ARTICLE

Knowledge, attitudes and practices of women regarding the prevention of mother-to-child transmission (PMTCT) programme at the Vanguard Community Health Centre, Western Cape – a pilot study

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Objective. The aim of the study was to determine the knowledge, attitudes and practices of women regarding the prevention of mother-to-child transmission (PMTCT) programme at a community health centre (CHC).

Method. A descriptive study was conducted using an administered, structured questionnaire.

Subjects and setting. Thirty-six educated women aged 18 - 39 years and attending the clinic took part. Participants were from informal settlements and mostly unemployed, receiving government grants.

Results. The majority (88.9%) scored 80% or more with regard to general HIV knowledge. Although the majority (78%) were formula feeding, primarily owing to their HIV status and convenience while working, 24% would not be able to sustain this feeding method after the initial 6 months' free supply provided by the provincial health services. The majority could not define the terms exclusive breastfeeding (89%), mixed feeding (81%) or cup feeding (94%) correctly. Attitudes were found to be positive with regard to both breastfeeding and formula feeding, but HIV status influenced it significantly ($p < 0.1$).

Conclusion. In conclusion, certain aspects of the PMTCT programme appear to have been effective at the CHC included in this study. The women were knowledgeable about HIV transmission and mother-to-child transmission (MTCT), but they were uninformed about certain essential aspects, i.e. prevention, cure and infant feeding. Attitudes were similar towards breastmilk or formula milk as a feeding choice but were influenced by HIV status. It was indicated that an informed decision-making process was not followed, rather that the women were advised to formula feed. Sustainability of formula feeding after 6 months and training of health workers specifically regarding feeding options need to be addressed.

In 2005, around 2.8 million men, women and children lost their lives to acquired immune deficiency syndrome (AIDS)-related diseases. Many more – 38.6 million – are living with HIV, and most of these are likely to die over the next decade. The most recent UNAIDS/WHO estimates show that, in 2005 alone, 4.1 million people worldwide were newly infected with HIV.[1] The 2005 National HIV Survey estimated that 10.8% of all South Africans more than 2 years of age were living with HIV. The highest prevalence, 16.2%, was found among those between 15 and 49 years old.[2]

HIV can be transmitted through body fluids as in sexual contact, intravenous drug abuse, direct blood contamination[3] and mother-to-child transmission (MTCT) during pregnancy, labour and breastfeeding.[4]

Of all South African women attending antenatal clinics during 2005, 30.2% were living with HIV.[2] The transmission of HIV from mother to infant is referred to as MTCT,[4] which is the cause of more than 90% of HIV infections worldwide among children.[5,6] Without intervention, 25 - 40% of mothers will transmit HIV to their infants during pregnancy and breastfeeding.[7]

Throughout pregnancy the risk of infection is 5 - 10%, whereas the risk increases to 10 - 20% during delivery and 5 - 15% during breastfeeding.[5]

Programmes aimed at PMTCT can play an essential role in reducing the risk of transmission, as well as slowing the spread of the disease. Intervention programmes in Africa have successfully reduced MTCT to approximately 12%.[7] In developed countries, counselling, testing and antiretroviral (ARV) therapy, linked with comprehensive antenatal and intrapartum care and effective promotion of formula feeding, have led to a reduction of MTCT rates to below 5%.[7]

Exclusive breastfeeding (giving a child no other food or drink, including no water, in addition to breastfeeding with the exception of medicines, vitamin drops or syrups, and mineral supplements[8]) may significantly lower the risk of MTCT compared with mixed feeding (feeding both breastmilk and other foods or liquids, and a term widely used in the MTCT literature – an infant who is either predominantly or partially breastfed is considered to be receiving mixed feeding[8]), which affects the integrity of the infant's gut mucosal lining.[9] Women need to have sufficient knowledge of HIV transmission and correct feeding practices to enable them to make an informed decision, thereby reducing the risk of MTCT.

The woman must decide on her feeding choice during pregnancy. By not breastfeeding, one can reduce the risk of MTCT by 5 - 15%. In some situations, when milk is incorrectly and unhygienically prepared,[10] the risk of formula feeding is greater than the risk of breastfeeding owing to diarrhoea and infections other than HIV that may occur.

When deciding on feeding choice, the availability of safe water, sanitation and income play an essential role due to the risk of contamination of the formula milk, which would increase morbidity and mortality.[3,4]

Health workers can influence the woman's decision and are therefore vital in MTCT prevention and the success of the programmes.[11] Women need to be educated and informed so an informed choice on infant feeding can be made.

The aim of this study was to determine the knowledge, attitudes and practices of women regarding the PMTCT Programme at Vanguard Community Health Centre, where the programme has been implemented since 2002.

Methodology

Study population

The study was conducted at Vanguard Community Health Centre (CHC), near Cape Town, South Africa, in January 2004. Data were collected over a 4-week period by the investigators. Inclusion criteria included all HIV-infected women (15 - 49 years), attending the Vanguard CHC antenatal clinic and on the PMTCT programme.* Participants were required to give informed consent and were English, Afrikaans or Xhosa speaking. The projected sample size was 60 - 80 participants as per the PMTCT register at the CHC.

Data collection

A questionnaire was developed in English in consultation with an educational expert and translated into Afrikaans. Comments regarding the content validity of the questionnaire were requested from those within the division with the most expertise regarding the PMTCT programme. Face validity was tested during a pilot study at Bishop Lavis CHC. As the population is predominantly Afrikaans-speaking, it was only possible to pilot the Afrikaans questionnaire. The questionnaire included sections on socio-demographic data (20 closed questions regarding employment, income, age, marital status, dependants, literacy, education level, housing and availability of water and sanitation), knowledge (14 closed and open-ended questions regarding transmission, risks, causes and cure of HIV as well as definitions for infant feeding practices and nutritional advice), attitudes (14 statements regarding breastfeeding and formula feeding with a 4-point Likert scale ranging from strongly agree, agree, disagree to strongly disagree), and feeding practices (25 open and closed-ended questions regarding support, choice of feeding methods, sustainability of formula feeding for all women and hygiene and current feeding practices for post-partum women only). To get an indication of honesty in answering, the final question in the questionnaire asked the women whether they guessed any of the answers and if so, whether it was more or less than half of the answers. The questionnaire was completed during a structured interview to ensure that illiterate clients were not excluded. The investigators, 3 BSc Dietetics final-year students (researchers of the study) and the Xhosa translator (nutrition advisor at Vanguard CHC), were standardised in terms of explanations given and interviews conducted using the questionnaire.

Permission was obtained from the Department of Health, the Provincial Government of the Western Cape and the Facility Manager of the Vanguard CHC. Ethics approval was obtained from the Head of Division: Human Nutrition as mandated and ratified by the Human Research Committee of the Faculty of Health Sciences, Stellenbosch University.

* In 1999 the SA PMTCT programme was implemented where all pregnant women presenting at public hospitals and clinics are entitled to voluntary confidential HIV counselling and testing. If tested HIV positive, they are entitled to receive free ARVs as well as free infant formula for the first 6 months of the infant's life if the mother chooses not to breastfeed.[4]

Statistical analysis

As questions were categorical, the means and standard deviations could not be determined for most of the variables. Frequencies of categories were determined and represented in tables or graphs as appropriate. Knowledge scores were determined using only the closed-ended questions regarding HIV transmission and infant feeding, with a maximum score of 10. Means and standard deviations were determined for these knowledge scores. The data were analysed using Microsoft Excel and manual calculations were used for the contingency tables and Pearson chi-square testing for independent variables. As the sample size was small, an alpha-level of 0.1 was deemed to have sufficient statistical power to determine statistically significant differences between correlations.

Results

All 36 women who met the inclusion criteria were included in the study. Interviews were conducted in English, Afrikaans or Xhosa. Twenty (55.6%) of the women were less than 6 months post-partum and 16 (44.4%) were pregnant. Questions concerning hygiene and current infant feeding practices were not answered by the pregnant participants. Participants were aged between 18 and 39 years, 11 (30.6%) were younger than 25 years, 8 (22.2%) were between 25 and 29 years and 17 (47.2%) were older than 30 years.

Twenty-three of the women (63.9%) were unemployed; of those, 8 (34.8%) were supported by their partner and 7 (30.4%) received government grants. Sixteen of the women (44.4%) had dependants and 18 (50%) of the women had an income of less than R500 per month. Thirty-four of the women (94.4%) reported that they could read and write, indicating literacy (general literacy and not language-specific literacy was assessed) and 17 of the women (47.2%) had an education level between Grades 11 and 12. Three (8.3%) participants reported no education and 3 (8.3%) reported tertiary education.

Twenty (55.6%) of the women reported living in informal settlements, 8 (22.2%) reported living in structured brick houses, 4 (11.1%) reported staying in a Wendy house/prefabricated building, 1 (2.8%) in a flat and the remainder (3) in other accommodation.

With regard to sanitation, 25 (69.4%) reported having an outside toilet, of which 23 (63.9%) were flush toilets. Fifteen (41.6%) reported having running tap water inside their house. At least once a week, 33 (91.7%) of the women had their waste removed. The most commonly reported energy sources for cooking were electricity (66.7%) and paraffin (38.9%).

Twenty-five of the women (69.4%) indicated that they did not guess any of the answers, whereas 7 (19.4%) reported guessing less than half the answers, and only 4 (11.1%) indicated that they guessed more than half of the answers.

Knowledge

A knowledge score of at least 50% (5 out of a maximum of 10) was obtained by all the women regarding knowledge of HIV transmission (Table I) with the mean score being 9/10 (SD 1.37). Thirty-two of the women (88.9%) scored at least 80%. Using the chi-square test, there was a statistically significant positive relationship between the education level (higher than grade 10) of the participants and the knowledge scores ($p < 0.1$[†]).

Table I. HIV/AIDS knowledge score distribution of the women

Score (10 max.)	No. of participants (N = 36)	Distribution (%)
10	17	47.2
9	11	30.6
8	4	11.1
7	1	2.8
6	1	2.8
5	2	5.6

Regarding specific questions, 33 of the women (91.7%) answered correctly that HIV causes AIDS and only 3 (8.3%) indicated that they were unsure. Eleven of the women (30.6%) reported that HIV/AIDS is curable, 15 (41.6%) that it was not curable and 10 of the women (27.8%) that they were unsure. Thirty-two of the women (88.9%) reported that MTCT is preventable, only 1 (2.8%) reported that it was not preventable, and 3 (8.3%) were not sure. The most common answers provided to the open-ended question regarding how MTCT could be prevented, were the exclusion of breastmilk in 11 of the women (30.6%) and the use of ARV drugs in 26 (72.2%).

Only 4 of the women (11.1%) explained the term exclusive breastfeeding correctly, and 18 (50%) indicated that they did know what exclusive breastfeeding meant and did not attempt an explanation (Fig. 1). Of the 14 who explained the term incorrectly, 6 (16.7%) erroneously thought that it meant not to breastfeed at all. Twenty of the women (55.6%) could not explain the term mixed feeding correctly and only 7 (19.4%) explained the term correctly. Only 2 of the women (5.6%) correctly explained the term cup-feeding, whereas 11 (30.6%) explained it incorrectly.

Attitudes

Thirty-five of the women agreed (10 strongly agreed and 25 agreed) that they were satisfied with health

[†] As a result of the small sample group, an alpha-level of 0.1 was used to determine if there was a statistically significant difference between correlations.

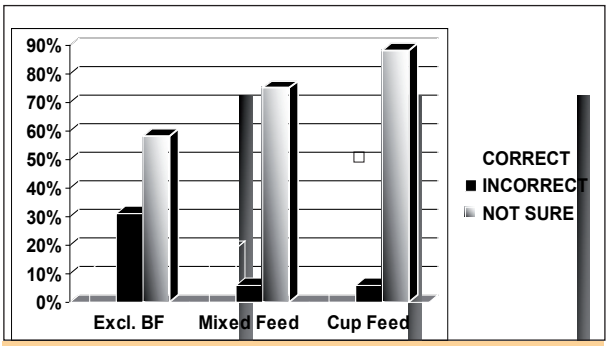

Fig. 1. Explanation of feeding practice terminology by mothers (N = *36).*

worker advice about PMTCT. In a closed-ended question, 32 of the women (88.9%) reported that they preferred to follow a health worker's advice compared to advice from family (5.6%), friends (2.8%) or a partner (2.8%). Twenty-three of the women (63.9%) disagreed (6 strongly disagreed and 17 disagreed) that they were happy/would like to breastfeed their infant. More than half of the participants (64.5%) reported that they felt they made the best feeding choice, and 20 (55.6%) were happy about their choice.

Table II indicates the strength of agreement or disagreement with the statements as indicated by the Likert scale regarding breastfeeding and formula feeding. Twenty-eight (77.8%) of the women agreed that breastfeeding and formula feeding is healthy, 28 (77.8%) agreed that breastfeeding is nutritionally complete and 26 (72.2%) that formula feeding is nutritionally complete. Twenty-nine of the women (80.6%) agreed that breastfeeding satisfied their infant, whereas 31 (86.1%) agreed that formula feeding satisfied their infant. Regarding hygiene of feeding methods, 32 (88.9%) of the women agreed that breastfeeding was hygienic and 29 (80.6%) indicated the same about formula feeding.

Contingency tables were drawn up to compare women that gave all correct responses regarding MTCT and all four aspects of attitude towards formula and breastfeeding respectively. The Pearson chi-square test indicated that there was no statistically significant relationship ($p > 0.1$) found between MTCT knowledge and attitude towards formula feeding but a statistically significant relationship ($p < 0.1$) between MTCT knowledge and attitude towards breastfeeding.

Practices

It should be noted that the scope of this study did not determine whether the participants actually practised what they reported doing.

Feeding choice

Twenty-three of the women (63.9%) responded that they had received information on infant feeding practices and nearly all of those women (22; 95.7%) had received such information from a health worker. Twenty-three (63.9%) reported that the health workers advised them to formula feed.

In an open-ended question regarding the reason for choosing a specific infant feeding method, the most

Table II. Attitudes of women towards breastfeeding and formula feeding (*N* = 36)

	Breastfeeding (*N* = 36)	**%**	**Formula feeding (*N* = 36)**	**%**
Healthy				
Strongly agree	9	25	5	13.9
Agree	19	52.8	23	63.9
Disagree	8	22.2	8	22.2
Strongly disagree	0	0	0	0
Nutritionally complete				
Strongly agree	8	22.2	6	16.7
Agree	20	55.6	20	55.6
Disagree	7	19.4	10	27.8
Strongly disagree	1	2.8	0	0
Satisfies infant				
Strongly agree	8	22.2	6	16.7
Agree	21	58.3	25	69.4
Disagree	7	19.4	5	13.9
Strongly disagree	0	0	0	0
Hygienic				
Strongly agree	10	27.8	6	16.7
Agree	22	61.1	23	63.9
Disagree	4	11.1	7	19.4
Strongly disagree	0	0	0	0

common reason stated was to protect their infant from contracting the virus (27 of 36, 75%). Other reasons stated included: going back to work (8.3%), advice from a counsellor at the clinic (2.8%), medical reasons preventing breastfeeding (2.8%), preferring not to breastfeed (2.8%) and because the formula was free (2.8%). The fact that the formula milk was free of charge would have reportedly influenced 8 (22.2%) of the participants in their decision regarding feeding options. Furthermore, 8 (22.2%) of the participants indicated that they felt they would be unable to financially continue feeding their child infant formula after the 6 months of free formula from the clinic.

Twenty participants were post-partum and 16 were pregnant. Post-partum women only were required to indicate factors influencing their current feeding choice. Fourteen (70%) of the post-partum participants reported being influenced in their decision; 12 of them reported being influenced by a health worker, and 2 by their partners. The women reported that their family supported (23 of 36, 63.8%) and approved (17 of 36, 47.2%) their feeding choice.

Feeding practices

These results were obtained from post-partum women only (*N* = 20). Only 1 participant (5%) reported that she exclusively breastfed her infant because she believes that it is the best method of feeding. Nineteen (95%) participants reported that they formula fed their infants. Cow's milk, evaporated milk, sweetened condensed milk, tea, fruit juice, infant porridge and water were the breastmilk substitutes (BMS) other than formula milk that were reportedly provided to the children. None of the participants gave cow's milk, evaporated milk or sweetened condensed milk before 12 months of age. Two (10%) participants gave tea between 3 and 6 months, 4 (20%) gave fruit juice before 6 months of age, 5 (25%) gave porridge before 3 months, and 3 (15%) gave porridge between 3 and 6 months. Regarding water, 9 (45%) participants gave water before 3 months and 4 (20%) between 3 and 6 months (Fig. 2).

Cup-feeding was uncommon, with only 5 women (25%) reporting that they cup-fed, and this was strengthened by the fact that when all of the women (*N* = 36) were asked which feeding method they thought was better for their baby, cup or bottle-feeding, 30 (83.3%) indicated that bottle-feeding was better.

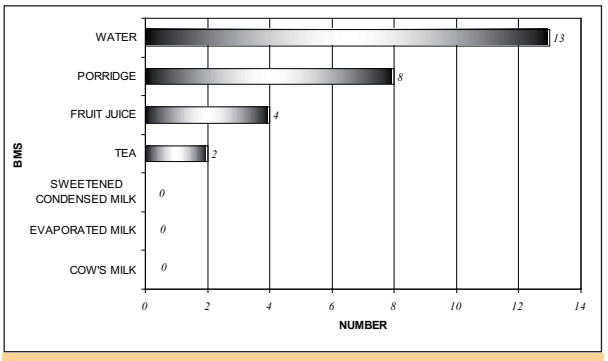

Fig. 2. Breastmilk substitutes (BMS) given to children before the age of 6 months (N = *20).*

With the 19 women already formula feeding, all reported washing bottles and teats every time before feeding the infant; 10 (52.6%) used boiling or hot water with soap or a steriliser, 7 (36.8%) used only boiling water and 2 (10.5%) used cold water and soap to clean the bottles and teats. Thirteen (68.4%) correctly explained the preparation of infant formula.

No participants reported that they had changed their feeding practices when friends and relatives came to visit.

Discussion

The sample of women all fell within the age range of those with the highest prevalence of HIV, namely 15 - 49 years.[2] Two-thirds of the women were unemployed and mostly supported by partners or government grants. Half of the women had an income of less than R500 per month, indicating poor financial conditions and that they may have been financially unable to sustain this option once the first 6 months' supply of free formula milk had finished. Housing conditions were poor in most cases with only 22% living in structured brick houses. More than half of the women only had access to running water outside of their home and most had an outside flush toilet. Waste was removed regularly in the majority of cases and two-thirds used electricity for cooking. Education levels were good, with at least half having an education level of grade 11 or higher and less than 10% reporting no education. Although the majority of women indicated that they could read and write, the two who could not are a cause of concern, as the accuracy of preparation and amounts of formula given to the infant would be questionable, and could result in the infant receiving inadequate nutrition. It is well known that hygiene, sanitation and income play a very important role in whether formula feeding should be considered as a feeding option. Contaminated water, bottles and mixing utensils can lead to pathogenic infections of the infant which increases morbidity and mortality rate due to dehydration and diarrhoea.[3,4] In lower socio-economic areas, the cost implications and sustainability of buying formula milk impacts on the decision regarding the feeding option, indicating that formula milk should be avoided.[12] Owing to the limiting factors that were present in this sample, such as unemployment, poverty, unreliable water sources and poor housing, the decision to formula feed may not have been in the best interests of these infants.

A factor that could impact on the results was that although two-thirds of the women reported not