



## ORIGINAL ARTICLE

# Challenges to delivering quality care in a prevention of mother-to-child transmission of HIV programme in Soweto

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**Background.** There has been little focus on the quality of care provided in the prevention of mother-to-child transmission (PMTCT) of HIV services in South Africa (SA).

**Objective.** To assess the quality of care in PMTCT services in Soweto, SA, focusing on the knowledge and experiences of healthcare workers and HIV-infected pregnant women accessing the services.

**Methods.** A cross-sectional survey was conducted in November - December 2009. A total of 201 HIV-infected pregnant women and 80 healthcare workers from 10 antenatal clinics were interviewed using standardised questionnaires.

**Results.** Among the HIV-infected pregnant women, the median gestational age was 20 weeks at the first antenatal visit and 32 weeks at the time of the interview. The majority of the women interviewed (71.5%) discovered that they were HIV-infected in the index pregnancy, and 87.9% disclosed their HIV status. Overall, 97.5% received counselling and 33.5% were members of a support group. Knowledge of antenatal and intra-partum PMTCT interventions was accurate in 62.7% and 43.3% of the women, respectively. Support group membership and current use of antiretroviral prophylaxis did not impact on the quality of knowledge. Of the healthcare workers, 43.8% were professional nurses and 37.5% were lay counsellors. The majority (80.0%) felt satisfied with their knowledge of the PMTCT guidelines and 96.3% felt competent in managing HIV-infected pregnant women. Yet, there were important deficiencies in the knowledge of the guidelines.

**Conclusion.** In our study, the knowledge of PMTCT interventions was low in both clients and healthcare workers. This points to the need to improve quality of care in PMTCT services, especially with increasingly complex PMTCT interventions recommended by international policies.

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In the past few years, South Africa (SA) has made significant progress in the provision of prevention of mother-to-child transmission (PMTCT) of HIV services, both in the delivery of more efficacious PMTCT interventions and also an increase in the proportion of women receiving the interventions.<sup>[1]</sup> According to a UNAIDS report, ~95% of HIV-infected pregnant women in SA received some antiretroviral therapy (ART) intervention for PMTCT in 2010.<sup>[2]</sup> While progress has been made, there are still several challenges in scaling up PMTCT services in the SA public healthcare sector. These relate to coverage at different steps of the PMTCT cascade, and also to the quality of care rendered in the services. According to a qualitative study documenting women's experiences of accessing ART and PMTCT programmes in several facilities in SA, health system weaknesses impacted negatively on access.<sup>[3]</sup>

Healthcare system and patient factors are important in the scale-up and success of HIV programmes (including PMTCT)<sup>[4-7]</sup> and the availability of interventions alone is

not sufficient to guarantee appropriate implementation and uptake.<sup>[4-5,8-9]</sup> Healthcare facilities need to be well-resourced with competent and motivated staff to provide the services, and there needs to be service uptake and treatment adherence by patients.<sup>[4-7]</sup> The providers' and patients' knowledge and attitudes are also important.<sup>[7,8]</sup> There is evidence to suggest that the patient-provider relationship may have an effect on decision-making during the antenatal period, and on the uptake of PMTCT interventions.<sup>[10]</sup> Yet, quality of care has not been a focus in most PMTCT services in SA; most are focused on increasing coverage in the PMTCT cascade. Several reviews have found poor performance and coverage in PMTCT programmes, despite the simplicity of some interventions; hence, the focus has been on increasing coverage.<sup>[5,11,12]</sup>

We conducted a cross-sectional survey to investigate key aspects of the quality of care in PMTCT services in antenatal clinics in Soweto, SA, focusing on the PMTCT programme knowledge and experiences of (i) healthcare workers and (ii) HIV-infected pregnant women accessing the services. This was performed against the backdrop of recently updated

PMTCT guidelines in 2008, when zidovudine (AZT) monotherapy became available for prophylaxis.<sup>[13]</sup>

## Methods

The study was approved by the Human Research Ethics Committee of the University of the Witwatersrand. All participants signed written informed consent to participate.

Until March 2008, all antenatal clinics in Soweto had only intrapartum single-dose nevirapine (NVP) for PMTCT for pregnant women who were not eligible for life-long ART. AZT was rolled out in phases across the antenatal clinics in March - October 2008. Prior to implementation of the guidelines, staff at the antenatal clinics, including lay counsellors, were trained on the new guidelines. The PMTCT service at each clinic was staffed by a professional nurse – a 'PMTCT co-ordinator' in charge of PMTCT services, including supervision of lay counsellors.

The study was conducted in November - December 2009; all facilities had at least 12 months of routine services under the 2008 PMTCT guidelines. Participating clinics were a mixture of low- and high-volume clinics, with 50 - 300 pregnant women presenting to each clinic per month. The HIV prevalence was 29% in 2009, and 15 - 20% of pregnant women were eligible for ART under the guidelines in place at the time (criterion: CD4<sup>+</sup> count  $\leq$  200 cells/ $\mu$ l).

## HIV-infected pregnant women

Using consecutive sampling, ART-eligible and -ineligible HIV-infected pregnant women presenting to the selected antenatal clinics for repeat visits were interviewed using a structured questionnaire. Their experiences of being HIV-infected and their knowledge of available PMTCT interventions were determined. Eight key-knowledge questions were selected; each was assigned a score of 1 for a correct answer and 0 for an incorrect answer (maximum score of 8).

## Healthcare workers

Healthcare workers from the same clinics were interviewed using a different questionnaire assessing their opinions and experiences of working in a PMTCT programme and their knowledge of the PMTCT guidelines. Consecutive sampling was used to select participants. Similar to the knowledge score devised for patients, a scoring system based on eight key questions was formulated. All interviewers received training on the questionnaire, and all were fluent in the local vernacular languages.

## Data analysis

Data were analysed using Stata version 12.0. Descriptive statistics used employed means and standard deviations (SDs) or medians and interquartile ranges (IQRs) (for continuous variables) and proportions (for categorical variables). We compared knowledge scores on subgroups using Student's *t*-tests and Fisher's exact tests. All statistical tests were two-sided ( $\alpha=0.05$ ).

## Results

### HIV-infected pregnant women

A total of 201 HIV-infected pregnant women were interviewed (Table 1). The mean age was 27.7 years (SD  $\pm$ 4.8); median gestational age was 20 weeks (IQR 16 - 24) at the first antenatal visit and 32 weeks (IQR 24 - 32) at the time of the interview. The majority of women (71.5%) discovered that they were HIV-infected in the index pregnancy. Of the women diagnosed in a previous pregnancy, 84.1% (37/44) had previously taken single-dose NVP for PMTCT. A baseline CD4<sup>+</sup> cell count was available for 92.0% of the participants: median 395 cells/ $\mu$ l (IQR 294 - 500); mean 420 cells/ $\mu$ l (SD  $\pm$ 190).

Overall, 87.5% (175/200) of the women had disclosed their HIV status; the majority (90.9%; 159/175) had done so to their partners. This finding did not differ according to timing of HIV diagnosis. Of the women who discovered that

they were HIV-infected in the index pregnancy, 68.0% had disclosed their status. There were various reasons for non-disclosure to the partner, including fear that the partner would leave, be violent, or accuse the woman of being unfaithful and infecting him with HIV. Less than half (45.3%) of the women knew their partner's HIV status. There was a significant difference in the knowledge of the partner's HIV status between women who had, and those who had not disclosed their HIV status: 89 (50.9%) v. 0 (0%) knew the partner's HIV status, respectively ( $p<0.001$ ). Of the partners with known HIV status, 81.3% were HIV-infected.

Of the women, 62.7% and 43.3% had accurate knowledge on antenatal and intrapartum prophylaxis, respectively. Overall, 97.5% (196/201) had received some counselling, 67.7% had received more than one counselling session, 88.6% (178/201) felt that the time spent on counselling was adequate, and 33.5% were part of a support group. There was no significant difference in knowledge between pregnant women who were members of a support group (mean score 5.29; SD  $\pm$ 0.98)), and those who were not (mean score 5.18; SD  $\pm$ 1.41) ( $p=0.542$ ) (Table 2). There was a significant difference in knowledge between women who were already receiving AZT prophylaxis (mean score 5.44; SD  $\pm$ 1.18) and those who were not (mean score 4.94; SD  $\pm$ 1.34) (Table 3) ( $p=0.005$ ).

**Table 1. Characteristics of pregnant women (N=201)**

Characteristics	
Age (years), mean ( $\pm$ SD)	27.7 ( $\pm$ 4.8)
Parity, median (IQR)	2 (1 - 2)
Gravidity, median (IQR)	2 (1 - 3)
Gestational age at booking (weeks), median (IQR)	20 (16 - 24)
Gestational age at interview (weeks), median (IQR)	32 (24 - 32)
CD4 <sup>+</sup> cell count (cells/ $\mu$ l), median (IQR)	395 (294 - 500)
When HIV status discovered (N=200)	
Current pregnancy	143 (71.5)
Previous pregnancy	44 (22.0)
Outside of pregnancy	13 (6.5)
Disclosed HIV status (N=199), n (%)	175 (87.9)
To whom disclosed, n (%)	
Partner	159 (90.9)
Parent	61 (34.9)
Sibling	42 (24.0)
Friend	30 (17.1)
Other	5 (2.9)

SD = standard deviation; IQR = interquartile range.

**Table 2. Characteristics and knowledge of pregnant women who were members of a support group (N=67) v. those who were not (N=133)**

Members of a support group	Yes n (%)	No n (%)	p-value
Characteristics			
Age (years)			
<25	18 (26.9)	35 (26.3)	0.764
25 - 35	47 (70.1)	91 (68.4)	
>35	2 (3.0)	7 (5.3)	
Parity			
≤2	58 (86.6)	109 (81.9)	0.407
3 - 5	9 (13.4)	24 (18.1)	
When HIV status discovered:			
Current pregnancy	44 (65.7)	98 (74.2)	0.043
Previous pregnancy	21 (31.3)	23 (17.4)	
Outside of pregnancy	2 (3.0)	11 (8.3)	
Disclosed HIV status	56 (83.6)	118 (88.7)	0.356
Correct knowledge			
AZT prophylaxis			
Indication	66 (98.5)	124 (93.2)	0.143
Timing of initiation	64 (95.5)	119 (90.2)	0.188
Duration of use	26 (38.8)	99 (74.4)	<0.001
Prophylaxis during labour	18 (26.9)	69 (51.9)	0.001
Need for infant prophylaxis	63 (94.0)	111 (83.5)	0.036
Type of infant prophylaxis	7 (10.5)	18 (13.5)	0.553
Duration of infant prophylaxis	52 (77.6)	62 (39.1)	<0.001
Duration of exclusive breastfeeding	59 (88.1)	87 (65.4)	0.001
Overall score, mean (±SD)	5.3 (±0.98)	5.2 (±1.41)	0.542

AZT = zidovudine; SD = standard deviation.

**Table 3. Difference in knowledge in pregnant women who were already on zidovudine (AZT) prophylaxis (N=114) and those who were not (N=86)**

AZT prophylaxis	Yes n (%)	No n (%)	p-value
Correct knowledge			
Indication for AZT	111 (97.4)	79 (91.9)	0.137
Timing of AZT initiation	101 (88.6)	82 (95.4)	0.125
Duration of use of AZT	79 (69.3)	47 (54.7)	0.034
Intrapartum prophylaxis	63 (55.3)	24 (27.9)	<0.001
Score, mean (±SD)	5.44 (±1.18)	4.94 (±1.34)	0.005

## Healthcare workers

Of the healthcare workers interviewed, 43.8% were professional nurses and 37.5% were lay counsellors; the majority (81.3%) had been in their current position for longer than a year (Table 4). Less than a half (47.5%) were satisfied with their working conditions. The most dissatisfaction was in terms of remuneration; only 28.8% were satisfied with their salary. In terms of workload, 80.0% of the workers felt that the new PMTCT programme increased their workload, and

92.5% felt that there was a need for more staff for the programme.

Most healthcare workers were satisfied with their knowledge of the PMTCT guidelines (80.0%) and with their general knowledge of HIV/AIDS (91.3%). In managing HIV-infected pregnant women, 96.3% were satisfied with their competence. Training received on the new guidelines was perceived to be adequate by 63.6%. The mean score for the workers' knowledge of the PMTCT guidelines was 5.15 (SD ±1.85): 5.41 (SD

±1.56) for professional nurses v. 5.19 (SD ±1.89) for lay counsellors ( $p=0.586$ ). There was no significant difference between the mean score of those who were satisfied with their knowledge of the guidelines (5.29; SD ±1.88) and those who were not (4.56; SD ±1.63) ( $p=0.157$ ) (Table 5). There was also no difference between the mean score of healthcare workers who thought that the training they received was adequate (5.10; SD ±1.9) and those who did not (5.14; SD ±1.7) ( $p=0.926$ ).

**Table 4. Characteristics of healthcare workers (N=80)**

Characteristics	n (%)
Gender (N=79)	
Female	74 (93.7)
Staff categories	
Professional nurse	35 (43.8)
Auxiliary nurse	9 (11.3)
Lay counsellor	30 (37.5)
Other	6 (7.5)
Time in current position	
<6 months	7 (8.8)
6 months - 1 year	8 (10.0)
>1 - 5 years	33 (41.3)
>5 - 10 years	22 (27.5)
>10 years	10 (12.5)

A high percentage of healthcare workers (86.3%) thought that HIV-infected pregnant women did not disclose their HIV status. There were a number of adverse opinions about HIV-infected women having children: 21.3% of healthcare workers thought that HIV-infected individuals should not have children; 53.8% thought HIV-infected individuals were having too many children; and 46.3% thought that social grants were an incentive for HIV-infected women to have children.

## Discussion

In this cross-sectional survey, several challenges were identified in the Soweto PMTCT programmes. The majority of pregnant women discovered that they were HIV-infected during pregnancy, and although disclosure to partners was high, less than half knew their partner's HIV status. There were important deficiencies in the

**Table 5. Characteristics and knowledge of healthcare workers who were satisfied with their knowledge of PMTCT (N=64) v. those who were not (N=16)**

Satisfied with knowledge of PMTCT	Yes, n (%)	No n (%)	p-value
Characteristics			
Staff categories			
Midwife	14 (21.9)	6 (37.5)	
PMTCT coordinator	10 (15.6)	0 (0)	
PCR nurse	4 (6.1)	2 (12.5)	
Lay counsellor	28 (43.8)	2 (12.5)	
Other	8 (12.5)	6 (37.5)	
Time in current position			
<6 months	4 (6.3)	3 (18.8)	
6 months - 1 year	7 (10.9)	1 (6.3)	
2 - 5 years	30 (46.9)	3 (18.8)	
6 - 10 years	19 (29.7)	3 (18.8)	
>10 years	4 (6.3)	6 (37.5)	
Correct knowledge			
Single-dose NVP			
Efficacy	55 (85.9)	11 (68.8)	0.211
Repeat in same pregnancy	52 (81.3)	10 (62.5)	0.410
Use in subsequent pregnancies	51 (79.7)	12 (75.0)	0.933
ART use in pregnancy	44 (68.8)	8 (50.0)	0.191
Sero-conversion during pregnancy	42 (65.5)	10 (62.5)	0.754
Exclusive breastfeeding and risk of MTCT	26 (40.6)	9 (56.3)	0.190
Extended breastfeeding and risk of MTCT	50 (78.1)	12 (75.0)	0.704
Contraception for HIV-infected women	19 (29.7)	1 (6.3)	0.105
Overall score, mean ( $\pm$ SD)	5.3 ( $\pm$ 1.88)	4.6 ( $\pm$ 1.63)	0.157

PMTCT = prevention of mother-to-child transmission of HIV; PCR nurse = nurse responsible for HIV PCR tests in infants; NVP = nevirapine; ART = antiretroviral therapy; MTCT = mother-to-child transmission of HIV.

women's knowledge of the available PMTCT interventions, despite receiving counselling and their perception that the counselling that they received was adequate. Neither the number of counselling sessions received, nor participation in a support group, had an impact on the quality of knowledge.

Staff in the PMTCT programme felt well prepared and well informed prior to the rollout of the updated PMTCT programme. The majority thought that the training received was adequate and almost all felt confident about managing HIV-infected women; yet, there were several important gaps in the knowledge of the PMTCT guidelines. Job satisfaction was low, mostly in terms remuneration. Moreover, several staff members expressed negative opinions about HIV-infected women having children.

The findings of this cross-sectional survey have important implications for PMTCT programmes in SA. Routine HIV testing for women, and men, of reproductive age needs to be encouraged, and linkages to care provided for those who test HIV-positive. This is especially important in women who are ART-eligible, as they carry a high risk of mother-to-child transmission, and ART initiated preconception decreases this risk significantly.<sup>[14]</sup> It will be important to assess the impact of the SA national HIV counselling and testing (HCT) drive on testing outside of pregnancy.<sup>[15]</sup>

Unpublished data from the Soweto PMTCT programmes indicate that the number of pregnant women presenting for antenatal care with a known HIV-positive status and already receiving ART has increased in the past 2 years (C Mnyani, unpublished data). The rate of disclosure among HIV-infected pregnant women in this survey was higher than that reported for most of sub-Saharan Africa, but similar to the findings of another study conducted in SA.<sup>[16-18]</sup> Disclosure has been shown to be important in women's uptake and adherence to PMTCT interventions.<sup>[16]</sup>

Our data on the women's knowledge of PMTCT interventions suggest that the quality of counselling given can be improved. Incorrect information, and hence incorrect practices, will be harmful in the context of PMTCT and may significantly increase the risk of mother-to-child transmission. While health knowledge is only one component of quality of care, there is evidence to suggest that poor quality of counselling, which translates to poor patient knowledge, is an important contributing factor

to non-adherence to PMTCT interventions.<sup>[5,19]</sup> Poor quality of counselling has been reported even in well-functioning PMTCT sites where counsellors, some nurses, had received structured training.<sup>[20]</sup> The SA public healthcare sector depends on the services of lay counsellors who receive a stipend, and also receive variable training. Counselling services are often interrupted, and there is evidence to suggest that this has a negative effect on PMTCT services.<sup>[21]</sup>

As we scale up PMTCT programmes and introduce more complex interventions, staff preparedness, including knowledge, needs to be improved.<sup>[22,23]</sup> There needs to be a review and standardisation of training providers, and also of training content. Support using trained peers who are experts in HIV care and management has been shown to be an important intervention in building capacity.<sup>[6]</sup> Negative staff attitudes towards HIV-infected women also need to be addressed. There is evidence that HIV-infected women who fear and/or experience stigmatisation may avoid participating in PMTCT programmes.<sup>[24]</sup>

## Study limitations

While our findings do have important implications, there are several limitations to this survey. Like all questionnaire-based research, the results may have been influenced by reporting biases. In this case, participants may have felt social desirability to report satisfaction with their PMTCT-related knowledge, but this potential bias was unlikely to have influenced their ability to report factual knowledge correctly. In addition, although the study was conducted under a different set of PMTCT policy guidelines, the findings are particularly noteworthy given the subsequent implementation of more complex PMTCT guidelines in SA and many other parts of Africa. The study was conducted in one urban community of high HIV prevalence and with established PMTCT services, and the results should be generalised to other settings with caution. Healthcare workers were generally reluctant to be interviewed, and this warrants further investigation. Also, we used a consecutive sampling strategy; although routine in this form of health services research, this may be more prone to bias than random sampling strategies. There are plans to perform a similar survey to assess experiences with, and knowledge of the latest SA PMTCT guidelines. Despite the limitations, there are strengths to the survey that warrant merit, including the

large number of pregnant women and different categories of staff who were interviewed.

## Conclusion

There are still several challenges in PMTCT services. Most importantly, knowledge of PMTCT interventions is surprisingly low in both clients and healthcare providers, and there is a need for enhanced interventions to improve the quality of care in PMTCT services. This is particularly important as PMTCT interventions become more complex during the ante- and postnatal periods.

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