

Voluntary counseling and testing among post-partum women in Botswana[☆]

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Abstract

Objective: To determine uptake and socio-demographics predictors of acceptance of voluntary counseling and testing (VCT) among post-partum women in Botswana.

Methods: Women attending maternal and child health clinics for their first post-partum or well baby visit in three sites in Botswana were offered VCT after a written informed consent. A standardized questionnaire was used to collect socio-demographic characteristics and reasons for declining VCT.

Results: From March 1999 to November 2000, we approached 1735 post-partum women. Only 937 (54%) of those approached accepted VCT. In multiple logistic regression analysis, younger maternal age, not being married, and less formal education were significant predictors of acceptance of VCT. Thirty percent of women who accepted VCT were HIV-positive.

Conclusion: Our results indicated that in Botswana prior to the initiation of a government Mother to Child Transmission (MTCT) prevention program, younger, unmarried, and less educated post-partum women were more likely to undergo VCT.

Practice implications: Our results have shown that interventions to improve VCT among post-partum women and more generally among women of reproductive age are warranted in Botswana. These interventions should account for differences such as age, marital status, education, and partner involvement to maximize VCT uptake.

Keywords: VCT; Post-partum women; HIV; Botswana

1. Introduction

HIV prevalence among pregnant women in Botswana rose from 18.1% in 1992 to reach a plateau of 38.5% in 2000

[☆] For more information on the Reflective Practice section please see: Hatem D, Rider EA. Sharing stories: narrative medicine in an evidence-based world. *Patient Education and Counseling* 2004;54:251-253.

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[1], and it is estimated that 9000 infants become HIV infected in Botswana annually through vertical transmission in the absence of any intervention program. Over 50% of hospital beds in pediatric wards are occupied by patients with HIV/AIDS related illnesses [2].

In 1994, Connor et al. [3] showed that it was possible to reduce the transmission of HIV from a mother to a child by more than 60% by using zidovudine among non-breastfeeding women in the USA and Europe. Intervention programs aimed at preventing sexual transmission of HIV or providing antiretroviral drugs for the prevention of Mother to Child

Transmission (MTCT) and or treatment rely heavily on the acceptance of VCT for HIV infection [4–11]. Understanding the socio-demographic and cultural characteristics for the acceptance of VCT could assist in the successful implementation of HIV intervention programs. In developed countries like United States of America, acceptance rates varied widely (3–100%) depending on the settings. It was in general higher among STDs patients and individuals at high risk for acquiring or transmitting HIV infection than among other populations like women attending family planning clinics [12–15].

Factors associated with high acceptance rates included clients' perceptions of HIV risk, acknowledging risk behaviors, confidentiality protections, gender, race, and having health insurance coverage. Refusal was mostly explained by prior HIV testing and fears about coping with results.

In developing countries specifically in Sub-Saharan Africa, VCT rates among pregnant women approached for participation in PMTCT clinical trials ranged between 33 and 95%. Factors associated with reluctance to HIV testing were fear of HIV-positive test result, stigmatization, discrimination, domestic violence, separation or divorce, and higher education [8,16–18].

Long turn around time for HIV test result has also been described as a cause of low VCT uptake [19].

In 1999, we initiated a study of HIV-1 C in Botswana the main goal of which was to evaluate HIV-1 replication patterns in association with MTCT. Results of the virology study are published elsewhere [20]. At the time of the study, voluntary counseling and testing services were limited and not well utilized by communities in our study sites. Rates and socio-demographics determinants of voluntary counseling and testing were poorly understood. Using mother/infant pairs approached for this study, we investigated the uptake and predictors of acceptance of VCT in Botswana.

2. Methods

2.1. Study design

From March 1999 to November 2000, before the initiation of the National MTCT prevention program, mothers attending public maternal and child health clinics in three sites (two villages Molepolole and Mochudi, and one town, Lobatse) for their first post-natal care (6–8 weeks post-partum) or first well baby (1 month post-partum) visit were approached to participate in the study. Those who agreed to participate with their babies provided written informed consent in English or Setswana, the national language of Botswana. Mothers who were under 21 years of age were required to have their legal guardian provide written consent in order to participate in the study. HIV screening results were provided within a week or at the next scheduled visit a month later, depending on mothers'

preference. Socio-demographic characteristics and reasons for not accepting VCT were collected from all women approached for the study using standardized questionnaires administered either in English or Setswana by the research staff. The questionnaire was piloted in a small number of potential study participants for clarity and acceptance before the initiation of the study.

Pre- and post-test counseling were offered by the research staff who were trained in HIV counseling and study protocol. HIV health education including introduction to our study was provided every morning to all women attending maternal and child health clinics. Potential study participants were invited to join the study team and counseling was provided individually in private rooms. Those who were undecided or requested time to think about the study were given the option to do so and encourage to discuss it with family members. If requested, a copy of the consent form was given to them to discuss with family members or parents. Questionnaires were reviewed for completeness and correctness by recruiting staff before collection for data capture. Weekly team meetings were held in all study sites to discuss study progress and difficult counseling cases encountered by recruiting staff.

If 4 months post-partum or less, HIV-infected mothers and their infants were asked to undergo clinical evaluation for HIV/AIDS related symptoms or diagnoses, to provide maternal blood, cervico-vaginal (CVF) and breast milk samples, and to have a blood sample drawn from their infants for HIV testing.

Women who tested HIV-positive and who were willing to formula feed were provided formula until their babies reached 6 months of age. All babies born to HIV-positive mothers were offered Pneumocystis Carini Pneumonia (PCP) prophylaxis until 1 year of age. Infant Polymerase Chain Reaction (PCR) results were provided to mothers who wished to know the HIV status of their babies. Mothers and their infants were encouraged to consult study physicians for any health problems. Women who were HIV negative were counseled about ways to stay negative. The study was approved by both the Botswana Health Research Unit and the Harvard School of Public Health Human Subjects Committee.

2.2. Specimen collection and laboratory tests

For all women consenting to VCT, 10 ml of blood was collected in an ethylene diamine tetraacetic acid (EDTA) containing tube and HIV testing was performed using two independent Enzyme Linked ImmunoSorbent Assays (ELISAs) (Ortho Ab-Capture (Ortho-Clinical Diagnostics) and Murex HIV-1.2.0 (Abbott-Murex, Murex Biotech Limited)). Unless lost to follow-up a second blood sample was collected from participants with indeterminate results and retested by ELISA. Western blot was used for final HIV status in case of a second indeterminate ELISA result. Determination of infant HIV status was detailed elsewhere [20].

2.3. Statistical analysis

The main outcome for the present analysis was acceptance of HIV testing among mothers offered VCT while attending their first postnatal or well baby visit.

To describe the participants studied, frequencies and percentages are presented for the description of categorical socio-demographics and clinical characteristics. For continuous variables, mean with standard deviation, median with interquartile range (IQR), and category frequencies are presented.

Logistic regression was used to determine the univariate and joint predictors of acceptance of VCT. For prediction of acceptance of VCT, age was categorized into quartiles and number of live births and pregnancies were dichotomized.

We tested for two-way interactions in the multiple logistic regression models to determine joint predictors. For the interaction found, we present odds ratios for one predictor within levels of the other predictor. To assess the effect of missing data on the different models, missing values were coded as dummy variables and were included as predictors of the outcome variable. Formal comparisons of the effect of missing data could not be done because models were not nested; however their effect was assessed by comparing coefficients in the different models. Statistical significance testing was two-sided and conducted at the 0.05 level, and 95% confidence intervals were provided for the estimates. No adjustments for multiple comparisons were made.

3. Results

From March 1999 to November 2000, 1735 mothers visiting maternal and child health clinics were approached for VCT and study participation (Fig. 1). The vast majority of women were Motswana (Botswana citizens), with a median age of 25 years.

Sixty-nine percent of women had 9 years of education or more. Married women represented only 15% of all women approached for VCT. As for occupation, the largest proportion of women approached for VCT were domestic workers in a home other than their own (43%). The median number of pregnancies and live births were both 2, with 41% of women having three or more live births. The majority of women had vaginal delivery (86%) during their last pregnancy (Table 1 summarizes the socio-demographic characteristics of women approached for VCT).

Nine hundred and thirty seven (54%) of the women accepted VCT. Out of 798 women who refused HIV testing, 29% mentioned fear of a positive HIV test as the main reason for their refusal and 15% requested more time to consider undergoing HIV testing. Fourteen percent desired a partner or parental consent before considering VCT and 5% were not interested in the study or were not living in the study area. Thirty-seven percent of women who refused testing did not provide a reason for their refusal.

Univariate and joint predictors of acceptance of VCT are shown in Table 2. Maternal age, education level, marital status, occupation, and study sites were all significantly associated with acceptance of VCT.

After adjustment for other predictors, acceptance of VCT decreased with age. Those who were 21 years of age or younger were more likely to accept VCT than the group of women 32 years of age or older (adjusted OR = 2.5, 95% CI 1.8–3.7).

Unmarried women were more likely to accept VCT than married or cohabiting women (adjusted OR = 1.5, 95% CI 1.1–1.9). Unemployed women were less likely to accept VCT as compared to domestic workers. Of all study sites, Mochudi had the highest acceptance of VCT (67%). There was a significant interaction between education and study sites. Within each site, generally the higher the level of education a woman had achieved the less likely she was to accept VCT. In Molepolole and Mochudi, women with 12 or more years of education were significantly less likely to

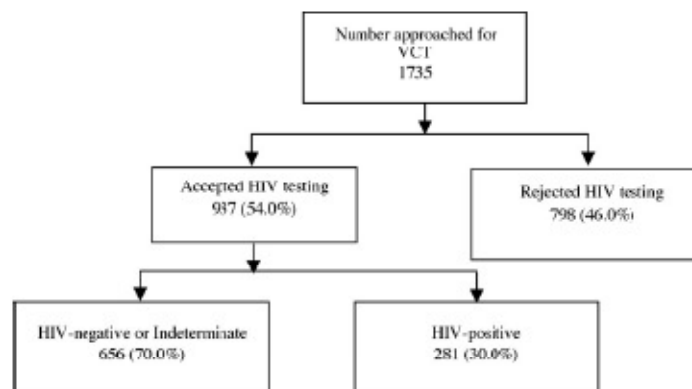


Fig. 1. Enrollment and repartition of participants.

Table 1
 Characteristics of women approached for study participation by acceptance of voluntary counseling

Characteristic	Total (n = 1735)	Accept (n = 937)	Reject (n = 798)	Percent accepting 54.0%
Area: n	1735	937	798	
Molepolole	410 (23.6%)	208 (22.2%)	202 (25.3%)	50.7%
Mochudi	711 (41.0%)	477 (50.9%)	234 (29.3%)	67.1%
Lobatse	614 (35.4%)	252 (26.9%)	362 (45.4%)	41.0%
Age: n	1715	927	788	
Mean (S.D.)	26.7 (6.5)	26.2 (6.7)	27.2 (6.3)	
Median (IQR)	25.0 (21.0, 31.0)	25.0 (21.0, 30.0)	26.0 (22.0, 31.5)	
14–21 years	429 (25.0%)	273 (29.4%)	156 (19.8%)	63.6%
22–25 years	439 (25.6%)	238 (25.7%)	201 (25.5%)	54.2%
26–31 years	451 (26.3%)	217 (23.4%)	234 (29.7%)	48.1%
>32 years	396 (23.1%)	199 (21.5%)	197 (25.0%)	50.3%
Nationality: n	1734	937	797	
Motswana	1705 (98.3%)	922 (98.4%)	783 (98.2%)	54.1%
Other	29 (1.7%)	15 (1.6%)	14 (1.8%)	51.7%
Education: n	1729	935	794	
0	112 (6.5%)	77 (8.2%)	35 (4.4%)	68.8%
7 years	432 (25.0%)	254 (27.2%)	178 (22.4%)	58.8%
9 years	788 (45.6%)	435 (46.5%)	353 (44.5%)	55.2%
12 years	347 (20.1%)	157 (16.8%)	190 (23.9%)	45.2%
>12 years	50 (2.9%)	12 (1.3%)	38 (4.8%)	24.0%
Marital status: n	1727	935	792	
Single	1327 (76.8%)	757 (81.0%)	570 (72.0%)	57.0%
Married	265 (15.3%)	111 (11.9%)	154 (19.4%)	41.9%
Cohabiting	123 (7.1%)	58 (6.2%)	65 (8.2%)	47.2%
Widowed	6 (0.3%)	5 (0.5%)	1 (0.1%)	83.3%
Divorced	2 (0.1%)	2 (0.2%)	0 (0.0%)	100.0%
Other	4 (0.2%)	2 (0.2%)	2 (0.3%)	50.0%
Single/widowed/divorced/others	1339 (77.5%)	766 (81.9%)	573 (72.3%)	57.2%
Married/cohabiting	388 (22.5%)	169 (18.1%)	219 (27.7%)	43.6%
Occupation: n	1698	914	784	
Domestic workers	724 (42.6%)	439 (48.0%)	285 (36.4%)	60.6%
Salaryed	484 (28.5%)	233 (25.5%)	251 (32.0%)	48.1%
Student	65 (3.8%)	32 (3.5%)	33 (4.2%)	49.2%
Unemployed	425 (25.0%)	210 (23.0%)	215 (27.4%)	49.4%
Number of pregnancies: n	1677	921	756	
Mean (S.D.)	2.6 (1.8)	2.7 (1.9)	2.6 (1.7)	
Median (IQR)	2 (1–4)	2 (1–4)	2 (1–3)	
1–2	997 (59.5%)	552 (59.9%)	445 (58.9%)	55.4%
>3	680 (40.5%)	369 (40.1%)	311 (41.1%)	54.3%
Number of live births: n	1677	919	758	
Mean (S.D.)	2.5 (1.7)	2.5 (1.7)	2.5 (1.7)	
Median (IQR)	2 (1, 3)	2 (1, 3)	2 (1, 3)	
1–2	1037 (61.8%)	572 (62.2%)	465 (61.3%)	55.2%
>3	640 (38.2%)	347 (37.8%)	293 (38.7%)	54.2%
Delivery: n	1715	935	780	
Cesarean	233 (13.6%)	128 (13.7%)	105 (13.5%)	54.9%
Vaginal	1482 (86.4%)	807 (86.3%)	675 (86.5%)	54.5%

For continuous variables the mean (standard deviation) and median (interquartile range) are given and for categorical variables frequencies and percentages are given. Percentage totals do not always add up to 100.0% due to rounding. Frequency totals do not always add up due to missing data.

accept VCT than were uneducated women. The education level at which the rates of acceptance of VCT decreased appeared to vary by site: in Molepolole there was no difference in acceptance of VCT between women who had 7 and 9 years of education and in Mochudi there was no

difference in acceptance of VCT between women who had 9, 12, and more than 12 years of education while in Lobatse there was a decrease at each level of education.

Of the women who accepted HIV testing, 281 (30%) of 937 were HIV-positive, and 2 had indeterminate results.

Table 2
Predictors of acceptance of voluntary counseling and testing

Characteristic	Odds ratio (95% CI)	
	Univariate analysis	Multiple logistic regression analysis
Age		
14–21 years	1.73 (1.15–1.90)	2.54 (1.77–3.66)
22–25 years	1.17 (0.89–1.54)	1.83 (1.30–2.57)
26–31 years	0.92 (0.70–1.20)	1.25 (0.92–1.70)
>32 years	1.00	1
Marital status		
Married/cohabiting ^a	1.00	1
Unmarried	1.73 (1.38–2.18)	1.46 (1.11–1.92)
Occupation		
Domestic workers [†]	1.00	1
Salaries	0.60 (0.48–0.76)	1.02 (0.78–1.34)
Student	0.63 (0.38–1.05)	0.79 (0.44–1.430)
Unemployed	0.63 (0.50–0.81)	0.67 (0.51–0.89)
Education		
0 ^a	1.00	
7 years	0.65 (0.48–0.76)	
9 years	0.56 (0.37–0.86)	
12 years	0.38 (0.24–0.59)	
>12 years	0.14 (0.07–0.31)	
Site		
Moepolole	1.48 (1.15, 1.90)	
Mochudi	2.93 (2.34, 3.66)	
Lobatse ^a	1.00	
Interaction site and education		
Moepolole		
0		1.00
7 years		0.52 (0.22–1.23)
9 years		0.59 (0.26–1.34)
12 years		0.29 (0.12–0.73)
>12 years		0.14 (0.03–0.62)
Mochudi		
0		1.00
7 years		0.30 (0.11–0.80)
9 years		0.17 (0.06–0.45)
12 years		0.20 (0.07–0.58)
>12 years		0.13 (0.03–0.54)
Lobatse		
0		1.00
7 years		0.81 (0.93–1.67)
9 years		0.36 (0.18–0.72)
12 years		0.16 (0.08–0.35)
>12 years		0.03 (0.004–0.25)

^a Referent category. For site and education interaction we give adjusted odds ratio within each site using no education as the referent category.

4. Discussion and conclusion

4.1. Discussion

Acceptance of VCT represents one of the most important steps leading to prevention opportunities like the prevention of mother to child transmission of HIV (PMTCT). It is estimated that more than 95% of all pregnant women in Botswana attend antenatal clinics during their pregnancy

[21], and mothers who participated in our study were very similar to those who participated in the national sentinel survey of antenatal women and in the now operational PMTCT programme. In the 2002 national sentinel survey (1), women had a mean age of 26 years, 78% were single, 67% were unemployed (67% versus 68% in our study if we combine unemployed and domestic workers), and 67% had at least 7 years of education.

Only 54% of women who were approached for our study accepted HIV testing. Once adjusted for others factors, acceptance of VCT decreased significantly with increasing age. This could be explained by older women perceiving themselves to be more likely to be HIV infected due to previous unsafe sexual practices or fear of an HIV-positive result after having lost relatives or friends with AIDS, the leading cause of adult death in Botswana.

Unmarried women were more likely to accept VCT than married or cohabiting women (44% versus 57%, respectively). In Botswana like in many African countries, married women are still often subject to their husband's authority [8,22,23], and may therefore refuse VCT or request permission from their partners for VCT in order to avoid potential negative consequences in case of disclosure of a positive HIV test result [24,25]. A study considering the role of men in the current PMTCT program in Botswana revealed that many men did not support the idea of having their partners being tested without their permission [26].

Our study revealed that women who were educated were less likely to accept VCT as compared to those who were uneducated. Similar observations were made in several studies [16–27] that looked at the acceptability of voluntary HIV testing by pregnant women in developing countries. This could be explained by the fact that women who were educated feared HIV testing due to their evaluation of risks or implications of a positive HIV result. In fact 72% of women in our study who cited fear as a reason for not accepting VCT had at least 7 years of education. Acceptance of VCT also differed according to sites, which may be explained by higher education levels in Lobatse Mochudi and Moepolole respectively. The quality of counseling may also be a contributory factor in different rates of acceptance (in Mochudi site, 50% acceptance of VCT was recorded in one of the recruiting clinics).

Our acceptance rate of VCT was low compared to reports from several countries where interventions to reduce PMTCT were offered to pregnant women [18]. In our study, infant formula was offered later during the post-partum period. Having already delivered, women may have felt that knowing their HIV status would not offer sufficient benefit to their children to offset the perceived risks of testing. The low acceptance of VCT might also be explained by the fact that during the time our study was conducted, HIV testing was not routinely promoted in the study sites, and community awareness of PMTCT for HIV was low. In our ongoing PMTCT clinical trial, which offers antiretroviral drugs for PMTCT and also for treatment to qualifying

mothers and infants, similar patterns of acceptance of VCT have been observed although the overall level of VCT acceptance has increased over time (68% in Lobatse, 71% in Molepolole, and 83% in Mochudi during the 2001–2003 screening period).

HIV prevalence was high among our study participants, and did not differ significantly by site. The HIV prevalence (29.9%) was close to the national HIV prevalence (35.9%) among pregnant women attending ANC who were anonymously tested in selected sites in 1999.

To study the impact of missing data on the different estimates, using our final multiple logistic regression models, we included in all factors a dummy variable for missing data. Their effect did not appreciably change the estimates from the analyses presented. Another limitation of our study is that women who lost their babies at delivery or within the first month post-partum were less likely to attend post-partum visit and therefore less likely to participate in our study. In our study we were not able to assess psychological predictors described as associated with VCT in Botswana [28].

4.2. Conclusions

Our results indicated that in Botswana prior to the initiation of the government MTCT prevention program, routine HIV testing and antiretroviral treatment, younger, unmarried, and less educated post-partum women were more likely to undergo VCT and that HIV prevalence was high among women of childbearing age.

4.3. Practice implications

Our results have shown that interventions to improve VCT among post-partum women and more generally among women of reproductive age are warranted in Botswana. These interventions should account for differences such as age, marital status, education, and partner involvement to maximize VCT uptake.

As routine VCT, PMTCT, and antiretroviral treatment programs are currently being implemented in the whole country, we anticipate awareness and uptake to be higher and the rate of mother to child HIV transmission to be significantly reduced in Botswana.

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