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Educational status and religion influence uptake of voluntary HIV counseling and testing by Ghanaian antenatal clinic attendees.

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Abstract

A cross-sectional survey of 150 gravidae, randomly sampled from three antenatal clinics in Tema was conducted to investigate factors influencing their acceptance of routine "opt-out" counseling and testing. Descriptive analysis was done for participants' demographic characteristics, as well as knowledge of vertical transmission and its implications for mother and child. Other measures of interest were rate and potential determinants of acceptance. Associations between respondents' socio-demographic variables and acceptance behaviour were determined using odds ratios, with p-values and 95% confidence intervals. P-values were obtained from Fisher's exact tests and significance levels set at a *p-value* of 0.05. Participants' mean age was 29.7years±1.31 *(95% CI 24.15-35.25).* Of 150 participants, 76.7% *(115/150)* were married, 9.3% *(14/150)* had received no formal education, 25.3% *(38/150)* were unemployed and 78.7% *(118/150)* were Christians. Most (96%; *144/150*) respondents knew about the disease and 89% *(128/144)* of this proportion identified vertical transmission as a means for its spread. Within the latter, 69% *(87/128)* knew of preventive interventions against vertical transmission. Acceptance rate of counseling and testing was approximately 93% *(140/150).* Main reasons cited for acceptance were to safeguard mother's own health *(92.1%, 129/140)* and to prevent transmission to baby *(87.1%, 122/140).* Respondents identified fear *(80%, 8/10)* and stigmatization *(70%, 7/10)* as perceived barriers to acceptance. Age *(OR=2.78; 95% CI=0.62-12.42; p=0.16)*, parity (*OR=1.98*; *95%CI=0.39-10.14; p=0.41)* and marital status *(OR=2.04; 95%CI=0.46-9.02; p=0.34)* did not influence acceptance behaviour. Educated women were about 1.5 times *[(132/136)/(9/14); OR=24.44; 95%CI=5.02-118.99; p=0.001)]* more likely than their uneducated counterparts to accept counseling and testing services, while Christian women were 1.2 times *[(115/118)/(26/32]); OR=13.27; 95%CI=2.53- 69.51; p=0.001)]* more likely to do so than Muslims. Counseling and testing services were highly acceptable among our sample irrespective of age, parity and marital status. Educational status and religion were potential determinants of acceptance.

Keywords: *HIV, voluntary counseling and testing (VCT), prevention of mother-to-child transmission (PMTCT), Ghana.*

1. Introduction

Over 90% of all new human immunodeficiency virus (HIV) infections in children are acquired through mother-to-child transmission (MTCT) (WHO, 2010). In Ghana, MTCT comes second to sexual contact as the major mode of spread of HIV, accounting for about 15% of all transmissions (NACP, 2010). Beside its putatively nocuous effects on the mother herself, HIV infections during pregnancy poses considerable threats to the newborn. Seropositive children often suffer social isolation and are prone to infections, respectively affecting their education and resulting in early death. Indeed, it is estimated that nearly half of all infants born to HIV-infected mothers who do not seek any intervention, die before the age of 5 years (UNAIDS, 2012).

Several global commitments have been made with the view to reducing and eventually eliminating MTCT within specific timelines. These programmes are largely centered on a blueprint that recommends four key actions including provision of HIV counseling, testing and antiretroviral therapy (ART) in a timely manner to pregnant women living with HIV to prevent vertical transmission (UNAIDS, 2012). Reviews of existing data have identified that counseling and testing, supported with pre- and post-natal maternal and infant ART as well as appropriate infant feeding options, is an effectual measure in reducing MTCT of HIV (Brocklehurst, 2002; Brocklehurst & Volmink, 2002). Its additional benefits include provision of emotional support and promotion of

behavioural changes for those who test HIV-positive (Cartoux *et al*, 1999).

In 2001, the UN Special General Assembly Session on HIV and AIDS (UNGASS) resolved to reduce the proportion of infected children born to HIV-positive mothers by 20% by 2005, and then by a further 50% by 2010. To achieve this target, UNGASS mandated its member states to provide 80% of pregnant women accessing antenatal clinics (ANCs) with information, counseling and other HIV-prevention services (WHO, 2010). Accordingly, Ghana developed policies that promoted integration of provider-initiated routine "opt-out" HIV counseling and testing, and related prevention of mother-to-child transmission (PMTCT) services into standard maternal-child health packages. With national antenatal care being free of charge and coverage remaining steadily above 90% of expected pregnancies (Ghana Health Service, 2012), such an intervention offered a means of extending PMTCT services to nearly all pregnant women in the country. Since 2005, utilization of antenatal VCT services by clients has risen from 2.6% $_{2005}$ through 40% $_{2009}$ to a current estimate of approximately 66% $_{2011}$ (GAC, 2012). This present estimate, though indicating tremendous gain, still falls short of the UNGASS target of 80%. Considering that identification of a pregnant woman's HIV status is the key entry point into PMTCT services (PEPFAR, 2009), any shortfall in uptake of counseling and testing could impede efforts at curbing MTCT. We do know that HIV VCT and other PMTCT services were routinely on offer to clients of all 1174 ANCs nationwide, as at December, 2011 (GAC, 2012). Therefore, could the reported low percentage uptake have resulted from ANC attendees' unwillingness to accept the VCT services on offer?

Findings from previous African studies which investigated pregnant women's VCT acceptance behaviour, identified the following as potential determinants of acceptance: confidentiality of HIV status, spousal willingness to co-test, fear of stigmatization by health personnel and family members, and religious beliefs (De Paoli *et al*, 2004); marital status, MTCT knowledge, availability of antenatal care follow up and perceived benefits of VCT (Demissie *et al*, 2009); and ignorance, fear of being positive, and cost of VCT (Yahaya *et al*, 2010). Within the Ghanaian context, however, available data on this subject remains scanty and is limited to the country's northern and middle sectors (Addo, 2005; Baiden *et al*, 2005; Holmes *et al*, 2008; Nyuzaghl *et al*, 2011), thereby precluding generalizations to other parts of the country. To the best of our knowledge, no such studies have previously been conducted in southern Ghana.

In this paper, therefore, we seek to describe a study of antenatal clients in Tema metropolis located in Ghana's southern sector. We focus on their demographic differentiae, perspectives of the consequences of HIV/AIDS infections to themselves and their babies, acceptance of routine "opt-out" HIV counseling and testing, and perceived barriers to acceptance. It is our view that documenting pregnant women's concerns about the provider-initiated "opt-out" HIV CT policy would aid its successful implementation and facilitate the overall achievement of the UNGASS and 2015 Millennium Development Goals.

2. Methods

A cross-sectional survey of pregnant women seeking prenatal care at Tema General Hospital, Tema Polyclinic and Narh-Bita Hospital was conducted from January to February 2012. Tema General Hospital and Tema Polyclinic are public health facilities. Their ANC days run from Tuesdays through Thursdays, with an average daily attendance of about 100. Narh-Bita Hospital, on the other hand, is a private-owned hospital which has ANC sessions from Mondays through Wednesdays, with approximately 60 pregnant women attending per day. All three hospitals provide routine perinatal HIV VCT services to the general public. Normally, gravidae are pre-registered and scheduled for monthly visits to the ANCs. Thus, each pre-registered gravida, in the absence of any acute ailments warranting an unscheduled visit, would present at the ANC only on a specific day once every month.

Our study targeted all pregnant women, regardless of gestational age, who were attending ANC for the first time with the current pregnancy. On each clinic day, commencing at 0900 hours GMT, the study objectives and procedure were explained to all eligible attendees present. This information was given first in English followed by translation into the two local languages predominantly spoken by residents – Ga and Twi. Thereafter, eligible attendees who gave verbal consent to participation were each assigned a unique number. Five of those numbers were randomly drawn using an internet-based random number generator application (www.random.org). Women whose numbers corresponded to those drawn were then asked to complete a previously pre-tested structured questionnaire, in a designated area away from the others. In all, a total of 150 women were recruited by this process for the study – 60 each from Tema General Hospital and Tema Polyclinic, and 30 from Narh-Bita Hospital.

Items on the questionnaire sought information on respondents' socio-demography, views on maternal and foetal

outcomes of HIV/AIDS, as well as predictors of uptake of HIV VCT. To eliminate information bias, standard explanations of the questionnaire items were given to all enrollees in one of three languages - English, Ga or Twi. Additionally, sealable envelopes were provided in which respondents returned completed questionnaires. Completed questionnaires were retrieved, sorted per study site and filed accordingly. Data accrual at Tema General Hospital and Tema Polyclinic spanned a four-week period. At Narh-Bita Hospital, data were gathered over two weeks.

Study data were analyzed using EPI-Info 3.4.3 (Center for Disease Control, Atlanta Georgia, 2008) statistical software. Descriptive analyses were performed for respondents' socio-demographic characteristics, knowledge of HIV/AIDS and MTCT, willingness to accept VCT and perceived barriers to VCT uptake. Association between respondents' socio-demographic variables and VCT acceptance behaviour were determined using odds ratios, with p-values and 95% confidence intervals. P-values were obtained from Fisher's exact tests and significance levels were set at a *p-value* of less than 0.05.

Approval to conduct this study at each of the three sites was obtained from their respective institutional review boards. A decision not to participate was strictly respected and women assured that non-participation would not in any way affect the quality of service they would receive at that facility. Confidentiality of study data was assured by omitting names of clients from the questionnaires and maximum effort made to maintain privacy of the respondents during questionnaire completion. Furthermore, access to study data was restricted to the researchers only.

3. Results

3.1 Socio-demographic characteristics of participants

Participants' mean age was 29.7years±1.31 (95% C.I 24.15-35.25). Out of the 150 enrollees, 76.7% *(115/150)* were married, 15.4% *(23/150)* had attained tertiary education as the highest level, 25.3% *(38/150)* were unemployed or housewives, 78.7% *(118/150)* were Christians and 39.3% *(59/150)* were primigravidae (Table 1).

Table 1: Study participants' socio-demographic characteristics

Demographic parameter		Distribution (N=150) % *(n)*	Demographic parameter		Distribution (N=150) % *(n)*
Age (years)	15-24	21.3 *(32)*	Marital status	Married	76.7 *(115)*
	25-34	60.0 *(90)*		Never married	22.7 *(34)*
	≥ 35	18.7 *(28)*		Divorced	0.6 *(1)*
				Widowed	*none*
Highest level of education	Tertiary	15.4 *(23)*	Occupation	Self-employed	45.3 *(68)*
	Secondary	33.3 *(50)*		Government worker	12.7 *(19)*
	Basic	42.0 *(63)*		Housewife/unemployed	25.3 *(38)*
	Uneducated	9.3 *(14)*		Other	16.7 *(25)*
Parity	None	39.3*(59)*	Religion		
	1	20.7 *(31)*		Christian	78.7 *(118)*
	2	22.0 *(33)*		Muslim	21.3 *(32)*
	3	11.3 *(17)*			
	≥ 4	6.7 *(10)*			

*Basic education = primary, junior secondary level; Secondary = senior secondary level

3.2 Perspectives of the maternal and infant implications of HIV/AIDS infections

Nearly all (96%; *144/150*) study respondents affirmed knowledge of HIV/AIDS and out of this proportion, 89% *(128/144)* specifically identified MTCT as a major mode of transmission of the disease. Within this group of respondents, 69% *(87/128)* distinctly acknowledged the availability of preventive interventions against MTCT of HIV/AIDS. Table 2 details participants' responses to questions that examined their outlook of the implications of HIV/AIDS infection to both mother and child.

Table 2: Study respondents' views on maternal and infant consequences of HIV/AIDS infections

Question	Responses	Distribution (N=144) % *(n)*
Views on maternal outcomes of HIV/AIDS infections.	Prone to infections and diseases	46.5 *(67)*
	Suffer social isolation	36.8 *(53)*
	High expenditure on medication	31.9 *(46)*
	No response	1.4 *(2)*
Views on infant outcomes of HIV/AIDS infections.	Affects education	30.6 *(44)*
	Would suffer social isolation	30.6 *(44)*
	Limited opportunities	29.9 *(43)*
	Prone to infections and diseases	31.3 *(45)*
	Early death	28.5 *(41)*
	No response	0.7 *(1)*

* Multiple responses per question accounts for total distribution of responses > N.

3.3 Acceptance of HIV VCT, and related determinants

Approximately 93.3% (140/150) of respondents indicated willingness to accept VCT if offered, with the remaining 6.7% (10/150) indicating otherwise. As shown in Table 3, the main reasons cited for acceptance were to safeguard mother's own health (92.1%, 129/140) and to prevent transmission to baby (87.1%, 122/140). Respondents who declined VCT attributed their decision largely to fear (80%, 8/10) and perceived stigmatization (70%, 7/10).

Table 3: Respondents' reasons for acceptance or declination of VCT

Question	Responses	Distribution (N=140) % *(n)*
Factors influencing decision to accept VCT	Prevent possible transmission to baby	87.1 *(122)*
	Safeguard own health	92.1 *(129)*
	Prevent possible transmission to partner	66.4 *(93)*
	Enable adherence to counseling & medication	20.7 *(29)*
	Educate family & friends	61.4 *(86)*

Question	Responses	Distribution (N=10) % *(n)*
Factors influencing decision to decline VCT	Perceived stigmatization	70 *(7)*
	Family disapproval	50 *(5)*
	Religion	20 *(2)*
	Partner's disapproval	60 *(6)*
	Fear	80 *(8)*

Question	Responses	Distribution (N=10) % *(n)*
Factors influencing change of mind to accept VCT	Assurance of confidentiality of results	90 *(9)*
	Treated well by health workers	90 *(9)*
	Reward	40 *(4)*
	Co-testing with partner	80 *(8)*
	Family encouragement	50 *(5)*

* Multiple responses per question accounts for total distribution of responses > N.

Overall, pregnant women's acceptance of VCT services was independent of age, parity and marital status. Respondents who had received basic education or higher were about 1.5 times [(132/136)/(9/14)] more likely than their uneducated counterparts to accept VCT, while Christian women were 1.2 times [(115/118)/(26/32]) more likely than Muslims to accept VCT (Table 4).

Table 4: Respondents' socio-demographic variables as potential determinants of VCT acceptance

Demographic parameter		Acceptance of VCT (N=150) Yes % *(n)*	No % *(n)*	Maybe % *(n)*	Tests of association Variables	OR *(95%CI; p-value)*
Age (years)	15-24	20.6 *(31)*	0.7 (1)	*none*	Younger	2.78 *(0.62-12.42; 0.16)*
	25-34	56.7 *(85)*	2.6 (4)	0.7 (1)	*vs.* Older	
	≥ 35	16.7 *(25)*	2.0 (3)	*none*		
Education	Tertiary	14.7 *(22)*	*none*	0.7 *(1)*	Educated *vs.* Uneducated	**24.44 *(5.02-118.99; 0.001)***
	Secondary	33.3 *(50)*	*none*	*none*		
	Basic	40.0 *(60)*	2.0 *(3)*	*none*	Higher *vs.* Basic	8.39 *(0.42-165.62; 0.06)*
	Uneducated	6.0 *(9)*	3.3 *(5)*	*none*		
Parity	None	37.3 *(56)*	1.3 *(2)*	0.7 *(1)*	Primigravidae *vs.* Multigravidae	1.98 *(0.39-10.14; 0.41)*
	≥1	56.7 *(85)*	4.0 *(6)*	*none*		
Religion	Christian	76.7 *(115)*	1.3 *(2)*	0.7 *(1)*	Christian *vs.* Muslim	**13.27*(2.53- 69.51; 0.001)***
	Muslim	17.3 *(26)*	4.0 *(6)*	*none*		
Marital status	Married	72.7 *(109)*	3.3 *(5)*	0.7 *(1)*	Married *vs.* Single	2.04 *(0.46-9.02; 0.34)*
	Single	21.3 *(32)*	2.0 *(3)*	*none*		

* Younger group = 15-34 years, Older group = age ≥ 35 years; Educated = basic, secondary, tertiary; Higher education = senior secondary, tertiary; Basic education = primary, junior secondary; Single = never married, divorced, widowed.

4. Discussion

Consistent with earlier findings from northern Ghana (Nyuzaghl *et al*, 2011), central Ghana (Holmes *et al*, 2008) and northern Uganda (Fabiani *et al*, 2003), majority of enrollees in our study averred that an HIV-positive pregnant woman could transmit the infection to her baby during pregnancy, delivery or breastfeeding. On examining their perspectives of the maternal burden of HIV infections, respondents identified the following as the main consequences: predisposition to opportunistic infections, social isolation and high expenditure on medication. Regarding the baby, respondents predicted the following as outcomes of HIV infection: negative impact on education, predisposition to illness, social isolation, limited life opportunities and early death. In general, the variety and accuracy of responses given by study participants reflect satisfactory knowledge of the possible maternal and neonatal outcomes of HIV infections in the absence of preventive interventions. In Ghana, nationwide awareness of HIV remains very high (99% for men and 98% for women) with the most common sources of general HIV/AIDS information being the media, schools, friends and churches/mosques (Ministry of Health, 2001). It was not surprising, therefore, that respondents appeared to be well-informed about the disease. Moreover, 90% of mothers interviewed had attained basic education or higher. Sexual health education is offered at one or more levels within the Ghanaian educational curriculum and it is likely, therefore, that these women may have acquired additional knowledge of HIV while in a formal school setting. Furthermore, nearly two-thirds of respondents had had at least one prior pregnancy; thus, they may have received pre-natal care previously. Such women may have received HIV/MTCT education such previous ANC visits, hence accounting for the overall fairly adequate knowledge score for HIV and MTCT.

The PMTCT programme proposed by the World Health Organization employs a four-pronged approach: VCT, provision of ART and prophylaxis, use of safer delivery methods, and use of safer infant-feeding options. ART and other prophylactic measures such as administration of Co-trimoxazole to babies born to seropositive mothers represent the medical arm of the PMTCT programme while safer delivery and infant-feeding practices constitute the programme's non-medical arm (UNAIDS, 2000). Despite participants' seemingly fair knowledge of HIV and MTCT, only 58% (87/150) of them distinctly acknowledged the availability of specific interventions against perinatal transmission. Similar low figures have previously been reported (Nyuzaghl *et al*, 2011; Mnyani & McIntyre, 2013). These observations hint that pregnant women seeking antenatal care, although fairly well-informed about HIV in general, often lack knowledge on PMTCT intervention strategies. Specialized information such as medical and/or non-medical preventive measures against MTCT may be considered too technical to be effectively disseminated via common modes such as the media. Thus, one would expect the pre-

natal clinics to serve as assured sources of accurate information pertaining to this subject. In many developing countries, fear of having to cope with positive test results is common. Nearly 74% of pregnant women interviewed in a Ghanaian study agreed to test if treatment options were available whereas 65% of them refused testing because to the best of their knowledge, no treatment options existed (Addo, 2005). For women of such inclination, being assured of the availability of interventions that would prolong their own lives if tested positive and prevent infection of their babies could encourage them to be more accepting of VCT. Healthcare staff of ANCs should therefore ensure the completeness of PMTCT education given to clients. For our study, it is plausible to suggest that the proportion of respondents who demonstrated awareness of PMTCT interventions (58%) could have been the same group of respondents who had probably received PMTCT education during antenatal care visits for previous pregnancies (60%).

In all, 93% of mothers who participated in this study indicated unreserved willingness to undergo VCT if offered during ANC visits. Earlier reports from Ghana (Holmes *et al*, 2008) cited congruently high rates of professed acceptance of counseling (98%) and testing (97%), as did results from Nigeria (Bello *et al*, 2011). This observation suggests that majority of ANC clients would willingly take up VCT. However, such high counseling and/or testing acceptance rates may be a specious representation of the actual because in questionnaire-based studies, some participants may tend to give socially desirable answers. Indeed, questions about high acceptability rates of VCT were raised by Temmerman *et al* (1995), who argued that most women consent to testing if asked by a medically-trained person. Moreover, over the years, as more insight has been gained into how VCT works in Africa, the concept of "overall acceptability" seems to have emerged as an important measure of the "true" acceptability of VCT services (Addo, 2005). Overall acceptability allows an individual, who has been counseled, time to decide whether or not to go ahead with the test, and after testing, whether or not to find out the outcome. These decisions are made independent of the health or research establishment, and are therefore likely to indicate that individual's true desire to know their status and act upon it thereafter. Data gathered by Cartoux and co (1998) from a multi-site cross-sectional study in Africa and Thailand mirrors this concept. They reported a high median VCT acceptance rate of 92% (IQR=53%-99.7%) but a considerably lower median overall VCT acceptability of 69% (IQR=33%-95%). Consequently, there may be a need to conduct further studies to investigate the overall acceptability of VCT services in this area of Ghana before making any generalizations from our study outcome.

Greater proportions of our respondents cited safeguarding their own health and preventing possible transmission to their babies as the primary reasons influencing their decision to accept VCT. Sixty-six percent (66%) of them were agreeable to VCT in order to prevent possible transmission to their partners. Nearly 7% of our interviewees declined VCT, attributing their decision to fear, stigmatization, and disapproval of partner and family. The issue of test disclosure and its aftermath especially for culturally diverse societies as found in sub-Saharan Africa continues to be dicey. Past reports indicate that women can be reluctant to undergo testing for fear of discrimination, loss of marital security or domestic violence (Temmerman *et al*, 1995; Van Der Straten *et al*, 1995). Women may feel a need to seek the consent of their partners in many African societies as male partners are the primary decision-makers in most issues including VCT (Bainer *et al*, 2000). Hence, successful PMTCT programmes must include strategies to reduce stigma by engaging male partners and families. In Botswana and Zambia, where disclosure of HIV status among pregnant women is relatively high, families and male partners are involved in decisions around ART and infant feeding. Rwanda has achieved remarkable success promoting male partner testing in antenatal clinics, with 78% of male partners reported tested for HIV in 2008 (WHO, 2010). Expectedly, 80% of our study participants who had initially declined VCT indicated readiness to change their minds if their partners would co-test with them while 50% of them would do so if they were encouraged by their families. Ninety percent (90%) of them would embrace VCT provided there was guarantee of test confidentiality.

Although married respondents showed a three-fold higher propensity to welcome VCT as compared to their single counterparts, no association was established between marital status and VCT acceptance behaviour among our sample. This is in contrast with Demissie's report from Ethiopia (2009), where a weak association existed between the two variables. Likewise, even though more women aged below 35years were willing to take up VCT, acceptance proved independent of age, corroborating earlier data from Uganda (Bajunirwe & Muzoora, 2005). However, conclusions from studies in Botswana (Thior *et al*, 2007) and Zambia (Thierman *et al*, 2006) that younger maternal age significantly affects acceptance are at variance with our findings. Despite an expectedly higher acceptance rate in multigravid mothers than in those presenting with index pregnancies, parity did not significantly influence participants' VCT acceptance tendencies. We had anticipated that prior pre-natal care, linked with PMTCT education, would have reduced multigravidae's apprehension about VCT and led to

significantly higher acceptance rates in that group. However, our findings proved otherwise.

In our survey, educational status was associated with VCT acceptance. Formally educated enrollees were about 1.5 times more likely than their uneducated counterparts to accept VCT. Education presumptively translates into better jobs and higher income. These may instill in women a sense of independence and control over their health, thereby enabling them to play a more active role in deciding to get tested (Holmes *et al*, 2008). On the contrary, Thierman (2006) and Thior (2007) arrived at dissimilar conclusions in their investigations, where acceptance rates were significantly higher rather in pregnant women without any formal education. Their findings advance Holmes' (2008) argument that educated women may consider themselves at lower risk of infection and perceive that they have less need for testing than those with no education. Alternatively, such results may indicate that those with no education feel less competent to make testing decisions and tend to accept whatever is presented to them by the health system.

No significance was noted between mothers' level of education (basic/post-basic) and acceptance behaviour. Previous studies, however, present varying outcomes. In Uganda, women who had attained higher education were found to be more likely to accept VCT (Fabiani *et al*, 2003) whereas in Nigeria, higher education was associated with lower acceptance rates (Elcannem & Gbedegesin, 2004). It is noteworthy that Holmes' earlier-discussed arguments may offer insight into these two scenarios as well. Highly educated women, while presumably being in greater control over their health, may downplay the risk of HIV infection and the need to get tested.

Christian women were 1.2 times more likely than Muslims to accept VCT. Considering that the Ghanaian population is predominantly Christian (Nyuzaghl *et al*, 2011), this result may be attributable to the relatively higher number of Christian enrollees on the study.

The wide 95% confidence intervals reported with odds ratios for educational status and religion depict low precision of observed associations between these two socio-demographic variables and acceptance behaviour. Conclusions from these associations should therefore be drawn cautiously. Although limited by size, our study is the first multi-site survey of its kind conducted in southern Ghana. It presents a fairly representative overview of what areas need strengthening in the quest to achieve national scale-up of effective PMTCT services.

5. Conclusions

In summary, study participants demonstrated satisfactory knowledge of HIV and its related burden of perinatal transmission. However, respondents' knowledge of specific interventions to prevent vertical transmission was poor. "Opt-out" HIV CT initiated by ANCs was highly acceptable to pregnant women enrolled on this study. Main barriers to acceptance of VCT were identified as fear, stigmatization and, disapproval of partner and family. Religion and educational status, but not level of education, were loosely associated with participants' VCT acceptance behaviour. In view of these findings, we recommend that provision of PMTCT education to ANC clients be intensified. Also, studies could be conducted to investigate overall acceptability of VCT and evaluate the quality of PMTCT services in general. Finally, the possibility of integrating co-testing of male partners into current routine ANC procedures needs to be explored. To encourage male partners, more male counselors could be recruited and VCT for couples carried out at less gender-specific venues other than antenatal clinics.

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