Zambia, the intended median duration of breastfeeding was 20.5 months and 100% (n=85) of uninfected mothers were breastfeeding while 98.2% (n = 54) of infected mothers were reported breastfeeding. The mean duration of breastfeeding was found to be 18 months in Uganda and 24 months in Tanzania (Poggensee *et al*, 2004). With breastfeeding as the only sustainable infant feeding option, prolonged breastfeeding will continue to persist in most African continents. Moreover the safe alternatives are usually unavailable, unaffordable or culturally unacceptable (Kourtis *et al*, 2003; Raisler & Cohn, 2005).

The practice of exclusive breastfeeding is rarely understood by most mothers in African countries (Mamabolo *et al*, 2004). Although breastfeeding is commonly practiced in Africa, exclusive breastfeeding for the first six months as recommended by WHO, is uncommon. This is mainly due to early introduction of complementary feeding (Mamabolo *et al*, 2004). WHO define exclusive breastfeeding as feeding the infant with only breastmilk and no other liquids or solids with the exception of drops or syrup consisting of vitamins, mineral supplements, or medicines (WHO, 2003). In most African countries the exclusive breastfeeding rate is low; in SA the rate was found to be 10.4% compared to 29% in Botswana, 15.5% Kenya, 19.6% Nigeria and 31.2% Swaziland (Swaziland Ministry of Health and Social Welfare, 2003; WHO, 2000). The tendency is the decrease of the practices as the infant grows. In KwaZulu Natal, SA exclusive breastfeeding was the method of choice in the zero to six weeks-aged infants and mixed feeding was common in the 6 – 14 weeks aged infants (Kassier *et al*, 2003). In Limpopo, South Africa, the exclusive breastfeeding rate declined from 44% when the infants were aged one month to 10 % by three months of age (Mamabolo *et al*, 2004). However, in other countries recent studies on infants have shown improvements in exclusive breastfeeding. The study in KwaZulu Natal province in South Africa reported that 32.1 %

and 43.5% of infants were exclusively breastfed in non PMTC and PMTC clinics respectively (Kassier *et al*, 2003). Exclusive breastfeeding carry a lower risk of transmission of mother to child of the HIV virus compared to mixed feeding (Coutsoudis, 2005).

Breastfeeding initiation has been reported to be delayed in some cultures. Breastfeeding initiation is traditionally delayed while water and herbal infusions are given to the baby to cleanse the stomach. Research reveals that the baby should be breastfed after birth (Brown *et al*, 2002; Wardlaw & Kessel, 2002; Whitney & Rolfes, 2005). The mother should be encouraged to breastfeed the baby whenever the baby wants to. This is often called demand or unrestricted breastfeeding. The breasts feel soft and empty in the first few days after birth. Only a small amount of yellowish first milk, called colostrum is secreted. The colostrum is healthy and enough for the baby to grow. The breasts will feel full after a few days and start to produce a lot of milk. This is referred to as the milk has 'come in'. The proper quantities of milk production may take two days or nearly a week. Milk is produced more quickly if demand feeding is practiced, resulting from hormonal stimulus (King, 2002).

Most mothers have been reported to give their infants water, juice and solids at an early age (Davies-Adetugbo, 1997; Filteau, 2003). A study on exclusive breastfeeding revealed that none of the participants believed that exclusive breastfeeding was possible for one day. They had deeply-rooted cultural beliefs that water was essential for infants to quench thirst and prevent indigestion and constipation. Their belief was that water should be given to the infant from birth. Water, glucose water and herbal teas were given to cleanse the baby's stomach (Davies-Adetugbo, 1997). Common reasons cited by mothers for giving food include that milk alone is not enough and that the baby cries (Kakute *et al*, 2005; Kruger & Gericke, 2001). In Limpopo Province in SA the most common reasons mentioned by mothers for the introduction of food were that milk was not enough to satisfy the baby, that the baby cried and that the mother did not cope with breastfeeding (Kruger & Gericke, 2001). Another study found that 20% (n = 64) of mothers introduced complementary food because breastmilk was not enough to satisfy the baby (Kakute *et al*,

2005). Other factors that are generally attributed to the early introduction of complementary feeding are: the mother's belief that she does not have enough milk, separation of the mother from the infant due to work or schooling, breast-related problems and lack of adequate information from the health workers about the importance of breastfeeding (Mamabolo *et al*, 2004). Breastfeeding practices have been found to be riddled with traditional beliefs all over the world including practices such as giving food to prevent infant from crying (Greiner, 2002; Kakute *et al*, 2005). A study on cultural barriers to exclusive breastfeeding in Cameroon revealed that mixed feeding was known to be an old practice encouraged by village elders (Kakute *et al*, 2005).

In the context of HIV, most mothers continue to choose breastfeeding over formula feeding. Reasons that have been cited for choosing breastfeeding include deeply-rooted traditional beliefs, positive health education messages promoting breastfeeding as being the best, stigmatization of non-breastfeeding mothers and the high cost of replacement feeds (Omari *et al*, 2003)

The option most likely to be chosen by HIV infected women who do not wish to risk breastfeeding their infants is complete replacement with formula or food from birth. This is evident in PMTC interventions conducted in both Botswana and Thailand. Upon counselling, women were able to make their own decision on whether to formula-feed or breastfeed (Botswana Ministry of Health and UNICEF Botswana, 2002; Talawat *et al*, 2002). In Thailand, 27% of mothers chose formula feeding upon counselling solely because they were HIV positive (Talawat *et al*, 2002). In Botswana 87% of HIV-infected mothers in the period of one to six weeks after birth, chose exclusive formula feeding because of their HIV positive status (Botswana Ministry of Health and UNICEF Botswana, 2002).

The major complementary foods vary from country to country but maize is observed to be popular in a number of African countries. In the national food consumption survey conducted in SA in 1999, maize, sugar, tea, brown bread and margarine were the six most common foods consumed by infants (Vitamin Information Centre, 2001). Furthermore, in

Nigeria and Tanzania the main food given to children was maize, either as solid porridge or as liquid porridge (Poggensee *et al,* 2004). In Limpopo Province in SA, stiff and soft maize porridge, sugar, tea, and brown bread were the most consumed foods in the area (Kruger & Gericke, 2001). A recent study in Limpopo further revealed that maize meal was still the major complementary food in the area (Mamabolo *et al*, 2004).

In conclusion the theories describe a link between knowledge, attitudes and behaviour. However, the relations are not always as predicted by the theories, and knowledge is not always positively influential on attitudes and behaviour. Attitudes can be influenced by other factors such as culture, physiological factors and socio-economic status. The background theories and the literature consulted were built in the structure of the research study in order to achieve the aim and objectives of the study. The methodology adopted is discussed next.

CHAPTER 3 METHODOLOGY

3.1 INTRODUCTION

Methodology refers to the general approach the researcher takes in carrying out the research project; to some extent, this approach dictates the particular tools the researcher selects. Therefore this chapter presents the research design and procedures adopted in producing the data.

3.2 RESEARCH DESIGN

A cross-sectional, descriptive survey was conducted to address the research problem. A quantitative approach was adopted as figures/numbers were assigned and used to measure knowledge and beliefs of mothers regarding infant feeding practices in the context of HIV/AIDS (Babbie & Mouton, 2001). A qualitative research technique (focus groups) was used for the purpose of validation and support.

3.3 AIM AND OBJECTIVES

The main aim of the study was to describe the knowledge and beliefs of Swazi women with infants aged 0 – 6 months in the Gilgal area, Swaziland regarding infant feeding practices in the context of HIV/AIDS.

Objectives

1. To describe the knowledge of mothers in the Gilgal area regarding HIV and infant feeding practices.
2. To describe the beliefs of mothers regarding HIV and infant feeding practices in the Gilgal area.
3. To describe the infant feeding practices of mothers in the Gilgal area with reference to the presence of HIV/AIDS.
4. To describe the role/influence of social references on the mothers beliefs towards infant feeding practices.
5. To describe the relationship between knowledge and beliefs regarding HIV and infant feeding practices of mothers in the Gilgal area.

6. To describe the relationship between knowledge, beliefs and infant feeding practices regarding HIV and infant feeding of mothers in the Gilgal area

3.4 CONCEPTUAL FRAMEWORK

This framework outlines the structure of the development of this study. It links knowledge, attitudes and practices.

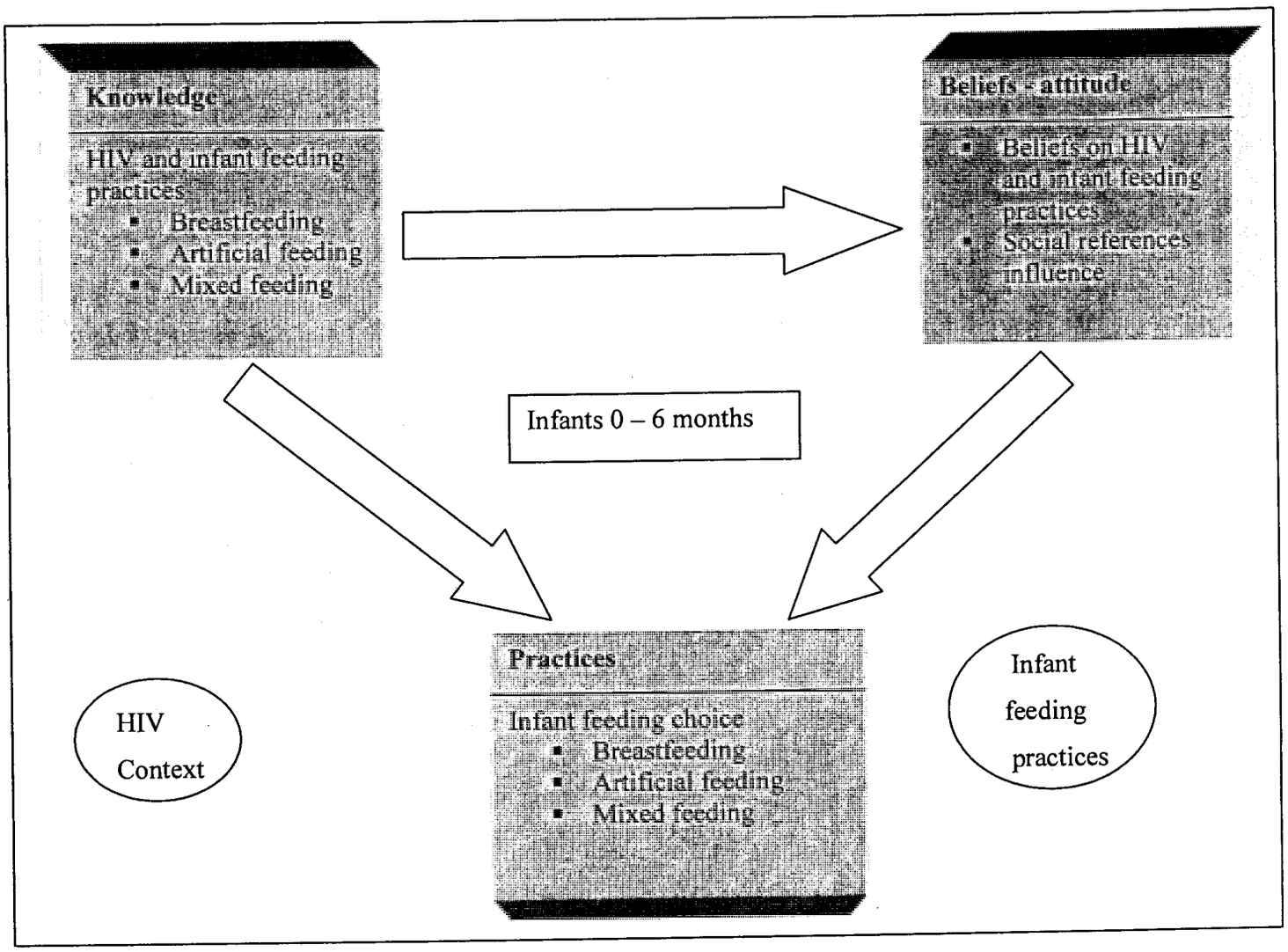

FIGURE 3.1: CONCEPTUAL FRAMEWORK FOCUSING ON THE RELATIONSHIP BETWEEN KAP

For this study, as the theoretical bases, theoretical triangulation was used to combine the theory of reasoned action (TRA) and the theory of planned behaviour (TPB). Also, the major concepts from the review of literature on knowledge, attitudes and practices on infant feeding have been considered in the development of the study model. The TRA-TPB is a comprehensive, theoretically-based, empirically-verified model that can help understand the personal motivational components of infant feeding behaviour (Kang *et al*, 2005). The theories suggest that the best predictor of how a person will act in a given situation is the strength of his/her intention with respect to that situation. The intention is strongly influenced by attitude. The theory of planned behaviour posits that knowledge as a component of perceived behavioural control influences behaviour indirectly through attitudes and intentions and also directly if it closely reflects actual control. Explicitly, knowledge has an influence on attitude, which in turn affects behaviour; it encourages a different set of beliefs among individuals (Worsley, 2002). Ogden (2000) further states that knowledge can directly predict health behaviours. As illustrated in the framework, assessment of knowledge will include knowledge on HIV and the various infant feeding practices. Attitudes include the mother's beliefs on HIV and infant feeding practices and also the references influence on the mothers feeding practices. Practices will comprise of the mothers infant feeding choice.

3.5 CONCEPTUALIZATION – DEFINITION OF CONCEPTS

KAP – for this study it refers to a study on Knowledge, Attitudes and Practices on infant feeding in the context of HIV. It posits that practices are influenced by the level of knowledge and attitudes regarding each infant feeding method.

Infant feeding practices refer to the adopted methods of nourishing a baby by a mother/ caretaker from birth. Infant feeding may be described according to patterns, timing, frequency and age of the infant (WHO, 2002). Optimal feeding changes with age as the infant grow and develop. For the purpose of this study infant feeding will include exclusive breastfeeding, artificial feeding and mixed feeding.

- Exclusive breastfeeding is when an infant receives only breastmilk and no other liquids or solids, not even water, with the exception of drops or syrups consisting of vitamins, mineral supplements, or medicines.
- Artificial feeding refers to feeding with breastmilk substitutes.
- Mixed feeding refers to feeding both breastmilk or a breastmilk substitute and other liquids or solid foods. In the literature the term mixed feeding is sometimes referred to as complementary feeding (solids). Besides the type of feeding other important dimensions of infant feeding will be studied. These include duration of feeding and age at which solids are introduced (WHO, 2002).

Beliefs –belief is generally defined as a conviction to the truth of a preposition acquired through perception, contemplation or communication. In the psychological sense, belief is a representational mental state that takes the form of a propositional attitude. Propositional attitude is a type of attitude that is defined as a relational mental state connecting a person to a proposition. They are often assumed to be the simplest components of thought and can express meanings or content that can be true or false. In being a type of attitude they imply that a person can have different mental postures towards a proposition, for example, believing, desiring, or hoping and thus imply intentionality. Therefore a belief is composed of both positive and negative evaluation of a particular behaviour and comprises outcome expectations (Ogden, 2000; Vereecken, Damme & Maes, 2005). In the context of this study beliefs will refer to beliefs of the mothers towards infant feeding options in the context of HIV. Beliefs will include mother's beliefs on HIV and breastfeeding, artificial feeding and mixed feeding. Also it will include the influence of social referents on the mother's attitude towards infant feeding practices. In the literature the term beliefs is sometimes referred to as attitude.

Knowledge – is cognition that meets both the meaning standards of the understanding and the truth standards of reason. Cognition refers to general rules of finding objective meaning relations within the manifold of sense. It is a cognition that has attained certainty, can be communicated and can be fit into a system of science (Makkreel, 2003). It is also referred to as a collection of true facts. In addition it is a system of beliefs –

what psychologists refer to as schema and meta-schema that is skeletal frameworks on which beliefs or facts are based (Worsley, 2002). In the context of this study knowledge will refer to the mother's level of knowledge regarding infant feeding practices in the context of HIV.

3.6 LIMITATIONS

The data on the infant feeding practices were reported by the mothers during the survey, richer data might have been obtained had it been possible to observe the mothers at home, but this was not possible due to limited resources (time, money and research assistants). The mothers were not chosen randomly but from the group that voluntarily attended at the clinic.

3.7 POPULATION AND SAMPLING

The study population comprised of mothers with infants aged zero to six months old attending at Gilgal clinic in the Manzini region in Swaziland (see Figure 3.2). A stratified sampling technique was used in selecting the subjects; the ultimate function of stratification was to organize the population into homogenous subsets and to select an appropriate number of elements from each (Babbie & Mouton, 2001). Therefore the mothers of infants were divided into three categories according to age namely: birth to two months, greater than two months to four months and greater than four months to six months. Moreover breaking down the six months age category into shorter periods of two months intervals ensured an even distribution of infants in the zero to six months age group and also according to feeding patterns of infants that vary according to age (Lung'aho, 1999). In Sub Saharan Africa, a majority of mothers usually manage to practice exclusive breastfeeding from birth to two months, and start introducing food to the infant's diet at three to four months or at five to six months of age. The greater than four months to six months age category was included mainly to measure the recommended exclusive breastfeeding rate in the context of HIV. The initial target was 100 mothers of infants aged zero to six months, however, the sample was sized down to 91 mainly because the mothers were discovered to have infants older than the targeted zero to six months age. Permission to conduct the study was sought and approved by the

Ministry of Health and Social Welfare (see Addendum A and B) A consent form outlining the purpose of the study and ethical issues was to the mothers upon signing (see addendum C).

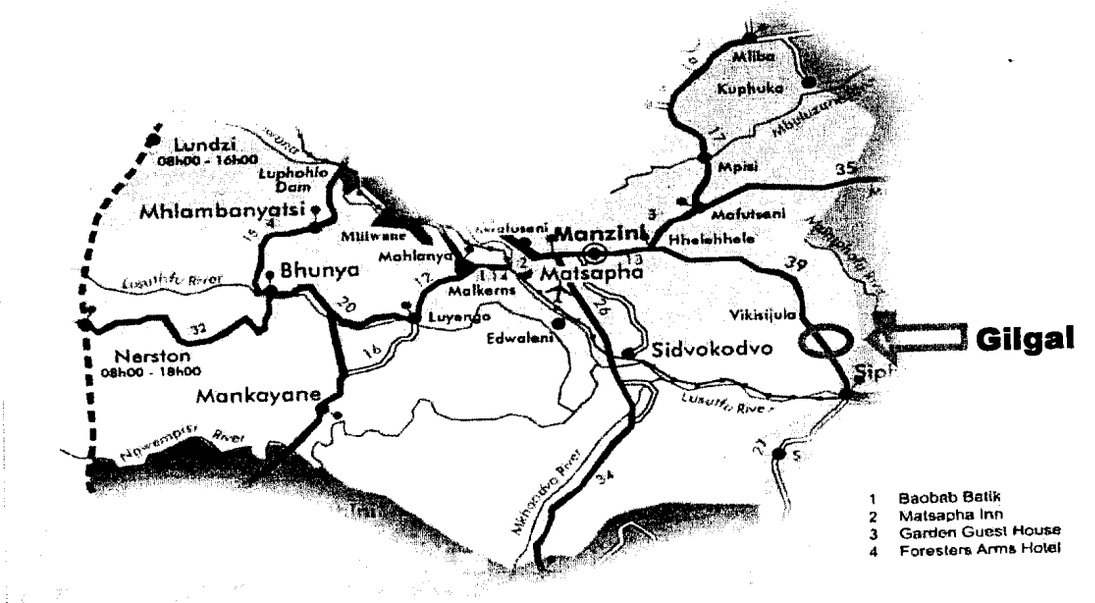

FIGURE 3.2: MAP LOCATING GILGAL AREA

3.8 MEASURING INSTRUMENTS

An adapted 24-hour recall (24-h), a questionnaire on knowledge and beliefs and focus groups on knowledge and beliefs were used to collect data for the study.

3.8.1 24-HOUR RECALL

The 24-h recall methodology is recommended by WHO and UNICEF to assess the feeding patterns (Lee & Nieman, 2003; Lung'aho, 1999; WHO, 2002). It has been widely used and found appropriate in surveys of dietary intake. The 24-h recall reflects current infant feeding status as the respondent is asked to recall in detail all the food and drink consumed in the past 24 hours (Lee & Nieman, 2003). The interviewer helps the respondent remember all that was consumed during the period in question and assists the respondent in estimating portion sizes of food. Questions in the 24-h recall clearly specify the reference time period, and are more consistent and comparable, and are therefore more useful for evaluation purposes. Recall bias is minimized compared to retrospective

data: asking mothers when they stopped or started particular feeding practices (longer periods) which tends to produce a heaping of data. The 24-h recall for this study was adapted in that it tried not only to record current status but also the feeding history (see Addendum D). Moreover it was not intended to collect information on nutritional adequacy of infant feeding.

3.8.2 NUTRITION KNOWLEDGE QUESTIONNAIRE

The questionnaire comprised of questions that measured knowledge of mothers regarding infant feeding practices in the context of HIV/AIDS. The questionnaire was administered by the interviewer in the mother's native language (see Addendum D). A four point scale with end points of true, false, uncertain and don't know was used to measure mother's level of knowledge. Probing questions were included to validate the four point scale questions. The score for the knowledge questions was fifteen.

3.8.3 BELIEFS/ATTITUDE QUESTIONNAIRE

Attitudes were measured by asking mothers questions regarding their beliefs towards infant feeding options regarding HIV (see Addendum D). A three point scale with end points yes, no and uncertain was used. The questions were validated with probing questions. The attitude score for the attitudes questions equalled seventeen. Also included were questions that were aimed at measuring the influence of significant others on the mothers infant feeding practices and motivation to comply with the significant others.

3.8.4 FOCUS GROUPS

Focus groups were used to further describe KAP, to add depth to the data and to triangulate. Focus groups are the most appropriate method for exploring social norms and personal opinions, allowing participants to talk freely about their own and others behaviour. A key feature of a focus group is the use of group interaction to produce data and insights that would be less accessible without the interaction found in a group (Abel, Park, Tipene-Leach, Finau & Lennah, 2001). People are more inclined to part with information when support of others is apparent. The tone of group interactions is such that people feel willing to express themselves on sensitive or long repressed topics

(Lindlof & Taylor, 2002:182). A discussion guide (see Addendum E) was used in conducting the session; the researcher introduced certain themes which guided the focus groups towards the study objectives. The themes on knowledge were: general breastfeeding period, differences in feeding the infant between HIV positive and negative mothers and breastfeeding by a mother who develops AIDS. The themes on beliefs were: Breastfeeding versus formula feeding, feeding utensils and best feeding option for HIV positive mothers. The themes for social referents were: influences on the mothers' decisions about infant feeding and most influential people.

3.9 OPERATIONALIZATION

The 24-h recall for assessing infant feeding practices was analyzed and interpreted into feeding patterns, breastfeeding practices and infant feeding type that were presented in frequencies, percentages, means and medians. The results was analysed to produce the feeding patterns followed by the mothers. Knowledge and beliefs was analyzed with the scoring system and percentages to determine the level of knowledge and beliefs. Multivariate analysis was used to analyze relationships between the knowledge, beliefs and practices. Focus group discussion on knowledge and attitudes on infant feeding practices were analyzed through content analysis and ethnography. Themes were developed regarding infant feeding in the context of HIV.

3.10 DATA COLLECTION

Data was collected in two phases; interviews were conducted in the first phase (two weeks) and focus groups were conducted in the second phase after finishing the questionnaires. The questionnaire was pretested on two mothers before the study. Permission to conduct the study was sought from the Ministry of Health and Social Welfare. Permission was granted upon review of the protocol. The data collection was done in the month of June 2006. The questionnaire was administered by the researcher to overcome illiteracy and language problems. The researcher and a trained observer facilitated the focus group discussions. Three focus group discussions were facilitated with seven mothers participating in each group. A food parcel was given to the mothers who participated in the focus groups as an incentive.

3.10.1 QUESTIONNAIRE PROCEDURE

A consent form (see Addendum C) was recorded after an elaborate explanation of the purpose of the study, and the relevant ethical considerations in the mother's native language. The ethical issues that were taken account of in the consent form included; purpose of the study, data collection process, adherence to confidentiality, voluntary participation and benefits of the study. Each questionnaire was completed in 15 – 20 minutes by the researcher. The questionnaire consisted of four sections

- Demographic information
- An adapted 24-h recall
- Knowledge questions
- Beliefs questions

3.10.2 FOCUS GROUP PROCEDURE

The procedure for conducting the focus group discussions was as follows:

- Confidentiality, voluntary participation and benefits of the study were explained to the mothers prior to the focus group discussion.
- The discussions were conducted in a spare room in the clinic. The participants were seated around a rectangular table with the researcher/moderator at the head of the table to ensure control over participation.
- The moderator introduced herself and the moderator upon inviting the mothers to introduce themselves.
- Participants were informed about the recording of the discussion. It was explained that the recording was important for report writing.
- Rules were established, emphasis was placed on how the contribution of each participant was important.
- The mothers were informed about the agenda and the outline of the study.
- The focus group discussion adopted two different interviewing styles namely directive and non-directive styles. The directive approach enabled the moderator to have control over the agenda for discussion and the non-directive approach provided greater opportunity for participants' views to emerge, rather than having the moderators imposing issues on them.

The observer made field notes during each session, which were discussed with the moderator immediately after the interview.

3.11 DATA ANALYSIS

Descriptive statistics were done and the data was presented as frequencies, means, medians and percentages. Inferential (Pearson, Spearman and Chi-square) and multivariate (parametric analysis of variance and non-parametric Kruskal Wallis test) statistics were done to establish the relationships between knowledge, beliefs and infant feeding practices. Content analysis and ethnography were used to analyze the qualitative data. Content analysis produces a relatively systematic and comprehensive summary or overview of the data set as a whole, sometimes incorporating a quantitative element. Ethnographic analysis aims to be contextual, i.e. to ground interpretation in the particularities of the situation under study, and it aims to represent the social world from the participants perspective, i.e. to ground interpretation in participants views of 'what is going on' rather than the analyst's view (Silverman, 2004:182-183). The transcriptions were supported by the debriefing interviews held with observer immediately after the discussions in the field. The debriefing was done to avoid omission of data and to verify key points. The researcher listened again to the audiotape of the interviews and compared it with the transcription to ensure that it was correct prior to beginning the analysis.

Content analysis was based on the examination of manifest and latent content. Manifest content refers to the visible, surface content for example counting the number of times a word appears. This method has an advantage of ease and reliability in coding. On the other hand it has a disadvantage of having less validity. Latent content refers to the underlying meaning. This method is not dependant on the frequency of words but the richer and deeper meaning of the word. For example the meaning may be reached after reading an entire sample of paragraphs or pages. The disadvantage of this method is that it has low reliability and specificity (Babbie and Mouton, 2004). The latent and manifest content were therefore both used to complement each other.

The traditions of ethnographic analysis generally rely upon the use of naturally occurring data i.e. data produced independently of the researcher. This is the direct quotation of the group discussion, the words of the participants are taken to provide a 'transparent' window onto what they understand, think, or believe about the concept under study (Silverman, 2004). The group-to-group approach was adopted to analyze the data. A detailed examination of two groups was first carried out. This was done to develop hypothesis and coding schemes that were then applied to the last group. The topics in the guide served as a practical structure for organizing the topic-by-topic analysis of the discussion. The fact that the guide organized each group discussion around the same set of topics in the same order was a strong point during analysis because it facilitated comparison of the groups. Transcription produces voluminous data that needs to be reduced and analyzed (Cassel & Symon, 2004; Henning, 2004). The reduction and analysis involves inductive reasoning and follows a non linear/spiral model of research design. Inductive reasoning involves sorting, categorizing and gradually boiling the information down to abstract, underlying themes (Leedy & Ormrod, 2005). Spiral design allows the investigator to metaphorically, dive in and out of the data as he or she proceeds. In this model a researcher generates new understanding, with varied levels of specificity during each phase of the project. She then uses this information to double back and again for more information. This forms a 'spiralled' approach to knowledge building (Hesse-Biber & Leavy, 2006). The data analysis spiral described by Creswell as quoted by Leedy & Ormrod (2005) was adopted in reducing and analyzing data for this study. See Figure 3.2 for the diagram illustrating the data analysis spiral.

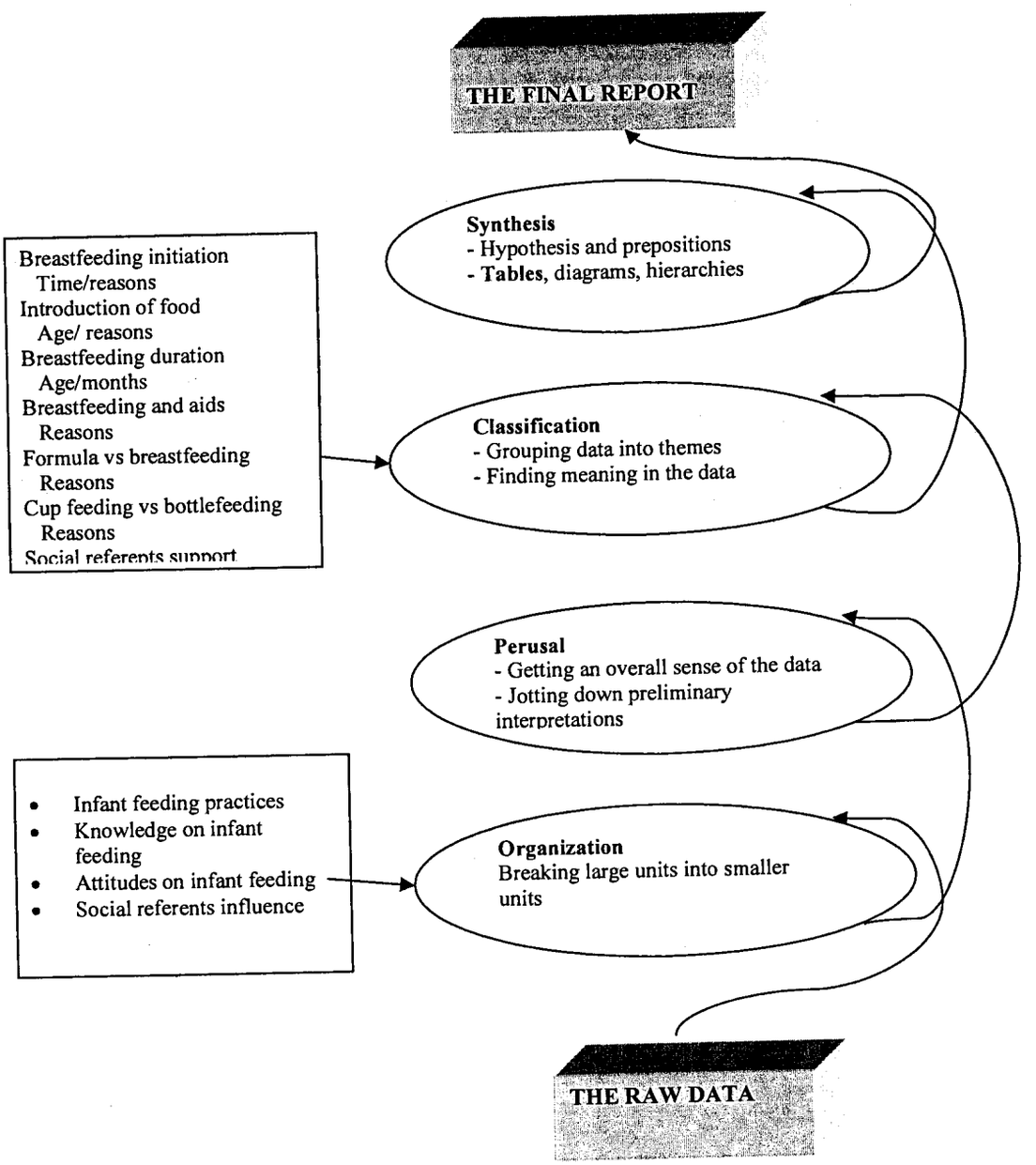

FIGURE 3.3: THE DATA ANALYSIS SPIRAL DESCRIBED BY CRESWELL, 1998 AS QUOTED BY LEEDY & OMROD (2005)

1. Organize the data; break down large bodies into smaller units perhaps in the form of stories, sentences, or individual words.

2. Peruse the entire data set several times to get a sense of what it contains as a whole. In the process, you, jot down a few memos that suggest possible categories or interpretations.
3. Identify general themes and sub-themes and then classify each piece of data accordingly (coding). At this point, the researcher should be getting a general sense of patterns - a sense of what the data mean.
4. Integrate and summarize the data for the readers. This step might include offering propositions or hypotheses that describe relationships among the categories. Importantly, the analysis should truly reflect the respondents' perceptions. Also involve packaging the data into an organizational scheme such as a table, figure or hierarchical diagram.

3.12 VALIDITY AND RELIABILITY

Reliability and validity form an integral part of research as they enhance the quality of a study. In planning an inquiry a researcher is inevitably asked how validity and reliability will be built into a design (Henning, 2004). Reliability has to do with the consistency of observations: whether a research instrument will yield the same results every time it is applied. Validity is defined as the ability of the instrument to measure what it purports to measure. It deals with the truth value of observations (De Vos, Strydom, Fouche & Delport, 2005; Henning, 2004; Lindlof & Taylor, 2002).

3.12.1 RELIABILITY

Reliability is divided into 3, namely stability reliability, representative and equivalence reliability.

Stability reliability concerns comparisons/reliability over time. It refers to the consistency of measures on repeated applications in different time periods. The test-retest method is used for pretesting instruments. Measurement is made more than once to the same group of people, in questionnaires and interviews, only two are made, but always to the same group of people (Babbie & Mouton, 2001; De Vos *et al*, 2005; Kumar, 2004). This was not tested due to time limitation.

Representative reliability is reliability across subpopulations or groups of people. The instrument should be applied and compared over different subpopulations; different races, ethnic groups, age groups etc (Kumar, 2004). In the study this was ensured through adopting the stratified sampling technique which subdivided the infants into three categories.

Equivalence reliability refers to the use of multiple instruments for one construct. The aim is to obtain the same results by using two parallel measurements (Babbie & Mouton, 2001; De Vos *et al*, 2005; Lindlof & Taylor, 2002). There are two methods to examine equivalence reliability:

The split half method randomly divides a test into two halves and determines whether both halves yield the same results. If the two halves differ then it points to a problem in the reliability. This type of validity was not applicable in this research study.

Intercoder/interrator reliability is tested by observation of consistent results from using several coders/observers in a study. The coders should produce the same code for a measurement to ensure reliability (Kumar, 2004). The researcher enhanced this type of reliability by training the moderator to ensure the same coding, however this was not measured

Other techniques for dealing with the basic problem of reliability:

- Using established measures refers to using measures that have proven their reliability in previous research. For this study this has been ensured by using the adapted form of 24-h recall that has been tried and tested in infant feeding.

- Clarity, specificity, training and practice will avoid unreliability. For this study clarity was achieved through conceptualization and use of clear definitions from literature review.

- Moreover the pretesting was done to ensure clarity. The instrument was pretested on two mothers before the actual research.

- Training the moderator was conducted to eliminate coding errors.

- The triangulation principle has been maximized by using three methods namely, the 24 hr recall, questionnaire and focus groups to enhance reliability

3.12.2 VALIDITY

Validity comprises two aspects namely: that the instrument actually measures the concept in question and that the concept is measured accurately (De Vos *et al*, 2005; Lindlof & Taylor, 2002). Validity was classified into two groups namely non-measurement validity and measurement validity

3.12.2.1 Non-measurement validity

External validity refers to the ability to generalize research results to a larger population. This is achieved through random sampling; additionally measurements are repeated several times in different situations (Lindlof & Taylor, 2002). For this study external validity was not determined due to time constraints.

Internal validity refers to the internal design of the research study and means that no errors are present. Potential threats to internal validity include factors in the research context e.g. changes in the instrument, the maturation of participant, reactivity to the measures (Lindlof & Taylor, 2002). It is mainly applicable in experimental research; therefore it was not applicable in this research study.

Inferential validity is when the correct statistical procedure is chosen and its assumptions are fully met. In this study this was ensured by using a qualified statistician (Henning, 2004; Lindlof & Taylor, 2002).

3.12.2.2 Measurement validity

There are four types of measurement validity namely: face validity, content validity, criterion validity and construct validity.

Face validity is when an instrument appears on the face to measure what it intends to measure. It rests on the investigator's subjective evaluation of the validity of a measuring instrument. The relevant question in this regard is: Does the measurement technique look as if it measures the variable that it claims to measure. The judgment that an instrument is measuring what it is supposed to is primarily based upon the logical link between the questions and the objectives of the study (Babbie & Mouton, 2001; De Vos *et al*, 2005; Henning, 2004). For this study face validity was ensured by a thorough study of the literature and consultation with field experts (Supervisor).

Content validity refers to how much a measure covers a range of meanings included within a concept (Babbie & Mouton, 2001; De Vos *et al*, 2005). For the study the 24-h recall and questionnaire was judged for content validity by experts in the field of study (study leader and other experts)

Construct validity is based on the logical relationships among variables. It involves measuring a phenomenon accurately according to what theory or construct would predict. It is for measures with multiple indicators and it is based upon statistical procedures (Babbie & Mouton, 2001; Kumar, 2004; Lindlof & Taylor, 2002). For this study construct validity was ensured by a using knowledge and attitude test that were developed from thorough study of the literature and consultation with field experts (Supervisor). Moreover, the statistician employed the relevant statistical procedures to ensure this validity.

Criterion related validity is based on some external criterion. It uses a standard or criterion that is known to indicate a construct accurately (Babbie & Mouton, 2001; De Vos *et al*, 2005). For this study criterion related validity was not applicable.

The methodology adopted was fruitful in addressing the objectives of the study. The conceptual framework ensured adherence to the aims and objectives of the study. Moreover the validity and reliability built into the study enhanced the quality of the data. Therefore the methodology adopted yielded results that will be presented in the next chapter.

CHAPTER 4 RESULTS

4.1 INTRODUCTION

It is difficult or impossible to explain a huge collection of raw data; therefore an essential part of research is the analysis of the data. The analysis is carried out for the purpose of obtaining answers to the research problem (De Vos Strydom, Fouche & Delport, 2002; Walliman, 2006). Elaborately, analysis means the categorizing, ordering, manipulating and summarizing of data to obtain answers to research questions (De Vos *et al*, 2002:223). The quantitative data and the data from focus groups will be presented concurrently in this chapter. The focus group data was obtained to verify and support the quantitative data. The data from focus groups will be discussed under relevant objectives. Focus group discussions were conducted to gather more in- depth data through discussions on some of the topics in order to verify and support the data from questionnaires. Three focus group discussions were facilitated with seven mothers participating in each group.

Data analysis involved transcribing the interviews and using the debriefing interviews held with the observer immediately after each session (Henning, 2004; Peterson-Sweeney, 2005). The data obtained was then analyzed using ethnographic content analysis. The ethnographic approach refers to the direct quotations from group discussions. Content is the numerical description of the data and the underlying meaning (Flick, Kardorff & Steinke, 2004; Silverman, 2004). Therefore this chapter will present findings obtained from the study in terms of the study objectives. The main objective of the study was to describe knowledge and beliefs of mothers of the Gilgal area with infants aged 0 – 6 months with regard to infant feeding practices in the context of HIV/AIDS. Furthermore, it was to describe the relationship between knowledge, beliefs and infant feeding practices, and the role of social references on the mothers' beliefs towards infant feeding practices.

The findings will be presented in the following order:

- The demographic information of the mothers,

- Feeding practices of mothers with reference to the presence of HIV and AIDS,
- Knowledge regarding HIV and infant feeding,
- Relationships amongst the knowledge, beliefs and infant feeding practices,
- Describing the role/influence of social referents on the mothers' beliefs towards infant feeding practices.

4.2 DEMOGRAPHIC INFORMATION

This study targeted mothers of infants aged 0- 6 months receiving post-natal care at the Gilgal clinic. Gilgal is a rural area located in the Manzini region of Swaziland. The area was selected on the grounds of being located in the region with the highest HIV prevalence rate in the country out of four regions. The criterion for selecting the mothers was based on the age of the infant, mainly because the study primarily sought to obtain information on mothers with infants within the age group 0 – 6 months old. Therefore this group was further stratified into three age groups:

- Group 1 - less than and equal to 2 months,
- Group 2 - greater than 2 months but less than and or equal to 4 months,
- Group 3 - greater than 4 months but less than and or equal to 6 months.

See Table 4.1 for the distribution of the infants.

TABLE 4.1: AGE OF THE MOTHER'S INFANTS (N = 91)

Age	Frequencies (n)	Percentage
Group 1	31	34.0
Group 2	30	33.0
Group 3	30	33.0

The stratification of the six months into shorter periods of two-month intervals ensured an even distribution of infants in the 0 – 6 months age group; moreover, feeding patterns of infants vary according to age (Lung'aho, 1999). In Sub-Saharan Africa, a majority of mothers usually manage to practice exclusive breastfeeding from birth to two months, and start introducing food to the infant's diet at 3 – 4 months or at 5 – 6 months of age. The initial target was 100 mothers of infants aged 0 – 6 months, however, the sample was

sized down to 91 mainly because the mothers were discovered to have infants older than the targeted 0 – 6 months age requirement. Consent of the mother was sought and confidentiality was assured. As shown in the table above, the mothers were almost equally distributed within the three age group categories to ensure a representative sample. The demographic information encompassed the education level and occupation of the mother and father, number of children each mother had and the mothers' age. The education levels of the mothers are shown in Table 4.2

TABLE 4.2: EDUCATION LEVEL OF MOTHERS (N=91)

Level of education	Frequency (n)	Percent (%)
No formal education	7	7.7
Adult education	0	0
Primary	39	42.9
Secondary	45	49.4
Tertiary	0	0

The results reflected that almost half of the mothers had reached secondary education (n=45, 49.4%), and the other half was poorly educated (n=46, 50.6%). None of the mothers had tertiary education. This reflects the low level of education in the community.

The types of occupations were grouped according to their level of skill because skill determines the level of income:

- The professional category included jobs that involved some level of advanced training for example, teacher, police, lawyer, banker, secretary,
- The skilled group included jobs that required some special training albeit not necessarily advanced e.g. mechanic, machine operator, or plumber,
- The semi-skilled group included jobs that did not require some special training, but needed some level of education or training e.g. shop assistants, security guard,
- Manual labour encompassed jobs that did not require skill e.g. maid, cleaner, gardener. Entrepreneur included all jobs in the commerce sector e.g. taxi owner, farmer.

The occupation level of the mothers and fathers are summarized in Table 4.3.

TABLE 4.3: OCCCUPATION LEVEL OF THE MOTHERS AND FATHERS (N=91)

Mothers occupation	Mothers		Fathers	
	Frequency (n)	Percent (%)	Frequency (n)	Percent (%)
Professional	2	2.2	7	7.7
Skilled	5	5.5	26	28.6
Semi-skilled	2	2.2	24	26.3
Manual	4	4.4	8	8.8
Entrepreneur	6	6.6	10	11
Unemployed	72	79.1	16	17.6

The results revealed that most mothers (n=72, 79.1%) were unemployed while a few had skill-related jobs (n=9, 9.9%). Also, a large number of fathers were employed in jobs requiring both skilled and semi-skilled labour. In this community skilled jobs included occupations such as mechanic, miner, plumber, sugar miller, builder, tailor, welder, or electrician, while semi-skilled jobs included occupations such as truck driver, shop assistant, bus conductor, waiter, security guard and soldier. In addition, only a few fathers were employed in the professional sector (n=7, 7.7%). Professional jobs included occupations such as lawyer, banker, secretary, land surveyor, police, and teacher. On the other hand, the low level of mothers with professional jobs is evidence of their lack of tertiary education. On a similar note, concentration of the fathers in the skilled and semi-skilled jobs might also reflect their low level of education. Overall the results reveal that in this community more often than not men tended to be the bread winners than women as exemplified by the disparity in the rate of employment between the two sexes.

The summary of the comparison of the mothers' age with the number of children each mother had is shown in Table 4.4.

TABLE 4.4: COMPARISON OF MOTHERS' AGE WITH THE NUMBER OF CHILDREN BY EACH MOTHER.

Age categories of mothers	Number of children each mother had n (%)									
	1	2	3	4	5	6	7	9	10	Total
16 - 20	14(15.4)	2 (2.2)								16(17.6)
20 – 24	13(14.2)	15(16.5)	5(5.5)	1(1.1)						34(37.3)
25 - 29	3(3.3)	7(7.7)	4(4.4)	3(3.3)			1(1.1)			18(19.8)
30 - 34		1(1.1)	2(2.2)	2(2.2)	2(2.2)		1(1.1)			8 (8.8)
35 - 39			1(1.1)	2(2.2)	1(1.1)	3(3.3)	1(1.1)		1(1.1)	9 (9.9)
≥ 40	1(1.1)		1(1.1)		1(1.1)	1(1.1)		2(2.2)		6 (6.6)
Total of number of children	31(34.0)	25(27.5)	13(14.3)	8(8.8)	4(4.4)	4(4.4)	3(3.3)	2(2.2)	1(1.1)	91 (100)

The mothers' ages ranged from 16 to more than 40 years. Most of the mothers who participated in the study were younger than 30 years (n=68, 74.7%). Also, the older the mother, the more children they had. Most mothers who were less than thirty years had less than four children compared to the older mothers. Of important note is that a majority of mothers who were less than 25 years had only one child (n=27, 29.6%) compared to the older ones (n=4, 4.4%).

4.3 INFANT FEEDING PRACTICES

The infant feeding practices of the mothers were investigated to establish the feeding pattern followed in the community. Infant feeding practices will be discussed under the following headings; breastfeeding practices, infant feeding type, infant feeding pattern.

4.3.1 BREASTFEEDING PRACTICES

The summary of breastfeeding practices of the mothers is shown in Table 4.5.

TABLE 4.5: BREASTFEEDING PRACTICES BY MOTHERS

	N = 91	%
Mother ever breastfed	90	98.9
Mother never breastfed	1	1.1
Currently breastfeeding	86	94.5
Intended duration of breastfeeding (n = 86)		
< 6 months	2	2.2
6 months	17	19.8
12 months	16	18.6
>12 months < 24 months	12	15.2
24 months	37	43.0
> 24 months	1	1.2
Median intended duration	18	

Of the 91 women interviewed 98.9% (n=90) had ever breastfed their babies and only 1.1% (n=1) mother did not breastfeed. Furthermore, most mothers (94.5%, n=86) were still breastfeeding at the time of data collection showing that breastfeeding is still a norm in this community. A larger proportion of mothers intended to breastfeed for 24 months (n=37, 43.0%), and only one mother intended to breastfeed beyond the recommended two years (24 months). The intended median duration of breastfeeding was found to be 18 months. However, the intended duration of six months was reported by only 19.8% (n=17) mothers. Only four mothers had stopped breastfeeding at the time of the study, at less than or equal to two months. The reasons mentioned included 'not enough milk, 'mother working', 'no breast milk' and one mother stopped because she tested HIV positive.

4.3.2 TYPE OF INFANT FEEDING

Categories of exclusive breastfeeding, predominant breastfeeding, complementary feeding and formula feeding/replacement feeding variables were constructed from the cross checking questions asked after the 24-hour recall. The cross-checking questions

included checking if the child was given any of the following: vitamins, mineral supplements, plain water, flavoured water, teas, juice, formula, cereal and traditional medicines. The constructed categories of infant feeding were defined as follows:

- Exclusive breastfeeding allowed infants to receive only breastmilk, and no other feeds with exception to drops or syrups consisting of vitamins, mineral supplements or medicine. Exclusive breastfeeding was determined by considering mothers who breastfed and gave only vitamins, mineral supplements or medicine and no other food or liquid.

- Predominant breastfeeding was defined as breastfeeding and giving the infant water and water-based drinks, fruit juice and sugar water, but no food-based liquid was allowed. Mothers who gave breastmilk and vitamins, mineral supplements or medicine and plain water and or flavoured water, fruit juice and tea were considered under the predominant definition.

- Complementary feeding' which refers to feeding the infant both breastmilk and/or a breastmilk substitute and solid and/or semi solid food, was established through determining the number of mothers who, besides breastfeeding and giving medicine (or not), fed either cereal or infant formula or both. Lastly, mixed feeding included all the mothers who were not practicing exclusive breastfeeding.

- Replacement feeding was defined as giving infants who were not breastfeeding formula and food.

A summary of the type of feeding practiced by mothers with infants aged 0 – 6 months is given in Table 4.6.

TABLE 4.6: TYPE OF INFANT FEEDING BY MOTHERS (N= 86)

	GROUP 1 n (%)	GROUP 2 n (%)	GROUP 3 n (%)	TOTAL n (%)
Exclusive breastfeeding	7 (7.7)	3 (3.3)	0	10 (11.0)
Predominant breastfeeding	12 (13.2)	5 (5.5)	1 (1.1)	18 (19.8)
Complementary feeding	12 (13.2)	20 (21.9)	26 (28.6)	58 (63.7)
Replacement feeding	0	2 (2.2)	3 (3.3)	5 (5.5)

Group 1 - ≤ 2months
Group 2 - > 2months ≤ 4 months
Group 3 - > 4 months ≤ 6 months

Exclusive breastfeeding was not a common practice in this study population as only 11.0% (n=10) mothers were found to be exclusively breastfeeding. In age group 1, only 7.7% (n=7) of mothers practiced exclusive breastfeeding while complementary and predominant breastfeeding was practiced at the same rate (n=12, 13.2%). In age group 2, complementary feeding was common, likewise with age group 3. This indicated that most babies were given complementary food from a very young age. Further, the comparison across the three age groups showed that exclusive breastfeeding was largely done by mothers of infants in age group 1 (7.7%, n=7), the newly born compared with the other age groups.

Predominant breastfeeding was also highly reported by mothers with infants from age group 1 (13.2%, n=12) compared to the other age groups. On the contrary, complementary feeding was highly reported in the older group of infants (50.5%, n=46). This indicated that complementary food was generally given from the age of two months or, at the latest, 4 – 6 months. Only 28.6% (n=26) mothers introduced solid food at the recommended age of 4 – 6 months. Overall, the results reflected that exclusive breastfeeding and predominant breastfeeding was common in the younger infants (age group 1) and declined as the infant grew older. While complementary feeding was highly prevalent in the older group (age group 2 and 3) compared to the others, the trend grew as the infant grew older. Lastly, the low rates of both exclusive and predominant

breastfeeding showed the low level of compliance by all mothers with the WHO recommendation of exclusive breastfeeding for six months.

Further, bottle-feeding was investigated with all the mothers: bottle-feeding was defined as giving the infant anything to drink from a bottle with a teat or nipple. The results reflected that the rate of bottle-feeding was 24.2% (n=22) and this rated fair as it was within the 5 – 29% rate for bottle-feeding (WHO, 2003). A very good rate is between zero and 2%, therefore there is still a gap between the recommendation and the practice (WHO, 2003). Formula feeds for example was the most bottle fed food by mothers (50%, n=11), and the most frequently mentioned reasons for bottle-feeding were related to suckling. The mothers of infants in age group 1 bottle fed because 'a bottle takes more quantity' and also because 'it's easy to measure from a bottle'. While, mothers of the infants of age group 2 bottle-fed because the baby was too young, and could only suckle. Lastly, mothers of the infants of age group 3 bottle-fed mainly because 'the baby could suckle easily from a bottle teat'. Generally, most mothers were inclined to use a bottle because of its different suckling effect. They wanted to give food already but found that the baby could not swallow. Thus porridge/cereal was diluted and presented in a bottle for the baby to drink (suckle).

4.3.3 INFANT FEEDING PATTERN

The meal periods were divided into seven categories namely; early morning, breakfast, morning snack, lunch, afternoon snack, supper and evening snack. The categories were developed based on the feeding meal periods typically followed by most mothers in both this study and the literature. The time was allocated as follows;

- Early morning 3 – 5 a.m.
- Breakfast 6 – 9 a.m.
- Morning snack 10 - 11 a.m.
- Lunch 12 – 1 p.m.
- Afternoon snack 2 – 4 p.m.
- Supper 5 – 8 p.m.
- Evening snack 7 – 10 p.m.

The typical foods consumed were grouped according to the five main food groups (cereals, proteins, milk and its products and fruits/vegetables) and an additional miscellaneous group including items like margarine, sugar, stock etc which is normally added to infant food for flavouring.

The most common used food items given to babies were from the cereal group, (see Table 4.7).

TABLE 4.7: CEREALS/GRAINS /TUBERS IN COMPARISON WITH THE MEAL TIMES

	MEAL TIMES							
Foods	**Early Morning**	**Break Fast**	**Morning Snack**	**Lunch**	**Afternoon Snack**	**Supper**	**Evening Snack**	**Total**
	n (%)	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**N**
Soft porridge	9 (6.4)	32 (22.7)	19 (13.5)	20 (14.2)	28 (19.9)	33 (23.4)		141
Instant maize-meal		4 (20)	4 (20)	2 (10)	6 (30)	4 (20)		20
Stiff porridge		3 (15.8)	3 (15.8)	5 (26.3)	2 (10.5)	5 (26.3)	1 (5.3)	19
Potatoes		2 (20)		3 (30)	1 (10)	4 (40)		10
Commercial cereal		1 (33.3)		1 (33.3)	1 (33.3)			3
Total	9	42	26	31	38	46	1	193

Cereals contributed approximately 21% of the total food intake. Only a few infants were fed starchy foods including cereals, grains or tubers at early morning and evening snack. Main cereals, including soft maize-meal porridge, instant maize meal and stiff porridge were given from breakfast to supper. On the other hand, commercial cereal and potatoes were fed at nearly the same rate. Overall, soft maize-meal porridge was the most highly consumed cereal while commercial cereal was the least fed cereal. Soft maize-meal porridge was mostly fed at breakfast (22.7%, n=32) and supper (23.4%, n=33) while stiff porridge was mostly fed at lunch (26.3%, n=5) and supper (26.3%, n=5). Prominent reasons mentioned by the mothers for feeding of soft porridge included 'infant is hungry', 'food filling to the baby', 'baby big enough to eat', and 'breastmilk not enough'. Porridge was mainly fed because it was believed to make the baby grow healthy, while

commercial cereal solely was given for being soft in texture. Further, instant maize-meal was primarily given because the infant cried and, potatoes were consumed because the baby preferred them to breastmilk.

The consumption of protein foods in comparison with meal times is summarized in Table 4.8

TABLE 4.8: PROTEINS IN COMPARISON WITH THE MEAL TIMES

	MEAL TIMES							
c. Mothers took advice from fathers.	**Early Morning** n (%)	**Break Fast** n (%)	**Morning Snack** n (%)	**Lunch** n (%)	**Afternoon Snack** n (%)	**Supper** n (%)	**Evening Snack** n (%)	**Total** N
Eggs		3 (60)		1 (20)	1 (20)			5
Peanut butter		1 (25)		1 (25)	2 (50)			4
Sugar beans			1 (33.3)	1 (33.3)	1 (33.3)			3
Peanut soup				1 (50)			1 (50)	2
Beef				1 (100)				1
Chicken						1 (100)		1
Total	0	4	1	5	4	1	1	16

Protein foods made up a very small percentage of the foods given to all the infants in the study (2%). The feeding of all the protein foods was accumulated more at lunch than at any other meal, indicating that most proteins were fed at lunch. Eggs were the most fed protein-rich foods whilst chicken was the least fed protein. Overall the feeding of protein foods was poor as evidenced by their low feeding frequency. All the proteins were largely given as an addition to cereals.

The consumption of milk/milk products in comparison with meal times is summarized in Table 4.9.

TABLE 4.9: MILK/MILK PRODUCTS IN COMPARISON WITH THE MEAL TIMES

	MEAL TIMES							
Food	**Early Morning** n (%)	**Break Fast** n (%)	**Morning Snack** n (%)	**Lunch** n (%)	**Afternoon Snack** n (%)	**Supper** n (%)	**Evening Snack** n (%)	**Total N**
Breastmilk	33 (6.7)	106 (21.4)	62 (12.5)	70 (14.1)	109 (22)	108 (21.8)	7 (1.4)	495
Formula	7 (8.3)	17 (20.2)	12 (14.3)	10 (11.9)	23 (27.4)	15 (17.9)		84
Powdered milk		2 (20)	1 (10)	1 (10)	4 (40)	2 (20)		10
Sour milk		2 (33.3)	1 (16.7)		2 (33.3)	1 (16.7)		6
Fresh cows milk		1 (20)	1 (20)	1 (20)		2 (40)		5
Yoghurt					4 (100)			4
Total	40	128	77	82	142	128	7	604

Milk and milk products contributed 65% of the total food intake. A few feedings of milk and milk products were reported at early morning and evening snack, but most feedings occurred from breakfast to supper; in other words, during the daytime hours. Breastmilk was the most fed milk, with most breastfeeding done at breakfast, afternoon snack and supper times. The most popular breastmilk substitute was formula milk, with most of its feedings done at afternoon snack. The overall consumption of powdered milk, sour milk, fresh milk and yoghurt was poor as a few feedings were reported for them. Furthermore, powdered milk, fresh milk, formula and sour milk were chiefly given as an addition to cereals. Other reasons to note for formula feeding included 'the infant cries', 'breastmilk not enough' and 'it washes down food'.

The consumption of vegetables/fruits in comparison with meal times is summarized in Table 4.10.

TABLE 4.10: VEGETABLES/FRUITS IN COMPARISON WITH THE MEAL TIMES

	MEAL TIMES							
Food	**Early Morning** n (%)	**Break Fast** n (%)	**Morning Snack** n (%)	**Lunch** n (%)	**Afternoon Snack** n (%)	**Supper** n (%)	**Evening Snack** n (%)	**Total** N
Green vegetables			1 (20)	3 (60)		1 (20)		5
Pumpkin					2 (66.7)	1 (33.3)		3
Orange juice				2 (66.7)	1 (33.3)			3
Carrot						2 (100)		2
Purity			2 (100)					2
Apple		1 (100)						1
Banana			1 (100)					1
Total	0	1	4	5	3	4	0	17

Consumption of vegetables and fruits was poor as a few feedings were reported in all groups. Moreover, vegetables and fruits made up a very small percentage of the total food intake (2%). Green vegetables were most fed of all vegetables; on the other hand, apples and bananas were least fed of all the fruits and vegetables. There were no fruit or vegetables given at early morning and evening snack. Fruits and vegetables were normally fed between morning snack and supper as evidenced by the clustering of feedings within the meal times falling between the two meal times. The green vegetables were solely given as an addition to cereal/grains and tubers as is common cultural practice.

The consumption of miscellaneous foods in comparison with meal times is summarized in Table 4.11.

TABLE 4.11: MISCELLANEOUS FOODS IN COMPARISON WITH THE MEAL TIMES

	MEAL TIMES							
Food	**Early Morning n (%)**	**Break Fast n (%)**	**Morning snack n (%)**	**Lunch n (%)**	**Afternoon Snack n (%)**	**Supper n (%)**	**Evening Snack n (%)**	**Total N**
Margarine	2 (6.1)	13 (39.4)	4 (12.1)	3 (9.1)	5 (15.1)	6 (18.2)		33
ORT		6 (25.0)	3 (12.5)	4 (16.7)	6 (25.0)	5 (20.8)		24
Sugar		7 (30.4)	2 (8.7)	5 (21.7)	4 (17.4)	5 (21.7)		23
Stock		2 (16.7)	1 (8.3)	3 (25,0)	2 (16.7)	4 (33.3)		12
Salt		1 (20)	2 (40)			1 (20)		4
Total	2	29	12	15	17	21		96

The most frequently fed miscellaneous food was margarine whereas salt was the least used food item. Margarine and sugar were mostly fed at breakfast, while ORT was given during the day time. The margarine, sugar and salt were basically added to cereals/grains and tubers, whilst, ORT were largely given when the infant was sick.

The overall feeding pattern followed by the mothers was established by selecting food items that was fed most frequently from each food category. The summary of the top foods given to infants in this community and the pattern in which it is usually given is shown in Table 4.12.

TABLE 4.12: PATTERN OF INTAKE ESTABLISHED FROM THE MOST FREQUENTLY CONSUMED FOOD ITEMS IN COMPARISON WITH THE MEAL TIMES

	MEAL TIMES							
Food	**Early Morning**	**Break Fast**	**Morning Snack**	**Lunch**	**Afternoon Snack**	**Supper**	**Evening Snack**	**Total**
	N (%)	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**N**
Soft porridge	9 (6.4)	32 (22.7)	19 (13.5)	20 (14.2)	28 (19.9)	33 (23.4)		141
Eggs		3 (60)		1 (20)	1 (20)			5
Breastmilk	33 (96.7)	106 (21.4)	62 (12.5)	70 (14.1)	109 (22)	108 (21.8)	7 (1.4)	495
Formula	7 (8.3)	17 (20.2)	12 (14.3)	10 (11.9)	23 (27.4)	15 (17.9)		84
Green vegetables			1 (20)	3 (60)		1 (20)		5
Margarine	2 (6.1)	13 (39.4)	4 (12.1)	3 (9.1)	5 (15.1)	6 (18.2)		33

As anticipated, breastmilk was the most consumed food by most babies in the study. Breastmilk was given throughout the day, but mostly at breakfast, afternoon snack and at supper. Further, complementary food that was commonly used was soft maize-meal porridge and formula feeds. The formula feeds were normally added to the soft maize-meal porridge. Moreover, margarine was the commonly consumed miscellaneous food. Similarly, soft maize-meal porridge and formula feeds were largely fed at breakfast afternoon snack and supper. The trend that transpired was typical since most feedings are generally done when children wake up and before they sleep. Generally, meats/proteins and vegetables were barely fed to these infants. Eggs were the most consumed protein rich food, and most protein foods were fed between lunch and the afternoon snack. Green vegetables were the commonly fed vegetable in the vegetable/fruit category. Generally vegetables and fruits were fed between morning snack and supper.

Further, the complementary food was rated to identify the 6 major foods given by mothers, see Figure 4.1.

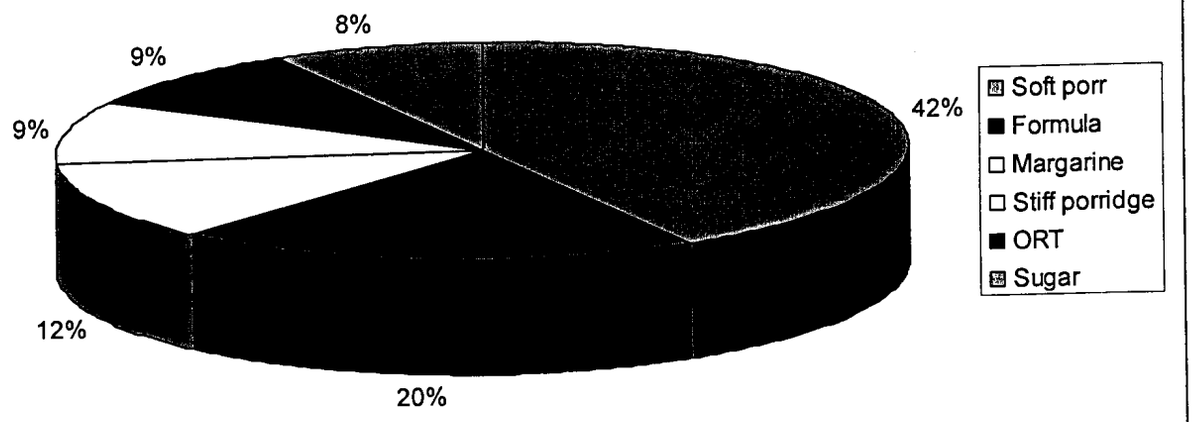

FIGURE 4.1: RATING OF COMPLEMENTARY FOODS GIVEN BY MOTHERS N = 91

Of all the complementary foods used, the six most common foods are listed in the order of importance in Figure 4.1. Soft maize-meal porridge was the commonly fed food while sugar was the least fed food of the six most common foods.

4.3.4 INFANT FEEDING PATTERNS AS VERIFIED BY FOCUS GROUPS

The theme on infant feeding was further explored by asking and probing on the following topics: feeding of the baby just after birth and introduction of solid foods. The results are presented in Table 4.13.

TABLE 4.13: INFANT FEEDING (N=21)

Theme 1: Feeding directly after birth		
Sub themes	**Reasons**	**Ethnography**
a. Breastfed immediately 76.2% (n=16)	- Breastfeeding is an expectation to mothers	'A mother has to breastfeed'
b. Gave ORT 23.8% (n=5)	- Baby cried -Difficulty with the milk supply. - Baby failed to breastfeed	'I gave the baby ORT because she used to cry a lot' 'Because milk could not come out well'
2. Theme 2: Onset of feeding		
a. At 3 – 4 months 47.6% (n=10)	- Infant is ready for the food - Baby cried	'Baby ready to eat' 'The baby cries because she is not satisfied' '*liyamulamula*'
b. At 1 – 2 months 28.6% (n=6)	- Inadequate supply of breastmilk	'No breastmilk' 'Baby not satisfied
c. Plans to introduce after 6 months 23.8% (n=5)	- Baby will be big enough to eat food.	'*Ucinile*'- baby will be strong

An aspect that came to the fore during focus group discussions was about what the infant was fed just after birth. Most mothers reported that they breastfed the baby immediately after birth while a few gave ORT. The majority of mothers' breastfed immediately after birth because they felt that it was expected of them to breastfeed the baby. On the other hand, ORT was given to the baby mainly because the baby cried a lot because there was no milk; mothers felt the baby needed to drink. Most mothers introduced food at 3 – 4 months primarily because they felt the infant was big enough to eat table food and that breastmilk alone could not satisfy the baby. Moreover mothers who introduced food at 1 – 2 months also felt that breastmilk alone was not fulfilling the baby. A few mothers planned to follow the recommended time of introducing food at six months of age.

4.4 KNOWLEDGE OF INFANT FEEDING AND HIV TRANSMISSION

The mothers' knowledge regarding HIV and infant feeding was investigated through evaluating their responses to fifteen knowledge statements. Two statements had sub-questions further probing for reasons. The results on knowledge ratings are summarized in Table 4.14.

TABLE 4.14: RESPONSE TO KNOWLEDGE QUESTIONS ON HIV TRANSMISSION (N=91)

Questions	[a]Responded correctly n (%)	Partially correct n (%)	[a]Responded incorrectly n (%)
Knowledge of ways of transmission			
1. An HIV positive mother cannot pass the infection to the child through breastfeeding, it is only transmitted through sexual contact (F)	75 (82.4)		16 (17.6)
2. An HIV positive mother is likely to pass the virus through breastfeeding (T)	74 (81.3)		17 (18.7)
3. An HIV positive mother is likely to pass the virus to the infant through kissing (F)	59 (64.8)		32 (35.2)
Mean Percentage	76.2		23.8
Knowledge of infant feeding of HIV + mothers			
4. Exclusive formula feeding from birth can be considered as an alternative by HIV+ mother if breastfeeding is impossible (T)	79 (86.8)		12 (13.2)
5. When HIV+ mothers feed breastmilk only, with no juice, and no food, for 6 months, it is enough for the baby to grow (T)	56 (61.5)		35 (38.5)
6. The longer the time of breastfeeding of an HIV infected mother, the less the infant is likely to get HIV infected (F)	55 (60.4)		36 (39.6)

Questions	[a]Responded correctly n (%)	Partially correct n (%)	[a]Responded incorrectly n (%)
7. When HIV positive mothers feed breastmilk only with no water, no juice, and no food, it is not enough for the baby (F)	42 (46.1)		49 (53.9)
8. Feeding the baby both breastmilk and food increases the risk of transmission of HIV from mother to child (T)	17 (18.7)	3 (3.3)	71 (78.0)
Mean percentage	54.8	0.6	44.6
Knowledge of maternal and infant health			
9. The HIV virus in the body is decreased when the mother is sick from AIDS (F)	77 (84.6)		14 (15.4)
10. A woman who gets sick from AIDS is more likely to transmit HIV infection to her infant through breastfeeding (T)	77 (84.6)		14 (15.4)
11. Breast infection in HIV infected mothers increases the risk of transmission of HIV through breastfeeding (T)	75 (82.4)		16 (17.6)
12. Oral thrush in the baby does not increase the chances of the baby to get the virus from the mother (F)	72 (79.1)		19 (20.9)
Mean percentage	82.7		17.3
Knowledge of general infant feeding			
13. In general artificial/formula feeding has less risk to infants health than breastfeeding (F)	77 (84.6)		14 (15.4)
14. Generally breastfeeding may contribute to high rates of diseases and deaths in infants (F)	69 (75.8)		22 (24.2)
15. Generally cup feeding is better than bottle-feeding (T)	50 (54.9)	4 (4.4)	37 (40.7)
Mean percentage	71.8	1.5	26.7

[a]Listed in descending order corresponding to questions

A raw score of 15 equalled the perfect score, and the average score was 10.5 (70%) and the median 11. It must be noted that partially correct category was developed for the

responses that considered both true and false responses correct as long as they were based on justified reasons. It was obtained by calculating the average of the correct responses. The mothers appeared knowledgeable about maternal and infant health, ways of transmission of HIV, and general knowledge about infant feeding. However they seemed less knowledgeable about infant feeding of HIV positive mothers as a few could correctly answer most statements dealing with this concept. The question least answered correctly was, 'feeding the baby both breastmilk and food increases the risk of transmission of HIV from mother to child' (18.7%, n=17). More than 50% of mothers responded incorrectly that when an HIV positive mother feed breastmilk only with no water, no juice and no food, it is not enough for the baby. Nearly 40 percent of the mothers did not know that the longer the time of breastfeeding of an HIV infected mother, the less the infant is likely to get HIV infected. Also, nearly 40% of mothers did not know that when HIV positive mothers feed breastmilk only with no juice and no food, for 6 months, it is enough for the baby to grow.

The reasons for the sub-questions were divided into two, namely reasons based on scientific proof and those based on misconceptions. The reasons for the sub-questions on cup feeding versus bottle feeding and on mixed feeding have been summarized in Table 4.15.

TABLE 4.15: REASONS FOR KNOWLEDGE QUESTIONS BASED ON SCIENTIFIC PROOF AND MISCONCEPTIONS

Reasons - Scientific	n (%)	Reasons - Misconceptions	n (%)
Q Feeding the baby both breastmilk and food increases the risk of transmission of HIV from mother to child (T) (N = 45)			
1. Advised by the nurse to breastfeed exclusively and not mix feed.	2 (4.4)	1. Baby can get infected through breastmilk	6 (13.3)
2. Mixed feeding makes the child sick	4 (8.9)	2. Formula milk will affect the baby's stomach	3 (6.8)
3. Mixed feeding facilitates HIV transmission	1 (2.2)	3. Mother should not breastfeed	2 (4.4)
4. Baby must breastfeed exclusively	9 (20)	4. Mother will not see which milk is good for the baby	2 (4.4)
5. Mother should choose one type of milk and do feed it exclusive	4 (8.9	5. Food may stretch intestines/ stomach and facilitate transmission	12 (26.7)
Total	20 (44.4)		25 (55.6)
Q Generally cup feeding is better than bottle-feeding (F) (N = 69)			
1. Cup not easily contaminated	10 (14.5)	1. Cup can be covered	5 (7.2)
2. Cup easy to clean	16 (23.2)	2. Ease of feeding	4 (5.8)
3. Cup does not affect teething	9 (13.1)	3. Prevents jaws from protruding	3 (4.4)
4. It does not cause tooth decay	13 (18.8)		
5. Cup spout stronger than bottle teats	8 (11.6)		
6. Cup recommended by clinic	1 (1.4)		
Total	57 (82.6)		12 (17.4)

For the statement 'feeding the baby both breastmilk and food increases the risk of transmission of HIV from mother to child', only 44.4% (n=20) of the reasons given were based on scientific proof, with 'baby must breastfeed exclusively' given as the most common reason. More than half of the reasons given were based on misconceptions (55.6%, n=25) with 'food may stretch intestines/stomach and facilitate transmission of HIV' as the most common misconception. On the other hand, 82.6% (n=57) of the reasons given were correct for the sub-question, 'generally cup feeding is better than bottle-feeding of any milk', with 'cup easy to clean' given as the most common scientific reason (23.2%, n=16). The most common misconception about cup feeding was that a cup can be covered compared to a bottle.

The source of information on infant feeding is summarized in Table 4.16.

TABLE 4.16: SOURCE OF INFORMATION ON INFANT FEEDING (N=91)

Source	Frequency (n)	Percentage (%)
Clinic	79	86.5
Radio	78	85.7
Family	59	64.8
Rural health motivator	45	49.4
Friends	23	25.3

As a source of information on infant feeding, the majority of mothers referred primarily to the clinic (86.5%, n=79) and least to friends (25.3%, n=23).

4.4.1 KNOWLEDGE OF HIV AND GENERAL INFANT FEEDING AS VERIFIED BY FOCUS GROUP DISCUSSIONS

The theme on knowledge of HIV and infant feeding was explored further in the focus group discussions probing on the following topics: duration of breastfeeding, differences in feeding between an HIV positive and negative mother and breastfeeding practices of a mother who develops AIDS. Note that for the second theme mothers were not probed for

reasons for the duration, therefore column two of theme number two has the content analysis for the duration/difference. The results are presented in Table 4.17.

TABLE 4.17: KNOWLEDGE OF HIV AND INFANT FEEDING (N=21)

Sub themes % (n)	**Reasons/Content**	**Ethnography**
Theme 1. General breastfeeding period		
a. Breastfeed for 2 years 90.4% (19)	- Nurses promoted the breastfeeding practice	'Taught by nurses to breastfeed for 2 years'
b. Breastfeed for 6 months 4.8% (1)	- Poor health of the mother limits breastfeeding to 6 months.	'If the mother is not healthy she should breastfeed for 6 months'
c. Breastfeeds over 2 years 4.8% (1)	- Ensures optimal growth to the infant.	' Two years is not enough for the baby to grow'
Theme 2: Differences in feeding the infant between HIV positive and negative mothers		
positive a. According to the recommendation – Breastfeed only for 6 months 66.6% (14)	- Sensitized on the new recommendation.	'She breastfeeds only for 6 months and then gives food'
b. Shorter exclusive breastfeeding for 3 months or alternatively 6 months 14.3% (3).	- Clinics promoted both feeding practices.	'Clinics advice on breastfeeding only for 3 months or 6 months'
c. Breastfeeds exclusively for 2 months 4.8% (1).	- The breastfeeding period should be kept brief.	'Mother stops breastfeeding only at 2 months and then gives formula'
d. No breastfeeding, she should give food 4.8% (1).	- Breastfeeding exposes the infant to HIV.	'She must not breastfeed the baby because she will pass the virus to the child'
e. Did not know how she	- Not informed on HIV	' Not very clear on how she

Sub themes % (n)	Reasons/Content	Ethnography
feeds the baby 9.5% (2)	positive mothers infant feeding practices.	feeds the baby'
Negative f. She feeds anyhow 33.3% (7)	- Choice of feeding options are wide	'A negative mother feeds the baby anyhow'
g. She breastfeeds more than the six months 28.6% (6).	- Breastfeeding not limited to 6 months.	'She exceeds the 6 months exclusive breastfeeding period'
h. She breastfeeds only for 2 months 4.8% (1).	- Complementary feeding starts earlier (2 months).	'Mother breastfeeds only 2 months and then can start giving the baby food'
i. She breastfeeds for 2 years 33.3% (7).	- Breastfeeding is longer	'She breastfeeds for 2 years'
Theme 3: Breastfeeding by a mother who develops AIDS.		
a. She must stop completely 100% (21)	- To ensure protection of the baby from infection.	'Baby will get the sickness' 'Baby will get the virus'

Almost all of the mothers knew that a mother has to breastfeed for two years (90.4%, n=19). All mothers knew that there was a difference in the feeding practices of an HIV positive mother and an HIV negative mother. Most of them knew that an HIV positive mother breastfeeds only for 6 months and then gives food. Three mothers knew about breastfeeding exclusively for three months or six months, showing that nurses could be promoting both options in this area. The misconception identified in the questionnaire that breastmilk of an HIV positive mother infected the baby transpired again in the focus group discussions. A considerable number of mothers (19.1%, n=4) did not know how an HIV positive mother should feed her baby. Moreover, the misconception that a mother who is HIV positive feeds anyhow (33.3%, n=7) resurfaced in the focus group discussion. All mothers knew that an HIV positive mother who develops AIDS should stop breastfeeding. Their strong reason was that the baby will get infected. This is in

agreement with the findings from the questionnaire which found most mothers to be knowledgeable about this aspect (84.6%, n=77).

4.5 BELIEFS ON INFANT FEEDING

Beliefs were investigated by evaluating the mothers' responses to questions on beliefs. Three questions had sub-questions further probing for reasons. The results on belief ratings are summarized in Table 4.18.

TABLE 4.18: RESPONSE TO QUESTIONS ON BELIEFS ON HIV TRANSMISSION (N=91)

Questions	[a]Responded correctly n (%)	Partially correct n (%)	[a]Responded incorrectly n (%)
Beliefs on infant feeding of HIV positive mother			
1. Do you feel there should be a difference in the way HIV positive and HIV negative mothers feed their babies? (N/Y)	38 (41.8)	20 (22.0)	33 (36.2)
2. Do you feel HIV positive mothers can feed both breastmilk and other milk feeds to their babies? N	41 (45.1)		50 (54.9)
3. Do you feel HIV positive mothers should formula feed from birth? N	14 (15.4)		77 (84.6)
4. Do you feel HIV positive mothers should breastfeed their babies? Y	21 (23.1)		70 (76.9)
5. Do you support breastfeeding only as an option for feeding for 6 months by HIV positive mother? Y	58 (63.7)		33 (36.3)
6. Do you support breastfeeding only without feeding of other liquids or foods to the infant by HIV positive mothers? Y	38 (41.8)		53 (58.2)
Mean percentage	38.5	3.7	57.8

Questions	[a]Responded correctly n (%)	Partially correct n (%)	[a]Responded incorrectly n (%)
Beliefs on maternal health			
7. Do you feel an HIV positive mother with a breast infection should continue breastfeeding while treating the breast infection? N	85 (93.4)		6 (6.6)
8. Do you feel an HIV positive mother with a breast infection should stop breastfeeding completely? N	6 (6.6)		85 (93.4)
9. Do you feel an HIV positive mother with a breast infection should stop breastfeeding temporarily until the breast infection is treated? Y	28 (30.8)		63 (69.2)
Mean percentage	43.6		56.4
Beliefs on general infant feeding			
10. Do you feel a mother should always breastfeed? Y	82 (90.1)		9 (9.9)
11. Do you feel mothers should feed any kind of milk from a bottle rather than from a cup? N	52 (57.1)	1 (1.1)	38 (41.8)
12. Under what circumstances do you think mothers should not breastfeed	30 (33.0)		61 (67.0)
Mean percentage	60.1	0.4	39.5

The highest positive belief score was 11 out of 17 questions, obtained by 3 mothers and the lowest score was 3 which was obtained by 7 mothers, furthermore, the average score for all mothers was 6.5 (38%). It must be noted that partially correct category was developed for the responses that considered both yes and no responses correct as long as they were based on justified reasons. It was obtained by calculating the average of the correct responses. A majority of mothers believed that an HIV positive mother with a breast infection should not continue breastfeeding while treating the breast infection,

whilst the least believed that an HIV positive mother with a breast infection should not stop breastfeeding completely. The mothers appeared to have negative beliefs on infant feeding of HIV positive mothers and maternal health since most did not agree with most questions in this regard. About five open ended belief questions were asked to further investigate the beliefs of mothers. The reasons for the sub-questions are summarized in Table 4.19.

TABLE 4.19: REASONS FOR BELIEFS BASED ON SCIENTIFIC PROOF AND MISCONCEPTIONS

Reasons – Scientific	**n (%)**	**Reasons – Misconceptions**	**n (%)**
Q Under what circumstances should not breastfeed (N=143)			
1. When mother is sick	25 (17.5)	1. Not enough milk	10 (7.0)
2. When she has a breast infection	40 (27.9)	2. Working away from home	12 (8.4)
3. When she has breast cancer	9 (6.3)	3. Mother is HIV positive	41 (28.7)
4. Baby has sores in mouth and mother positive	2 (1.4)	4. Baby refuses breastmilk	1 (0.7)
5. Advised by nurse or doctor	1 (0.7)	5. Milk is affordable	1 (0.7)
		6. Baby sick	1 (0.7)
Total	77 (53.8)		66 (46.2)
Q Do you feel there should be a difference in the way an HIV positive mother and an HIV negative mother feeds her baby (Y) (N=96)			
Positive			
1. The mother has to breastfeed exclusively for 6 months	14 (14)	1. The mother should not breastfeed	30 (30)
2. The mother has to breastfeed only	2 (2)	2. The mother expresses milk for 6 months	1 (1)
3. The mother breastfeeds for a shorter period of time	6 (6)	3. The mother breastfeeds and gives food	1 (1)

Reasons – Scientific	n (%)	Reasons – Misconceptions	n (%)
4. The mother is counselled on infant feeding	6 (6)	4. The mother must breastfeed for 4 months	1 (1)
Negative			
5. The mother breastfeeds	16 (16)	5. The mother introduces food at 3 months	1 (1)
6. The mother breastfeeds longer	19 (19)	6. The mother can feed anyhow	1 (1)
7. The mother can mix-feed	2 (2)		
Total	65 (65)		35 (35)

Q Do you feel there should be a difference in the way an HIV positive mother and an HIV negative mother feeds her baby (N=27)			
1. Clinics advise that there should be no difference	1 (3.7)	1. They both breastfeed and give food	4 (14.8)
2. An HIV positive mother breastfeeds as well like a negative mother	3 (11.1)	2. They both feed the same way	9 (33.3)
3. They both breastfeed exclusively for 6 months	10 (37.1)		
Total	14 (51.9)		13 (48.1)

Q Do you feel HIV positive mothers can feed both breastmilk and other milk feeds to their babies (N=73)			
1. Mixed feeding will make the baby sick	7 (9.6)	1. Breastmilk will infect the baby	16 (21.9)
2. An HIV positive mother should breastfeed exclusively	13 (17.8)	2. Artificial milk not healthy	4 (5.5)
3. Mother must choose one type and do it exclusively	12 (16.4)	3. Mother will not be able to observe which milk is good for	1 (1.4)

Reasons – Scientific	n (%)	Reasons – Misconceptions	n (%)
		the baby	
4. Mixed feeding facilitates transmission of HIV	9 (12.3)	4. An HIV positive mother should not breastfeed	8 (11)
5. Advised by nurse not to mix-feed	1 (1.4)	5. Food/other milks may stretch intestines/stomach and facilitate transmission	2 (2.7)
Total	42 (57.5)		31 (42.5)

Q Do you feel mothers should feed any kind of milk from a bottle rather than from a cup (N=65)			
1. Cup easy to clean	13 (20)	1. Baby feeds well from a cup	6 (1.5)
2. Bottles are easily contaminated	21 (32.3)	2. A cup can be covered	2 (3.1)
3. Bottle teats affect teething	2 (3.1)	3. Cup prevents jaws from protruding	1 (1.5)
4. Bottles can cause tooth decay	14 (21.5)		
5. Advised by nurse to use cup	1 (1.5)		
6. Cups have a strong spout	5 (7.7)		
Total	56 (86.1)		9 (13.8)

About half of the reasons mentioned to clarify circumstances when breastfeeding should be avoided 53.8% (n=77) were correct. The most common correct scientific-based circumstance was to avoid breastfeeding when a mother had a breast infection. However, 46.2% (n=66) of the reasons mentioned were misconceptions. On the other hand, the mostly mentioned misconception was that HIV positive mothers should not breastfeed. Both yes and no responses for the question 'Do you feel there should be a difference in the way an HIV positive and negative mother breastfeeds' were considered correct as long as they were correctly substantiated. Therefore 65% (n=65) of the reasons given were correct including 'exclusive breastfeeding for six months, while an HIV negative mother should breastfeed longer' as the familiar reason for the difference. Most mothers

gave the misconception that an HIV positive mother should not breastfeed. Of the mothers that believed that HIV positive mothers should feed any kind of milk from a cup rather than a bottle 86.1% (n=56) of the reasons that were reported were correct with 'bottles easily contaminated' as the general reason for preference of cup feeding. The major misconception for cup feeding was that the baby fed well from a cup. Of the mothers that did not believe in mixed feeding, 57.5% (n=42) had correct reasons with 'HIV positive mother should breastfeed exclusively' as the most common scientific reason. On the other hand, the most disturbing misconception for mixed feeding was that 'breastmilk will infect the child'. Lastly, mothers mainly believed HIV positive mothers should stop breastfeeding when they had a breast infection because they could transmit the virus to the child (n=89, 97.8%).

4.5.1 BELIEFS ON HIV AND INFANT FEEDING AS VERIFIED BY FOCUS GROUP DISCUSSIONS

Beliefs were also assessed through the focus group discussions. The theme on beliefs on HIV and infant feeding was explored by asking and probing on the following topics: breastfeeding versus formula-feeding, cup-feeding versus bottle-feeding, formula-feeding versus breastfeeding by HIV positive mothers. The results on beliefs are summarized in Table 4.20.

TABLE 4.20: BELIEFS ON HIV AND GENERAL INFANT FEEDING (N=21)

Sub themes % (n)	**Reasons/Content**	**Ethnography**
Theme 1. Breastfeeding versus formula feeding		
a. Breasfeeding preference 85.7% (18)	Reasons for breastfeeding - Nutritious - Ensures baby growth - Fresh and healthier Reasons for not choosing formula - Financial constraints - Makes the infant susceptible to	'The baby gets all the gets 3 groups of nutrients in breastmilk' 'Its expensive'

Sub themes % (n)	Reasons/Content	Ethnography
	diseases. - Its not fresh - It is contaminated by chemicals - Preparation is time consuming	'Formula makes the baby sick'
b. Formula preferred 14.3% (3).	- It is healthy	'Nutritious'
Theme 2: Feeding utensils		
a. Cup feeding is best 52.4% (11)	Reasons for cup - Dental health maintained. - Encouraged by nurses. - Free from contamination. - Hygienic	'Does not rot the teeth like the bottle' 'Easy to clean'
b. Bottle-feeding is best 47.6% (10)	Reasons for bottle - Better suckling - Free from contamination. - Takes more volume of milk. - Ease of feeding solids.	'Teats softer, same as suckling breast teats' ' It can be covered' 'Its big and it takes more quantity.
Theme 3: Best feeding type for an HIV positive mother between formula and breastfeeding.		
a. Formula best 95.2% (20).	Reasons for formula - Baby is not exposed to infection. - Baby's system should adapt to formula from birth than at 6 months.	' The baby wont get infected through formula milk'
b. Breastfeeding is best 4.8% (1).	Reasons for breastfeeding - It is also safe. - No risk of infection to the baby.	'The baby will not get infected through breastfeeding'

Generally, breastfeeding was found to be the best feeding option by most mothers, and it was preferred over formula-feeding. Reasons for favouring breastfeeding were all related to health while reasons for disfavouring formula included economic and health reasons. Cup-feeding and bottle feeding rated almost equally to the mothers. Mothers preferred cup feeding for justifiable and unjustifiable reasons. The justifiable reasons included: 'it doesn't rot the teeth', and 'encouraged by nurses', while the unjustifiable included 'it can be covered'. Moreover, mothers preferred the bottle mostly for unjustifiable reasons including: 'bottle can be covered', 'big it takes more quantity 'and 'food can be fed through it if the baby does not want to eat'. Some mothers believed that the bottle was more convenient particularly when the infant was still young, because it is easier for the baby to suckle from the bottle than from a cup. Almost all of the mothers felt that formula was a better option for HIV positive mothers. Only one mother preferred breastfeeding to formula feeding. The negative attitude the mothers had towards breastfeeding was identified earlier in the questionnaire. The focus group discussions validated that the mothers believed that breastfeeding was not a safe feeding option for an HIV positive mother.

4.6 SOCIAL REFERENTS

The support of social referents was investigated to determine the influence of social referents on the mother's beliefs towards infant feeding practices. The influence was reported by the mothers and not the social referents themselves. The comparison of breastfeeding and bottle-feeding beliefs of social referents is summarized in Figure 4.2.

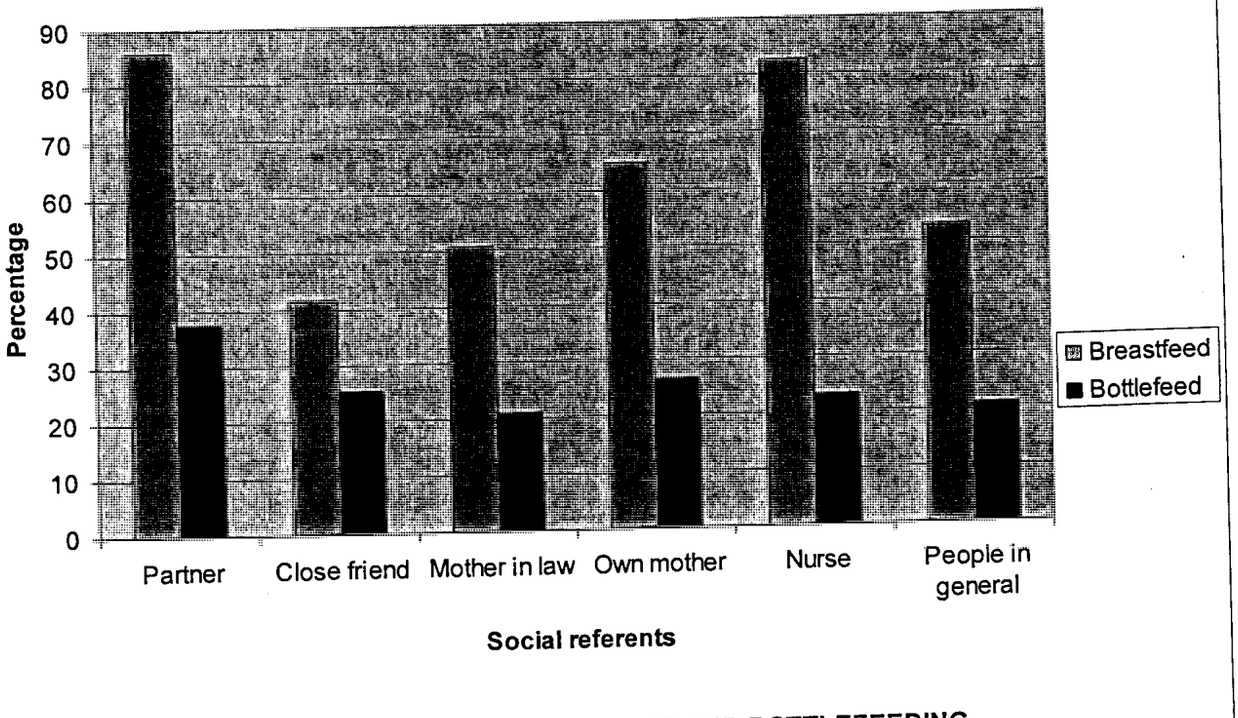

FIGURE 4.2: COMPARISON OF BREASTFEEDING AND BOTTLEFEEDING BELIEFS OF SOCIAL REFERENTS N = 91

Mothers reported that partners enormously supported breastfeeding at 85.7% (n=78) compared to close friends who were found to be least supportive at 41.8%. Similarly, partners were most supportive of bottle-feeding of all the social referents (37.4%, n=34). On the contrary, people in general and mothers-in-law were least supportive of bottle-feeding. On the whole, support of bottle-feeding by all referents was poor as their support fell below 50%.

The reasons for supporting bottle-feeding and breastfeeding by the social referents as reported by the mother were consolidated into six groups, namely: baby's health and well being, family or community pressure, mothers' health, and according to recommendations. The reasons given for the support of breastfeeding and bottle-feeding are summarized in Table 4.21.

TABLE 4.21: REASONS FOR SUPPORTING BOTTLEFEEDING AND BREASTFEEDING BY SOCIAL REFERENTS

Reason groups	Responses summarized	Most common quotes
1. Baby's health and well being	• Healthy • Breastmilk is the baby's medicine • Baby grows well • Protective from diseases • Good for the baby • Result in a healthy baby	"Healthy' 'Baby grows well' 'Protective from diseases'
2. Convenience	• Cheaper • Available • Mother is able to tell if the baby is sick • Natural way of feeding the baby • If mother is working	'Cheaper' "Mother is working"
3. Family/community pressure	• All babies born in the family breastfeed • Recommended by nurse • Knows that the baby should be breastfed	"Knows that the baby should be breastfed "
4. According to recommendation	• Must do it exclusively • Good for 6 months • Ideal after six months • Ideal when baby has grown	"Good for 6 months" "Ideal after 6 months"
5. Mother's health	• Contraceptive • Mother bonds with the baby	" Contraceptive" " Recommended if mother cannot breastfeed"

Reason groups	Responses summarized	Most common quotes
	• If mother is sick • Mother can maintain healthy weight	
6. Nutritional reasons	• To complement breastmilk • Filling • Baby hungry • Mother does not have enough milk	" To complement breastmilk" " Filling"

The most common quote for the reason baby's health and well being was 'healthy', for convenience it was cheaper and for nutrition it was 'to complement breastmilk'. It is interesting to note that the family and community still held onto the belief that the baby should breastfeed.

The main categories for the reasons for not supporting bottle-feeding and breastfeeding were categorized as follows: babies' health and well being, convenience, family/community pressure, according to recommendations and mothers health. The reasons for not supporting bottle-feeding and breastfeeding are shown in Table 4.22.

TABLE 4.22: REASONS FOR NOT SUPPORTING BOTTLEFEEDING AND BREASTFEEDING

Reason groups	Responses summarized	Most common quotes
1. Baby's health and well being	• It makes the baby sick • It is not healthy • It causes tooth decay • It causes diarrhoea • Baby does not grow well	" Its not healthy" " It makes the baby sick" " Baby does not grow well"

Reason groups	Responses summarized	Most common quotes
2. Inconvenient/convenient	• Expensive • It's not easily available • It's not as fresh as breastmilk • If mother is working • Causes conflict	" Expensive" " It's not fresh" "If mother is working"
3. Family/community pressure	• Believes a baby should breastfeed • Nurses advise not to bottle-feed • All babies born in the family breastfeed • Does not like it • Advised by the nurse	"Does not like it" " Believes a baby should breastfeed"
4. According to recommendations	• Must do it exclusively • Ideal after 6 months	" Mother must do it exclusively"
5. Mothers health	• Fear of HIV transmission • If mother is sick • It causes weight loss • Breastfeeding ages mother	"Fear of HIV " transmission"

The most common quote for not supporting bottle-feeding was that it was expensive and the family and community common reason was that they did not like it because they did not believe in it. Most social referents suggested the fear of transmission as the reason for not supporting breastfeeding to HIV positive mothers. The leading reasons for breastfeeding and bottle-feeding are shown in Table 4.23.

TABLE 4.23: LEADING REASONS FOR BREASTFEEDING AND BOTTLE FEEDING

Feeds	Social referents					
	Partner **BF = 78** **BT = 34**	**Close friend** **BF = 38** **BT= 23**	**Own mother** **BF = 59** **BT=25**	**Mother in law** **BF =46** **BT = 19**	**Nurse** **BF = 75** **BT = 21**	**People in general** **BF = 47** **BT = 19**
Breastfeeding	55 (70.5%) Baby's health	31 (81.6%) Baby's health	49 (83.0%) Baby's health	37 (80.4%) Baby's health	50 (66.7%) Baby's health	36 (76.6%) Baby's health
Bottle-feeding	15 (44.1%) Nutritional	9 (39.1%) Nutritional	11 (44%) Nutritional	8 (42.1%) Nutritional	6 (28.6%) Recommendation	7 (36.8%) Baby's health

BF = Breastfeeding total
BT = Bottle-feeding total

The most frequently mentioned reason for supporting breastfeeding by all social referents was related to the baby's health and well-being. Overall, only a few social referents did not support breastfeeding. Of important note is that close friends did not support breastfeeding mainly due to convenience. On the contrary, a majority of the social referents supported bottle-feeding chiefly because of nutritional reasons. Further, nurses' support of bottle-feeding was based on the recommendation of bottle-feeding after six months. The mother's own mother did not support bottle-feeding because it affected the baby's health and well being. Lastly, nurses strongly did not support bottle feeding because of reasons related to the infant feeding recommendation and the baby's health and well-being with 'the baby does not grow well' as the strongest reason. The importance of social referents is rated in Table 4.24.

TABLE 4.24: RATING OF THE IMPORTANCE OF VIEWS OF DIFFERENT SOCIAL REFERENTS (N= 91).

Social referents	Very important & I follow advice	Important to me but may not follow advice	Not at all important to me
Partner	72 (79.1)	8 (8.8)	4 (4.4)
Nurse	68 (74.7)	6 (6.6)	3 (3.3)
Own mother	51 (56.04)	12 (13.2)	1 (1.1)
Mother in law	44 (48.35)	6 (6.6)	3 (3.3)
People in general	23 (25.3)	11 (12.1)	19 (20.9)
Close friends	21 (23.1)	7 (7.7)	18 (19.8)

Partner's views were found to be more important than all the other social referents; also, it is of particular interest to note that nurses were rated second in importance to partners. Further, the importance of the views of people in general and close friends were more or less the same to mothers. Remarkably, only a few mothers found the partner, mother-in-law, own mother and nurse's views not important, which could be indicative of their huge influence in infant feeding. It can be safely concluded that fathers and nurses are very influential in infant feeding of mothers of this community.

4.6.1 SOCIAL REFERENTS' INFLUENCE AS VERIFIED BY FOCUS GROUP DISCUSSIONS

The theme on social referents' beliefs on HIV and infant feeding was explored by asking and probing on the following topics: influential referents in infant feeding, most influential social referents, and influence of social referents when mother is sick. The results on social referents are summarized in Table 4.25.

TABLE 4.25: SOCIAL REFERENTS INFLUENCE ON INFANT FEEDING DECISIONS

Sub themes	Reasons/Content	Ethnography
Theme1: Influences on the mother's decisions about infant feeding		
a. A majority mentioned taking advice from, own mother, mother- in-law, rural health motivator	- Living arrangement with the mothers influenced the mother's feeding practices. - Rural health motivators were considered educated on the subject.	'We listen to them because we stay with them' 'Rural health motivators visit us and teach us on proper infant feeding'
b. A few mothers listened to grandmothers' advice because they were not informed about the subject.	- They were considered to be less knowledgeable	'Grandmothers don't know' 'Their advice is outdated'
	- Their advice on infant formula was taken based on financial reasons. - Some fathers did not involve themselves in infant feeding.	'We listen to them if they want us to feed formula because it means that they afford it' 'They do not care about the feeding of the baby'
d. Mothers listened most to nurses	- Nurses were believed to be educated on infant feeding	' They know everything about infant feeding'
Theme 2: Most influential people		
a. Nurses 95.2% (20)	- They were considered most knowledgeable of everyone on infant feeding	'They know more than everyone because they are educated on baby feeding'
b. Family 4.8% (1)	- Family supportive to the mother.	'Because they are always there to help'

Sub themes	Reasons/Content	Ethnography
Theme 3: Support of the HIV positive mother when she is sick		
a. Most mothers mentioned that the family continues to support.	- Supportive families all get involved in the feeding of the baby.	'If the relative discloses her status, they support her in her feeding choice in the family' 'The baby is fed formula when the mother is sick'
b. The mother's own mother and grandmother remain supportive	- The mother's own mother and the grandmother continue to offer support. The other family members neglect the mother.	'The other family members peep through the window' 'They will not even touch your baby'
c. People in the area are not supportive	- People in the area tend to shun the mother when she is sick	' People keep away from you'

An aspect that emerged from the focus groups was that most mothers no longer took advice from their grandmothers. Their advice was considered 'outdated'; this showed that grandmothers' advice had lost its value in this community. Another aspect was that some mothers considered fathers to be not concerned about infant feeding. This is a challenge, as fathers would have to be motivated in order to involve them in infant-feeding programs. However, nurses remained the most important influencers on infant feeding. Continued support was given by families even when the mother fell sick. In particular, mother's own mother and grandmother were the most supportive in the family. However, some mothers reported that in some families other family members were not supportive.

4.7 RELATIONSHIPS OF RESULTS

The correlation between knowledge and beliefs/attitudes scores was performed to determine if there could be a relationship between the two concepts as depicted by the basic theory of planned behaviour. The theory describes that knowledge influences

attitudes through encouraging a different set of beliefs among individuals, which in turn affects behaviour. The overall relationship between knowledge and attitude was tested using both the Pearson and Spearman correlation statistics. Working at a significance level of 5%, $p<0.05$ indicate a statistically significant relationship. The results are shown in Table 4.26.

TABLE 4.26: RELATIONSHIP BETWEEN KNOWLEDGE AND BELIEFS SCORES

	Statistic	p value
Pearson attitudes and knowledge	0.13946	0.1874
Spearman attitudes and knowledge	0.13408	0.2051

$p<0.05$ (Pearson and Spearman test)

Both Pearson and Spearman coefficients were <0.3, indicating that there was a very weak relationship between the knowledge and attitude scores. The correlation coefficients were not statistically significant as $p>0.05$. Therefore it can be safely said that there was no statistical evidence of a relationship between knowledge and attitude scores. This means that a high level of knowledge did not necessarily mean having high attitude visa versa.

Furthermore, the association between responses to individual-matched knowledge and attitude questions was explored by performing the Chi-square test. Statistically significant associations between knowledge and attitude responses are indicated by $p<0.05$. The results are shown in Table 4.27.

TABLE 4.27: RELATIONSHIP BETWEEN RESPONSES TO MATCHED KNOWLEDGE AND BELIEFS QUESTIONS

Matched questions Knowledge/Beliefs question number		Statistic	p value
Q15/ Q14	Cup feeding versus bottle-feeding in general	35.5828	<0.0001
Q6/ Q6	Breastmilk only is enough for 6 months by HIV positive mothers	13.8639	0.0002
Q7/ Q8	Breast infection increases the risk of transmission in HIV positive mothers	**	0.5857
Q5/ Q5	Breastmilk only is enough for HIV positive mothers	2.1785	0.1400
Q13/ Q11	Mixed feeding increases the risk of Transmission in HIV positive mothers	5.8925	0.0152

**Fishers exact test – no statistic given

The results show that there was a significant association between knowledge and attitudes in three aspects: cup-feeding versus bottle-feeding, breastmilk only is enough for six months and breast infection increases the risk of transmission. Otherwise, knowledge and attitudes in terms of breast infection and the risk of transmission together with breastmilk only is enough for HIV positive mothers did not show any association.

The Parametric analysis of variance (ANOVA) and the non-parametric Kruskal Wallis test were used to determine the relationship between the mothers' knowledge score and infant feeding practices. The relationship between attitudes score and infant feeding was also tested in the same manner. The four identified categories of infant feeding practices were used namely: exclusive breastfeeding, predominant breastfeeding, complementary feeding and replacement feeding/non-breastfeeding. See results in Table 4.28.

TABLE 4.28: RELATIONSHIP BETWEEN KNOWLEDGE/BELIEFS SCORE AND INFANT FEEDING PRACTICE

	Statistic	p value
Knowledge and infant feeding	1.2	0.3141
Beliefs and infant feeding	0.72	0.5443

The results indicate that there was no statistical difference between knowledge scores of mothers in the four feeding practice groups. In addition, there was no evidence of differences in beliefs/attitude scores of mothers with different feeding practices. The non-parametric Kruskal Wallis test also indicated that there was no evidence of differences in attitude scores and knowledge scores of mothers with the different feeding practices. This indicates that there was no statistical difference in the average scores for both knowledge and attitude in relation to the infant feeding practices. This means that no group proved to have a higher level of knowledge and more positive attitudes. The mean scores for the infant feeding practices are illustrated in Table 4.29.

TABLE 4.29: THE MEAN SCORES OF KNOWLEDGE AND BELIEFS FOR EACH INFANT FEEDING PRACTICE

INFANT FEEDING PRACTICE	KNOWLEDGE Mean (%)	BELIEFS Mean (%)
1. Exclusive breastfeeding	9.75	7.10
2. Predominant breastfeeding	11.33	6.04
3. Complementary feeding	10.47	6.59
4. Formula feeding	9.7	5.9

Further, correlation between knowledge and beliefs by infant feeding practice was tested using the Pearson correlation coefficient at significant level $p<0.05$. See Table 4.30 for the summary of the relationships

TABLE 4.30: THE ASSOCIATION BETWEEN KNOWLEDGE AND BELIEFS BY INFANT FEEDING PRACTICE

INFANT FEEDING	STATISTIC	p value
1. Exclusive breastfeeding	- 0.108	0.766
2. Predominant breastfeeding	-0.672	0.002
3. Complementary feeding	0.357	0.0059
4. Formula feeding	0.8687	0.056

The results show that there was **a** very weak relationship between knowledge and beliefs/ attitudes scores in the exclusive breastfeeding group. The high p value ($p>0.05$) means that this relationship was not statistically significant. In the predominant group, the correlation between knowledge and attitude was medium; the low p value ($p<0.05$) shows that the relationship was statistically significant although the correlation is negative. The negative relationship means that mothers who had high knowledge had negative attitudes, visa versa. The complementary feeding group indicated that there was a low correlation between knowledge and attitudes and the relationship was statistically significant as $p<0.05$. This means that mothers, who had high knowledge, had a positive attitude. The results show that there was a strong correlation between knowledge and attitudes in the formula feeding group. However, the p value was just greater than 0.05 therefore this relationship was not strictly statistically significant. This could have been due to the small sample size (n=5). The association between knowledge and attitude by practice is illustrated in Figure 4.3 to 4.6.

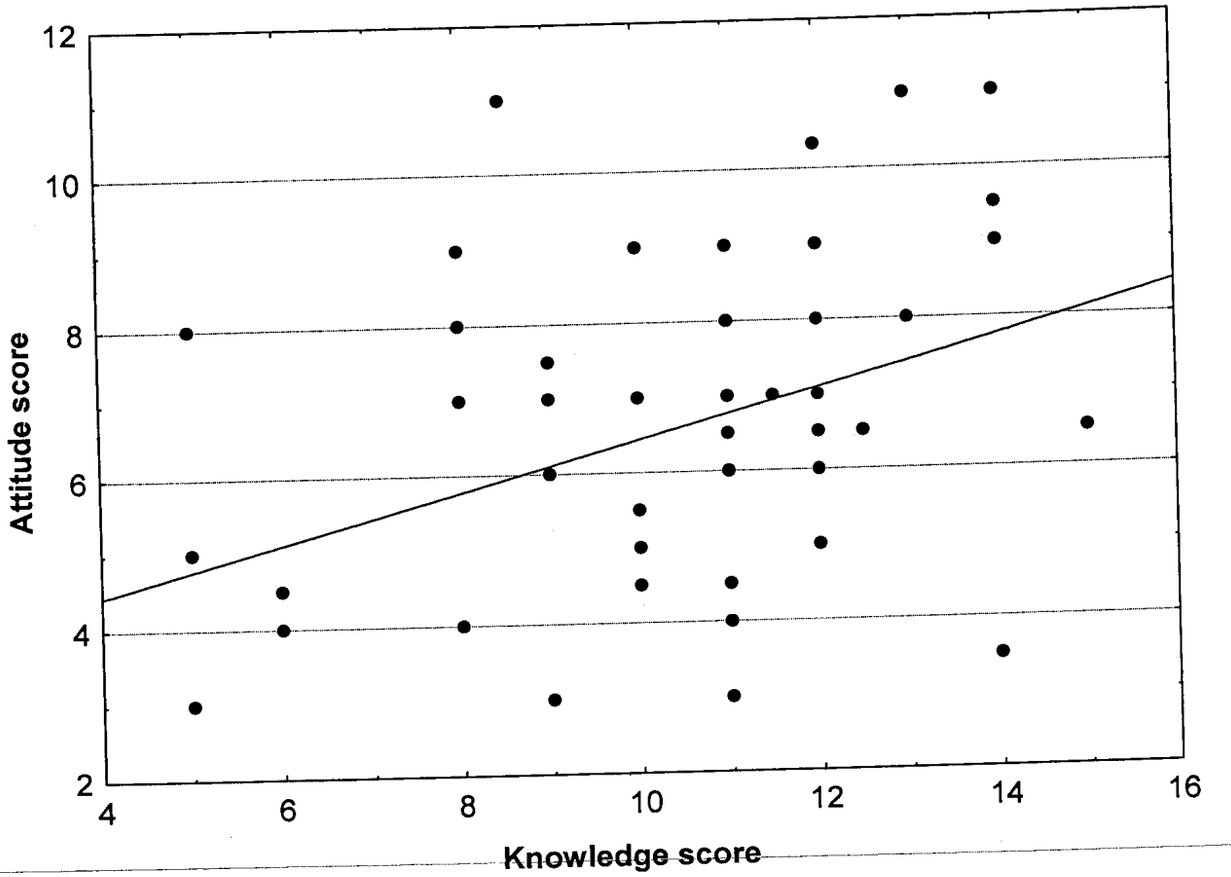

FIGURE 4.3: RELATIONSHIP BETWEEN KNOWLEDGE AND BELIEFS/ATTITUDES OF MOTHERS WHO PRACTICED EXCLUSIVE BREASTFEEDING

The dots are scattered on the graph indicating that there is no trend observed. This means that there was no relationship between knowledge and attitudes of mothers who practised exclusive breastfeeding.

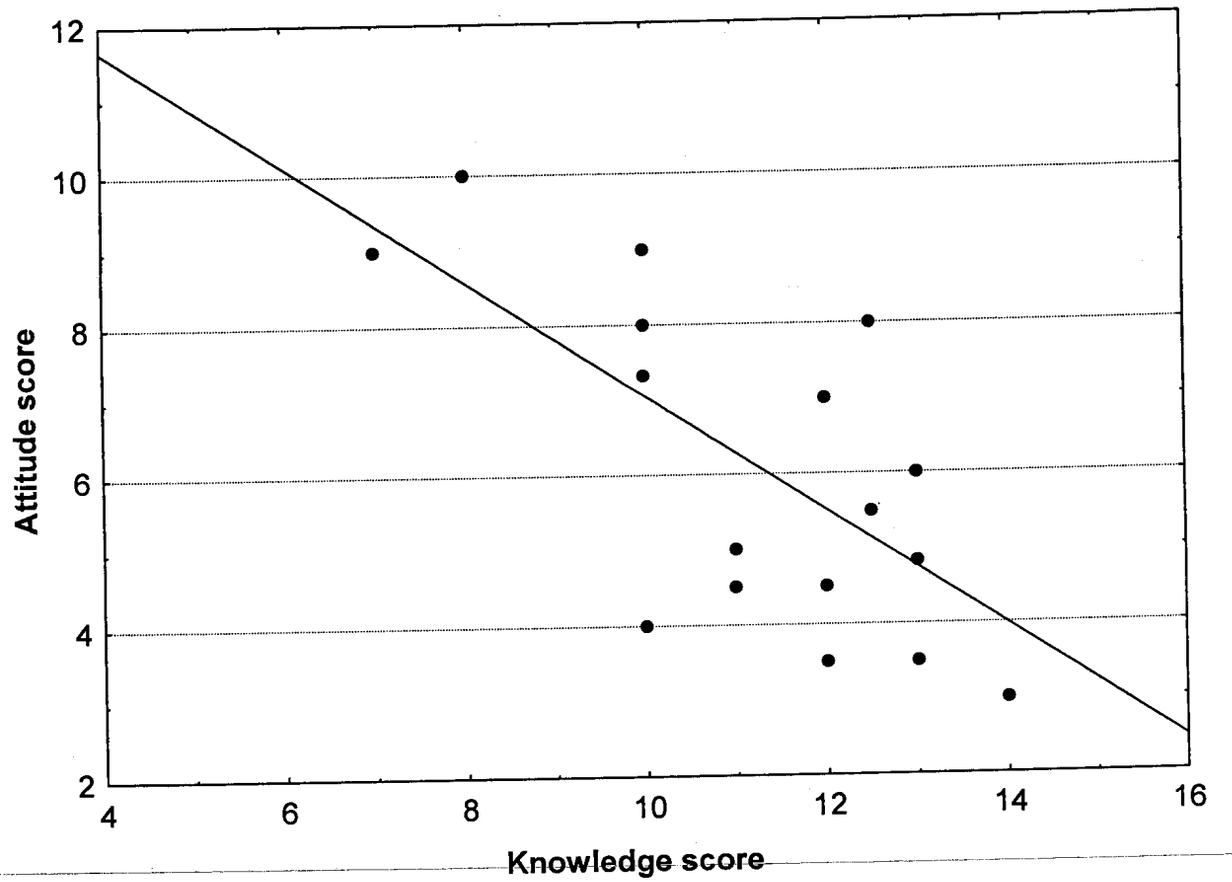

FIGURE 4.4: RELATIONSHIP BETWEEN KNOWLEDGE AND BELIEFS/ATTITUDE OF MOTHERS WHO PRACTICED PREDOMINANT BREASTFEEDING

The dots are plotted around the trend line indicating that there was a significant relationship between knowledge and attitudes of mothers who practiced predominant breastfeeding. However the trend line is negative as it is placed on the other end of the graph. This indicates that the correlation between knowledge and attitudes was negative, the higher the knowledge score the more negative was the attitude visa versa.

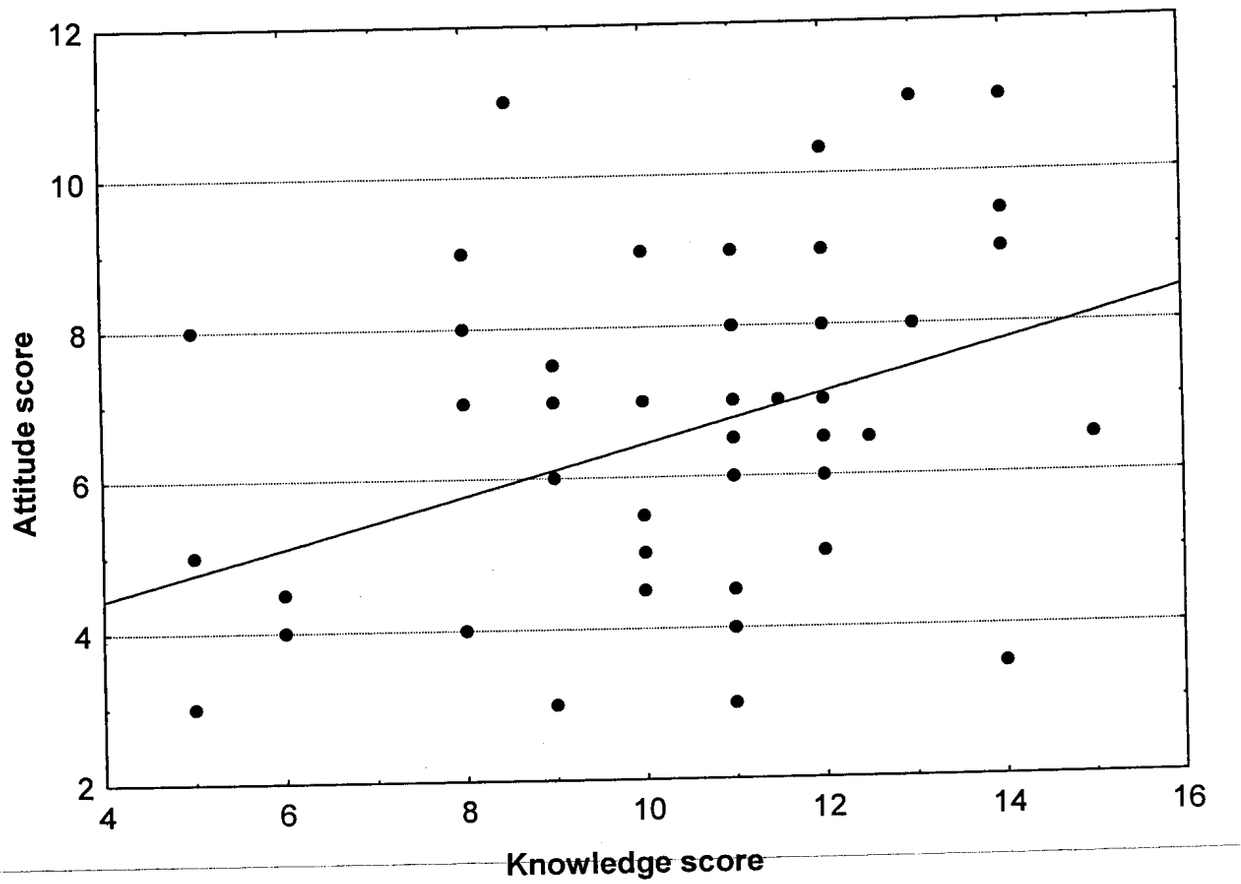

FIGURE 4.5: RELATIONSHIP BETWEEN KNOWLEDGE AND BELIEFS/ATTITUDE OF MOTHERS WHO PRACTICED COMPLEMENTARY FEEDING

This graph shows that there was a relationship between knowledge and attitudes of mothers, meaning that their level of knowledge almost correlated with their attitudes. The higher the knowledge was the better the attitude.

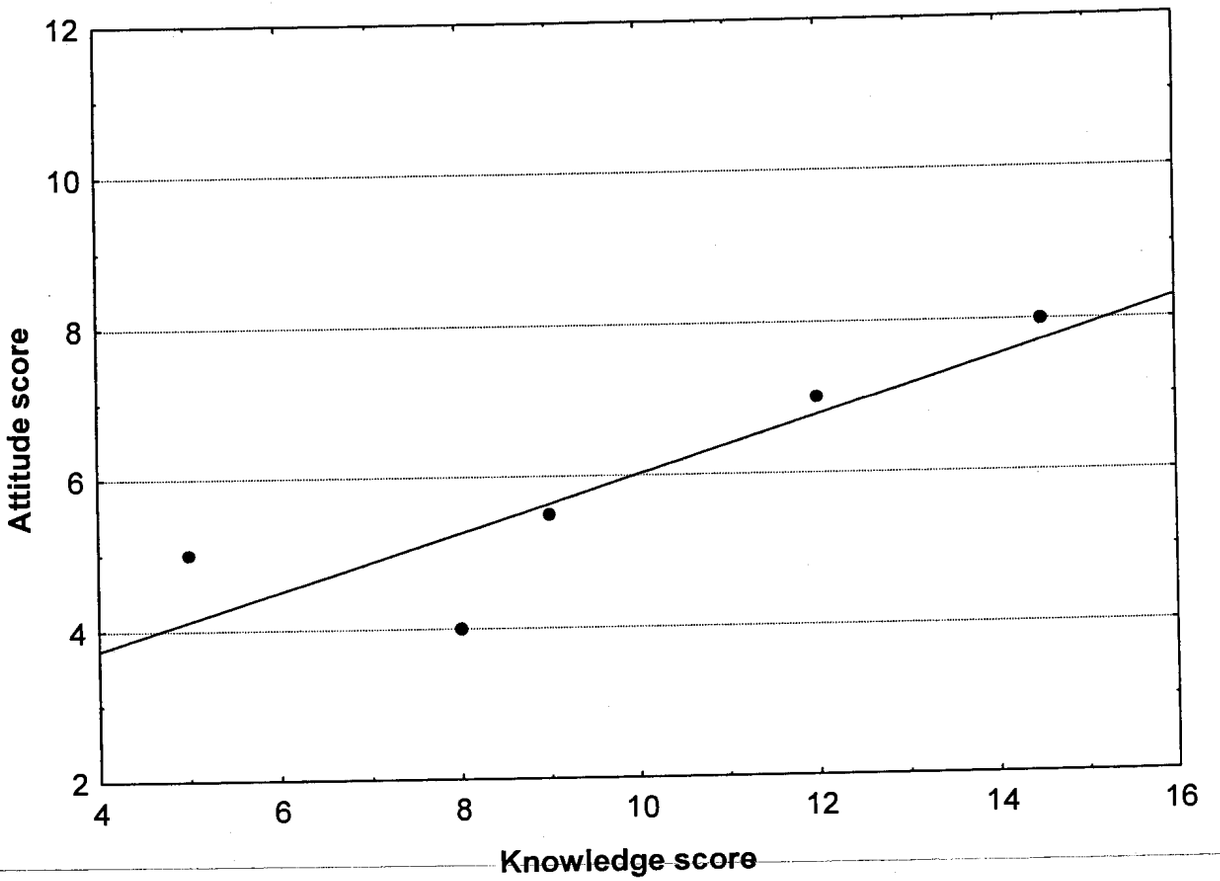

FIGURE 4.6: RELATIONSHIP BETWEEN KNOWLEDGE AND BELIEFS/ATTITUDE OF MOTHERS WHO PRACTICED REPLACEMENT FEEDING

The dots are plotted around the trend line showing that there was a relationship between knowledge and attitudes although it was not strictly significant

CHAPTER 5 DISCUSSION

5.1 INTRODUCTION

This study provides data on knowledge and beliefs of mothers attending at Gilgal Clinic in Swaziland regarding infant feeding practices in the context of HIV/AIDS. The discussion will begin by describing the demographic information and then follow with the objectives. The objectives are as follows:

- Infant feeding practices of mothers with reference to the presence of HIV and AIDS
- Knowledge regarding HIV and infant feeding
- Beliefs of mothers regarding HIV and infant-feeding practices
- To describe the role/influence of social referents on the mothers' beliefs towards infant-feeding practices
- Relationships amongst the knowledge, beliefs and infant feeding practices

5.2 DEMOGRAPHIC INFORMATION

The final sample consisted of 91 mothers of infants aged 0 – 6 months after cancellation of nine questionnaires that were not within the targeted sample. The sample was stratified into shorter periods of two month's intervals within the 0 – 6 months to ensure even distribution of infants in this age group. Additional demographic information included education level of the mother, occupation of both the mother and father and the number of children each mother had.

Almost half of the mothers had secondary education (n=45, 49.4%) while the other half were poorly educated. The last population and housing census conducted in Swaziland in 1997 revealed that nationally 17.8% of females had secondary education, only 0.7% had tertiary education and 68.9% had less than secondary education (Central Statistics Office, 1997). Findings from this study show that there has been a dramatic increase in secondary education attainment in females whilst the tertiary education level remains poor in this community.

A majority of mothers in this study were unemployed, the few mothers that were employed were scattered in the professional, skilled, semi-skilled, manual and entrepreneurial categories. On the other hand fathers were mostly employed in the skilled and semi-skilled jobs and only 17.6% were unemployed. Unemployment is accountable for 26.2% in females and 20.2% in males in Swaziland (Central Statistics Office, 1997). Additionally a recent report revealed that regionally 26.9% of females and 24.3% of males in the Manzini region are unemployed (Central Statistics Office, 2001). In this study the higher percentage rate of unemployment than the national study could be the result of the small sample size used in this study compared to the national study. However in this community females (mothers) remain the highly unemployed group compared to males, as with the national study. Moreover the findings from this study are in line with the national study that found that a few males and females are employed in the professional category (6.52% M) and (13.52% F) while the majority are employed in skilled and semi-skilled jobs.

Most mothers in this study were younger than 30 years (n=68, 74.7%). Moreover, the trend was that the older the mother, the more children they had. Most mothers who were less than thirty years had less than 4 children compared to older mothers. Findings from this study correspond with the results from the national study that revealed that most mothers aged less than thirty years had 1 – 3 children. For instance 60% of mothers aged 25 – 29 years had 1 - 3 children. On the other hand 37.7% of mothers aged 30 – 34 years had 4 – 6 children (Central Statistics Office, 1997). The results from this study might be evidence to improved family planning practices among the younger age group of women.

5.3 INFANT FEEDING PRACTICES

5.3.1 BREASTFEEDING PRACTICES

Breastfeeding is the norm and of long duration in most parts of Africa. In this study the breastfeeding rate was 94.5% with the intended mean duration of 18 months. Research shows that in most African cultures breastfeeding is universal and it can be continued to two years; on average mothers breastfeed for 18 – 25 months (Omari *et al*, 2003; Poggensee *et al*, 2004; SARA project, 2001; UNAIDS, 2002; UNICEF *et al*, 2004). The

high rates of breastfeeding could be explained by the fact that in most developing countries, breastfeeding is the only sustainable infant feeding option. The safe alternatives are usually unavailable, unaffordable or culturally unacceptable. (Kourtis *et al*, 2003; Raisler & Cohn, 2005). From this study, the high unemployment rate of mothers (79.1%) and the few fathers hired in professional occupations (7.7%) could reflect the low level of income in most of the mothers' households to afford infant formula. One study on infant feeding practices of women in a perinatal HIV prevention study in Nairobi proved that financial constraints was the main reason a few mothers selected replacement feeding (30%) (Kiari *et al*, 2004).

Other research suggests that non-financial considerations such as demographics are also important in determining the infant feeding choice. However in this study the effect of demographics on infant feeding were not investigated. Higher education, young age and urban location affect the infant feeding practice. A study conducted in Uganda and Tanzania found that education, women with higher education tended to breastfeed for shorter periods compared with those with lower education and younger women were likely to breastfeed less compared to older mothers. Lastly women living in urban areas were less likely to feed up to two years (Poggensee *et al*, 2004). From the Gilgal study the level of education was low as all the mothers had education below tertiary level. This could have resulted in the long intended breastfeeding duration of 18 months by the mothers. Furthermore, the rural location of the area of study could also explain the long intended duration of breastfeeding by the mothers.

5.3.2 TYPE OF INFANT FEEDING

Even though breastfeeding was widely prevalent in the Gilgal area, exclusive breastfeeding (feeding breastmilk only and allowing pharmaceutical medicines) was not common, as only 11% of mothers' breastfed exclusively. Considerable variations regarding exclusive breastfeeding rates exist across countries. The rates for exclusive breastfeeding for infants under four months are low in most African countries. In South Africa the rate was 10.4%, Botswana (29%), Kenya (15.5%), and Nigeria (19.6%) (UNICEF, 2003). Further the findings from this study showed a significant decline in

exclusive breastfeeding (to 3% in older infants) with increasing infant age. These findings were similar to a study conducted in KwaZulu Natal and Limpopo provinces in South Africa (Kassier *et al*, 2003; Mamabolo *et al*, 2004). In KwaZulu Natal it was found that exclusive breastfeeding was the method of choice in infants aged 0 – 6 weeks and mixed feeding was common in infants aged 6 – 14 weeks (Kassier *et al*, 2003). In Limpopo the exclusive breastfeeding rate was 50.1% in infants less than 4 months of age, and the number declined from 44% of infants aged one month to 10% of infants by three months of age (Mamabolo *et al*, 2004). However, other studies on infant feeding have shown improvements in exclusive breastfeeding. The study in KwaZulu Natal province in South Africa reported that 32.1 % and 43.5% of infants were exclusively breastfed in non PMTC and PMTC clinics respectively (Kassier *et al*, 2003). The increase of exclusive breastfeeding rates shows the increased efforts by the health departments in alleviating the problem of exclusive breastfeeding (Kassier *et al*, 2003; Orne-Gliemann *et al*, 2006).

The low rates of exclusive breastfeeding in Swaziland are evidence of early introduction of liquids and solids in infants' diets. There is a general perception that infants need additional fluids for normal growth, especially water to quench thirst, and to prevent indigestion and constipation (Davies-Adetugbo, 1997). The decline in exclusive breastfeeding as the infant grew proved that a few mothers could sustain this feeding method up to the recommended age of six months. This was probably because they felt breastmilk alone was not adequate for growth. Therefore they felt the baby needed an additional source of nutrients in the form of extra solids.

The focus group discussions revealed the aspect that some mothers fed ORT immediately after birth. This indicated that the mothers hardly understood the concept of exclusive breastfeeding or the need and relevance of implementing ORT. The mothers gave ORT to the baby mainly because they thought the baby cried either because she could not suckle well or the milk supply was poor. Some mothers said it was because the milk took time to come out. In a study conducted in Nigeria, mothers gave the baby glucose water, plain water and herbal teas for about three days before initiation of breastfeeding. The herbal teas were given to cleanse the baby's stomach. King (2002) explains that for the first few

days after delivery, the breasts feel soft and empty. They secrete only small amounts of the yellowish thicker first milk called colostrum. This milk is enough for a normal baby and it is exactly what a baby needs for the first few days. After a few days, the breasts begin to feel full and sometimes hard. They start to produce a lot of milk, and this is referred to as the milk has 'come in'. The milk may 'come in' within two days or nearly a week after child birth. It happens more quickly if the baby is allowed to feed whenever he wants to from the time of delivery. This is called demand or unrestricted feeding (King, 2002). Therefore from this study it can be concluded that the mothers believed that the colostrum was not enough and also that they did not practice demand feeding since they complained about having insufficient milk. This could be due to poor stimulation as babies were not allowed to suckle at the breast. In addition mothers could have been breastfeeding in a poor suckling position, which resulted in the baby not breastfeeding properly. Poor suckling position interferes with the milk production and results in a poor milk supply (King, 2002). Thus the infant feeding intervention should take into consideration educating the mothers on colostrum, demand feeding and good suckling positions for breastfeeding.

One central aspect of the WHO/UNICEF breastfeeding recommendation is that breastmilk only should be fed for the first six months by both HIV positive mothers and HIV negative mothers. Breastmilk can be complemented with solid foods after six months, however, for HIV negative mothers the period of breastfeeding can be extended to two years (IBFAN, 2000; LINKAGES, 2004; UNICEF *et al,* 2004; WHO, 2003). Most developing countries emphasize the six months exclusive breastfeeding period to all HIV positive mothers and mothers who do not know their status to avoid stigmatization. In addition breastfeeding is superior to replacement feeding in most African environments in the first six months because it is the only sustainable infant feeding option. The recommendation also puts emphasis on the right of the mother to infant feeding choice (Coutsoudis, 2005; IBFAN, 2000). Exclusive breastfeeding carries a lower risk of transmission of HIV from mother to child than mixed feeding (Coutsoudis, 2005). Complementary breastfeeding practice was common (63.7%) with mothers complementing breastmilk as early as two months or less and the trend increased as the

infant grew older. This indicated that mothers were inclined to introduce food for more nutrients as the infant grew older. The focus group discussions further confirmed that complementary feeding was began early (1 – 2 months) because the 'baby was not satisfied'. Therefore it is clear that as much as breastfeeding is successful there is still a challenge of reshaping it to support the new international recommendation of exclusive breastfeeding for six months to all mothers.

5.3.3 INFANT FEEDING PATTERN

The common pattern of feeding involved breastfeeding throughout the day; but mostly at breakfast and twice in the afternoon. Further feeding of soft maize-meal porridge and infant formula also formed part of the typical pattern. These foods were also fed commonly at breakfast and twice in the afternoon. The trend was typical as most feedings were generally done when the child woke up and before bed time at night. Consumption of proteins and vegetables and fruits was poor. Research has shown that mixed feeding carries a higher risk of mother-to-child transmission of HIV compared to exclusive breastfeeding (Coutsoudis, 2005). Therefore the high rate of complementary breastfeeding (mixed feeding) highlights the number of infants who are at risk of contracting HIV. However, in this study the mothers were not probed for their status, but in a country (Swaziland) where HIV prevalence is high (42.6%) (Swaziland Ministry of Health and Social Welfare, 2004) it can be speculated that a number of infants could be at risk of contracting the HIV virus.

Moreover, the introduction of these foods exposes the young infants to contaminants and contributes to diarrhoea and infections endangering child survival (Davies-Adetugbo, 1997; WHO, 2003). Mothers were probably deluded by the thicker consistency of cereal than breastmilk. They assumed that more consistency (less liquid) meant more nutritious yet soft porridge generally has lower nutrient density compared to breastmilk. Formula is also not as nutrient-dense as breastmilk and is associated with the development of infections and allergies (King, 2002). This is evidenced by the reasons quoted by the mothers for giving additional food; generally mothers fed soft maize-meal porridge and formula because breastmilk alone was considered to be not enough to satisfy the baby.

Reasons cited for soft porridge included 'infant is hungry', 'food filling to the baby', 'baby big enough to eat', and 'breastmilk not enough'. Reasons for formula were 'the infant cries', 'breastmilk not enough'. This concurs with previous studies that reflect that most mothers mentioned 'breastmilk was not enough to satisfy the baby' and that 'the baby cried' as part of the major reasons for early introduction of complementary food (Kiari *et al,* 2004; Kruger & Gericke, 2001). Most mothers in African cultures still do not find it possible to adhere to the new approach of exclusive breastfeeding for six months. This is probably because breastfeeding practices are riddled with traditional beliefs all over the world including practices such as giving food to prevent the infant from crying (Greiner, 2002). A study on cultural barriers to exclusive breastfeeding in Cameroon confirmed that mixed feeding was known to be an old practice encouraged by village elders (Kakute *et al*, 2005) Therefore, the promotion of exclusive breastfeeding must also include working with older women who are the major arbiters of infant feeding patterns (Greiner, 2002). This would help to see if respectful education can make them open to the new recommendation. Mothers would be likely to adopt the recommendation once it has gained local credibility.

The six most common foods included in the infants' diets in addition to breastmilk were soft maize-meal porridge, formula milk feeds, margarine, stiff maize-meal porridge, ORT and sugar. This is in line with the national food consumption survey conducted in South Africa (1999) that listed maize, sugar, and margarine as the part of the six most common foods consumed by infants (Vitamin Information Centre, 2001). Further, studies undertaken in semi-rural areas of South Africa, in Nigeria and Tanzania have found maize-meal porridge as the major supplement given to babies (Kruger & Gericke, 2001; Mamabolo *et al*, 2004; Poggensee *et al,* 2004). Thus it seems maize is the most common food used as a supplement in Swaziland as well, probably because maize is the staple food in the country. With reference to this study, health workers need to investigate the nutritional adequacy of maize meal and the other common foods, and if inadequate consider fortification of these foods. In addition, dietary diversification would also ensure improvement of the infants' diet. Food fortification is one of the food based strategies for preventing micronutrient malnutrition. It is the addition of nutrients to commonly eaten

foods to maintain or improve the quality of a diet. The fortified foods would be promoted as complementary foods at six months particularly the maize cereals. Moreover, fortified local foods would ensure optimum health not only in this community but at national level. Dietary diversification aims to increase dietary availability, regular access and consumption of vitamin and mineral-rich foods in at risk and micronutrient deficient groups. In this community dietary diversification would be achieved by educating the mothers on varied diet to ensure provision of all nutrients (The American Dietetic Association, 2001).

5.4 KNOWLEDGE

Knowledge is important because it either directly influences behaviour or indirectly influences attitude and consequently behaviour. Knowledge indirectly influences behaviour by influencing attitudes through encouraging a different set of beliefs among individuals which in turn affects behaviour (Worsley, 2002). Generally mothers were knowledgeable on infant feeding in the context of HIV (70% mean score). The alternate use of open ended questions and knowledge statements in the questionnaire contributed to revealing the gaps in the mothers overall knowledge levels (Orne-Gliemann *et al*, 2006). The focus group discussions supported this finding as mothers were found to be generally knowledgeable as they gave correct responses to most knowledge questions discussed. The comparison of the results with the PMTCT knowledge level conducted three years ago (47.7%) shows a dramatic improvement in knowledge (Swaziland Ministry of Health and Social Welfare, 2003). Rating the level of knowledge, mothers were most knowledgeable on maternal and infant health, followed by ways of HIV transmission, then general infant feeding practices and least knowledgeable on infant feeding practices by HIV positive mothers.

There is paucity of data in specific categories particularly that of maternal health in the context of HIV. The findings on high knowledge on HIV transmission by mothers in this study (76.2%) corresponds with a study by Omari *et al* (2003) which found that 85% of HIV infected mothers were knowledgeable regarding the risk of transmission of HIV through breastfeeding. Their study was different from this study in that the mothers knew

their HIV status as the sample was drawn from a clinic that followed up and counselled HIV mothers. In contrast, other researchers have shown a lack of knowledge on HIV transmission by mothers (Ministry of Health and Child Welfare & UNICEF Zimbabwe, 2004; Walter *et al*, 2001).

The high knowledge about general infant feeding practices (71.8%) corresponds with several past studies on general knowledge on breastfeeding. A study conducted by Chatman *et al* (2004) in the rural areas of Jamaica found that 98% of mothers indicated satisfactory breastfeeding knowledge. Further, a study by Kong & Lee (2004) conducted in Hong Kong found that 90.4% of mothers were knowledgeable about breastfeeding practices. However it must be noted that these studies only focused on breastfeeding. Moreover, on general infant feeding practices, a misconception on cup feeding transpired from the Gilgal study. Mothers reported that generally cup feeding was better than bottle-feeding of any milk because a cup can be covered. This calls for right advice on how cup feeding is better than bottle-feeding. Advice would include teaching about the advantages such as: cup is easy to clean, and it does not interfere with suckling at the breast etc. (King, 2002; LINKAGES, 2004).

The finding from this study that infant feeding practices by HIV positive mothers was the least known category (54.8%) by mothers is consistent with a study by Orne-Gliemann *et al* (2006). Their study found that only 55.8% of mothers were knowledgeable on infant feeding practices by HIV positive mothers. In contrasts the Ministry of Health and Child Wefare & UNICEF Zimbabwe (2004) found that mothers from the Makoni and Tshololo Regions in Zimbabwe were knowledgeable on infant feeding practices by HIV positive mothers. This shows that in the Gilgal study, mothers lacked knowledge in the most critical aspect which could explain the discrepancy of their infant feeding practices. In particular mothers were most likely not to know that feeding the baby both breastmilk and food increases the risk of transmission of HIV from mother to child. The high practice of mixed feeding (complementary breastfeeding) could be explained by the fact that the mothers were least knowledgeable on this subject. Feeding both breastmilk and food endangers the health of the infant (Coutsoudis, 2005). Moreover, the misconception

that the food in mixed feeding may stretch the intestines/stomach and facilitate transmission of HIV emerged from this study. This indicates that nurses might have chosen a simpler way to make the mother understand the transmission of HIV. However, nurses must clearly explain to the mothers the mechanisms of transmission of HIV from mother to child (UNICEF *et al,* 2004). It is imperative to impart the right knowledge about the transmission in order to make the mothers realize how big a risk mixed feeding is to the infant. The focus group discussions further reported a considerable number of mothers who did not know how an HIV positive mother should feed her baby. Therefore, the lack of knowledge on infant feeding by HIV positive mothers demands an in depth program aimed at improving knowledge on this aspect.

The overall high level of knowledge in this study shows that the mothers received information on infant feeding and HIV. A majority of mothers reported the clinic and the radio as their major sources of information. Other studies have found the clinic to be the main source of information to most mothers (Berridge *et al*, 2005; Kassier *et al*, 2003). Furthermore, Kang *et al* (2005) also found that students mentioned nurses as the most significant and influential contributors to breastfeeding education. This highlights the important role that a clinic and the radio can play in disseminating knowledge.

5.5 BELIEFS

The findings show that in general the mothers' attitude on infant feeding in the context of HIV was negative as they got an average attitude score of 38%. The mothers' beliefs were most negative on infant feeding by an HIV positive mother (38.5%), followed by beliefs on maternal health (43.6%), then general infant feeding (60.1%). The negative attitudes on infant feeding by HIV positive mothers (38.5%) could illustrate that the low level of knowledge of mothers in this aspect had an influence on attitudes as explained in the basic theory of reasoned behaviour and theory of planned behaviour. The theory describes that knowledge can indirectly influence attitudes through encouraging a different set of beliefs among individuals which in turn affects behaviour (Worsley, 2002). Further Baron & Byrne (2003) explain that an attitude strength could be influenced by the level of knowledge, meaning that how much an individual knows about

an object can affect the strength of his/her attitude regarding that object or topic. The attitude strength in turn exerts pressure on behaviour. Therefore since the knowledge about infant feeding by HIV positive mothers was low it could have resulted in a negative attitude. Therefore rectifying the poor knowledge might be the first step in correcting the negative attitudes of women on breastfeeding when they are HIV positive.

Moreover, the negative beliefs on infant feeding practices by HIV positive mothers were probably a result of the misconceptions the mothers had about infant feeding by HIV positive mothers. As reflected in both the questionnaire (N=77, 84.6%) and focus groups (N=20, 95.2%) findings, the mothers believed that HIV positive mothers should not breastfeed. They believed that HIV positive mothers' milk infect the baby. For this reason, mothers did not regard the new recommendation on infant feeding as a valid option. This indicates that the mothers in this area did not find the World Health Organization credible in infant feeding, or that they may not be properly informed on the recommendations or the organization. Therefore health professionals should make an effort to inform the mothers about the international body responsible for development of the recommendations. Findings from this study are supported by a study conducted in Thailand that found that most HIV-infected mothers had negative attitudes towards breastfeeding. They mentioned HIV infection as a reason for not breastfeeding (Talawat *et al*, 2002). Contradictory to findings of this study, other studies have found that HIV positive mothers expressed negative attitudes about not breastfeeding. This indicated that the mothers would breastfeed regardless of their HIV status. The majority of HIV infected mothers felt that the society would stigmatize them if they were not breastfeeding. Not breastfeeding in these societies was tantamount to declaring ones HIV positive status (Omari *et al*, 2003; Thairu *et a*l, 2005). Therefore a PMTCT program in this area should take into consideration the misconceptions about breastfeeding in improving infant feeding in the context of HIV.

The negative attitude on maternal health (43.6%) is in contrast with research carried out in Zimbabwe that found that mothers generally had positive beliefs on maternal health (Ministry of Health and Child Welfare & UNICEF Zimbabwe, 2004). This shows that

mothers did not believe in the importance of good health in HIV positive mothers. This highlights the number of infants' who could be at risk of contracting HIV due to mothers' poor health practices. Maternal health has been proven as a high risk factor of HIV transmission through breastfeeding (Coutsoudis *et al*, 1999; Swaziland Ministry of Health and Social Welfare, 2003). Therefore an in-depth education on maternal health is necessary to make the mothers realize the importance of their health in controlling the transmission of HIV from mother to child.

The negative attitudes on general infant feeding could be influenced by the traditional beliefs of the mothers as explained in infant feeding practices. Most mothers still believed in traditional beliefs such as 'breastmilk alone is not enough'. It is of interest to note that almost half of the mothers in both the questionnaire (40.7%, n=37) and focus-groups (47.6%, n=10) generally believed in bottle-feeding, thus concurring with a study by Omari *et al* (2003) which found that 20 out of 29 mothers' bottle-fed their babies. Another qualitative study by Dorosko & Rollins (2003) found that mothers believed that infant formula must always be bottle-fed rather than cup-fed. They stated that their babies refused to drink from a cup. The reasons for bottle-feeding that emerged from both the questionnaires and focus groups of this study were related, as they all referred to the ease of feeding associated with bottle-feeding. Mothers in the focus groups expressed that 'teats are softer and they are the same as suckling breast teats'. This showed that a considerable number of mothers were not aware that generally cup-feeding was safer than bottle-feeding. Bottles are difficult to clean, and need to be boiled after each feed, mothers are highly likely to leave the bottle lying around in the heat. Bottles also interfere with suckling in that a baby who learns to suckle from a bottle may have difficulty suckling from the breast and may refuse altogether (King, 2002). Thus, addressing general infant feeding should begin with changing the traditional beliefs.

5.6 SOCIAL REFERENTS

The mothers were interviewed on the beliefs of the social referents on infant feeding. The mothers reported that partners (85.7%) and nurses (82.4%) supported breastfeeding. This finding conquers with a study by Kong & Lee (2004) who found that 97% of fathers

wanted their babies to be breastfed. Inconsistent with this study are other studies that found a few fathers to be supportive of breastfeeding (Li *et al*, 2005; Swanson & Power, 2005). Partners supported breastfeeding because of reasons related to the baby's health and well-being. The large support for breastfeeding could mean that partners were sensitized on the benefits of breastfeeding. A considerable number of partners (37.4%) supported bottle-feeding citing nutrition as the reason for support. A considerable number of other social referents (including mothers in law, mothers own mother and people in general) also supported bottle-feeding for nutritional reasons. This finding is disturbing as breastfeeding is superior in nutrition to formulas. Health workers should aim at having most fathers supporting breastfeeding and ensure that support for bottle-feeding is for the correct reasons.

Of particular interest is the mothers' perception of social pressure from different sources of references. The mothers agreed that their partners' views on infant feeding were most important followed by those of nurses. Findings from this study coincide with other studies that found that mothers rated the views of fathers as most important in their infant feeding practices (Kong & Lee, 2004; Swanson & Power, 2005). In contrast, a study conducted in KwaZulu Natal, South Africa, found that the infants' grandmothers were most influential in the mother's infant feeding choice followed by nurses. However, their study was different from this study in that the mother was not asked about the father's influence (Kassier *et al*, 2003). Fathers have been found to be very influential on the mothers' infant feeding choice (Lawrence & Ruth, 1999; Shaker, Scott & Reid, 2004). The influence is probably due to fathers being the main decision-makers in the families in most African countries. Therefore, the partner's belief on breastfeeding should be used as a source of influence. The results from this study imply the involvement of fathers in infant feeding interventions as they proved to have an impact on the mothers' infant feeding choice. Nurses should also be encouraged to offer continued support to promote the appropriate infant feeding as they were also highly influential.

The focus groups brought to the fore that grandmothers' advice was no longer valuable to most mothers particularly the young mothers as it was considered outdated. This could be

considered a positive attitude as grandmothers are the major arbiters of the old improper infant feeding practices in rural communities. However, the old mothers probably still believed in the traditional beliefs. Therefore it would be fruitful to include both the old and young mothers in the program in efforts to eradicate the old traditional beliefs. The focus group discussions also revealed that stigma was prevalent in this community, as people in the area did not give continued support to mothers who progressed to AIDS. The people in general and some family members would keep away from the mother when she fell sick. Only the mother's own mothers and grandmothers offered support when the mother was sick. Stigma has been shown to impede efforts to work effectively with mothers in reducing mother-to-child transmission of HIV (Bond *et al*, 2002). Thus stigma should be encompassed in efforts to improve the social referents' attitudes towards HIV infected mothers in this community.

5.7 RELATIONSHIPS

5.7.1 RELATIONSHIP BETWEEN KNOWLEDGE AND BELIEFS

There was no statistical significant relationship between knowledge and beliefs/attitude of the group of women included in this study. This meant that in general high knowledge did not necessarily lead to having a positive attitude and having a positive attitude did not mean having good knowledge. These findings are not consistent with the basic theory of reasoned behaviour and theory of planned behaviour's aspect that posits that knowledge can indirectly influence behaviour by influencing attitudes through encouraging a different set of beliefs among individuals (Baron & Byrne, 2003; Worsley, 2002). In contrast to this study past research on university students and nurses found a statistical significant relationship between knowledge and attitudes on breastfeeding practices (Kang *et al,* 2005; Spear, 2004). This indicated that knowledge was positively influential to attitudes in their studies.

Results from the Gilgal study suggest that knowledge does not always influence attitudes. Attitudes could be influenced by other factors such as social, cultural, economic and physiological factors (Martens & Kue Young, 1997; Swanson & Power, 2005). In this regard it can be safely said that mothers were knowledgeable on infant feeding practices

by HIV positive and negative mothers but they did not believe in them. For instance mothers who knew that exclusive breastfeeding was safe for their babies would still prefer mixed feeding to exclusive breastfeeding. This proved that other factors were more influential on their attitude than their knowledge on infant feeding in the context of HIV. It could probably be due to strong cultural beliefs associated with mixed feeding in this community such as 'breastmilk is not enough for the baby to grow'. A mother's infant feeding attitude and behaviour may be influenced by what is deemed acceptable in her own culture (Li *et al*, 2005; Swanson & Power, 2004). Singh-Manoux & Marmot (2004) further argue that health related behaviours are never truly voluntary, they are a product, and embedded in structures of society. The perceived physiological ease or difficulty of doing a particular behaviour influences attitudes. Physiological difficulty includes breastfeeding problems such as breast complaints, insufficient milk, and maternal fatigue. These may negatively influence the attitudes towards breastfeeding and consequently behaviour (Berrigde *et al*, 2005; Wambach, 1997). The socioeconomic status has been found to be influential on attitudes towards infant feeding. Previous research has shown that women of higher socio economic status are likely to prefer feeding formula or other foods than exclusive breastfeeding (Filteau, 2003; Goksen, 2002). In most African cultures financial constraints is the major cause for the low use of replacement feeding (Kiari *et al*, 2004).

In this study a statistically significant association between knowledge and attitudes was found on the individual matched questions, indicating that having a high knowledge resulted in having a positive attitude. These matched questions were specifically those with positive health outcomes including questions on cup feeding versus bottle feeding, breastmilk only is enough for six months, and breast infection increases the risk of HIV transmission. This suggests that matching knowledge and attitude questions could be more effective in finding the association compared to concluding on the overall score. Future studies should consider analysis of matched questions on knowledge and attitudes. The results from our study suggest increased efforts towards strengthening the relationship between the mothers' knowledge and attitude on particular important issues related to HIV.

5.7.2 RELATIONSHIP BETWEEN KNOWLEDGE, BELIEFS AND INFANT FEEDING PRACTICE

There was no statistical difference between the knowledge scores of mothers in the four categories of infant feeding practices. The categories were exclusive breastfeeding, complementary feeding, predominant breastfeeding and replacement feeding. This indicated that the level of knowledge of the mothers practicing these various methods was more or less the same. Moreover there was no significant relationship found between attitudes of mothers in the four infant feeding groups. These findings are not confined to Gilgal mothers; a study in Jamaica found no difference between mothers who practiced exclusive breastfeeding and partial breastfeeding with respect to knowledge and attitudes towards breastfeeding (Chatman *et al*, 2004). However, a related study on PMTC conducted in Nairobi, Kenya, found that exclusive breastfeeding was associated with better knowledge about prevention of mother to child transmission of HIV (Kiari *et al*, 2004). However Shaker, Scott & Reid (2004) found that mothers who were breastfeeding had higher knowledge and positive attitudes towards breastfeeding compared to mothers who were formula feeding.

Findings from this study show that mothers in the various groups had almost the same level of knowledge and attitudes; no group was superior to the other in both aspects. This is abnormal as one would expect the mothers who followed the proper feeding practices (exclusive breastfeeding and formula feeding) to be more knowledgeable than those practicing complementary and predominant breastfeeding. It must be noted that the sample size of the four groups was not the same, because stratification was based on the age of the infant rather than the type of feeding. This was because it was expected that infant feeding practices would vary according to the age of the infant. Overall, the knowledge was high but statistically no feeding group showed a higher level of knowledge, also the overall attitude was negative and statistically no feeding group proved to have a more positive attitude than the other. This showed that the level of knowledge did not necessarily guarantee proper infant feeding practice. However, although knowledge did not directly influence behaviour it was clear that behaviour was more influenced by attitude. This underscores the need to improve the negative attitudes

of the mothers such that they correlate with the level of knowledge to improve infant feeding practices.

A statistical significant relationship was found between knowledge and attitude of mothers who practiced predominant breastfeeding. Although the strength of the relationship was high, it was negative indicating that in this group mothers who had high knowledge had a negative attitude visa versa. Thus, even if they knew the correct feeding practice their attitudes posed to be the opposite thus influencing their behaviours negatively. A statistical significant relationship was found between knowledge and attitudes of mothers who practiced complementary feeding, however the strength of the relationship was weak as evidenced by the correlation coefficient (0.357). These results show that in this group there was a slight tendency for mothers with high knowledge to have a positive attitude visa versa. The findings reflect that knowledge could ultimately have positively influenced the attitudes of the mothers, but the weak relationship proved that the influence was not strong enough to have resulted in a proper practice.

The relationship found between knowledge and attitudes of mothers who practiced replacement feeding was not strictly statistically significant since the p-value was just above 0.05, however the relationship was strong. This is probably due to the small sample size (n=5). This means that in this category mothers who had good knowledge also had a positive attitude visa versa. This shows that good knowledge on the new recommendation may have influenced attitudes positively which led to following the guideline. This is in agreement with the theory of reasoned behaviour and theory of planned behaviour (Worsley, 2002). However a study in Thailand found that women who practiced replacement feeding had high knowledge on transmission of HIV through breastfeeding but had negative attitudes towards breastfeeding. This discrepancy could have resulted from the Thai infant feeding guideline that recommended exclusive formula feeding (Talawat *et al*, 2002). It is important to note that the sub sample was too small (n=5) for one to generalize. This suggests for a study on a larger sample of replacement feeding mothers for purposes of generalization.

Statistically there was no significant relationship found between knowledge and attitudes of mothers who practiced exclusive breastfeeding. This meant that there was no clear pattern between knowledge and attitude; having good knowledge on the subject did not necessarily mean having a positive attitude about the subject. This result is puzzling as one would expect mothers in this group to have a high level of knowledge corresponding with a positive attitude. However it must be noted that the sample size was small (n=10) and attitudes can be affected by other factors. Overall although there was a significant relationship found between knowledge and attitudes of mothers that practiced replacement breastfeeding, predominant and complementary feeding, the weak and negative strengths associated with the feeding practices indicate the imbalance between knowledge and attitude. This underscores the importance of a program that will aim at strengthening the relationship such that knowledge positively influences attitudes and behaviour. The success of infant feeding interventions depend on a clear understanding of knowledge and attitudes that facilitate or hinder the appropriate infant feeding practice (Kang *et al*, 2005).

CHAPTER 6

6.1 EXECUTIVE SUMMARY

The study was conducted with the intention to describe the knowledge and beliefs of mothers of infants aged 0 – 6 months with regard to their infant feeding practices in the context of HIV. The mothers that were targeted were receiving post-natal care at the Gilgal clinic in Swaziland. Gilgal is a rural area situated in the Manzini region of Swaziland. The area was selected on the justification of being located in the region with the highest HIV prevalence rate in the country out of the four regions. All mothers regardless of their status were involved in the study since the study aimed at providing information to benefit the implementation of a PMTC program that would benefit the whole community.

The research was addressed through a cross sectional descriptive survey in the quantitative paradigm. A qualitative research technique (focus groups) was used for validation and support purposes. The study' objectives were to describe the knowledge and beliefs of mothers with regard to infant feeding practices in the context of HIV, to describe the relationships among these three concepts and to further describe the influence of social referents on mothers' beliefs. The research was carried out in the month of June 2006. The research was carried out by the researcher/author, and one trained field worker who helped as an observer in the focus group discussions. A stratified and convenience sampling technique was used to select the sample. A stratified sampling technique was used to select the mothers based on the age of their infants and the mothers' general feeding patterns. The convenience sampling referred to including all mothers complying with the study parameters attending at the Gilgal clinic at the time that the researcher attended the clinic for data gathering purposes.

The measuring instruments used were an adapted 24-hr recall of dietary intake of the infants to formulate a pattern of food intake for infants, and to assess infant feeding practices. Secondly, a questionnaire was constructed particularly for this research study to measure knowledge and beliefs and focus group discussions were conducted to add in

depth data on infant feeding, knowledge and beliefs. Raw data were coded, computed and statistically analyzed. Descriptive statistics were performed and the data was presented as frequencies, means, medians and percentages. Pearson, Spearman and Chi square tests were used to determine the relationships between knowledge and attitudes. The parametric analysis of variance (ANOVA) and the non-parametric Kruskal Wallis tests were done to test the relationships between knowledge, attitudes and infant feeding practices. Content analysis and ethnography were used to analyze the qualitative data by thorough transcriptions followed by identifying new themes and sub-themes. Subsequently the qualitative data was used to add depth to the quantitative analysis.

The theories of reasoned and planned behaviour frameworks were adopted in the development of this study. These theories posit that knowledge can indirectly influence attitudes through encouraging a different set of beliefs among individuals which in turn affects behaviour. The theories further describe that knowledge can have a direct effect on behaviour without mediating the effect of attitude. Lastly, they posit that the perceived influence of other people's views is an important predictor of infant feeding behaviour. Therefore the study was conducted with the intention to investigate whether knowledge or attitudes can directly influence infant feeding practices. Lastly the study aimed at investigating the degree of influence of social referents on the mothers regarding their feeding practices.

The results indicated that breastfeeding was highly practiced (94.5%) and the intention to breastfeed was 18 months. This proved that breastfeeding is still a norm in most African cultures (Omari *et al*, 2003; Poggensee *et al*, 2004; SARA project, 2001; UNAIDS, 2002; UNICEF *et al,* 2004). However exclusive breastfeeding was only 11% indicating the low level of adherence to the new infant feeding recommendation. The typical feeding pattern involved breastfeeding throughout the day, mostly at breakfast and twice in the afternoon. In addition feeding soft maize-meal porridge and infant formula also formed part of the typical pattern. These foods were commonly fed at breakfast and twice in the afternoon. The results highlighted the need to reshape the old norm of breastfeeding with introduction of complementary feeding from a very early age to support the new infant

feeding practice of exclusive breastfeeding for 6 months. Moreover focus group data revealed that some mothers fed ORT to their babies immediately after birth as a replacement for colostrum. Generally knowledge of infant feeding in the context of HIV was high; however the mothers lacked knowledge in the most crucial aspect which was knowledge of infant feeding by HIV positive mothers. Overall attitudes on infant feeding practices by HIV positive mothers were negative, particularly on infant feeding by HIV positive mothers. Mothers followed most partners' and nurses' advice regarding infant feeding. This showed that fathers and nurses were influential towards the mother's feeding practice. Focus groups reflected that stigma was prevalent in this community and it demands addressing as it could impede efforts to improve infant feeding practices. There was no significant relationship found between knowledge and attitudes, indicating that attitudes on infant feeding were not driven by knowledge but other factors such as culture. This stresses the need for improvement of the mothers' attitudes. Moreover the mothers in the four feeding categories had almost the same level of knowledge and attitudes. No group proved superior to another as it would have been expected.

There was a significant relationship found between knowledge and beliefs/attitudes of mothers who practiced predominant breastfeeding, complementary and replacement feeding. This indicated that knowledge positively influenced the attitude of mothers in these categories. However the relationships were weak and negative, proving the necessity to strengthen the relationship between knowledge and attitudes. There was no statistical relationship found between knowledge and attitude of mothers who practiced exclusive breastfeeding, meaning having high knowledge did not necessarily mean having a positive attitude. One would expect these mothers to have high knowledge with a positive attitude. However, it must be noted that the sample size was small (n=10) and attitudes can be affected by other factors.

6.2 CONCLUSIONS

6.2.1 INFANT FEEDING PRACTICES

The first objective was to **describe the infant feeding practices of mothers of infants aged 0 – 6 months in the Gilgal area.** The objective was attained through the 24 h recall

and focus group discussions. It was concluded that exclusive breastfeeding was rarely practiced by mothers. This is in line with previous studies on infant feeding in other countries, South Africa (10.4%), Botswana (29%), Kenya (15.5%), and Nigeria (19.6%) (WHO, 2000). Focus group data reflected that the problem of exclusive breastfeeding is aggravated by the fact that some mothers fed ORT immediately after birth. The mother gave ORT to the baby mainly because she had a problem with the milk supply and because the baby had suckling difficulty. The general feeding trend, however, involved feeding breastmilk, soft maize-meal porridge and infant formula. There was a general perception that breastmilk as the only food was not enough to satisfy the baby. The six most popular foods consumed by the infants were soft maize-meal porridge, margarine, stiff maize porridge, and sugar. Similar to these findings is the National Food Consumption Survey conducted in South Africa (1999) that listed maize meal, sugar, and margarine as part of the six most common foods consumed by infants (Vitamin Information Centre, 2001).

From the results from this study a program that will shape up the mothers' present practices to support the new recommendation was recommended. Demand feeding and breastfeeding techniques need to be evaluated closely to eradicate feeding of ORT after birth and to implement correct procedures. The program must take into account the mothers negative reasons for feeding additional foods. It should be born in mind that breastfeeding practices in most African cultures are tied to traditional beliefs. Therefore broader implications should involve working with older women, who are the major arbiters of infant feeding pattern. Treating the problem by its roots may help in promoting the new recommendation, as it would ensure that the elder mothers are advocating the proper infant feeding practices. With reference to the six foods, health professionals need to look into the nutritional adequacy of these foods and consider ways of increasing the nutrient density of these foods. Food fortification and dietary diversification would be some of the ways of improving the quality of the infants' diets (The American Dietetic Association, 2001). Broader implications of promoting exclusive breastfeeding should involve promotion of breastfeeding at national level not only within efforts to prevent mother-to-child transmission of HIV (PMTC), but also to avoid stigmatization. Also the

maternity protection policies should be reviewed to increase maternity leave to ensure that it is feasible for working mothers to breastfeed exclusively.

6.2.2 KNOWLEDGE

The second objective of the study was to **describe knowledge of the mothers in the Gilgal area regarding HIV and infant feeding practices.** The level of knowledge was assessed by the questionnaire including knowledge statements on HIV and infant feeding. Focus groups were conducted to add depth to the data. It was concluded that mothers were generally knowledgeable about infant feeding in the context of HIV. Rated in order of the level of knowledge, mothers were most knowledgeable on maternal and infant health. Following was the ways of HIV transmission, knowledge of general infant feeding and they were least knowledgeable about infant feeding by HIV positive mothers. Focus group discussions confirmed that mothers were generally knowledgeable about infant feeding practices. Similar to this study is a study conducted in Lusaka, Zambia (Omari *et al*, 2003) which found 85% of HIV infected mothers were knowledgeable about the risk of transmission of HIV through breastfeeding. However it must be noted that in their study the mothers knew their HIV status as the sample was drawn from a clinic that followed up and counselled HIV infected mothers. Results from this study showed that as much as the mothers were knowledgeable, they were highly likely to not know about appropriate infant feeding practices by HIV positive mothers.

Important to note are the misconceptions about mixed feeding and cup feeding that emerged from this study. Mothers had the misconception that food stretches the stomach and facilitates transmission of the virus in that way. This shows that the mothers' understanding of transmission was vague. Therefore nurses need to educate the mothers on the mechanisms of transmission of HIV from mother to child. A considerable number of mothers knew that cup feeding was better than bottle-feeding because it could be covered. This means that mothers' knowledge of why cup-feeding was better was based on the wrong reasons. Thus, nurses should promote cup-feeding for justifiable reasons. The clinic and the radio were found to be the most influential contributors to the mothers' infant feeding knowledge. This underscores the efficacy of clinics and radios in

disseminating information. Therefore, the findings indicate the need for an in-depth education program on infant feeding practices by HIV positive mothers that would improve the mothers' knowledge of this aspect. The program should also aim at correcting the mothers' misconceptions regarding infant feeding particularly as it relates to traditional beliefs. General infant feeding practices by all mothers should also be included in the program. Continued support should be given to mothers by nurses and health organizations involved in infant feeding, and the radio should be considered as the medium for informing the mass.

6.2.3 BELIEFS

The third objective was to **describe the beliefs of mothers regarding HIV and infant feeding practices in the Gilgal area**. This objective was achieved by administering a questionnaire and conducting focus group discussions. Generally the mothers' attitudes were negative; they were most negative on infant feeding by HIV positive mothers, maternal health and lastly general infant feeding. The negative beliefs on infant feeding by HIV positive mothers could have been influenced by the low level of knowledge regarding this aspect as described by the basic theory of reasoned behaviour and theory of planned behaviour. These results suggest that rectifying the knowledge might correct the attitudes. The misconception that an HIV positive mother should not breastfeed was revealed by both the questionnaire and the focus groups. Mothers believed that the HIV positive mothers' milk infects the baby. This could have negatively influenced their overall attitudes on infant feeding by HIV positive mothers. The negative attitude on maternal health is in contrast with research carried out in Zimbabwe that found that mothers generally had positive beliefs on maternal health (Ministry of Health and Child Welfare & UNICEF Zimbabwe, 2004).

It could be concluded that mothers' attitudes were most negative on the aspect that is a high risk factor of HIV transmission through breastfeeding. Therefore it is recommended that an in-depth education program on maternal health be developed and implemented. Such a program will make the mothers realize the importance of their health in controlling the transmission of HIV from mother-to-child. Consideration of the mothers'

misconceptions is vital in efforts to improve their attitudes on infant feeding. Attitudes on general infant feeding have been proved to be riddled with traditional beliefs. Therefore involvement of the arbiters of the traditional beliefs in the program would be important in improving beliefs and attitudes.

6.2.4 SOCIAL REFERENTS

The fourth objective was to **describe the influence of social referents on the mothers' beliefs towards infant feeding practices.** The questionnaire reflected fathers and nurses as the social referents that were highly supportive of breastfeeding. This finding is in agreement with a study by Kong & Lee (2004) who found 97% of fathers to be supportive of breastfeeding. Previous research shows that partners were more influential on the mothers' infant feeding choice (Lawrence & Ruth, 1999; Shaker, Scott & Reid, 2004). This shows that fathers approved of breastfeeding as a proper infant feeding practice. It is disturbing that except for the mother's own mother, all of the social referents supported bottle-feeding for nutritional reasons. This indicated that they believed infant formula was healthier than breastfeeding as a feeding option for a normal healthy baby. The results indicated mothers regarded their partners' views as most important to them followed by nurses' views. It was concluded that mothers considered these two referents' views valuable in infant feeding. The focus group discussions revealed that the grandmothers' advice was no longer valuable to the mothers. They were considered to be less knowledgeable about infant feeding particularly to the young mothers. However the old mothers probably still held on to the old beliefs on infant feeding. Stigma existed in this community as people tended to discontinue supporting the mother when she fell sick, they would literally shun away from the mother.

Thus findings from this study imply the involvement of fathers in infant feeding intervention to promote the new infant-feeding recommendation. Fathers who are equipped with knowledge would be likely to influence proper infant feeding practices and ensure their sustainability. It may also be of value to further study the fathers' knowledge and attitudes to infant feeding. The success of the program will also rely on having knowledgeable nurses who have positive attitudes on the new recommendation.

Therefore the nurses should get advanced training to ensure that they impart the correct knowledge and attitudes to the mothers. Both old and young mothers should be included in the program to ensure eradication of the old infant feeding beliefs. Broader implications should also involve the distant social referents to sustain exclusive breastfeeding in this community. Stigma should be addressed to improve the society's attitude and to ensure local credibility of the new infant feeding recommendation.

6.2.5 RELATIONSHIPS

The fifth objective was to **describe the relationship between knowledge and beliefs regarding HIV and infant feeding practices.** The relationship between knowledge and beliefs was determined through performing Pearson and Spearman correlation statistics. The results showed that statistically there was no significant relationship between knowledge and attitudes; meaning having high knowledge did not necessarily lead to having a positive attitude. Findings from this study were not consistent with the basic theory of reasoned behaviour and theory of planned behaviour (Worsley, 2002). These theories describe that knowledge can indirectly influence behaviour by influencing attitudes through encouraging a different set of beliefs among individuals. It can be concluded that mothers were knowledgeable about infant feeding practices by HIV positive mothers but they did not believe in them. Therefore they would not implement their knowledge into practice. For instance, mothers who knew that breastfeeding only was safe for their babies would still choose to practice mixed feeding. This could probably be due to the fact that other factors were more influential on their attitude than knowledge. In this regard it could be speculated that culture could have been more influential as most infant feeding beliefs are riddled in cultural beliefs as discussed in the literature. Attitudes could be influenced by other factors such as social, cultural, economic and physiological factors (Martens & Kue Young, 1997; Swanson & Power, 2005).

A statistical significant relationship was found between knowledge and attitude on certain individual topics. The topics included cup feeding, exclusive breastfeeding and breast infection and HIV transmission. Therefore testing the relationship between individual

matched questions/topics suggests that it could more effective in finding the association compared to overall score. Future studies should consider analysis of matched questions on knowledge and attitude. These results suggest for increased efforts towards strengthening the relationship between knowledge and attitudes. Lastly, a study on the other factors (such as cultural and economic factors) that could influence attitude is imperative to address infant feeding practices in this community.

The sixth objective was to **describe the relationship between knowledge, beliefs and infant feeding practices of the mothers in the Gilgal area.** The results revealed that statistically there was no significant relationship between knowledge scores of mothers in the four different feeding practices namely: exclusive breastfeeding, predominant breastfeeding, complementary and replacement feeding. This reflects that the mothers in all the feeding categories had almost the same level of knowledge on infant feeding in the context of HIV. Moreover there was no significant relationship found between attitudes of mothers in all the infant feeding groups. These results revealed that the mothers also had almost the same attitude towards infant feeding in the context of HIV. Results from this study conquer with a study by Chatman *et al* (2004) who found no significant difference in knowledge and attitudes of mothers who practiced exclusive breastfeeding and partial breastfeeding. One would expect the mothers who followed the proper practices (exclusive and replacement feeding) to exhibit higher knowledge and more positive attitudes towards infant feeding. Generally knowledge was high but statistically no group proved to be more knowledgeable and attitudes were generally negative and no group had more positive attitudes. This indicated the need to strengthen attitudes such that they correlate with knowledge.

A statistical significant relationship was found between knowledge and attitudes of mothers who practiced predominant breastfeeding, complementary and replacement. The mothers in both the predominant and complementary feeding groups were likely to have high knowledge and positive attitudes. However, the relationships were weak, confirming the necessity to strengthen the relationship between knowledge and attitudes. Mothers who practiced replacement feeding were likely to have high knowledge and negative

attitudes, visa versa. This also indicated the need for a program to correct the negative attitudes. Statistically there was no significant relationship found between the knowledge and attitudes of mothers who practiced exclusive breastfeeding, meaning having high knowledge did not necessarily mean having a positive attitude. One would expect these mothers to have high knowledge with a positive attitude. However, it must be noted that the sample size was small (n=10) and attitudes could be affected by other factors. Overall an urgent attention needs to be given to the improvement of attitudes of the mothers regarding HIV and infant feeding.

6.3 PRACTICAL IMPLICATIONS

From this study it transpired that the mothers lacked knowledge in the most critical aspect of mother to child transmission of HIV. Further they generally had a negative attitude and did not adhere to the recommended feeding practices. The findings indicate the need of a program on MTCT to provide more information on mother-to-child transmission on infant feeding and the various practices involved. This information will help increase their knowledge which will consequently change their beliefs.

The nurses' roles should be expanded as educators of the new infant feeding recommendation. It would be rewarding to offer continued education on MTCT to the nurses to ensure that they transfer the right knowledge and positive attitudes to the mothers. This program should be coordinated from a central facility, like the Ministry of Health in Swaziland. Education may be given in the form of group work, discussions, posters, songs and dramas.

Community involvement is important in ensuring support for mothers and sustainability of the new infant feeding recommendations. Fathers should be involved in the program as they have proved most influential on mothers' infant feeding practices. The elder women (own mother, mother-in-law and grandmother) should be included because they are the arbiters of the present infant feeding practices in the community. Broader implications by the Ministry of Health and infant feeding organizations should consider disseminating information through radio as it has proved effective in this community. In addition, the

Ministry should consider integrating exclusive breastfeeding at national level not only within efforts to prevent mother-to-child transmission of HIV, but also to avoid stigmatization. Also the maternity protection policies should be reviewed to increase maternity leave to ensure that it is feasible for working mothers to breastfeed exclusively. The MTCT program should focus on the critical issues identified in Table 6.1

TABLE 6.1: THEMES AND TOPICS FOR THE MTCT PROGRAM FOR GILGAL CLINIC

Themes	Topics
General infant feeding practices	• Initiation of breastfeeding after birth • Unrestricted feeding • Breastfeeding techniques • Length of breastfeeds • Longer breastfeeding (2 years) • Introduction of solids at 6 months to all mothers • Sequential introduction of food • Encourage cup feeding rather than bottle-feeding with appropriate motivation • Hygiene in cup feeding
Infant feeding practices by HIV positive mothers	• Exclusive breastfeeding for six months • Explain the meaning of exclusive breastfeeding • Transition from exclusive breastfeeding to replacement feeding • Other safe feeding options
Mother and infant health	• Mother and baby should maintain good health • Regularly check breast for infection

Themes	Topics
	• Discuss the different breast infections and symptoms. • Seek prompt treatment for breast infection • Options of feeding when she has a breast infection. • Regularly check the baby's mouth for sores or lesions and treat immediately • Mother should stop breastfeeding when sick of AIDS
Culture	• Misconceptions on general infant feeding • Misconceptions about breastfeeding by HIV positive mothers.

6.4 RECOMMENDATIONS FOR FURTHER STUDY

From the results, the following recommendations for future studies could be made:

1. Mothers remain with the right to infant-feeding choice; therefore this demands increased efforts on testing and counselling to ensure that they make the right choice. Therefore a study on monitoring of counselling and testing programs should be done to measure their efficacy in this community.

2. A study needs to be carried out in the mothers' natural environment because the clinic environment could have influenced their responses. This study would give a true reflection of the infant feeding practices as the mother's feeding would be observed instead of being reported by the mother.

3. The findings reflected that infant feeding practices could be riddled with traditional beliefs which are typically promoted by old women in the society.

Therefore it is recommended that a study that will give insight into their level of knowledge and attitudes should be conducted to help eradicate the problem of non-exclusive breastfeeding in this community.

4. An analysis of the nutrient content of the six common foods needs to be done so these foods could be used as vehicles for fortification if necessary, particularly the maize meal for the infants cereal.

5. Breastfeeding techniques and demand feeding must be closely studied to gain insight into the problem of feeding of ORT to infants.

6. The results in other aspects suggest that knowledge does not always influence attitudes. But other factors can influence attitude; these include: previous exposure, cultural, economic and physiological factors. Thus it is recommended that a study on these factors be conducted to measure their influence on the mothers' attitudes and infant feeding practices.

7. The partners and nurses were found to be influential on the mothers' infant feeding. It is recommended that a study to explore the nurses' and partners' knowledge and attitudes be conducted to gain insight and ensure successful promotion of the new infant feeding practice.

8. HIV positive mothers should wean their infants abruptly after 6 months to avoid transmission of HIV from mother to child. It would be necessary to conduct a study that would evaluate the transition of mothers from exclusive breastfeeding to complementary feeding.

9. Stigma against HIV infected people was identified. Therefore it is recommended to assess stigma in all sectors in the society in an effort to improve and sustain the new recommendation

The insights gained during the research led to the following recommendations to improve new research.

10. More field workers should have been used to administer the questionnaires. The researcher experienced the problem of having many mothers to interview at once. Had there been more data collectors, the questionnaire administration could have taken a shorter period of time. Therefore more data collectors need to be trained for a study that is conducted under a limited period of time.

11. The stratification sample technique based on the age of infants resulted in small sample sizes in the infant feeding categories. The small sample sizes of some of the feeding groups affected the performance of some of the descriptive tests as they could not be performed on small samples. Moreover generalization of the results to a larger population was questionable with the small samples. Therefore future studies should consider stratifying the sample based on the feeding type rather than the age of the infants to ensure a larger sample.

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ADDENDUM A: APPLICATION LETTER

World Vision

Swaziland

P.O. Box 2870
Mbabane
H100
Swaziland
Southern Africa

Tel. (268) 422 1665/5/6
Fax: (268) 422 1663

6th June 2006

The Director of Health Services
P.O. Box 5
Mbabane

Dear Dr. C. Mabuza

Request For Permission To Conduct Research Study In Government Clinics

This letter serves to request for your permission to conduct a study in the Gilgal and Siphofaneni clinics. The study will focus on mothers with infants aged 0-6 months and will make use of an administered questionnaire and focus groups. The study seeks to determine the knowledge and beliefs of women with regard to infant feeding practices in the context of HIV and AIDS. The study will describe the knowledge, beliefs and practices on infant feeding in the context of HIV and AIDS. The study is significant in that it will provide information that will assist World Vision and other stakeholders in planning interventions aimed at the prevention of HIV infection and mitigation of HIV and AIDS impact. The study is meant to begin June 12, 2006.

World Vision has development programmes within Gilgal and Siphofaneni areas aimed at preventing the spread of HIV and AIDS and mitigating its impact within Gilgal Area development Programme. Our programmes in these areas have been carried out in collaboration with the Gilgal and Siphofaneni Clinics. It is in this regard that we hope the results of the study will be of benefit to other stake holders including the clinics. Sindi Mahlalela will conduct the study under the supervision of World Vision.

I hope my letter meets your most favorable response.

Yours Faithfully

Russell Dlamini
Ministry Quality Director

ADDENDUM B: PERMISSION LETTER FROM GOVERNMENT

Ministry of Health and Social Welfare
P. O. Box 5
MBABANE

7th June 2006

Sindi Mahlalela
University of Pretoria
P/Bag Pretoria
2000
PRETORIA

Dear Sindi

YOUR REQUEST TO CONDUCT A STUDY IN THE GOVERNMENT CLINICS

I refer to your letter dated 6th June 2006. Permission is hereby granted to you to conduct a study on the knowledge and beliefs of Swazi women with regard to infant feeding practices in the context of HIV and AIDS. The study is expected to commence on the 8th June 2006 until the end of August 2006.

We would appreciate if your findings would be communicated back to the ministry.

MINISTRY OF HEALTH AND SOCIAL WELFARE
P.O. BOX 5
MBABANE
07 JUN 2006
UNDER SECRETARY
SWAZILAND

Yours faithfully

FOR: **Dr. C. S. MABUZA**
DIRECTOR HEALTH SERVICES

ADDENDUM C: CONSENT FORM

THE KNOWLEDGE AND BELIEFS OF SWAZI WOMEN WITH REGARD INFANT FEEDING PRACTICES IN THE CONTEXT OF HIV/ AIDS

The above mentioned study is conducted in collaboration with World Vision Organization by Sindi Mahlalela a Masters student in consumer science who is currently studying at the University of Pretoria. The main of the study is to describe the knowledge and beliefs and practices on infant feeding in the context of HIV/AIDS of mothers with infants aged 0 – 6 months in the Gilgal area in Swaziland. The information on the knowledge and beliefs regarding infant feeding practices will serve as a basis for developing a model/framework that will be used World vision and health clinics for preventative interventions.

I (name) ..... hereby give my permission to participate in the study.

I understand that

- My participation is voluntary, if I choose not to participate or to withdraw from the study at anytime, there will be no penalty.
- The questionnaire will be administered to me by an interviewer in my native language.
- The questions will be asked once.
- The amount of time to finish answering the questionnaire will be 1 ½ hours.
- Answers given by myself will be kept confidential to research staff and my identity will remain anonymous in the analysis of the study.
- The results of the study will be published and my name will not be used.

My Participation in the study will generate information that will help in improving the quality of life of the infants.

Signature (Participant)..... Date .....

Signature (Researcher)..... Date.....

ADDENDUM D: QUESTIONNAIRE

24 hr recall

Question	Response
1. Date of interview	
2. Name of the respondent	
3. Child's name	
4. Respondents number	
5. Child's date of birth (or age calculated and completed in months	Dd/mm/yy (Age in weeks)
6. Has (name) ever been breastfed	Yes continue below……..1 No skip to Q10……..2
7. Are you still breastfeeding	Yes continue below and skip Q9 and Q10……1 No skip to Q10, then skip Q11 and continue…….2
8. How long do you intend breastfeeding? (Record age in months, If mother does not know record 99)	
9. At what age was breastfeeding stopped (Record age in months, if mother does not know record 99)	

For office use only

V1		1 - 3
V2		4 - 5
V3		6
V4		7
V5		8 - 9
V6		10 - 11

10. Why did you stop breastfeeding	
11. Since this time yesterday have you breastfed	

V7			12-13
V8			14

12. What was fed to the baby from the time she/he woke up to the time she/he went to sleep?

Time	Food/drink	Preparation	Reason for type
Before breakfast			
Breakfast			
Lunch			

V9							15-20
V13							21-26
V17							27-32
V21							33-38
V25							39-44
V29							45-50
V33							51-56
V37							57-62

Snack			
Supper			
Dinner			
Midnight			

V41							63-68
V45							69-74
V49							75-80
V53							81-86
V57							87-92
V61							93-98
V65							99-104
V69							105-110
V73							111-116
V77							117-122
V81							123-128
V85							129-134

13. Since this time yesterday, has the child received any of the following	Response		Reasons			
13.1. Vitamins, mineral supplements, medicines	Yes	1	13.2. 1 -10	V89		135
	No	2		V90		136-137
13.3 Plain water	Yes	1	13.4. 1 -10	V91		138
	No	2		V92		139-140
13.5 Flavoured water, fruit juice & tea	Yes	1	13.6 1 - 10	V93		141
	No	2		V94		142-143
13.7 Infant formula or other milk	Yes	1	13.8 1 - 10	V95		144
	No	2		V96		145-146
13.9 Cereals or porridge	Yes	1	13.10 1 - 10	V97		147
	No	2		V98		148-149
13.11 Traditional medicines	Yes	1	13.12 1 - 10	V99		150
	No	2		V100		151-152
13.13 Other foods	Yes	1	13.14 1 - 10	V101		153

	No	2	
13.15 Other foods	Yes	1	13.16 1 -10
	No	2	
14. Since this time yesterday has the baby been given anything to drink from a bottle with a teat or a nipple.	Yes	1	
	No	2	
If yes what			Reason

V102			154-155
V103			156
V104			157-158
V105			159
V106			160-161
V107			162-163
V108			164-165

15. Are your feeding patterns the same everyday Yes = 1 No = 2

V109			166-167

16. If no how was it different.....

.....

.....

.....

V110			168-169
V111			170-171
V112			172-173
V113			174-175

Questionnaire

Knowledge

For office use only

1. An HIV positive mother is likely to pass the virus to the infant through kissing the baby.

   1. True 2. False 3. Uncertain 4. Don't know

V114		176

2. An HIV positive mother is likely to pass the virus to the infant through breastfeeding.

   1. True 2. False 3. Uncertain 4. Don't know

V115		177

3. An HIV positive mother cannot pass the infection to the child through breastfeeding, it is only transferred through sexual contact between partners.

   1. True 2. False 3. Uncertain 4. Don't know

V116		178

4. The longer the time of breastfeeding of an HIV infected mother, the less the infant is likely to get HIV infected.

   1. True 2. False 3. Uncertain 4. Don't know

V117		179

5. When HIV positive mothers Feed breast milk only with no water, no juice, and no food, it is not enough for the baby.

   1. True 2. False 3. Uncertain 4. Don't know

V118		180

6. When HIV positive mothers feed breast milk only, with no water, no juice, and no food, for 6 months, it is enough for the baby to grow.

   1. True 2. False 3. Uncertain 4. Don't know

V119		181

7. Breast infection in HIV infected mothers increases the risk of transmission of HIV through breastfeeding

1. True 2. False 3. Uncertain 4. Don't know

V120		182

8. In general artificial/ Formula feeding has less risk to infant's health than breastfeeding.

1. True 2. False 3. Uncertain 4. Don't know

V121		183

9. A woman who gets sick from AIDS is more likely to transmit HIV infection to her infant through breastfeeding.

1. True 2. False 3. Uncertain 4. Don't know

V122		184

10. The HIV virus in the body is decreased when the mother is sick from AIDS

1. True 2. False 3. Uncertain 4. Don't know

V123		185

11. Oral thrush in the baby does not increase the chances of the baby to get the virus from the mother

1. True 2. False 3. Uncertain 4. Don't know

V124		186

12. Generally breastfeeding may contribute to high rates of diseases and deaths in infants.

1. True 2. False 3. Uncertain 4. Don't know

V125		187

13. Feeding the baby both breastmilk, artificial milk and food increases the risk of transmission of HIV from mother to child.

1. True 2. False 3. Uncertain 4. Don't know

V126		188

13.1 If **true** how does it increase the risk of transmission?

.....

.....

V127			189 -190
V128			191-192

13.2 If false how does it not increase the transmission of HIV from the mother to the child.

.....

.....

V129			193-194
V130			195-196

14. Exclusive formula feeding from birth can be considered as an alternative by HIV positive mothers if breastfeeding is not possible.

1. True 2. False 3. Uncertain 4. Don't know

V131		197

15. Generally cup feeding of any milk is better than bottle feeding of any milk.

1. True 2. False 3. Uncertain 4. Don't know

V132		198

15.1 If **true** why is cup feeding better than bottle-feeding?

.....

.....

.....

V133			199-200
V134			201-202

15.2 If false, why is cup feeding not better than bottle-feeding

.....

.....

.....

V135			203-204
V136			205-206

18. How did you get the information / knowledge to feed the baby.

	Yes	No
Family		
Friends		
Clinic		
Radio		
Television		
Rural health motivators		
Others		

V137		207
V138		208
V139		209
V140		210
V141		211
V142		212
V143		213

Attitudes

V144		214

1. Do you feel a mother should always breastfeed?

1. Yes 2. No 3. Uncertain

2. Under what circumstances do you think mothers not breastfeed?

No breastmilk	1
Not enough breastmilk	2
Not healthy	3
Mother is working outside home	4
Has an infection	5
Other	6

V145		215
V146		216
V147		217

3. Do you feel there should be difference in the way an HIV positive mother and an HIV negative mother feeds her baby.

V148		218

1. Yes 2. No 3. Uncertain

3.1 If yes why do you feel there should be a difference

.....

.....

V149			219-220
V150			221-222

3.2 If no why do you feel there should be no difference

.....

.....

.....

V151			223-224
V152			225-226

4. Do you feel HIV positive mothers should breastfeed their babies?

1. Yes 2. No 3. Uncertain

V153		227

5. Do you support breastfeeding only without feeding of other liquids or foods to the infant by HIV positive mothers?

1. Yes 2. No 3. Uncertain

V154		228

6. Do you support breastfeeding only as an option for feeding for 6 months by HIV positive mothers?

1. Yes 2. No 3. Uncertain

V155		229

7. Do you feel an HIV positive mother with a breast infection should stop breastfeeding completely?

1. Yes 2. No 3. Uncertain

V156		230

8. Do you feel an HIV positive mother with a breast infection should continue breastfeeding while treating the breast infection?

1. Yes 2. No 3. Uncertain

V157		231

9. Do you feel an HIV positive mother with a breast infection should stop breastfeeding temporarily until the breast infection is treated?

1. Yes 2. No 3. Uncertain

V158		232

10. Why do you feel she should stop breastfeeding when she has a breast infection?

1. Mother will pass the virus to the child
2. Mothers will fall ill
3. Other

V159		233

11. Do you feel HIV positive mothers can feed both breastmilk and other milk feeds to their babies?

1. Yes 2. No 3. Uncertain

V160		234

12. If yes why do you feel they can practice the above mentioned practice (mixed feeding)?

.....

.....

V161			235-236
V162			237-238

13. If no why do you feel they cannot practice the above mentioned practice (mixed feeding)?

.....

.....

V163			239-240
V164			241-242

14. Do you feel mothers should feed any kind of milk from a bottle rather than from a cup.

1. Yes 2. No 3. Uncertain

V165		243

15. If yes why do you think they should feed from the bottle.

.....

.....

V166			244-245
V167			246-247

16. If no why do you think they should not feed from the bottle but from the cup.

.....

.....

V168			248-249
V169			250-251

17. Do you feel HIV positive mothers should formula feed from birth?

1. Yes 2. No 3. Uncertain

V170		252

18. Please indicate which of the following people think you should definitely breastfeed

	Yes	No	Neutral	Reasons
18.1 Partner (not relevant)				18.2. 1 - 10
18.3 Close friend (not relevant)				18.4. 1 - 10
15.5 Mother in law (not relevant)				15.6. 1 - 10
15.7 Own mother (not relevant)				15.8. 1 - 10
15.9 Nurse (not relevant)				15.10. 1 – 10
15.11 People in general (not relevant)				15.12. 1 - 10

V171		253
V172		254-255
V173		256
V174		257-258
V175		259
V176		260-261
V177		262
V178		263-264
V179		265
V180		266-267
V181		268
V182		269-270

19. Please indicate which of the following people think you should definitely bottle-feed.

	Yes	No	Neutral	Reasons
16.1 Partner (not relevant)				16.2. 1 – 10
16.3 Close friend (not relevant)				16.4. 1 – 10
16.5 Mother in law (not relevant)				16.6. 1 – 10
16.7 Own mother (not relevant)				16.8. 1 – 10
16.9 Nurse (not relevant)				16.10. 1 – 10
16.11 People in general (not relevant)				16.12. 1 – 10

V183		271
V184		272-273
V185		274
V186		275-276
V187		277
V188		278-279
V189		280
V190		281-282
V191		283
V192		284-285
V193		286
V194		287-288

20. Are the following people's view important to you?

	Very important to me & I follow their advice	Important to me but I may not follow their advice	Not at all important
Partner (not relevant)			
Close friend (not relevant)			
Mother in law (not relevant)			
Own mother (not relevant)			
Nurse/ midwife (not relevant)			
People in general (not relevant)			

V195		289
V196		290
V197		291
V198		292
V199		293
V200		294

Demographic information

1. Mother's level of education.
    1. No formal education
    2. Adult education
    3. Grade 1 and 2
    4. Standard 1 – 5
    5. secondary
    6. Tertiary

V201		295

2. What is the source of income for the family.....

V202			296-297
V203			298-299

3. How many children do you have .....

V204			300-301

4. Age of the mother.....

V205			302-303

ADDENDUM E: PROCEDURE FOR FOCUS GROUP DISCUSSION

1. The focus group will comprise of 6 – 7 people.

2. The group members will sit around a rectangular table with the moderator at the head of the table, this sitting arrangement enables the moderator to have control over individual's level of participation. Moreover, most participants feel more comfortable when seated around a table.

3. The moderator will get the list of names corresponding to the seating arrangement of the participant. This allows the interviewer to direct questions at group members by name with immediate and simultaneous eye contact.

4. The moderator will introduce herself and explain the project/research, then introduce the observer by name and explain that she is there to observe

5. Inform them that the discussion will be recorded and that the recording will remain confidential to staff members. Explain that recording is necessary for report writing. Tell them that anyone is at liberty to leave the discussion at any time they feel uncomfortable.

6. Make the participants feel at ease to express themselves openly. Tell them that the goal of the session is to learn from their greater experience, assure them that their presence and opinion are not only valued but also necessary for the success of the group.

7. Tell them about the agenda and outline of the study. The topic will be introduced in its most general form and leave more specific questions and issues for later questioning.

   The study is about the knowledge and beliefs of Swazi women with regard to infant feeding practices regarding HIV and AIDS

   Outline – subjects to be discussed

- General knowledge on infant feeding
- Knowledge of infant feeding and HIV
- Attitudes of mothers on infant feeding in the context of HIV.

Method

The moderator will ask questions and the group will then discuss it. The moderator will encourage all group members to speak. The focus group discussion will adopt two different interviewing styles namely directive and nondirective style. The directive approach will enable the moderator to have control over the agenda for discussion, and the non directive will provide greater opportunity for participant's view to emerge, rather than having the moderator's framing of the issues imposed on them. The discussion will begin on general topics and progress to more specific issues.

8. The session will begin by introducing ourselves to each other. Each participant will introduce herself and tell us about her child's name and age and the method of feeding.

Guideline or questions

- **General knowledge on infant feeding**
  - What should babies be fed when they are born?
  - When should this change and why?
  - How long should mothers' breastfeed their babies?
  - How long should mothers, feed their babies breast-milk only (exclusive breastfeeding).
  - When should a mother start introducing food?
  - Why at that age? Get an answer for every age mentioned.
  - Is there a difference in the way that HIV positive mothers and other mothers should feed their babies?

- **Breastfeeding and HIV**
  - How should an HIV positive mother feed her baby
    - What
    - Why

- If they should breastfeed how long?
- How long do they breastfeed only
- When can they give other milks and food?
  - ➢ If they can give other milks and food, why?
  - ➢ If they should not give other milks and food, why?
- Do you think formula feeding is better than breastfeeding?
  - ➢ Why?
- Should a mother who develops AIDS continue breastfeeding?
  - ➢ If yes/no why?

➢ **Bottle feeding and HIV**

- If a mother chooses artificial feeding
  - ➢ How should she give it to the baby?
  - ➢ Why?
- Why for each response e.g. Please tell me more on how bottle feeding is better than cup feeding or the other way around

➢ **Attitudes**

- Which feeding option is better for an HIV positive mother, formula or breastfeeding?
  - ➢ Reasons for preferred option e.g. can you explain why you say breastfeeding is better.
- How long do you think HIV positive mothers should breastfeed?
  - ➢ Why?
- Do you prefer feeding from a cup or a bottle
  - ➢ Why

➢ **Social referents influence**

- Who influences your decisions about infant feeding
  - ➢ Why those people – get reasons for each type of person
- Does the people around you have more influence when you are HIV positive or less
  - ➢ Why?
- Would you attend nutrition education for HIV positive mothers?

- Why – if not what would be the best way to spread such information I your communities?

ADDENDUM F: A DETAILED MTCT FRAMEWORK FOR THE GILGAL CLINIC

TABLE 6.2: A FRAMEWORK FOR A MTCT PROGRAM FOR GILGAL CLINIC

Themes - General infant feeding practices	
Sub-themes	**Topic**
Initiation of breastfeeding after birth	• Keep the mother and the baby together. • Encourage the mother to let the baby suckle. • Discourage forcing the baby to suckle immediately after birth. • Most babies would be ready to try suckling within an hour. Their suckling reflex may be strong at this time. • Unrestricted breastfeeding • Breastfeeding of colostrum
Length of breastfeeds	• The baby should be allowed to suckle as long as she wants
Breastfeeding techniques	• Good suckling position ensures a good flow of milk • Poor suckling position results in; o Sore and cracked nipples o A poor milk supply and a baby who fails to grow. o An unsatisfied baby who wants to feed all the time. o A frustrated baby who refuses to feed. o Engorged breasts.
Duration of breastfeeding	• Encourage breastfeeding for 2 years to mothers who are HIV negative.
Complementary feeding at 6 months to all mothers	• Continued breastfeeding and appropriate complementary feeding to HIV negative mothers.
• Sequential introduction of food	• Food thickness and variety is increased as the infant gets older. • At six months the mother gives pureed, mashed and semi solid foods.

	• At 7 months the mother introduces vegetables • At 8 months she introduces fruits and from 9 – 10 months she gives proteins (meat). • By 12 months the baby eats table food
Cup feeding	Advantages of cup feeding • Hygienic reasons • Does not interfere with suckling at the breast • Does not cause tooth decay
Theme – Infant feeding practices by HIV positive mothers	
Exclusive breastfeeding for six months	• Breastmilk only • No other liquids or solids • Not even water • Drops or syrups consisting of vitamins, mineral supplement or medicines are an exception.
Transition from exclusive breastfeeding to replacement feeding	• Abrupt cessation of exclusive breastfeeding at 6 months by HIV positive mothers. • Express breastmilk and feed by cup. • Accustom the infant to cup feeding between regular breastfeeds. • Eliminate one feeding at the breasts at a time. Once the infant accepts cup feeding replace breastfeeding with expressed breastmilk given by cup. • Express breastmilk and discard it if the breasts become engorged during this process. • Use cold compresses to reduce the inflammation. • Feed only the breastmilk when transition is complete. • Resist the desire to breastfeed at night time or when the child wants comforting. • Provide adequate protection against pregnancy. Women who stop breastfeeding exclusively lose the contraceptive protection it provides.
Mother and infant health	

The mother should maintain good health	• Regularly check for breast infection • Discuss the breast infections and symptoms • Breast infections such as full breasts, engorged breasts, mastitis, breast abscess, nipple crack and breast thrush • Prompt treatment of breast infection • Mother should stop breastfeeding when she develops AIDS.
The infants health should be maintained	• Regularly check the baby's mouth for oral thrush and mouth ulcers. • Treat infections immediately.

Cultural beliefs

Traditional beliefs	• The belief that breastmilk alone is not enough for the baby to grow. • Misconceptions that the breastmilk of an HIV positive mother infects the baby.