

## **INFANT FEEDING PRACTICES IN KWAZULU-NATAL**

**An exploratory study of current infant feeding practices of  
mothers with 0-6 month old infants attending PMTCT and non-  
PMTCT clinics in Central Durban**



# Infant Feeding Practices in KwaZulu-Natal

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## **EXECUTIVE SUMMARY**

### **Introduction**

Exclusive breastfeeding for the first six months of an infant's life is recommended worldwide. In 1998 the South African Demographic and Health Survey (SADHS) showed that only 10% of mothers exclusively breastfeed at 3 months. As the HIV virus is transmissible via breast milk, UNAIDS (2000) recommends that women in developing countries should be given a choice of feeding method, after counselling on the risks and benefits of breast feeding versus formula feeding. As a result, the Prevention of Mother-to-Child Transmission (PMTCT) programme was launched in KwaZulu-Natal with the aim of providing interventions to prevent mother to - child transmission of the HIV virus. However, research has shown that infant feeding practices are influenced by numerous factors. Ultimately mothers will feed their infants in a manner they feel comfortable with, even if it is not always the most appropriate choice.

### **Aim**

The aim of this study was to determine and compare the current infant feeding practices and some of the factors that influence these practices of Zulu mothers with 0 - 6 month old infants attending PMTCT and non - PMTCT clinics in Central Durban, KwaZulu-Natal.

### **Methodology**

A cross sectional, descriptive survey was conducted amongst 150 mothers sampled from 3 non – PMTCT clinics and 150 mothers sampled from 3 PMTCT clinics. To further explore factors that could influence infant feeding practices, interviews were conducted with clinic-based nursing staff (n = 42) and PMTCT counsellors (n = 9) working at the PMTCT and non-PMTCT clinics in which the survey was conducted

### **Summary of research findings and conclusions**

Overall, one quarter of the mothers attending non-PMTCT clinics and one third of mothers at PMTCT clinics were practising exclusive breastfeeding at the time of the survey. The general trend was that mothers attending PMTCT clinics were more inclined to breast-feed their infants exclusively (34% versus 24%) or formula feed (16,7% versus 12,7%) than mothers attending non-PMTCT clinics. Furthermore, there was a significant decline in exclusive breastfeeding and predominant breastfeeding with increasing infant age in both clinic groups. Infants were more inclined to be mixed fed or formula fed with increasing infant age. In both clinic groups, exclusive breastfeeding was the method of choice in the 0- 6 week age category, while a preference for mixed feeding was shown in the 6- 14 week category. This trend persisted in the 14 week to 6 month age category, especially in the non-PMTCT clinics, while there was a small but pronounced increase in formula feeding amongst PMTCT mothers. Although these figures can be explained as a result of implementing the PMTCT programme, the positive trends observed in non-PMTCT clinics serve as an indicator that the INP and Baby Friendly hospital initiative have an impact on the feeding choices mothers make.

Despite the limited duration of the PMTCT programme at the time of the study, indicators of the impact of the intervention include that PMTCT mothers introduced foods and/or liquids in addition to breast milk at a later stage of their infant's lives compared to non-PMTCT mothers. Furthermore, more mothers attending PMTCT clinics were shown how to breastfeed and were more likely to have received information about formula feeding. Despite these indicators of a positive impact of the PMTCT programme, the mean age for introducing liquids and/or solids in addition to breast milk was at about six weeks and the incidence of this practice was very high for both groups. The small difference in the incidence of formula feeding observed between the two clinic groups suggest the presence of constraints to safe infant feeding choices.

As observed, infant feeding practices were far from ideal in both clinic groups. However, the high level of antenatal clinic attendance documented for both groups serves as evidence that if utilized optimally, the antenatal clinic could serve as an ideal medium through which infant feeding education can take place. Especially since clinic-based nursing staff were cited as the most important source of infant feeding information by both groups of mothers in the antenatal and postnatal phase. However, the documented infant feeding practices should be interpreted against the backdrop of factors such as socio-demographic characteristics of the mothers, availability of resources such as social support from peers and significant others and local infant feeding beliefs that could influence infant feeding decisions. Indicators of infant feeding knowledge generated by interviews conducted with clinic-based nursing staff and PMTCT counsellors indicated the level of infant feeding knowledge of staff was not optimal.

### **Recommendations**

- **To health authorities:**

Health workers conducting infant feeding education need to be aware of the infant feeding practices and infant feeding beliefs held by their target group. Many women make their infant feeding decisions early in pregnancy. As a result, antenatal infant feeding education needs to commence as early as possible during pregnancy. The mother's first postnatal visit needs to occur before the infant is six weeks old. Where mothers opt to formula feed, they should be provided with the necessary practical advice. Nursing staff and PMTCT counsellors involved in infant feeding education should receive appropriate training and regular, ongoing supervision to ensure the promotion of appropriate infant feeding practices.

- **For further research:**

Appropriate interventions should be evaluated to determine feasible strategies to improve infant feeding practices of mothers and caregivers, irrespective of HIV status. Constraints to formula feeding in communities where breastfeeding is the social norm should be determined. Studies of this nature should be conducted in a non-clinic environment. Results generated from the interviews with clinic-based nursing staff and PMTCT counsellors should be followed up with a larger study sample to validate the data generated by this study.

## 1. INTRODUCTION

WHO and the United Nations Children's Fund (UNICEF) recommend that exclusive breastfeeding should be continued for 6 months (180 days)<sup>1,2</sup>. The term exclusive breastfeeding is used when all fluid, energy, and nutrients are provided by breast milk, with the possible exception of small amounts of medicinal supplements<sup>3</sup>.

In South Africa one of the goals of the Integrated Nutrition Programme (INP) is to enable all women to breastfeed their children exclusively up to the first six months of life and thereafter to continue breastfeeding in addition to the introduction of appropriate complementary foods up to twenty-four months of age<sup>4</sup>.

However, the incidence of exclusive breastfeeding reported in the South African Demographic and Health Survey (SADHS)<sup>5</sup> in 0-3 month old babies was 10%. According to De Villiers<sup>6</sup>, the early introduction of supplementary foods seems to be the rule rather than the exception in South Africa. This observation has been confirmed by local researchers<sup>7,8,9</sup>.

Early mixed feeding is of concern as it is one of the factors that is responsible for malnutrition, growth faltering and the high mortality rate in infants in developing countries<sup>10</sup>. In South Africa, growth faltering usually sets in during the weaning period and the eventual outcome is stunting<sup>11</sup>. Data generated by the South African Vitamin A Consultative Group (SAVACG)<sup>12</sup> indicated that one in four South African children aged six to seventy one months, are stunted. On a provincial level, the incidence of stunting in KwaZulu-Natal is one in six.

HIV transmission through breast milk has complicated the advice one now gives on breastfeeding. A meta-analysis, estimated that breastfeeding may increase the rate of transmission by 14%<sup>13</sup>. The consensus on vertical transmission of HIV by breast milk led to the recommendation that in developed countries, HIV-infected women should not breast feed their infants<sup>14</sup>. However, the health risks of formula feeding in poor communities in developing countries remain high and in addition, Coutoudis<sup>15</sup>, points out that should HIV-1 infected women in developing countries opt to use breast milk substitutes, they might be stigmatised in communities where breastfeeding is the norm. This author continues by stating that where HIV-infected women have no option but to breastfeed, promotion of exclusive breastfeeding may be one way of increasing the safety of breastfeeding. These recommendations are based on the results of a study which suggested that the risk of transmission of HIV-1 is less with exclusive breastfeeding for at least the first 3 months of life than mixed feeding and similar to that of formula feeding<sup>16</sup>.

To address the above issue, UNAIDS recommends that women in developing countries should be given a choice of feeding method, after counselling on the risks and benefits of breast versus formula feeding<sup>17</sup>. Ultimately, the choices

women make, depend partly on the environment they live in. Influences of partners, elders, friends and family can play a role in their infant feeding decision as well as their social circumstances and finances.

This is a particularly important issue in KwaZulu-Natal, South Africa as the HIV prevalence amongst pregnant women in KwaZulu-Natal for 2001 was estimated to be 33,5%, making it the epicentre of the AIDS pandemic<sup>18</sup>.

In order to address the above problem, the Prevention of Mother-to-Child Transmission (PMTCT) programme was launched in KwaZulu-Natal in June 2001. The aim of the programme is to provide interventions to prevent mother-to-child HIV transmission to all pregnant women in the province. Some of the specific objectives of the project are to provide voluntary confidential counselling and HIV testing in clinics offering routine antenatal services and to provide counselling on safe infant feeding practices for HIV-positive women. The programme also offers free breast-milk substitutes for women who decide not to breastfeed. Women who choose breastfeeding are counselled on correct breastfeeding technique to reduce the risk of mastitis and nipple damage. Training of nursing staff and other staff members, including lay counsellors, on PMTCT related issues also form part of the programme.

Identification of actual infant feeding practices of women attending PMTCT as well as non-PMTCT clinics and investigating possible differences between the two clinic types will enable insight into the various factors that influence infant feeding decisions.

An audit of locally implemented nutrition education interventions revealed that there is a definite need for well planned and structured nutrition education strategies promoting appropriate, safe infant feeding practices within the context of the high HIV prevalence, especially in KwaZulu-Natal

To facilitate the development of guidelines regarding infant feeding for the education of Zulu women attending municipal-and provincial clinics in central Durban, a Programme Planning Model was developed<sup>19</sup>.

As can be seen from this model, a crucial first step in this process is to determine the actual feeding practices of mothers as well as the predisposing, enabling and reinforcing factors thereof. An in depth literature search as well as assessment of other data sources indicated that no detailed information in this regard is available for the target group in the central Durban area. Given the recent implementation of the PMTCT programme, it is of great interest to determine current infant feeding practices of mothers attending PMTCT and non-PMTCT clinics.

## **2. AIM**

The aim of this study is to determine and compare the current infant feeding practices and associated factors of Zulu mothers with 0-6 month old infants attending PMTCT and non-PMTCT clinics in central Durban, KwaZulu-Natal.

## **3. OBJECTIVES**

For the purpose of this study, the following objectives were formulated:

- 3.1. To describe and compare the socio-demographic characteristics of mothers attending PMTCT and non-PMTCT clinics.
- 3.2. To describe, categorize and compare the current infant feeding practices of mothers attending PMTCT and non-PMTCT clinics.
- 3.3. To describe and compare the following of mothers attending PMTCT and non- PMTCT clinics:
  - ❑ knowledge, attitudes, perceptions and beliefs regarding infant feeding practices.
  - ❑ the influence of family, friends and clinic based health workers in shaping current infant feeding practices
  - ❑ the availability of resources that could influence infant feeding practices
  - ❑ physical and emotional health.
- 3.4. To evaluate and compare the training, ongoing education and knowledge on infant nutrition of nursing staff and PMTCT counsellors from PMTCT and non-PMTCT clinics.

## **4. DEFINITION OF TERMS**

For the purpose of this study, the following infant feeding practices and clinic categories were used for data grouping, interpretation and discussion:

### **4.1. Exclusive Breastfeeding**

The infant's sole source of nutrition is breast milk with the complete absence of water, herbal tea or foods, except vitamin/mineral drops, syrups and medicine preparations<sup>20</sup>.

### **4.2. Predominant Breastfeeding**

The infant's predominant source of nutrition is breast milk. However, the infant may also have received water or water-based drinks (including sweetened or flavoured water, teas, infusions, etc.); fruit juice; Oral Rehydration Salts (ORS); drop and syrup forms of vitamins, minerals, and

medicines or folk fluids (in limited quantities). With the exception of fruit juice and sugar-water, no food-based fluid is allowed under this definition<sup>21</sup>.

### **4.3 Mixed Feeding**

Mixed feeding refers to giving the baby some breast feeds, and some artificial feeds, either milk or cereal or other food<sup>21</sup>. In the literature the term mixed feeding is also sometimes referred to as partial breastfeeding.

### **4.4 Formula Feeding**

Formula feeding refers to giving a child who is not receiving any breast milk a suitable breast-milk substitute<sup>21</sup>. The terms replacement feeding, non-breastfeeding or bottle feeding are also sometimes used in the literature to indicate formula feeding.

### **4.5. PMTCT Clinic**

A PMTCT (prevention of mother-to-child transmission) clinic is a clinic participating in the PMTCT programme.

### **4.6. Non PMTCT Clinic**

A non-PMTCT clinic is a clinic where the PMTCT programme has not been implemented. At the time of the study the non PMTCT clinics surveyed all fell under the jurisdiction of the Ethekewini Municipality, Durban.

## **5. PROCEDURES AND METHODS**

### **5.1. Study Design**

A cross sectional, descriptive survey of women and their infants aged 0-6 months attending PMTCT and non-PMTCT clinics in Central Durban was conducted. Data on current infant feeding practices as well as some of the factors that influence these practices was collected. To further explore factors that could influence infant feeding practices, interviews were conducted with clinic based nursing staff and PMTCT counsellors working in the PMTCT and non-PMTCT clinics.

### **5.2. Sampling**

#### **5.2.1. Sampling frame and selection of clinics**

The sampling frame involved all non-PMTCT clinics (n= 10) and all PMTCT clinics (n = 4) in Central Durban. Unfortunately no information was available on the attendance rates of mothers with 0-6 month old infants. It was therefore not possible to determine the potential number of respondents per clinic.

Three non-PMTCT clinics in central Durban (see Table 1) were selected from a list of 10 made available by the Ethekewini Municipality using the convenience sampling method. Clinics where formalized research was already being conducted at the time of the study were excluded. Clinics selected were those that are predominantly attended by Zulu mothers (Sahadeo 2002).

At the time of the study, there were only four PMTCT clinics operational in central Durban. The clinic that was situated in an Indian suburb was excluded, because it was not predominantly attended by Zulu mothers. The remaining three clinics were included in the study.

### 5.2.2. Sample

The survey was conducted amongst 300 Zulu mothers of infants that fell into three age categories at the time of the study, namely 0- 6 weeks, 6-14 weeks and 14 weeks to 6 months. The infant age categories of the sample were selected to coincide with the national immunization schedule and to ensure an even spread of infants in the 0-6 month age group. One hundred and fifty Zulu mothers were selected from well baby clinics at PMTCT clinics and 150 from well baby clinics at non-PMTCT clinics.

The number of Zulu mothers of infants 0-6 months interviewed at each clinic (Table 1) was determined as follows:

**Table 1: Clinics included and numbers of mothers interviewed at each clinic**

	Non-PMTCT Clinics (n = 150)			PMTCT Clinics (n = 150)		
	Lancers Road (n = 48)	Glen Earle (Newlands East) (n = 46)	Lamontville (n = 56)	Kwamashu Polyclinic, Rydalvale Clinic* (n = 42)	Umlazi Section K Clinic (n = 36)	Umlazi Section D Clinic (n = 71)
Mothers with infants 0- 6 weeks	16	15	19	14	12	24
Mothers with infants 6- 14 weeks	16	15	19	14	12	24
Mothers with infants > 14 weeks-6 months	16	15	19	14	12	24

\* Infants aged 0-6 weeks attend the Kwamashu polyclinic. Beyond 6 weeks of age they attend the Rydalvale clinic for follow up.

For non-PMTCT clinics the proportion of mothers interviewed per clinic was based on the number of children younger than five years of age attending each PMTCT clinic on a monthly basis. For PMTCT clinics the proportion of

mothers interviewed at each clinic was based on average figures of the number of pre HIV-test counseled mothers attending each PMTCT clinic on a monthly basis.

All Zulu mothers who were sampled were given the opportunity to volunteer for participation.

### **5.2.3. Sampling technique**

Mothers in each clinic were recruited by means of systematic random sampling. Inclusion criteria for selection were as follows:

The respondent

- 1) Had to be the infant's mother
- 2) Had to be older than 18 years
- 3) Had to have Zulu as be their mother tongue
- 4) Should not have twins (index child)
- 5) Should not have received any formal training in nutrition
- 6) Should have an infant younger than 6 months of age at the time of the study.

Respondents were selected as follows: the first mother waiting to be seen by clinic staff was selected if she met the inclusion criteria. She was then interviewed after seeing the clinic-based nursing staff. From then on every third mother in the queue meeting the inclusion criteria was interviewed until the correct number of interviews were conducted per age stratum. If a sampled mother did not meet the inclusion criteria, the next mother was sampled. Each clinic was visited on consecutive days until the correct number of mothers per infant age stratum was sampled.

### **5.2.4. Selection of clinic-based health workers**

No sampling technique was used to select health workers who participated in this study. All clinic-based nursing staff and PMTCT counsellors who were willing to be interviewed and were actively involved in nutrition counselling of mothers with infants 0-6 months of age were interviewed. All clinic staff at both clinics were interviewed apart from nine professional nurses working at PMTCT clinics who refused to be interviewed. As no nutrition advisors from the Department of Health worked at the sampled clinics, none were included in the study.

## **5.3. Methods and Instruments**

### **5.3.1. Development and pilot testing of questionnaire used to interview mothers**

The dendrogram technique<sup>22</sup> was used to develop the structured questionnaire used for interviewing mothers through the development of a conceptual framework on which questions were based. It is important to note that characteristics such as self-esteem, self-efficacy, self-confidence, depression and attitude were not assessed with separate questionnaires or

instruments, but rather with a number of appropriate questions, as is suggested by several researchers<sup>23</sup> for larger surveys in which a large number of variables are being assessed.

The resulting questionnaire was assessed by experts in the field to evaluate the appropriateness and coverage thereof, especially in terms of content. It was translated into Isizulu by a registered Zulu translator, using the back translation method.

The questionnaire was tested in a pilot study representing 5% of the total sample size (n= 15) prior to implementation in the field. Piloting was conducted in a clinic (Point Road Clinic) that did not form part of the sampled clinics cited in Table 1. Minimal changes to the questionnaire were required after pilot testing was completed.

### **5.3.2. Development of schedule used to interview clinic-based health workers**

During the compilation of the conceptual framework depicted in Figure 2, clinic based nursing staff and PMTCT counsellors were identified as role players in shaping infant feeding decisions. As a result, an interview schedule was developed to gather data on their pre-registration training, ongoing education and knowledge on infant feeding as well as their personal breastfeeding experience.

The interview schedule was assessed by experts in the field to evaluate the appropriateness and coverage of the research questions. Interviews were conducted in English.

The interview schedule was piloted amongst health workers who did not form part of the final sample.

### **5.4. Data collection**

The data was collected by trained fieldworkers during November-December 2002. Interviews with mothers took place in a consulting room where possible, or in a secluded area away from other mothers or nursing staff. The average interview duration was 30 to 40 minutes.

Interviews with clinic-based health workers were conducted by the researcher on pre-arranged days and times that suited the respondents. All interviews were conducted in an office made available for this purpose. The average health worker interview was completed within 15 to 20 minutes.

### **5.5. Data capturing and statistical analysis**

All data generated by this study were captured using the Statistical Package for Social Sciences (SPSS) computer package (version 11.0).

Frequencies were tallied for categorical variables and mean  $\pm$  SD were computed for continuous variables. To determine the differences between the PMTCT and non-PMTCT groups for all the relevant variables, Pearson's Chi-square with clinic type as classification variable, were computed for categorical variables and the independent samples t-test for continuous variables.

Frequencies were tallied and percentages reported for data generated by interviewing the health workers.

## **5.6. Reliability and validity of data**

Reliability was ensured by training the fieldworkers, pilot testing the questionnaire, providing field workers with clear instructions which formed part of each survey, posing the questions clearly and unambiguously in the indigenous language, checking the reported birth weights against the date of birth on the infant's Road To Health Card and by ensuring that numerous items in the questionnaire measured the same construct.

## **5.7. Ethical Considerations**

Permission from the Director: Health, Ethekewini Municipality and Superintendent-General: Department of Health KZN was obtained to access the clinics. Ethical approval was obtained from the ethics committee, Nelson Mandela Medical School, University of Natal.

Individuals sampled for this study were subject to voluntary participation and were guaranteed confidentiality and anonymity. Respondents were interviewed after they signed an informed consent form. After the interview, the mothers received a food hamper to the value of R25.

## **6. RESULTS AND DISCUSSION**

For the purpose of this report, data concerning the two clinic groups are reported separately and data showing differences between the two clinic groups are highlighted. Where a wide range of responses were obtained for certain open-ended questions, only the most significant responses are reported.

### **6.1. Socio-demographic characteristics of mothers attending PMTCT and non-PMTCT clinics**

#### **6.1.1 Results and discussion**

The most important socio-demographic characteristics describing the Zulu mothers who were interviewed in this study are summarized in Table 2.

**Table 2: Socio-demographic characteristics of mothers attending PMTCT and non-PMTCT clinics (mean ± SD and column %)**

Descriptor	Non-PMTCT Clinics (n = 150)	PMTCT Clinics (n = 150)	P- value	Degrees of freedom
Mean age (years)	25,71 (SD 5,387)	25,51 (SD 5,541)	0,752§	
Completed level of education			0,021¶	3
• None	2,0% (n = 3)	1,3% (n = 2)		
• Primary school	9,3% (n = 14)	11,3% (n = 17)		
• Secondary school	71,3% (n = 107)	81,35% (n = 122)		
• Tertiary education	17,3% (n = 26)	6,0% (n = 9)		
% of working mothers*	14,7% (n = 22)	10,0% (n = 15)	0,219¶	1
% having a say in income expenditure*	60,0% (n = 90)	36,7% (n = 55)	0,000¶	1
% of mothers with a known income*	39,4% (n = 59)	55,4% (n = 83)		
% of mothers with a known income that falls below the poverty line	81,4% (n = 48)	39,8% (n = 33)	0,912¶	1
Source of drinking water			0,000 ¶	1
• Tap in house	74,7% (n = 112)	45,3% (n = 68)		
• Outside source	25,3% (n = 38)	54,7% (n = 82)		

\* % yes reported, the remainder no

§ Independent samples t- test

¶ Pearson's Chi-square test

The above data suggests that the Zulu mothers sampled for this study had a mean age of 25 years and the majority have a secondary school level education. In both clinic groups the majority of mothers were not working. Mothers attending PMTCT clinics were significantly more inclined to have no say in income expenditure and not to have tap water in the house than those attending non-PMTCT clinics. For mothers from both clinics most of the water from outside the home was from a public tap or bought water, only 2% of the households used water from rivers or streams or dams or rainwater.

Of those mothers with a known household income, more mothers attending non-PMTCT clinics reported to have an income that falls below the poverty line. Due to the fact that fewer respondents recruited from the PMTCT clinics (39,4%) as opposed to non-PMTCT clinics (55,3%) knew what the household income was at the time of the study, it is problematic to compare the two clinic groups in terms of the percentage of respondents living below the poverty line (R1000/household of four people).

## 6.2. Current infant feeding practices of mothers with 0-6 month old infants attending PMTCT and non-PMTCT clinics

The classification of the current infant feeding practices of the Zulu mothers as well as how these practices relate to the age category of the infant at the time of the study are described in Tables 3-5. The infant feeding practices describe how the mothers fed their infants in the week prior to the survey. Overall one quarter of the mothers at the non-PMTCT clinics and one third of the mothers at the PMTCT clinics were practicing exclusive breast feeding at the time of the survey. The trend depicted in Table 3, was that mothers attending PMTCT clinics were more inclined to breast feed their infants exclusively, or to formula feed than mothers attending non-PMTCT clinics.

**Table 3: Column % of current infant feeding categories by PMTCT and non-PMTCT Clinics (infants aged 0-6 months)**

Feeding category	Non-PMTCT Clinics (n = 150)	PMTCT Clinics (n = 150)	Pearson Chi-square p-value
• Exclusive B/F	24,0% (n = 36)	34,0% (n = 51)	0,088
• Predominant B/F	14,0% (n = 21)	8,7% (n = 13)	
• Mixed feeding	49,3% (n = 74)	40,7% (n = 61)	
• Formula Feeding	12,7% (n = 19)	16,7% (n = 25)	

The difference in exclusive breastfeeding rates between mothers at the two groups of clinics was seen particularly in the younger infants (0- 6 weeks) and the older infants (14 weeks- 6 months) as shown in Tables 4 and 5. The rate of exclusive breastfeeding was 64% in the infants aged 0- 6 weeks whose mothers were attending the PMTCT clinics, compared to 41% for the group attending the non-PMTCT clinics.

**Table 4: Column % of current infant feeding categories by infant age category for PMTCT clinic (n = 150)**

Feeding category	0- 6 weeks (n = 50)	6 weeks- 14 weeks (n = 58)	14 weeks – 6 months (n = 42)	Total (n = 150)	Pearson Chi-square p-value
EBF	64,0% (n = 32)	25,9% (n = 15)	9,5% (n = 4)	34% (n = 51)	0,000
Mixed feed	18,0% (n = 9)	50,0% (n = 29)	54,8% (n = 23)	40,7% (n = 61)	
Formula feed	10,0% (n = 5)	13,8% (n = 8)	28,6% (n = 12)	16,7% (n = 25)	
Predominant BF	8,0% (n = 4)	10,3% (n = 6)	7,1% (n = 3)	8,7% (n = 13)	

**Table 5: Column % of current infant feeding categories by infant age category for non-PMTCT clinic (n = 150)**

Feeding category	0- 6 weeks (n = 49)	6 weeks- 14 weeks (n = 63)	14 weeks – 6 months (n = 38)	Total (n = 150)	Pearson Chi- square p- value
EBF	40,8% (n = 20)	25,4% (n= 16)	0% (n=0)	24,0% (n = 36)	0,000
Mixed feed	20,4% (n = 10)	52,4% (n = 33)	81,6% (n = 31)	49,3% (n = 74)	
Formula	10,2% (n = 5)	12,7% (n = 8)	15,8 % (n = 6)	12,6% (n =19)	
Predominant BF	28,6% (n = 14)	9,5% (n = 6)	2,6% (n = 1)	14,0% (n = 21)	

The data depicted in Table 4 and 5 show a significant decline in exclusive breastfeeding (EBF) and predominant breastfeeding with increasing infant age in both clinic groups. The opposite holds true for mixed feeding and formula feeding in that infants were more likely to be mixed fed or formula fed with increasing age. In both clinic groups, exclusive breastfeeding was the feeding method of choice in the 0- 6 week age category while a preference for mixed feeding was shown in the 6- 14 week category. The latter trend persisted in the 14 week to 6 month age category. This trend is consistent with the infant feeding practices reported in Table 6 where retrospective data are reported.

**Table 6: Breastfeeding-related practices of Zulu mothers attending PMTCT and non-PMTCT Clinics (mean ± SD and column %)**

Descriptor	Non-PMTCT Clinics (n = 150)	PMTCT Clinics (n = 150)	P-value
% of study infants where breastfeeding was stopped*	11,1% (n = 15)	7,1% (n = 10)	
% of mothers who ever breast fed that were shown how to breast feed*	60,5% (n = 89)	76,5% (n = 114)	0,003 ¶
% of mothers who felt the infant is satisfied after breastfeeding*	69,9% (n = 100)	69,5% (n = 98)	0,211 ¶
% of mothers who practised demand feeding*	69,4% (n = 100)	68,1% (n = 96)	0,804 ¶
% of mothers who introduced breast feeding immediately after birth*	49,7% (n = 72)	60,7% (n = 85)	0,252 ¶
% of infants who sucked a dummy*	19,3% (n = 29)	14,7% (n = 22)	0,282 ¶
% of mothers who gave food and/or liquids in addition to breast milk*	75,4% (n = 107)	67,4% (n = 95)	0,138 ¶
Mean age (weeks) at which other foods/ liquids were given in addition to breast milk	5,83 (SD 5.180)	6, 91 (SD 5,332)	0,144§

\* % yes reported, the remainder no

§ Independent samples t- test

¶ Pearson's Chi-square test

The above data clearly shows that the initiation rates and duration of continued breastfeeding is very high. In addition most mothers have been shown how to breast feed, felt that the baby is satisfied after breastfeeding, practice demand feeding and introduced breastfeeding immediately after birth. However, the prevalence of supplementary feeding is high and the mean age at which this practice occurs is very young (six to seven weeks).

The data reported in Table 7 gives an indication of the percentage of mothers who received information about formula feeding and received free formula.

**Table 7: Column % of formula-related infant feeding practices by PMTCT and non-PMTCT clinics**

Descriptor	Non- PMTCT Clinics (n = 150)	PMTCT Clinics (n = 150)	Pearson Chi-square p-value
% of mothers who received information about formula feeding*	27,3% (n = 41)	42,3% (n = 63)	0,007
% of mothers who received free formula from clinic*	2,7% (n = 4)	8,7% (n = 13)	0,025
% of mothers who were shown how to make a bottle*	19,5% (n = 29)	22,1% (n = 33)	0,568

\* % yes reported, the remainder no

Respondents attending PMTCT clinics were significantly more likely to receive information on formula feeding and were more likely to receive free formula from the clinic than those attending non-PMTCT clinics. However, only a fifth of mothers attending both clinic groups were shown how to make a bottle.

### 6.2.1. Discussion

The findings from this study suggest that in these clinics, the incidence of exclusive breastfeeding is higher in both PMTCT and non-PMTCT settings, compared to results reported by the South African Demographic and Health Survey and studies conducted in KwaZulu-Natal.

#### 6.2.1. Prevalence of exclusive breastfeeding

An important part of describing infant feeding practices is the description of the prevalence of exclusive breastfeeding rates. The methods used in our cross sectional study included a 7 day recall to determine the current status of exclusive breastfeeding and retrospective data collection to determine rates of exclusive breastfeeding since birth.

The data on the current prevalence of exclusive breastfeeding from this survey shows a higher prevalence rate than the national data from the South African Demographic and Health Survey (1998, p134) which also gave cross sectional data on current exclusive breastfeeding rates. The prevalence of exclusive breastfeeding in the 0-3 month age category reported by the South

African Demographic and Health Survey is 10%. This figure is lower than the 32,1% and 43,5% reported for non-PMTCT and PMTCT clinics respectively when data for infants aged 0-14 weeks are pooled. This could be related to increased efforts to increase exclusive breastfeeding e.g. the Baby Friendly hospital initiative and suggests a positive impact of the INP. It could possibly be explained by the fact that the Demographic and Health Survey was conducted amongst all population groups, broader levels of socio-economic status and the fact that data on exclusive breastfeeding rates were not disaggregated according to province to facilitate comparison.

A more recent study was conducted in a rural area of KwaZulu-Natal.<sup>24</sup> The cross-sectional component of this study reported that 36% of infants aged 0-12 weeks had been exclusively breastfed in the past 24 hours. This figure is similar to the 32,1% and 43,5% reported by mothers with infants aged 0-14 weeks. (see tables 4 and 5). So these more recent data sets from rural KwaZulu Natal also indicate a higher prevalence of exclusive breast feeding than that reported by the South African Demographic and Health Survey.

#### **6.2.1.2. Infant feeding practices in PMTCT clinics in comparison to non-PMTCT clinics**

The trend observed in this study was that mothers attending PMTCT clinics were more inclined to breastfeed exclusively or formula feed their infants when compared to mothers attending non-PMTCT clinics. This is in line with the global infant feeding policy and what is promoted at PMTCT clinics.

The observed trends for a higher percentage of PMTCT mothers introducing breastfeeding immediately after birth, the lower percentage of mothers introducing food and/or liquids in addition to breast milk, the later introduction of foods and liquids in addition to breast milk and the higher percentage of respondents who were shown how to breastfeed amongst respondents recruited from PMTCT clinics, could be indicative of the impact of the PMTCT programme and the Baby Friendly Hospital situated in Umlazi from where the majority of respondents were recruited.

A further indicator of the possible impact of the PMTCT programme is that mothers attending PMTCT clinics were more likely to have received information about formula feeding. The small difference between the two clinic groups in terms of whether they were shown how to make a bottle indicates that more attention should be given to the practical implementation of formula feeding in PMTCT clinics.

Although these are signs of a positive impact of the PMTCT programme, it should be noted that the mean age at which liquids and/or solids were introduced in addition to breast milk, was very young at both groups of clinics (5,83 weeks versus 6,91 weeks for non-PMTCT versus PMTCT mothers).

Although there was a noticeable increase in formula feeding amongst infants aged 14 weeks to 6 months attending PMTCT versus non-PMTCT clinics, the difference in the incidence of formula feeding between the two clinic groups was not as large as expected. It is possible that constraints concerning formula feeding could explain these results. One of these constraints could be a lack of tap water in the house. .

### 6.3. Knowledge, attitudes, perceptions and beliefs regarding current infant feeding practices

#### 6.3.1. Results

The results of a number of selected variables concerning knowledge, attitudes, perceptions and beliefs of mothers regarding infant feeding are presented in Tables 8 and 9.

**Table 8: Antenatal clinic attendance and nutrition education received in antenatal and postnatal phase**

Descriptor	Non PMTCT Clinics (n = 150)	PMTCT Clinics (n = 150)	P-value
Frequency of antenatal clinic attendance by mothers (times/pregnancy)	8,33 (SD 2,346)	7,45 (SD 2,478)	0,002 §
% of mothers making use of clinic during pregnancy *	93,0% (n = 140)	96,7% (n = 145)	0,185 ¶
% of mothers receiving ante-natal nutrition education*	56,7% (n = 85)	66,7% (n = 100)	0,107 ¶
% of mothers receiving postnatal nutrition education*	42,3% (n = 63)	52,7% (n = 79)	0,072 ¶

\* % yes reported, the remainder no

§ Independent samples t- test

¶ Pearson's Chi-square test

**Table 9: Knowledge, attitudes, perceptions and beliefs regarding current infant feeding practices**

Descriptor	Non PMTCT Clinics (n = 150)	PMTCT Clinics (n = 150)	P-value
Mother's opinion on mean age (in months) at which food and/or liquids in addition to breast milk should be given	3,91 (SD 1,842)	4,95 (SD 2,895)	0,002 §
% of mothers cleaning infant's stomach*	50,7% (n = 76)	47,3% (n = 71)	0,564 ¶
Ingredients used to cleanse infant's stomach:			
• Harmful ψ ingredients	84,2% (n = 64)	63,4% (n = 45)	0,004 ¶
• Harmless ψ ingredients	15,8% (n = 12)	36,6% (n = 26)	
Main reason for breastfeeding study infant:			
• Health	41,1% (n = 58)	53,3% (n = 72)	#
• Breast is best	20,6% (n = 29)	11,1% (n = 15)	
• Nutritious	9,2% (n = 13)	8,1% (n = 11)	
Main reason for giving study infant something other than breast milk:			
• Hungry baby	59,3% (n = 64)	62,5% (n = 55)	#
• Baby cried a lot	9,3% (n = 10)	3,4% (n = 3)	
• Milk too little /weak	8,3% (n = 9)	2,3% (n = 2)	
Main reason for infant's crying:			
• Hungry baby	72,7% (n = 109)	68,7% (n = 103)	#
• Wet baby	11,3% (n = 17)	16,0% (n = 24)	
• Wants to be picked up	6,7% (n = 10)	6,7% (n = 10)	

\* % yes reported, the remainder no

ψ Harmful ingredients: Umuthi wenyoni, milk of magnesia, Sunlight water, castor oil, herbs

ψ Harmless ingredients: Water, sugar water, fruit juice, tea, warm milk

# No p-values, open-ended questions

§ Independent samples t- test

¶ Pearson's Chi-square test

### 6.3.2. Discussion

The percentage of mothers from both clinic groups making use of the clinic during pregnancy is similar to the 94% antenatal care from doctors/nurses reported by the South African Demographic and Health Survey. It can be speculated that the slightly higher frequency of antenatal clinic attendance among non-PMTCT mothers could possibly be due to the higher level of education recorded for them as well as a higher inter-household status as was reflected by more non-PMTCT mothers having a say in income expenditure.

The most important reasons cited as to why mothers from PMTCT and non-PMTCT clinics breastfeed their infants could be seen as an indicator of appropriate knowledge regarding the benefits of breastfeeding. However, it is interesting to note that recall of the generic term "breast is best" was higher

amongst non-PMTCT mothers, whereas more PMTCT mothers cited infant health as their reason for breastfeeding. This could be indicative of a more in depth level of infant feeding education being conducted at PMTCT clinics.

The mean age of about 4-5 months at which both groups of mothers thought liquids and/or solids should be given to infants in addition to breast milk is in contrast to the mean age of 6-7 weeks at which both groups of mothers introduced foods and/or liquids in addition to breast milk. This could illustrate the fact that knowledge is not always a good indicator of actual feeding practices, as is often reported in the literature. However, the fact that no clear distinction was made between the age at which liquids should be introduced and the age at which solids should be introduced complicates the interpretation of these results. On closer inspection of the data, it was found that none of the mothers cited water as an example of a liquid that should be given in addition to breast milk. This illustrates the fact that the mothers who were interviewed did not view water as important to mention when discussing their infant feeding practices. However, in terms of promoting exclusive breastfeeding, the importance of discouraging mothers to give their infants water should not be overlooked.

The incidence of “stomach cleansing” reported in this study is similar to that reported by Steyn et al<sup>25</sup>, namely that more than 50% of the study population received a herb mixture after birth. However, in the latter study the purpose of the administration thereof, was not clear. Significantly more mothers from non-PMTCT clinics ( $p=0,004$ ) used harmful ingredients for stomach cleansing which included commercially bought preparations. This could be indicative of the positive impact of educational efforts conducted at PMTCT clinics. However, the fact that nearly half the mothers from both clinic groups practiced “stomach cleansing” and that it undermines the promotion of exclusive breastfeeding justifies further investigation of this practice.

## **6.4 Influence of family, friends and clinic-based health workers on current infant feeding practices**

### **6.4.1 Results**

The results of a number of selected variables concerning the influence of family, friends and clinic-based health workers on infant feeding practices are presented in Table 10.

**Table 10: Influence of family, friends and clinic-based health workers on current infant feeding practices**

Descriptor	Non-PMTCT clinics (n = 150)	PMTCT Clinics (n = 150)	Pearson Chi-square p-value
Predominant source of antenatal education: <ul style="list-style-type: none"> <li>• Professional nurse</li> <li>• Staff nurse</li> <li>• Mother/grand –mother</li> </ul>	57,1% (n = 48) 23,8% (n = 20) 4,8% (n = 7) 8,3% (n = 7)	57,6% (n = 57) 30,3% (n = 30) 6,1% (n = 6) 2,0% (n = 2)	#
Predominant source of postnatal education: <ul style="list-style-type: none"> <li>• Professional nurse</li> <li>• Staff nurse</li> <li>• Mother/ grandmother</li> <li>• Other mothers/sisters/friends</li> </ul>	54,7% (n = 35) 21,9% (n = 14) 7,8% (n = 5) 9,4% (n = 6)	55,7% (n = 44) 30,4% (n = 24) 5,1% (n = 4) 3,8% (n = 3)	#
Influence to give infant something other than breast milk: <ul style="list-style-type: none"> <li>• Own decision</li> <li>• Mother</li> <li>• Clinic staff</li> <li>• Sister/other relative</li> </ul>	50,9% (n = 55) 21,3% (n = 23) 11,1% (n = 12) 9,3% (n = 10)	60,2% (n = 53) 15,9% (n = 14) 8,0% (n = 7) 9,1% (n = 8)	#
% of mothers living with infant's father*	30,7% (n = 46)	36,7% (n = 55)	0,272

\* % yes reported, the remainder no

# No p-values, open-ended questions

## 6.4.2 Discussion

The fact that clinic based nursing staff are the most important source of infant feeding information both antenatally and postnatally underlines the important role that clinic based staff can play in shaping appropriate infant feeding decisions.

Mothers reported that the decision to feed their infants something other than breast milk was mainly their own, followed by the advice from their mother (infant's grandmother) and clinic staff. These results are contrary to the results reported by other researchers<sup>26</sup> who found that where mothers introduce other food despite advice from health professionals to continue with exclusive breastfeeding, they do so because of social pressure.

The fact that the majority of mothers from Non-PMTCT and PMTCT clinics did not live with the infant's father could be the reason why the infant's father did not feature as a major role player in influencing the mother to give the infant something other than breast milk.

## 6.5. Resources that influence current infant feeding practices

### 6.5.1 Results

Some of the resources that are available to mothers attending PMTCT and non-PMTCT clinics that could influence current infant feeding practices were reported in Tables 2 and 8. As a result, only selected variables are reported in Table 11.

**Table 11: Resources that influence current infant feeding practices of mothers attending PMTCT and non-PMTCT clinics (Column and frequency %)**

Descriptor	Non-PMTCT Clinics (n = 150)	PMTCT Clinics (n = 150)	Pearson Chi-square p-value
% of mothers where clinic is within walking distance*	81,3% (n = 122)	78,0% (n = 117)	0,473
Mother's main sources of infant care support:			#
• Nobody	31,3% (n = 47)	28,0% (n = 42)	
• Mother/mother-in law	25,3% (n = 38)	32,0% (n = 48)	
• Sister/other relatives	20,0% (n = 30)	11,3% (n = 17)	
• Infant's father	7,3% (n = 11)	15,3% (n = 23)	

\* % yes reported, remainder no

# No p-values, open-ended question

### 6.5.2. Discussion

The resources that influence infant feeding practices include the availability of time, money, infant care support, access to safe, clean drinking water and access to health care facilities.

The majority of mothers attending non-PMTCT and PMTCT clinics had secondary school education. However, there was a significant difference between their overall level of education in that mothers attending non-PMTCT clinics were better educated because a higher percentage had obtained a tertiary level of education.

The majority of mothers were unemployed. It could therefore be speculated that they have enough time to care for their infants and take them to the clinic. Almost a third of mothers from both clinic groups reported to have no infant care support. This could hamper infant care, especially where the household income is low. Low inputs by the infant's fathers can be linked to the fact that only a third of mothers reported to live with the infant's father. This could be indicative of a high number of female-headed households amongst the mothers that were interviewed in this study.

A study conducted by De Villiers & Senekal<sup>27</sup>, indicated that being cared for by any other person than a child's biological mother constitutes a greater risk for a child to experience growth failure. Hence the results of our study

pointtowards the importance of involving the grandmother in strategies aiming to improve infant feeding practices. Due to the fact that there was no apparent difference in the level of infant care support experienced by mothers from the two clinic groups, the difference in the feeding practices reported in Table 3 cannot be accounted for by the level of infant care support experienced.

Considering the above results, it can be speculated that the majority of mothers from both clinic groups did not experience a major lack of resources in that they had sufficient time to facilitate adequate infant care, had access to clean, safe water (although not necessarily in the house) and adequate access to health care facilities. However, despite the fact that adequate data on household income was not available for this study, it is possible that a lower socio-economic status, as was reflected by a lack of tap water in the house, and a lack of infant care support for a subsection of the sample could be viewed as potential confounding factors in making appropriate infant feeding choices

## 6.6. Physical and emotional health of mothers attending PMTCT and non-PMTCT clinics

### 6.6.1 Results

The results of the responses used to assess the physical and emotional health of mothers are presented in Table 12.

**Table 12: Column % of physical and emotional health related variables/ factors by PMTCT and non-PMTCT clinics  $\psi$**

Descriptor	Non-PMTCT Clinics (n = 150)	PMTCT Clinics (n = 150)	Pearson Chi-square p-value
% of planned pregnancies*	32,0% (n = 48)	38,7% (n = 58)	0,227
% of sick infants*	30,0% (n = 45)	38,0% (n = 57)	0,155
<b>Emotional health</b>			
% feeling good about themselves as a person*	96,7% (n = 145)	94,7% (n = 142)	0,395
% feeling worthwhile*	97,3% (n = 146)	98,7% (n = 148)	0,365
% receiving adequate emotional support from family and friends*	87,3% (n = 131)	84,7% (n = 127)	0,506
% satisfied with living arrangement*	90,0% (n = 135)	90,0% (n = 135)	1,000
% experiencing stress*	58,7 % (n = 88)	61,3% (n = 92)	0,637
<b>Physical health</b>			
% thinking they are healthy*	92,7% (n = 139)	91,3% (n = 137)	0,907

$\psi$  Descriptors of emotional health selected from Postpartum Depression Predictors Inventory<sup>28</sup>

\* % yes reported, the remainder no

# No p-values, open-ended question

## **6.6.2 Discussion**

The results indicate that the majority of mothers from both clinic groups reported good levels of perceived physical health and parameters of emotional health. However, nearly two thirds experienced stress at the time of the study.

It is of concern that only one third of mothers from both clinic groups reported a planned pregnancy with the study infant. According to the Postpartum Depression Predictors Inventory, an unplanned pregnancy places a mother at risk for the development of postnatal depression. As a result, this aspect requires further investigation, especially due to the negative impact poor child spacing could have on childcare and infant feeding practices.

## **6.7. Training, ongoing education and knowledge about infant feeding of clinic based nursing staff and PMTCT counselors**

### **6.7.1. Results**

The results of the interviews conducted with a small sample of clinic-based nursing staff working at PMTCT and non-PMTCT clinics as well as the interviews conducted with PMTCT counsellors are reported in Table 13.

**Table 13: Training, ongoing education and knowledge about infant feeding of clinic based nursing staff and PMTCT counsellors (frequency %\*)**

Descriptor	Non-PMTCT nursing staff (n = 27)	PMTCT nursing staff (n = 15)	PMTCT counsellors (n = 9)
Job title of nursing staff interviewed: <ul style="list-style-type: none"> <li>Professional nurse</li> <li>Staff nurse</li> </ul>	88,9% (n = 24) 11,1% (n = 3)	33,3% (n = 5) 66,6% (n = 10)	
<b>Nutrition education during pre-registration</b>			
% of staff receiving pre –registration training on infant nutrition	88,9% (n = 24)	60,0% (n = 9)	55,6% (n = 5)
% of staff able to recall 4 messages based on their training	20,8% (n = 5)	54,5% (n = 6)	40,0% (n = 2)
Relevant messages recalled: <ul style="list-style-type: none"> <li>B/F /Exclusive B/F for 6 months</li> <li>Exclusive B/F 3-4 months</li> <li>Encourage B/F</li> <li>Advantages of B/F</li> <li>B/F for 2 years</li> </ul>	29,6% (n = 8) 11,1% (n = 3) 18,5% (n = 5) 7,4% (n = 2) 7,4% (n = 2)	10,0% (n = 1) 10,0% (n = 1) 40,0% (n = 4) 10,0% (n = 1) 10,0% (n = 1)	60,0% (n = 3) - 40,0% (n = 2) - -
<b>Nutrition education based on refresher courses attended</b>			
% of staff that attended refresher courses on infant nutrition since qualifying	88,9% (n = 24)	40,0% (n = 6)	100,0% (n = 9)
% of staff that were able to recall 4 new messages based on refresher courses	16,7% (n = 4)	16,7% (n = 1)	100,0% (n = 9)
Some relevant recalled messages: <ul style="list-style-type: none"> <li>Exclusive B/F for 6 months</li> <li>Exclusive B/F for 6 months if HIV+</li> <li>Advantages of B/F</li> <li>Advantages of B/F when HIV+</li> <li>Positioning baby</li> </ul>	41,7% (n = 10) 33,3% (n = 8) 12,5% (n = 3) 0,0% (n = 0) 0,0% (n = 0)	83,3% (n = 5) - 16,7% (n = 1) - -	11,1% (n = 1) 11,1% (n = 1) 33,3% (n = 3) 11,1% (n = 1) 22,2% (n = 2)
% of staff experiencing a need for ongoing education	92,3% (n = 24)	93,3% (n = 14)	100,0% (n = 9)
% of staff who felt their clinic has an infant feeding policy	70,4% (n = 19)	80,0% (n = 12)	88,9% (n = 8)
Cited the policy: <ul style="list-style-type: none"> <li>Exclusive B/F</li> <li>Encourage B/F</li> <li>B/F till 6 months</li> <li>B/F 18-24 months</li> <li>Solids at 6 months</li> <li>Solids at 4 months</li> <li>Educate the mother on her level</li> </ul>	31,6% (n = 6) 10,5% (n = 2) 10,5% (n = 2) 21,1% (n = 4) 5,3% (n = 1) 10,5% (n = 2) 5,3% (n = 1)	8,3% (n = 1) 41,7% (n = 5) 8,3% (n = 1) - - - 25,0% (n = 4)	14,3% (n = 1) 57,1% (n = 4) 28,6% (n = 2) - - - -
% of staff that have children	88,9% (n = 24)	93,3% (n = 14)	77,8% (n = 7)
% of staff that breastfed their children	77,8% (n = 21)	93,3% (n = 14)	66,7% (n = 6)

\* Because of the small sample size, inferential statistical analyses were limited

### 6.7.2. Discussion

Due to the recent changes that have occurred in recommendations for infant feeding practices in general, compounded by the high HIV prevalence, staff training is an important component of promoting safe infant feeding practices.

Staff members who attended refresher courses were asked whether they learnt anything new from this source of ongoing education since completing their pre-registration training. It was hoped that all of them would be familiar with the message of exclusive breastfeeding for the first six months of an infant's life. However, less than half of the staff members from non-PMTCT clinics were able to recall this message whereas the majority of staff members from PMTCT clinics were able to do so. More than half of PMTCT counsellors were able to recall this message after they had completed their initial training, hence only about 10% said that this was something new they learnt in relation to the attendance of refresher courses.

The scope and content of infant nutrition knowledge that staff obtained during pre-registration training and after attendance of refresher courses are in accordance with the statement made by WHO/UNICEF<sup>29</sup> that health personnel often have insufficient knowledge to provide appropriate support to mothers.

An area of concern is the relatively low response rate at which nursing staff and PMTCT counsellors recalled exclusive breastfeeding as an important infant feeding message when dealing with infants younger than six months of age. This could be indicative of a lack of knowledge about appropriate infant feeding practices. The majority of staff interviewed indicated that they experienced a need for ongoing education. This could be indicative of a positive attitude towards continuous education.

Fewer staff members from non-PMTCT clinics thought that the clinic where they were working had an infant feeding policy. The scope of clinic policies cited, indicates a lack of knowledge of, or insight in the topic, possible confusion as to what a policy is, or simply the absence of a clear infant feeding policy at clinic level. The fact that only a minority of nursing staff interviewed could describe the clinic policy as the promotion of exclusive breastfeeding, is indicative of a lack of familiarity with the national breastfeeding policy.

These results are cause for concern and indicate a need for increased education and ongoing training of nursing staff regarding infant feeding policy. However, considering the small number of clinic-based nursing staff who were interviewed as part of this study and that the sample was skewed due to an uneven distribution between professional nurses and staff nurses between the two clinic groups, (nine professional nurses at the PMTCT clinics were not willing to be interviewed), it would be prudent to repeat the same study with a much larger sample of respondents to validate the findings.

## 7. CONCLUSIONS

Overall, one quarter of the mothers with infants aged 0-6 months attending the non-PMTCT clinics and one third of mothers at the PMTCT clinics were practising exclusive breastfeeding at the time of the survey. The general trend was that mothers attending PMTCT clinics were more inclined to breast feed their infants exclusively or to formula feed than mothers attending non-PMTCT clinics.

The results of this survey indicate that the current prevalence of exclusive breastfeeding is considerably higher than the national data from the South African Demographic and Health Survey (1998, p134). Although these figures can be explained as a result of implementing the PMTCT programme, the positive trends observed in non-PMTCT clinics serve as an indicator that the INP and the Baby Friendly hospital initiative have an impact on the feeding choices mothers make.

Despite the limited duration of the PMTCT programme at the time of the study, indicators of the impact of the intervention include that a lower percentage of PMTCT mothers introduced foods and/or liquids in addition to breast milk and at a later stage of their infant's lives compared to non-PMTCT mothers. Furthermore, more mothers attending PMTCT clinics were shown how to breastfeed and were more likely to have received information about formula feeding.

Despite these indicators of a positive impact of the PMTCT programme, the mean age for introducing liquids and/or solids in addition to breast milk was high for both groups (at 6 weeks). Furthermore, the mean age at which both groups of mothers thought that solids should be given was contradictory to their actual feeding practices- illustrating the fact that knowledge is not always a good indicator of actual feeding practices.

The small difference in the incidence of formula feeding observed between the two clinic groups suggest the presence of constraints to safe infant feeding choices in PMTCT clinics such as access to safe, clean water and possible stigmatisation experienced by mothers that opt to formula feed.

Seeing that the provision of counselling on safe infant feeding practices is an important component of the PMTCT programme, it can be viewed as positive that antenatal-and postnatal nutrition education seemed to have occurred more often in PMTCT clinics as opposed to non-PMTCT clinics. This could explain why a higher incidence of exclusive breastfeeding and slightly later introduction of supplementary foods and liquids were observed amongst mothers attending PMTCT clinics.

As observed, infant feeding practices were still not ideal in both clinic groups. However the high level of antenatal clinic attendance documented for both groups serves as evidence that if utilized optimally, the antenatal clinic could serve as an ideal medium through which infant feeding education can take place. Especially considering the fact that clinic-based nursing staff were

cited as the most important source of infant feeding information by both groups of mothers in the antenatal and postnatal phase.

However, the documented infant feeding practices should be interpreted against the backdrop of factors that could influence infant feeding decisions, such as the socio-demographic characteristics of the mothers surveyed. More educated mothers tend to have a higher inter-household status and are more likely to have a say in income expenditure as well as having a better ability to make use of health care facilities such as well baby clinics. Where mothers do not work, it can be assumed that they are more likely to have sufficient time for infant care. Although the majority of mothers did not live with the infant's father, this need not be viewed as a constraint to appropriate infant nutrition as a child's nutritional status is often better in female-headed households. Access to clean water is essential to facilitate safe formula feeding practices. However, despite the fact that the majority of mothers surveyed had access to tap water, it was not always available in the house. This could have made formula feeding an inconvenient choice.

Although a third of mothers indicated that they had no infant care support, the majority indicated the availability of resources such as social support from peers and significant others like the infant's grandmother. Furthermore, the presence of social support could also impair the promotion of exclusive breastfeeding in that the infant's grandmother was cited as the second most important influence to give the infant something other than breast milk. Results generated by this study indicate that infant feeding beliefs and practices that could be constraints to the promotion of exclusive breastfeeding include the assumption that infant crying is most often a hunger cue, that breast milk alone cannot satisfy an infant's hunger because it is too little or too weak and that an infant's stomach requires cleansing.

The importance of taking cognisance of beliefs such as those reported in the previous paragraph, lies in that when an infant's crying is assumed to be hunger and breast milk is perceived to be inadequate to fulfill this need, infants are often given solids or supplementary formula feeds in an attempt to stop their crying/hunger. This practice would jeopardize exclusive breastfeeding.

The importance of training and ongoing education of clinic-based health workers should not be overlooked. As role players in shaping infant feeding decisions their training and ongoing education should reflect the national infant feeding policy as well as the latest developments in the field of infant nutrition.

## **8. RECOMMENDATIONS**

### **8.1 Recommendations to health authorities**

- Health workers conducting infant feeding education need to be aware of the infant feeding practices applicable to their target group as well as unfounded infant feeding beliefs held by that target group. In gaining insight into such, often unfounded beliefs, health workers are more likely to start their education efforts “where the mothers is at” and in so doing, are more likely to build a trusting relationship where the odds for successful outcomes are greater.
- Many women make their infant feeding decisions very early in their pregnancy. As a result, antenatal infant feeding education needs to commence as early as possible during pregnancy.
- The mother’s first postnatal visit needs to occur before the infant is 6 weeks old, in order to curb inappropriate infant feeding practices.
- Where mothers opt to formula feed, they should be provided with the necessary practical advice in order to implement formula feeding effectively and safely.
- The PMTCT programme is a good example of an intervention where counselling on infant feeding forms an important part of the interaction between a health worker and a mother. This programme should therefore be used as a vehicle to improve infant feeding support to all mothers, not just those with an HIV positive status. Furthermore, mothers should be continually motivated to breast feed exclusively, both at discharge after labour and at the first postnatal clinic visit and should be given the necessary support where beliefs are held that breastfeeding alone is not sufficient to meet an infant’s needs.
- Nursing staff and PMTCT counsellors involved in infant feeding education should receive appropriate training and regular, ongoing education regarding the promotion of appropriate infant feeding practices and issues such as counseling skills.
- To ensure that message delivery at clinic level is in accordance with national policy, every baby clinic should have a written infant feeding policy that is clearly communicated to all staff.
- The effectivity of message delivery could be enhanced by the attendance of refresher courses on issues such as counseling skills.

## 8.2 Recommendations for further research

- Appropriate strategies should be investigated to combat inappropriate infant feeding practices of mothers and caregivers, irrespective of HIV status.
- Constraints to formula feeding such as the level of stigmatisation experienced due to formula feeding in communities where breastfeeding is the social norm should be determined. This would give an indication of the feasibility, effectivity and cost effectiveness of providing free breast milk substitutes to mothers who opt to use them and could also serve as an indicator of whether community awareness strategies are necessary in order to facilitate the execution of this arm of the PMTCT programme.
- Studies investigating the infant feeding practices of mothers and the factors influencing their infant feeding decisions should be conducted in a non-clinic environment. This would limit the level of bias that the research environment could have on the data being generated.
- In order to do a more in depth assessment of the emotional health of mothers, appropriate, culturally specific measuring instruments should be used.
- Results generated by the interviews conducted with clinic-based nursing staff and PMTCT counsellors should be followed up with a larger study sample to validate the data generated by this study.

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