Factors Associated with Pregnancies among HIV-positive Women in a Prevention of Mother-to-child Transmission Programme

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ABSTRACT

Objective*: This study identified factors contributing to pregnancies in HIV-positive women who were on a prevention of HIV from mother-to-child transmission (PMTCT) programme in Letlhakeng Sub-district, Botswana.*

Method: *A cross-sectional descriptive survey was employed using an interviewer administered (face-to-face) questionnaire to obtain information from 35 HIV-positive pregnant women registered for a PMTCT programme. Use was made of a non-probability sampling method to obtain information from all the pregnant women who sought antenatal care (ANC) during the survey period.*

Results: *The age of the participants ranged between 18 and 37 years with a modal age of 30 years and a mean of 29.02 years (standard deviation of 5.29). The majority of the participants were single (66%) and had two or more children (74%). About half of the participants (49%) had secondary school education and a high proportion of them knew their HIV-positive status for more than one year prior to the interview day (77%) while the same number of them were unemployed. Pregnant participants seemed to know their HIV status prior to pregnancy. Sharing information about the HIV status of their partners and the participant's financial dependence on their partners did not show any significant association with their pregnancy status. However, the partner's desire for parenthood (*$p < 0.05$*, 95% CI), the age difference between them and their partners (*$p < 0.05$*, 95%CI) and the use of condoms (*$p < 0.05$*, 95% CI) indicated significant associations between decision-making and the pregnancies.*

Conclusion: *Pregnancy is common among HIV-positive women who are on a PMTCT at Letlhakeng sub-district as was shown by this study and this may constitute a serious health risk to the child and to the population in general.*

Key words: Botswana, economic dependence, HIV-positive status, knowledge, influence pregnancy.

Factores Asociados con Embarazos entre Mujeres VIH Positivas en un Programa de Prevención de la Transmisión de Madre a Hijo

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RESUMEN

Objetivo: *Este estudio identificó factores que contribuyen a los embarazos en mujeres VIH positivas que tomaban parte en un programa de prevención de la transmisión del VIH de madre a hijo (PMTCT) en el subdistrito Letlhakeng, Botswana.*

Método: *Se empleo un estudio descriptivo transversal, usando un cuestionario (cara a cara) administrado por el entrevistador para obtener información de 35 mujeres VIH positivas en estado de gestación, registradas para un programa PMTCT. Se usó un método de muestreo no probabilístico para obtener la información de todas las mujeres embarazadas que buscaron atención prenatal (APN) durante el periodo de estudio.*

Resultados: *La edad de las participantes fue entre 18 y 37 años, con una edad modal de 30 años y una media de 29.02 años (desviación estándar de 5.29). La mayoría de las participantes eran solteras (66%) y tenían dos o más niños (74%). Alrededor de la mitad de las participantes (49%) habían alcanzado la enseñanza media y una alta proporción de ellas conocían su condición de VIH positiva*

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desde hacía más de un año antes del día de la entrevista (77%), mientras el mismo número de ellas se hallaban desempleadas. Las participantes embarazadas parecían conocer su estado VIH con anterioridad al embarazo. Compartir la información sobre el estado de VIH de sus parejas y la dependencia financiera de las participantes respecto de sus parejas, no mostró ninguna asociación significativa con su estado de embarazo. Sin embargo, el deseo de paternidad de sus parejas ($p < 0.05$*, 95% CI), la diferencia de edad entre ellas y sus parejas (*$p < 0.05$*, 95% CI) y el uso de condones (*$p < 0.05$*, 95% CI) indicó asociaciones significativas entre la toma de decisión y los embarazos.*

***Conclusión:** El embarazo es común entre mujeres VIH positivas que toman parte en un programa de tipo PMTCT en el subdistrito Letlhakeng, tal cual lo ha mostrado este estudio. Esto puede constituir un serio riesgo de salud para el niño y la población en general.*

Palabras claves: Botswana, dependencia económica, estado VIH positivo, conocimientos, influir en el embarazo

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INTRODUCTION

Although AIDS-related deaths among women have decreased, the number of HIV-positive women, especially of reproductive age has increased (1). A better understanding of the interaction between HIV and family planning is needed, since antiretroviral therapy allow HIV-positive women to live longer and healthier lives (1, 2). A study by Richter *et al* (2) showed that many women living with HIV remained committed to having children, however they seemed uncertain about the chances of transmitting the virus to their children. Perinatal transmission and reproductive decisions of HIV-infected women can be categorized into statistical and epidemiological groups. Reports on studies performed elsewhere attempted to explain the complexities of human relationships, life experiences, personal and cultural influences and situational and environmental variables that impact on the HIV-infected woman as regards reproductive decision-making. However, it is only with genuine attempts to understand a woman's perspective and the dynamics and unique variables that influence reproductive decision-making, as well as maintaining a non-judgmental and culturally sensitive perspective that one can help to assist women and society as a whole, in coming to terms with the complexities of HIV and reproductive decision-making (3). Also, Williams *et al* (3) reported that reproductive decision-making in HIV-positive women is influenced by various factors, including demographic and situational variables, psychological patterns, counselling techniques, access to care and the attitude of healthcare providers.

Despite available intervention mechanisms, many women living with HIV still become pregnant which can have negative implications on the mother's and child's health such as decreased immune status, increase in opportunistic infections, premature death, risk of HIV transmission to the partner and child as well as a negative impact on the societal and national economic productivity.

Mother-to-child transmission (MTCT) of HIV is the major cause of HIV infection in children and preventing MTCT is one of the principal objectives of the Botswana Prevention of Mother-to-Child transmission (PMTCT) programme (4). In the absence of preventive measures, the risk of a baby acquiring infection from the mother through pregnancy, labour, delivery and breastfeeding is between 25–40% (5).

The PMTCT programme includes postnatal counselling on the challenges and risks of subsequent pregnancies and safer sex practices. Prevention of Mother-to-Child transmission is part of broader strategies to prevent the transmission of HIV and sexually transmitted diseases to the child and male partners, care for HIV-positive women and their families and to promote maternal-child health (MCH). The programme also addresses prevention of HIV transmission to pregnant women, prevention of unintended pregnancy among HIV-infected women, family planning, interventions to reduce transmission from HIV-infected pregnant and lactating women to their children, HIV counselling and testing, short course on antiretroviral therapy, HIV and infant feeding counselling, support male involvement, care and support of women, children and families infected and affected by HIV/AIDS (6).

Letlhakeng sub-district is in Kweneng district which is in the southern part of Botswana. The sub-district has a population of about 41 000 people (7) and 23 health facilities, 8 of which offer PMTCT services. The 2006 Sentinel Surveillance Survey indicated that among pregnant women attending antenatal clinics, Letlhakeng sub-district had a prevalence of 28% (4).

This study investigated the factors which contribute to the reproductive choices of women living with HIV who were participating in the PMTCT programme in Letlhakeng sub-district in Botswana. It is anticipated that the results will inform the authorities of the need for improving service delivery of the PMTCT programme.

SUBJECTS AND METHODS

A cross-sectional survey was conducted over a one-month period. Study participants were from a population of pregnant women living with HIV-infection who enrolled for a

PMTCT programme at eight clinics in the Letlhakeng sub-district of southern Botswana.

Thirty-five pregnant women selected during antenatal clinic (ANC) visits were each interviewed by trained midwives and lay HIV counsellors for between 45 to 60 minutes using an interviewer administered questionnaire.

A semi-structured questionnaire was used to obtain socio-demographic information of each interviewee. The interviewers administered the questionnaires which were developed and translated from English to the local language and back-translated to the local language by a bilingual expert before and after data collection. Training sessions were conducted for the interviewers (midwives and PMTCT lay counsellors) at the eight clinics selected in the sub-district prior to data collection. Participants were informed about the study and informed of their right to participate or not. Consenting participants were then interviewed, health information documented and the data processed.

All HIV-positive pregnant women registered on a PMTCT programme for the current pregnancy and who utilized one of the chosen facilities for ANC during the survey period were included.

HIV-positive pregnant women who did not register on a PMTCT programme or during ANC for a current pregnancy were excluded.

Prior to the study, a protocol was submitted to the Research, Ethics and Publications Committee of the School of Public Health and the Medical Research and Ethics Committee of the Faculty of Health Sciences of the University of Limpopo. The protocol was approved by both the Ethics Committee of the University of Limpopo and the Ministry of Health of Botswana.

In order to ensure participants confidentiality and anonymity, the interview was conducted in a private room and no personal identifiers of patients were recorded. An explanation of the procedures of the study and what the possible risks and benefits of the study were, were explained to all participants prior to conducting the interviews. Participation in the study was voluntary and participants were informed of their right not to take part or to withdraw from the study at any time. An informed consent form which satisfied the above-mentioned criteria was given to the study participants to sign. Only consented HIV-positive women participated in the study.

Data were entered into a MS Excel spreadsheet and double punched for accuracy. Epi-info software was used for analysing data. The use of some statistical methods was necessary: descriptive analysis included frequencies, proportion or percentage, mean, median and standard deviation.

To test the strength of association between two discrete variables, the investigators used the Pearson Chi-square test of association; Chi-square (at respective degree of freedom) and p-value ($p < 0.05$) at 95% confidence interval were also used to test the association between different factors and subsequent pregnancy. Cross-tabulation for different variables under study and comparison between women who were pregnant and those who were not was done.

RESULTS

Thirty-five HIV-positive pregnant women participated in the study of which 43% became pregnant after being informed of their HIV status while 57% were diagnosed at the current pregnancy.

Of the 35 HIV-positive pregnant women interviewed, 34% were aged between 30–33 years. The majority were single (66%), married or living with a partner (17%). The results show that 74% had more than two children and that 86% had two or more pregnancies. Among the participants, 49% had secondary education while 35% had primary education. The majority of the participants (77%) had known their HIV-positive status for more than one year prior to becoming pregnant. Most participants (77%) were unemployed. Table 1 shows that partners living together accounted for more than 80% of pregnancies, making living together with a partner a significant factor for becoming pregnant among HIV-positive women in this community.

Table 1: Sociodemographic characteristics of participants

Category		Total	
		No.	%
Age (Years)	18–21	3	8.6
	22–25	6	17.1
	26–29	8	22.9
	30–33	12	34.3
	34–37	6	17.1
Marital status	Single	23	65.7
	Married	6	17.2
	Living together	6	17.1
Number of children	≥ 2 children	26	74.3
	≤ 1 child	9	25.7
Number of pregnancies	≥ two	30	85.7
	one (current)	5	14.3
Educational level	None	4	11.4
	Primary	12	34.3
	Secondary	17	48.6
	Tertiary	2	5.7
Length of knowledge of HIV-positive status	> 1 year	27	77.1
	≤ 1 year	8	22.9
Employment status*	NT	27	77.1
	FT	4	11.4
	PT	1	2.9
	SE	3	8.6
Monthly income (pula)	0	26	74.3
	20 < 500	4	11.4
	> 500	5	14.3

* NT = not employed, FT = fulltime employed, PT = part time employed and SE = self-employed.

Overall, 74% of participants had two or more children and 26% had one child or none (Table1). Fifty-eight per cent of the participants with two or more children had subsequent

pregnancies while none of the participants with one child or none had subsequent pregnancies. The results showed a significant association ($p < 0.05$) between the number of children and pregnancies ($p < 0.05$).

Fifty-six per cent (not shown in Table) of participants who had knowledge of their HIV-positive status for more than a year reported having a pregnancy. The results showed a significant association ($p < 0.05$) between the length of known HIV status and pregnancy.

Less than half of the participants (45.5%) reported that their partners had influenced their decision to become pregnant while 54.5% reported no influence (Table 2).

Table 2: Partner's influence on participants' pregnancy decision

Category		Total No	%	*p*-value (95 % CI)	Chi-square (at 1 DF)
Have partner	Yes	32	91.4	0.72738	0.1215
	No	3	8.6		
Live together with partner	Yes	26	81.3	0.1371	2.2
	No	6	18.8		
Depend economically on partner	Yes	23	71.9	0.96049	0.0025
	No	9	28.1		
Partner contacted after HIV result	Yes	25	78.1	0.95703	0.0029
	No	7	21.9		
Partner asked to HIV test	Yes	25	92.6	0.127216	2.3262
	No	2	7.4		
Knowledge of partner HIV status	Yes	21	65.6	0.888126	0.0198
	No	11	34.4		
Partner (s) knowledge of participant HIV status	Yes	30	90.9	0.43900	0.5989
	No	3	9.1		
Partner's HIV status	Positive	13	65	0.88759	0.020
	Negative	7	35		
Partner's influence on participant pregnancy decision	Yes	15	45.5	0.04785	3.9152
	No	18	54.5		
Number of sexual partners	1	32	97	0.2659	1.2375
	≥ 2	1	3		
Partner older than participant	Yes	27	84.4	0.03180	4.6091
	No	5	15.6		

Eighty-four per cent of participants reported that their partners were older than them (Table 2). Fifty-two per cent of those who reported their partners being older were pregnant indicating a significant association between having older partners and becoming pregnant.

Results as shown in Table 3 indicate that there is no significant association between the family influence and participants' pregnancy decision.

Only 20% (Table 3) of the participants reported that their religion influenced their decision to become pregnant while knowing their HIV-positive status. The result showed that there is no association ($p > 0.05$) between religion and pregnancies

Table 3: Influence by family members on pregnancy decision

Category		Total No.	%	*p*-value (95%CI)	Chi-square (at 1DF)
Inform family about HIV status	Yes	29	82.9	0.6977	0.1509
	No	6	17.1		
Family influence the pregnancy decision	Yes	9	25.7	0.1466	2.1065
	No	26	74.3		
Religion	Yes	7	20	0.1654	1.815
	No	28	80		

Table 4: Impact of PMTCT and ART interventions on reproductive decision-making

Category		Total No.	%	*p*-value (95% CI)	Chi-square (at 1DF)
Pre-test counselling	Yes	33	94.3		
	No	2	5.7	0.207197	1.5909
Post-test counselling	Yes	33	94.3		
	No	2	5.7	0.207197	0.2682
Currently on HAART	Yes	6	17.1		
	No	29	82.9	0.604542	0.2682
Plan new pregnancy after knowing their HIV status	Yes	10	28.6		
	No	25	71.4	0.58915	0.2917
Counselled on risk of becoming pregnant while HIV-positive	Yes	32	91.4	0.11671	2.4609
	No	3	8.6		
Received additional counselling after delivery	Yes	12	50.0		
	No	12	50.0	0.68204	0.1678

Table 4 shows the impact of PMTCT and ART interventions on reproductive decision-making. Slightly over 94% of the participants received pre-test and post-test HIV screening counselling respectively. About 83% of the participants were on ART and about 29% of the participants plan to have children after knowing that they were HIV-positive which indicate an association between being on ART and having new pregnancies.

A large number of participants (94%) reported having knowledge about family planning; 42% of those who had knowledge about family planning did not become pregnant. The results show that there is no association ($p > 0.05$) between having knowledge about family planning and pregnancy (Table 5).

Fifty-six per cent of the participants had used condoms sometimes, 31% did not use condoms and about 13% always used condoms. Seventy per cent of non-condom users and

Table 5: Participants and family planning factors

Category		Total No.	Total %	*p*-value (95%CI)	Chi-square (1DF)
Knowledge about family planning	Yes	33	94.3	0.833497	0.0442 (1 DF)
	No	2	5.7		
Received family planning counselling	Yes	29	82.9	0.697713	0.1509 (1 DF)
	No	6	17.1		
Intention to use contraception	Yes	28	93.3	0.072999	3.2143 (1 DF)
	No	2	6.7		
Method of contraception used	Injection	9	33.3		3.3551 (4 DF)
	Mixture	8	29.6	0.5002	
	Pills	4	14.8		
	Condom	3	11.1		
	Others	3	11.1		
Counselling about condom usage	Yes	32	91.4	0.72738	0.1215 (1 DF)
	No	3	8.6		
How often do you use condoms	Sometimes	18	56.3	0.0477	6.0840 (2 DF)
	Not	10	31.3		
	Always	4	12.5		
Religion allowed condom use	Yes	17	70.8	0.727943	0.1210 (1 DF)
	No	7	29.2		

39% of those who sometimes used condoms had subsequent pregnancies. The results show that there is a significant association ($p < 0.05$) between using condoms and pregnancy (Table 5).

Overall, 97% of the participants gave possible reasons for being pregnant after being counselled about risks of becoming pregnant while HIV-positive (Fig 1).

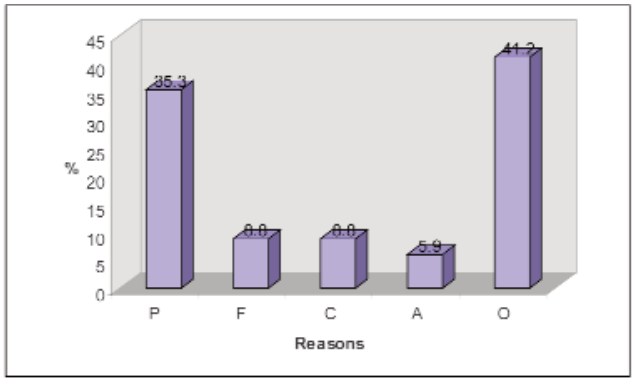

Fig 1: Possible reasons for pregnancy

P = partner request, F = fear of stigma, C = previous child born HIV-negative, A = ARV effect during pregnancy and O = other reasons.

In general, this report shows that only 8.6% had a low knowledge about HIV/AIDS transmission, 45.7% had medium knowledge and 45.7% had high knowledge. Note: low knowledge < 60%, medium knowledge 60–75% and high knowledge > 75% (Table 6).

Table 6: Participants knowledge of HIV/AIDS transmission

Level of knowledge of HIV/AIDS transmission	Frequency	%
Low knowledge	3	8.6
Medium knowledge	16	45.7
High knowledge	16	45.7

DISCUSSION

This study examined the factors which contribute to pregnancies in women living with HIV-infection who participated in a PMTCT programme.

The findings of this study show that most participants were in the age groups of 30–33 years and 34–37 years. It also shows that most HIV-positive pregnant women were living with their partners (not married). The results indicate no significant association between many of the sociodemographic factors (age, level of education, marital status) and pregnancies. This finding is in contrast to that of Bedimo *et al* (8) and Sowell *et al* (9), Blair-Rug *et al* (10) and da Silveira *et al* (11) who reported that women who became pregnant were more likely to be young, single and living separated from their partners; also Kirshenbaum *et al* (1) and Kumar and Bent (12) reported that reproductive decision-making is influenced by limited education.

Although many sociodemographic factors did not demonstrate a significant association with pregnancy or subsequent pregnancy, the results however showed an association between the number of children of the participants, the length of known HIV-status and subsequent pregnancy. This finding is in agreement with that of Kirshenbaum *et al* (1) who reported that women diagnosed early and who live longer knowing their HIV-positive status were more likely to become pregnant.

Among the factors investigated in this study, only factors such as: partner having an influence on the participant's decision to become pregnant and the partner(s) being older have a significant association with subsequent pregnancies. This finding corroborates the findings of Van Benthem *et al* (13) and Kumar and Bent (12) who reported that women who had older sexual partners can be associated with subsequent pregnancies. Da Silveira *et al* (11) and Cooper *et al* (14) reported that a partner's desire for parenthood can be associated with pregnancies or subsequent pregnancies among HIV-positive women.

Studies had identified the influence of family members and religion on HIV-positive women having pregnancies (1, 12). However, the findings of this study did not show any significant association between family members or religious influences on decision-making by the participants to become pregnant.

Health interventions, such as PMTCT and ARV treatment have an important influence on women's reproductive intentions and decisions in this health setting, as they affect two important considerations concerning child and parent health (14). The results of the study showed that these programmes are well implemented and do affect decision-making of HIV-positive women to become pregnant but such association is not significant. This may be related to the small sample size of the population study. The finding is in contrast to that of Termmerman *et al* (15) who reported that PMTCT significantly influenced decisions on sexual behaviour and pregnancy among HIV-positive women and that of Blair *et al* (16) who observed higher rates of pregnancy among women on HAART. Some participants reported becoming pregnant or desired to have children because of their belief in the efficacy of risk reduction strategies such as antiretroviral therapy, counselling and PMTCT (1, 14) while some participants were motivated to become pregnant because their previous child was HIV-negative.

Other possible reasons for becoming pregnant after receiving counselling on risks of becoming pregnant while HIV positive, was due to the partner's request for a child and was found to be so in more than a third of all the responses. This is supported by a study which found an association between a partner's desire for parenthood and subsequent pregnancy (11); also fear of stigmatization and discrimination at not having children are reasons why HIV-positive women become pregnant as reported by Kirshenbaum *et al* (1).

In a few healthcare settings where family planning is not well integrated, there were problems with effectiveness of a PMTCT programme. This is in line with the findings of Preble *et al* (17) who stated that family planning is not well applied and a large number of partners of HIV-positive women are not using condoms. It has been reported that receiving family planning counselling, having adequate knowledge about family planning, the intention to use contraception, method of contraception used, counselling about condom use, all have an association with having subsequent pregnancies.

The result of this study shows that there is an association between condom use and subsequent pregnancies. However, there have been reports on a lack or low use of condoms among HIV-positive women (3, 18, 19). A study by Wilson *et al* (20) shows that HIV-positive women having one HIV-positive child were more likely to use condoms than HIV-negative women.

The study participants knowledge about risk of HIV transmission was found to be very high. The results show that knowledge about HIV risk and transmission among participants and perceived risk for contracting HIV were not associated with the reproductive decisions. This finding is similar to that of Ahluwalia *et al* (21). However, contrary results have been reported by Kline *et al* (22) and Cooper *et al* (14) who reported that lack of adequate knowledge had been found to be one of the contributing factors for pregnancies or subsequent pregnancies among HIV-infected women.

CONCLUSION

The results of this study are in agreement with some previous studies. Various factors seem to influence the decision of HIV-positive women to have a child or children. We report an association between the length of knowledge of HIV status and subsequent pregnancy. Some studies have reported the impact of family members on women in making a pregnancy decision, but the results of this study seem not to show an association between participant disclosures of their HIV status or family members or religion influencing pregnancy decision-making with regards to subsequent pregnancies.

Health intervention, such as PMTCT and ARV have an important influence on women's reproductive intentions and decisions in this health setting, since they affect two important considerations on child and parent health. As observed in this study, participants gave the following reasons for pregnancy or subsequent pregnancies: partner's request of pregnancy, fear of stigmatization and discrimination and confidence in the efficacy of risk reduction strategies. Also, the study showed an association between the use of condoms and subsequent pregnancies. The knowledge about HIV transmission among the participants was found to be generally high.

In light of the findings of this study, the following recommendations are suggested:

* Policies and efforts towards HIV prevention should be integrated into other social issues such as empowerment of women, creating job opportunities, gender equality and not be based only on sexual behaviour, educational activities and health promotion.
* Health authorities should include the information for family planning for HIV-couples into family planning guidelines.
* The districts should work closely with men within the community and initiate an open discussion on reproductive options for HIV-positive couples and intensify the promotion of correct and consistent use of condoms.
* Government should improve the provision of family planning services and personnel involved in service delivery should be given adequate and up-to-date training on condom use among HIV-positive women as a means of preventing HIV transmission.
* A study on factors contributing to pregnancies or subsequent pregnancies among HIV-positive women on a PMTCT programme should involve male and female HIV-positive individuals using a larger sample size.

Among the women registered for a PMTCT programme, we did not find a large number of pregnant women who were HIV-positive and who came for ANC, hence the small sample size reported in the study. The result of this study does not reflect the opinion of all HIV-positive pregnant women in the sub-district of Letlhakeng.

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