

# The practice of exclusive breastfeeding among mothers attending a postnatal clinic in Tswaing subdistrict, North West province

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## Abstract

**Objectives:** The aim of this study was to determine reported infant feeding practice with reference to exclusive breastfeeding, exclusive formula feeding and mixed feeding at six weeks postpartum among women attending a postnatal clinic in the Tswaing subdistrict of North West province, and the strength of the association between maternal human immunodeficiency virus (HIV) status and exclusive breastfeeding.

**Design:** Three hundred and eighty-six randomly selected women from seven primary healthcare clinics in Tswaing subdistrict, who were in their sixth postnatal week between November 2009 and February 2010, were enrolled in this study. Data were collected using a researcher-formulated questionnaire to ascertain demographics, including HIV status, as well as reported infant feeding practice. Secondary analysis was carried out to determine the strength of the association between the HIV status of the subjects and exclusive breastfeeding

**Setting and subjects:** This study was conducted among women over the age of 18 years attending their first six weeks postnatal visit in seven primary healthcare clinics that provide postnatal care in the rural Tswaing subdistrict of the North West Province.

**Outcome measures:** The self-reported infant feeding practice at six weeks postpartum, demographic determinants of reported infant feeding practice, and the strength of the association between maternal HIV status and reported infant feeding practice, particularly exclusive breastfeeding, constituted the main outcome measures.

**Results:** Comparatively, more HIV-negative ( $n = 157$ ), than HIV-positive women ( $n = 43$ ), reported that they were breastfeeding exclusively and had received infant feeding counselling ( $n = 258$  vs.  $n = 65$ ,  $p$ -value  $< 0.05$ ). Exposure to infant feeding counselling and a negative HIV status were associated with higher exclusive breastfeeding rates.

**Conclusion:** HIV-positive women are still at risk of transmitting HIV to their nursing infants on account of suboptimal infant feeding methods in the prevention of mother-to-child transmission (PMTCT) context. This calls for further research in this area, and in the interim, more support to pregnant and nursing HIV-positive mothers, with a view to achieving the aims of the PMTCT programme

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## Introduction

A key element in the response to the human immunodeficiency virus (HIV) epidemic is the prevention of mother-to-child transmission (PMTCT) programme, and specifically the infant feeding component. This is an evidence-based initiative that was implemented in response to the challenge of reducing the burden of this disease in the paediatric age group in particular, and in the population in general.

The provision of evidence-based infant feeding information during the antenatal period is a key component of the programme for the PMTCT of HIV, which aims to reduce HIV-associated morbidity and mortality. Current South African national recommendations are in favour of exclusive breastfeeding, irrespective of maternal HIV status, particularly in rural and resource-poor settings.<sup>1</sup>

In 2009, in light of programmatic experience in PMTCT, the World Health Organization (WHO) revised its infant

feeding guidelines to recommend exclusive breastfeeding for the first six months of life, unless replacement feeding is acceptable, feasible, affordable, sustainable and safe. Where antiretroviral drugs are available, exclusive breastfeeding for six months and continued breastfeeding until 12 months are recommended. The thrust of the new WHO guidelines for HIV and infant feeding is that countries should choose one infant feeding strategy which can be recommended by the health services to HIV-positive mothers.<sup>2</sup> Exclusive breastfeeding is defined as giving no other food or drink, except breast milk (not even water) for the first six months of life. However, according to this approach, infants are allowed to receive oral rehydration salts, and drops and syrups (vitamins, minerals and medicines).<sup>3</sup>

As a consequence, South Africa committed itself with the 2011 Tshwane declaration to adopting the new WHO recommendation, with a pronouncement that health services would essentially support only one feeding strategy, specifically breastfeeding.

Hitherto, South African PMTCT guidelines have recommended two options for HIV-positive mothers:

- Exclusive breastfeeding for six months, lifelong antiretroviral therapy and continued breastfeeding until 12 months, or
- Exclusive formula feeding when replacement feeding is acceptable, feasible, affordable, sustainable and safe. Free formula is provided for at least six months.<sup>4</sup>

Previously, there had been concerns about the risk of transmission of the HIV contained in breast milk, but evidence from prospective studies carried out in Durban, demonstrated that exclusively breastfed infants had no excess risk of HIV transmission over the age of six months, compared to those who were never breastfed.<sup>5</sup> Also, breastfeeding confers increased protection from diarrhoeal and respiratory illnesses within the first six months of life.<sup>6</sup>

Furthermore, the Kesho Bora Multicentre Collaborative Study, with an arm in Durban, has shown that within the PMTCT context, the safety of exclusive breastfeeding, and support for maternal health, can be guaranteed by triple highly active antiretroviral therapy (HAART) offered to mothers who were previously deemed to be ineligible.<sup>7,8</sup>

In spite of the foregoing evidence, which has informed South African national guidelines with respect to exclusive breastfeeding,<sup>4</sup> contextual challenges influence decision-making with regard to exclusive breastfeeding. In a qualitative study, Doherty et al identified key barriers faced by HIV-infected women in practising exclusive breastfeeding. Achieving exclusivity was challenging and related to the fact that a significant proportion of these mothers were young, single and unemployed, and struggled to protect their decision-making autonomy against a background of fear of disclosure and stigma.<sup>9</sup>

As a consequence, in poorly resourced settings, there is a danger of mixed or replacement feeding taking place. In addition, formula feeds cannot always be safely prepared or stored. These infant feeding modalities increase the risk of childhood mortality and morbidity and also escalate the risk of transmission of HIV, particularly in the case of mixed feeding.<sup>10</sup>

Mixed feeding might not be a distinctly South African phenomenon, as studies from Cote d'Ivoire in West Africa have shown that a high risk of infection exists in the context of maternal HIV infection on account of the fact that exclusive breastfeeding is not well accepted and mixed feeding is the most favoured option.<sup>11</sup>

From the researchers' experience of clinical care in the rural context, nursing mothers do not seem to have a sufficient understanding of the cause-effect relationship between HIV and disease needed to ensure an understanding of the utility of exclusive breast milk for infants born to both HIV-positive and HIV-negative mothers, and the risk of viral transmission in the case of a mother being positive. Importantly, the influence of context in deciding what infant feeding modality is best for them, irrespective of HIV status, does not seem to be taken into consideration.

The North West province recorded an overall HIV prevalence of 11.3% in 2008. This represents the fourth highest prevalence in South Africa's nine provinces.<sup>12</sup> The HIV prevalence rate obtained from the District Health Information System for Tswaing subdistrict, excluding antenatal clients, for the period April 2009 to March 2010, stood at 28.8%. The antenatal prevalence for the same period was recorded as 19.6%.

This research aimed to determine reported infant feeding practices, with reference to exclusive breastfeeding, exclusive formula feeding and mixed feeding at six weeks postpartum among women attending a postnatal clinic in the Tswaing subdistrict of North West province, and the strength of the association between HIV status and reported infant feeding practice, with a focus on exclusive breastfeeding in particular.

## Method

### Study design

A quantitative, cross-sectional descriptive and analytical study design was used.

### Study site

Tswaing subdistrict falls within the Ngaka Modiri Molema district of North West province. The town of Delareyville is the magisterial headquarters. The population is essentially rural, with settlements aggregating mainly around farms. It is approximately 150 km from the provincial capital of

Mahikeng. Its seven primary healthcare clinics (PHCs) offer postnatal care services and were used for this study.

### Study population

The study population comprised women who attended their first six-week postnatal clinic visit at the seven PHCs that provide this service in Tswaing subdistrict.

### Study sample

Of the 729 women who constituted the sample frame, 386 women met the eligibility criteria and were deemed to constitute the study population statistically. An assumption of a 20% non-response rate was made, bringing the final study sample population to 463 women. Thus, the aim was to collect data from 66 women in each clinic (463/7). The study was undertaken between November 2009 and February 2010.

Female patients aged 18 years and older attending their first PNC clinic visit at six weeks postpartum, who had given informed consent to participate in the study, had antenatal care in the Tswaing subdistrict, and had their HIV status recorded as evidenced by appropriate coding on the antenatal card and/or the infant's Road to Health Chart were included in the study. Mothers who presented with medical complaints which had influenced their infant feeding practice were excluded.

### Sampling

Data were collected from the envisaged study sample population of approximately 463 women. The women were sampled from the seven postnatal clinics, which run concurrently across the subdistrict from Monday to Friday. Actual data collection stopped after 386 respondents had been enrolled and data collected from them. This number represented the number of statistically determined respondents minus the 20% envisaged non-responders. A total of 38 women, approximately 10% of the study sample population, could not be accounted for after the issuing of serial numbers and were assumed to have dropped out. Therefore, the total number of women who were issued serial numbers was 424 (386 respondents plus 38 who dropped out before administration of the questionnaire).

The researchers attended these clinics on a rotational basis during the study period until the target sample size per clinic was attained. Clinic visits were conducted twice every month, while Atamelang Health Centre, one of the study sites, was visited four times a month.

Women attending the PNC clinic were first approached as a group in order to introduce the researcher and to explain the purpose of the study. This assisted in allaying any fears of preferential treatment or victimisation. Every day, women were selected to take part in the study using simple

random sampling by way of a random number generator. The process entailed limiting the range of possible random numbers to the number of patients booked for the day, and choosing random numbers from this range to select 30% of the women. The 30% daily sampling ratio was mutually deemed to be the least likely to interfere with normal clinic activities by the researchers and translators. This sampling procedure was applied as the women awaited booking while seated in a queue in the clinic waiting area. Serial numbers were issued to the selected women after they had undergone the postnatal clinic process. This was to ensure that the women did not feel unduly coerced or committed to participate in the study.

The women were allowed to complete the postnatal procedures before the questionnaire was administered. It was expected that some of the women who had previously consented before undergoing the postnatal clinic process would decide to drop out at this stage. The use of multiple visits during the data collection stage ensured that this did not compromise the sample size.

### Data collection tool

A researcher-formulated questionnaire was available in English and translated into the local Tswana language, which encompassed demographics, HIV status and reported infant feeding practice. This was used to collect data from eligible respondents. The overall Cronbach's alpha coefficient of the questionnaire stood at 0.84, which was above the 0.7 that was accepted as the cut-off for reliability. Furthermore, all components of the questionnaire showed internal consistency.

### Pilot study

A pilot study was undertaken at one of the seven study sites in the Tswaing subdistrict and revealed that the estimated time to complete the questionnaire ranged from 10-15 minutes. The pilot study was also used to identify ambiguous questions that needed to be excluded from the questionnaire. No translation difficulties were identified. The pilot study population constituted part of the study sample for this study. Information that was obtained from the pilot study was used to modify the researcher-formulated questionnaire before it was utilised for this study.

### Data analysis

The data are presented in frequency tables and bar charts for all variables in order to determine the distribution thereof. A descriptive analysis of the participants was carried out to provide estimates of central tendency and variability from the mean. Cross-tabulation was also performed to determine the relationship between the predictor and response variables. The results were analysed using statistical software SPSS® 17.0.

## Ethics

The study was approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand and the Research Committee of the North West Department of Health. Participants who opted to take part in this study were provided with written information and consent forms, from which the content was read out and explained to them. Only those who signed the consent forms were allowed to proceed with the interview process. The translators also signed a confidentiality clause. The final questionnaires were anonymous and could not be linked to the respondents. The interview was carried out in a private room to ensure privacy and confidentiality after a letter containing information was issued and the consent form had been signed.

Aspects taken into account because of the social sensitivity and public health importance of HIV infection were as follows:

- When asked about their HIV status, it was stressed to patients that they did not need to divulge this if they had any misgivings about doing so.
- Mothers who were HIV-positive were assessed with regard to clinical staging, CD4 counts, DNA PCR for infants, the need for prophylaxis and their eligibility to commence HAART. Appropriate referrals were made and treatment was given with regard to extant guidelines and protocols.

## Results

### Demographic characteristics

The mean age of the mothers was 25 years [standard deviation (SD) = ± 6.4 years] and their ages ranged from 18-41 years. The majority of respondents (45.3%) were 18-23 years old (Table I).

Parents (31.3%) were the largest source of income, with a mean monthly expenditure of R648.80 (SD ± R700.38). The self-reported HIV prevalence in this study stood at 18.4%. Women who received infant feeding advice during pregnancy constituted 87.8% of this study. 77.2% of them were HIV-negative. As can be seen in Table II, significantly more HIV-negative mothers (p-value = 0.000) were exposed to infant feeding counselling.

$$\chi^2 = 40.7 \text{ and } p\text{-value} = 0.000$$

### Distribution of reported infant feeding practice

Figure 1 indicates that the majority (53.1%, n = 205) of respondents said that they were breastfeeding exclusively at six weeks. Exclusive formula feeding (26.6%, n = 103) was the next most prevalent reported infant feeding practice, followed by mixed feeding (20.3%, n = 78). Mixed feeding

**Table I:** Demographic characteristics of respondents

| Variable   | n   | %    |
|--|-----|------|
| <b>Age (in years); mean age (± SD) = 24 years (± 6.4)</b>                    |     |      |
| 18-23  | 175 | 45.3 |
| 24-29  | 129 | 33.4 |
| 30-35  | 66  | 17.1 |
| 36-41  | 16  | 4.1  |
| <b>Marital status</b>  |     |      |
| Single   | 73  | 18.9 |
| Married  | 306 | 79.3 |
| Cohabiting   | 7   | 1.8  |
| <b>Highest level of education</b>  |     |      |
| None   | 47  | 12.2 |
| Grade 2-4  | 81  | 21   |
| Grade 5-8  | 114 | 29.6 |
| Grade 9-12   | 141 | 36.6 |
| Post-secondary   | 2   | 0.5  |
| <b>Source of income</b>  |     |      |
| Grant  | 104 | 26.9 |
| Pension  | 25  | 6.5  |
| Employed   | 97  | 25.1 |
| Parents  | 121 | 31.3 |
| Partner  | 39  | 10.1 |
| <b>Monthly expenditure on self (in Rands); mean (± SD); 648.8 (± 700.38)</b> |     |      |
| 50-350   | 40  | 10.4 |
| 351-650  | 171 | 44.3 |
| 651-950  | 0   | 0    |
| 951-1 250  | 141 | 36.5 |
| 1 251-1 550  | 21  | 5.4  |
| + 1 551  | 13  | 3.4  |
| <b>Received infant feeding counselling</b>                                   |     |      |
| Yes  | 339 | 87.8 |
| No   | 47  | 12.2 |
| <b>Human immunodeficiency virus status</b>                                   |     |      |
| Positive   | 71  | 18.4 |
| Negative   | 298 | 77.2 |
| Unknown  | 17  | 4.4  |

SD: standard deviation

for the purposes of this study was defined as the giving of other liquids and/or foods, together with breast milk, to an infant under six months of age.<sup>13</sup>

### Reported infant feeding practice versus human immunodeficiency virus status

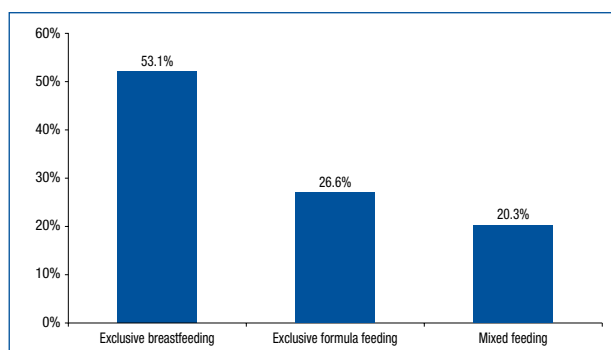
It is clear from a comparison of infant feeding practices that only exclusive breastfeeding showed a significant difference with regard to HIV status (p-value = 0.02) (Table III).

**Table II:** Infant feeding counselling versus human immunodeficiency virus status (n = 386)

| Exposure to infant feeding counselling | Positive, n = 71 (18.4%) | Negative, n = 298 (77.2%) | Unknown, n = 17 (4.4%) |
|--|--------------------------|---------------------------|------------------------|
| Yes                                    | 65 (91.5)                | 258 (86.6)                | 16 (94.1)              |
| No                                     | 6 (8.5)                  | 40 (13.4)                 | 1 (5.9)                |

**Table III:** Reported infant feeding practice at six weeks postpartum versus human immunodeficiency virus status (n = 386)

| Variable                 | Positive, n = 71 (18.4%) | Negative, n = 298 (77.2%) | Unknown, n = 17 (4.4%) | p-value |
|--------------------------|--------------------------|---------------------------|------------------------|---------|
| Giving breast milk alone | 43 (60.6)                | 157 (52.7)                | 5 (29.4)               | 0.02    |
| Giving formula alone     | 18 (25.4)                | 79 (26.5)                 | 6 (35.3)               | 0.18    |
| Mixed feeding            | 10 (14.1)                | 62 (20.8)                 | 6 (35.3)               | 0.66    |

**Figure 1:** Distribution of reported infant feeding practice at six weeks postpartum

HIV-negative women were more likely to breastfeed exclusively than HIV-positive women. Thus, HIV-positive status was not associated with exclusive breastfeeding.

## Discussion

Analysis of the demographic variables showed that the majority of the respondents were young, predominantly in the grade 9-12 educational category, and their parents were their main source of income. This reflects the characteristics of nursing mothers in HIV-endemic regions of rural South Africa, which were alluded to by Doherty et al.<sup>9</sup> These women face the challenges of financial and decision-making autonomy and are also at risk of early weaning and the premature introduction of modified cow's milk. In rural communities, these are added barriers to optimal growth and development, besides the increased risk of mother-to-child transmission of HIV potentially caused by mixed feeding, thus posing a challenge to PMTCT programme initiatives which aim to improve exclusive breastfeeding rates and which are recommended for rural HIV-positive women, in particular.

Significantly more HIV-negative, than HIV-positive, women, said they had been counselled during antenatal visits. This surprising finding points to an important challenge for the PMTCT programme. This might lead to programme failure in the sense that viral transmission from mother to infant could still occur on account of failure to institute relatively simple

targeted interventions: infant feeding counselling in this case. Windeale et al demonstrated that the latter is the most cost-effective short-term intervention to ensure optimal and safe nutrition for the feeding infant.<sup>14</sup>

This study showed that exclusive breastfeeding at six weeks was a practice that was more prevalent in the HIV-negative (157, 52.7%) group of women, than in their HIV-positive (43, 60.6%) peers (Table III). This could relate to the finding in this study that showed that HIV-negative mothers were more likely than HIV-positive ones to have received infant feeding counselling during the antenatal period. This association between infant feeding counselling, which in the South African public health context emphasises exclusive breastfeeding and higher exclusive breastfeeding rates, is buttressed by the results of a randomised trial that controlled for the Hawthorne effect, which was carried out in Ghana, west Africa. This trial showed that prenatal exclusive breastfeeding lactation counselling significantly increased exclusive breastfeeding rates up to six months after delivery.<sup>15</sup> The dichotomy noted in this study between HIV-positive and HIV-negative mothers exists needs to be explored. Lower exclusive breastfeeding rates among HIV-positive mothers could expose their infants to diarrhoeal and respiratory illnesses which exclusive breastfeeding would have protected them from, particularly in rural settings,<sup>6</sup> with a resultant increase in the risk of their infants acquiring HIV infection in the setting of mixed feeding.<sup>16</sup> As this study shows, 14.1% of HIV-positive respondents (Table III) reported that they were practising mixed feeding.

The above finding of lower exclusive breastfeeding rates in HIV-positive mothers is at variance with the findings of Rollins et al, who also compared exclusive breastfeeding rates between HIV-positive and HIV-negative women. Their study indicated that, at one week postpartum, most HIV-infected women intended to breastfeed exclusively and adhered to this intention from that time.<sup>17</sup> Robbins et al hypothesised that it was possible that factors such as the time at which the study was conducted postpartum, and the intensive support given to the study participants, could

have influenced the study outcomes, and also accounted for the variance in the present study.

## Limitations

Studies like this, which involve the disclosure of sensitive information, potentially suffer from a social desirability bias that might impact on the results. In addition, the mothers may have given what they felt to be socially acceptable answers to the interviewers.

Caution would need to be exercised if the results of this study were to generalised to other rural settings, because the possibility of sociocultural influences, which may vary across geographical areas, may have impacted on the study variables to give different outcomes and associations.

Women who were younger than 18 years of age, as indicated in the study exclusion criteria, were excluded for ethical reasons. Legally, they are considered to be minors and would have needed the consent of a guardian to participate in this study. This could have threatened the principles of patient autonomy and confidentiality, especially as it related to their HIV status. In reality, this age group represents a particularly vulnerable group and it would be important to know more about their infant feeding practices.

## Conclusion

The exclusive breastfeeding rate in this study population was lower in HIV-positive women than it was in their HIV-negative counterparts. The negative implications of the reduction of mother-to-child transmission of HIV cannot be overemphasised. A number of putative reasons might exist, such as the fact that HIV-negative women were more likely to receive infant feeding counselling. It is the opinion of the researchers that the national South African PMTCT programme has made positive strides, especially with the provision of new PMTCT guidelines. It is hoped that a study like this has pointed to the direction in which greater effort needs to be made, particularly in the area of further research, with the aim of consolidating gains in the PMTCT context and assisting in improving standards for better service delivery.

## Recommendations

The researchers recommend that further research is directed at ascertaining the reasons for the difference in the recorded exclusive breastfeeding rates in this study. Such efforts should also seek to explore the possible influence of sociocultural factors on this study finding. As indicated, women who were younger than 18 years of age were

excluded from this study, but they represent a particularly vulnerable group. Studies that are able to control for the ethical issues that resulted in their exclusion from this study are recommended. Finally, the quality and practice of infant feeding counselling need to be examined to ensure that they are in keeping with current PMTCT guidelines.

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