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Desire for fertility among HIV seroconcordant and discordant couples in Lusaka, Zambia

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Abstract

Pregnancy rates and the desire to conceive are increasing among women living with HIV in Africa. However, attempts to conceive may increase the risk of HIV transmission or reinfection. A better understanding of factors influencing fertility desires would significantly contribute to programmes to meet the reproductive needs of women living with HIV. Using a couples-based approach, this paper explored fertility desires among HIV seroconcordant and discordant couples in Lusaka, Zambia. Participants were 208 heterosexual couples recruited from community health clinics and their respective catchment areas. Couples completed assessments on demographics, condom use, relationship quality, and communication. Desire for children was often shared among couple members, and the strongest predictor of participants' desire for children was having a partner who wanted children. Additionally, the number of children participants had, their own reports of positive communication, and their partner's HIV serostatus influenced reproductive desires. Results support the involvement of both couple members in preconception counselling and pregnancy planning interventions. The inclusion of both partners may be a more effective strategy to respond to the reproductive needs of couples affected by HIV, enabling them to safeguard the health of both partners and infants.

Keywords

HIV; pregnancy planning; couples counselling; intervention; Zambia

Introduction

An estimated 60% of persons living with HIV in sub-Saharan Africa are women in their childbearing years (UNAIDS 2012). Reproductive desires and rates of pregnancy among HIV seropositive women in sub-Saharan Africa have increased considerably since the advent of antiretroviral therapy (ART), due in part to improved quality of life, increased life expectancy and reduced rates of mother-to-child transmission (Westreich et al. 2012; Huntington et al. 2013; Berhan and Berhan 2013). Concurrently, increased emphasis is being placed on ensuring the reproductive rights of women living with HIV, including the right to determine the number and timing of their children, to choose contraception, and to access and engage in prevention of mother-to-child transmission (PMTCT) programmes

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during pregnancy and postpartum (e.g., World Health Organization 2006; London, Orner, and Meyer 2008). Addressing reproductive rights may empower women living with HIV in Africa by placing them more in control of family planning methods and reproductive decision making (Newmann et al. 2013) as well as promoting enhanced HIV treatment outcomes and quality of life by engaging women in care before, during and after pregnancy (London et al. 2008). Accordingly, preconception counselling and family planning have been recommended as a component of routine care for all women living with HIV who are of reproductive age (World Health Organization 2012).

However, HIV seropositive women wishing to become pregnant may face considerable stigma from the health care community (Withers et al. 2013; Wagner et al. 2012; Cooper et al. 2007). Service providers may neglect to address safer conception if they are not made explicitly aware of a woman's intentions to conceive or assume that women living with HIV should not or do not wish to have children (Hoyt et al. 2012). Across a range of contexts in Africa, patient- provider discussions of conception and family planning appear to be infrequent (Matthews et al. 2012; Awiti Ujiji et al. 2010). A better understanding of the determinants of fertility desires, i.e., planning to have or actively attempting to have (additional) children, would significantly contribute to the development of programmes and interventions to meet the reproductive needs of women living with HIV (Berhan and Berhan 2013; Gruskin et al. 2008). In addition, this knowledge may enhance service providers' ability to identify women 'at risk' of pregnancy and provide optimal preconception counselling and care.

Previous research on the determinants of fertility desires has yielded mixed results. Men and women of younger age and those without children are more likely to desire children (Berhan and Berhan 2013; Nattabi et al. 2009). However, desire for fertility may also be influenced by gender, antiretroviral therapy (Kipp et al. 2011; Smith and Mbakwem 2007), HIV and PMTCT-related knowledge (Peltzer, Chao, and Dana 2009), stigma and social support (De La Cruz, Davies, and Stewart 2011; Cooper et al. 2007; Craft et al. 2007), as well as family, culture, and gender norms (Taylor et al., 2013; Craft et al. 2007; Wesley et al. 2000). Additionally, fertility desires are often shared between couples and may be influenced by relationship characteristics such as couples' communication, relationship dynamics, and IPV (e.g., Taylor et al. 2013; De La Cruz et al. 2011; Nobrega et al. 2007). However, studies examining dyadic factors have typically been qualitative in nature or not included quantitative couples data (e.g., Nattabi et al. 2009; Withers et al. 2013). Some quantitative studies have assessed the influence of partners based on information collected from only one member of the couple, and others have conducted analyses of men and women separately rather than as couples. The assessment of the desire to conceive while maintaining the dyad as the unit of analysis is a technique that could significantly enhance our understanding of mutual fertility desires.

The present study explored the factors influencing fertility desires among HIV seroconcordant and discordant couples in urban Lusaka, Zambia. Using a couples-based approach, the Actor-Partner Interdependence Model (APIM; Kenny, Kashy, and Cook 2006), it was theorised that the characteristics of both the 'actor' (one's own characteristics) and the 'partner' would influence the reproductive desires of both members of the couple.

Methods

This paper presents data from a larger study - the Partner 2 Project - conducted in Lusaka, Zambia. Ethics review and approval was obtained prior to study onset from the University of Zambia Research Ethics Committee and the Miller School of Medicine, University of Miami Institutional Review Board, in accordance with the provisions of the US Department of Health and Human Services and the Zambian government.

Participants

Participants were 208 HIV seroconcordant and discordant heterosexual couples recruited from community health clinics (CHCs) and their respective catchment areas in urban Lusaka, Zambia. Recruiters were male and female HIV positive peers working in collaboration with the CHCs and community advisory boards, who were representatives of sub-divisions of each community. All participants were over the age of 18, at least one member of the couple was HIV seropositive, couple members were sexually active within the last 30 days, and the couple's relationship had been ongoing for at least 6 months. Participants' serostatus was confirmed prior to enrolment from HIV testing records, and HIV negative participants were re-tested upon study entry. Couples were aware of the entry criteria for this study, and participants were knowledgeable of their partner's HIV status. Screening to confirm partner status was conducted using a rotating series of questions given to each partner (e.g., what are the names of your/your partner's siblings?), which were checked for concurrence. Approximately 30% of couples screened for enrolment were not eligible due to lack of sexual activity in the previous month or failure to demonstrate couple status. Very few eligible individuals declined to participate. All consents and assessments were conducted in English, Nyanja or Bemba, the primary local languages in Lusaka, and all Lusaka staff members were fluent in all three languages. Following provision of informed consent, couple members completed an assessment individually and separately using an Audio Computer Assisted Self-Interview (ACASI) system. Participants were compensated for their time and travel expenses (50,000 Zambian Kwacha, ~US\$10).

The Partner Project recruited 240 couples, however, sixteen women were currently pregnant at study entry and sixteen were over the age of 45; these women and their partners were excluded from the analyses (32 couples). Thus, the dataset used for this manuscript consisted of 208 couples (n = 416 individuals).

Measures

Demographic characteristics.—The questionnaire assessed age, educational level, employment status, religion, marital status, number of children, use of ART, and children's HIV serostatus.

Fertility desires—Participants were asked if they were planning to have additional children in the future and whether or not they were actively trying to conceive a child. Differences between those planning to have more children and those actively trying to have a child were examined, and no differences in psychosocial predictors of interest (i.e., relationship quality, communication) were found. Thus, participants who were planning to

have additional children and those trying to conceive were grouped into those having fertility desires. Participants who indicated that they were neither planning to have children nor trying to conceive were classified as not having fertility desires.

Condom use—Participants reported the frequency of sexual intercourse each day of the preceding week and the type of condom used, if any (i.e., male or female condoms). A pictorial representation of each condom was provided to enhance comprehension.

Relationship Quality—The Dyadic Adjustment Scale (DAS; Spanier 1976), a 32 item measure, was used to assess the quality of couples' relationships. The DAS contains four sub-scales, Consensus, Satisfaction, Cohesion, and Expression of affection, and higher scores indicate better relationship quality in each domain. The overall alpha for the DAS in this sample was .86. However, the individual subscales demonstrated varying degrees of reliability in this sample, ranging from low (Expression of affection, $\alpha = .40$) to high (Consensus, $\alpha = .86$).

Communication and Intimate Partner Violence (IPV)—A modified version of the 17-item Conflict Tactics Scale (Straus 1979) was used to measure positive communication (e.g., negotiation, problem solving) and IPV (e.g., hitting, pushing, shoving). Participants indicated the number of times their partners had used positive communication and IPV during the preceding month. Responses were scored using a Likert scale of 0 (never) to 6 (more than 20 times).

Statistical Analyses

Preliminary analyses included t-tests and chi-square tests of independence to examine associations between fertility desires and condom use, relationship quality and communication variables. Those showing an association, using a moderate level of significance of $p < .20$, were retained for entry along with demographic characteristics into a multivariable logistic regression model.

Analyses of couples data using logistic regression was guided by methodology described by Spain, Jackson, and Edmonds (2012). The Actor-Partner Interdependence Model (Kenny et al., 2006) was used to estimate the relative effects of participant's own (actor) and their partner's (partner) assessment of predictor variables on reproductive desires. In the APIM, "actor" and "partner" measures of the same variables are entered into a regression model simultaneously, so that the effect of each person's predictors on the outcome can be measured while taking the partner's value into account. In more traditional analytic techniques utilising individuals, this interdependence within couples cannot be estimated. Figure 1 presents a path diagram of the APIM.

Due to the non-independence of reproductive desires within couples, all multivariable analyses utilised models including a residual correlation between members of the dyad. Variables were entered into the model using forward elimination, where each variable is entered by itself and retained for the multivariable model if a significant ($p < .05$) association is found. Then, all significant predictors were entered into the model simultaneously and those which no longer showed association were removed. Interactions

between remaining main effects were entered and tested similarly, with significant interactions retained. All predictors were tested for differences between genders (i.e., interactions with gender), and gender was dropped from the model if non-significant. Three models were constructed; the first including only actor effects, the second including only partner effects, and the third including all actor and partner effects which were found to be significant. Statistical analyses were performed using SAS PROC GLIMMIX (SAS v.9.3, SAS Corporation, Cary, NC).

Results

Demographics

Participants (N = 416, 208 couples) were an average of 37.5 ± 7 years old (no women were over the age of 45) with 8 ± 3 years of education, and most were unemployed (n= 263, 63.2%). The majority of participants were married (n=402, 96.6%) and had an average of 3 ± 2 children. Of those who had children, 87 (22.0%) had at least one HIV-positive child. Just over half of participants identified as Protestant (n=218, 52.4%), followed by Catholic (n=142, 34.1%), and not religious/other (n=56, 13.4%). Thirty participants were HIV seronegative (7.2%), which resulted in 30 of the couples (14.4%) being HIV-serodiscordant and 178 of the couples (85.6%) being HIV-seroconcordant. Of the 386 HIV seropositive participants, 248 (64.3%) were taking ART.

Fertility desires were split nearly in half, with 47% (n = 194) of participants planning to have or actively attempting to have additional children, and 53% (n = 222) having no desire for additional children. Seventy percent of couples (n = 146) reported similar fertility desires, and 30% of couples (n = 62) disagreed [$\kappa = .40$, 95% CI = (.28, .53)]. Using a level of significance of $p < .20$, baseline differences between those with fertility desires and those without were noted in age ($t = 2.50$, $p = .013$), number of children ($t = 6.05$, $p < .001$), use of positive communication ($t = 2.79$, $p = .006$) and experience of violence ($t = 1.58$, $p = .1150$). Table 1 presents further information on participant demographics and condom use, relationship quality, and communication.

Actor-partner analysis

This analysis assessed the impact of a person's own predictors (actor effects) and their partner's predictors (partner effects) on the likelihood of having fertility desires. The first preliminary model included only actor effects. In summary, the current number of children and use of positive communication influenced desires. Each additional child was associated with a 24% decrease in the odds of having fertility desires [Odds ratio = 0.76, 95% CI = (0.67, 0.85)] and a one-point increase in positive communication was associated with a 4% increase in odds of desiring additional children [OR = 1.04, 95% CI = (1.01, 1.08)].

The second preliminary model assessed only partner effects. Partner fertility desires had the strongest effect on the actor's desire to have a child; participants with a partner who wanted children demonstrated nearly 5 times the odds of fertility desires as compared to those whose partner did not want children [OR = 4.89, 95% CI = (3.10, 7.73)]. Also, partner HIV serostatus impacted actor's desire to have additional children, such that participants with an

HIV seronegative partner were almost 3 times more likely to have fertility desires in comparison to those with an HIV seropositive partner [OR = 2.83, 95% CI = (1.29, 6.24)]. Additionally, there was an interaction between actor gender and partner's number of children, such that among men, each additional child their female partner had was associated with a 24% decrease in odds of fertility desires [OR = 0.76, 95% CI = (0.64, 0.92)]. In contrast, among women, the relationship between partner's number of children and fertility desires was not significant.

The final model considered actor and partner effects together, adding all significant effects to the model, and testing interactions between them. Actor number of children, actor report of positive communication, partner fertility desires and partner HIV status remained significant; however, the effect of partner number of children was no longer significant. Additionally, no interactions between predictors were found and no effects of gender were discovered. Beta coefficients and standard errors as well as odds ratios and 95% confidence intervals for all parameters in the final model are presented in table 2.

Discussion

This study to examine determinants of fertility desires among HIV seroconcordant and discordant couples in Lusaka, Zambia. Consistent with previous studies identifying a high proportion of HIV seropositive individuals in Africa desiring and seeking pregnancy, nearly half of the participants expressed desires for children. Using the Actor-Partner Interdependence Model, results highlight the dyadic nature of fertility desires. The desire for children was often shared among couple members, and the strongest predictor of participants' desire for children was having a partner who wanted children. Additionally, the number of children participants had, their own reports of positive communication, and their partner's serostatus influenced reproductive desires. These findings support inclusion of both members of the couple in efforts to promote safer conception practices among HIV seroconcordant and discordant couples.

The association between relationship dynamics and fertility desires was inconsistent; as found in previous research (De La Cruz et al. 2011), neither actor's nor partner's perception of the quality of their relationship impacted their fertility desires. However, the use of positive communication, such as negotiating and problem solving, was associated with greater desire to conceive. In countries in Africa, communication within couples may have tremendous influence on women's HIV risk and sexual and reproductive health. Improving couples' communication skills may help women negotiate safer sex and reduce the risk of IPV (Conroy 2014; Pettifor et al. 2014). Communication may also play an important role in preconception planning behaviours such as mutual HIV testing (Stern and Buikema 2013). Additionally, research has emphasised the positive impact of communication on partner participation in prevention of mother-to-child transmission programmes (Orne-Gliemann et al. 2010; Villar-Loubet et al. 2013). Thus, interventions to promote women's reproductive health in Africa should continue to promote positive communication strategies within couples. Future studies should examine whether positive communication is associated with uptake of preconception counselling and family planning.

Results are consistent with previous research suggesting that already having children reduces the desire for more children (Berhan and Berhan 2013). Previous studies found younger age to be associated with a desire to conceive; interestingly, this study did not find a relationship between actor or partner age and reproductive desires. This may be due, in part, to the relatively older age of women participating. Although actor serostatus did not impact fertility intentions, participants with an HIV seronegative partner were more likely to want additional children. This finding provides further support for interventions promoting safer conception and clinical preconception counselling for serodiscordant couples. Finally, during the study period, in Zambia, ART was prescribed to those living with HIV after their CD4 cell count dropped below 350 cells/mL (Zambia Ministry of Health 2007). Previous research has associated the use of ART with fertility desires; however, this study found no association between ART and fertility desires.

This study was primarily limited as a secondary data analysis; many of the measures were selected for their relevance to HIV prevention, but may not have been ideal for uncovering determinants of fertility desires. For example, although the Dyadic Adjustment Scale has been previously utilised in Africa (e.g., Pretorius 1997) and the reliability of the overall measure was high (Cronbach's $\alpha = .86$), the low alpha values for some of the individual subscales in this sample suggest that this measure may not be ideal for assessing some domains of relationship quality (e.g., expression of affection). Additionally, finding that positive communication influenced fertility intentions could also reflect the length of the relationship, which was not assessed. However, as most of the participants were married and couples were required to be in a relationship for at least 6 months (eligibility criteria), it can be inferred that participants were in longer-term relationships. Further studies should continue to examine relationship factors that may impact fertility desires among both long-term and short-term couples. Finally, the number of HIV serodiscordant couples in this sample was limited. Findings related to serodiscordance should be interpreted with caution, and further research should continue to examine whether HIV serodiscordance is associated with increased fertility desires.

Conclusions

This study found high rates of reproductive desires among seroconcordant and discordant couples, and that individuals' desires for pregnancy were influenced by both their own and their partner's characteristics and desires. Given the high rates of unplanned pregnancy among women living with HIV in countries such as Zambia, intervening in the community health care setting to promote pregnancy planning and safer conception should be an important element in ongoing clinical care. Results support involvement of both members of the couple in preconception counselling and pregnancy planning interventions. Inclusion of both partners may be a more effective strategy to respond to the reproductive needs of couples affected by HIV, enabling them to better safeguard the health of both partners and infants.

Acknowledgments

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Figure 1.

The actor-partner interdependence model, used to estimate the relative impact of both a person's own (“actor”) and their partner's (“partner”) predictor variables on fertility desires. Unidirectional arrows are used to show predictive paths, and bidirectional arrows indicate correlation between members of the couple. Because this is a logistic regression model, e_1 and e_2 do not strictly indicate residual error, but can be conceptualized as “unexplained variance” in the likelihood of having fertility desires. As members of the couple are likely to share desire for (more) children, this model allows the likelihood of having fertility desires to be correlated within the couple.

Table 1

Individual demographics and baseline sexual barrier use, relationship quality, communication, and HIV-related knowledge

Characteristic	Not Trying or Planning n = 222 individuals n(%) /m(sd)	Trying or Planning n = 194 individuals n(%) /m(sd)	<i>t-test/X², p</i>
Age	38.3 (7.26)	36.6 (6.93)	2.50, 0.013
Years of education	8.2 (3.20)	8.5 (3.10)	1.08, 0.281
Marital Status			0.07, 0.791
Married	7 (3.2%)	7 (3.6%)	
Not married	215 (96.8%)	187 (96.4%)	
Number of children	3.7 (2.02)	2.6 (1.78)	6.05, <.001
Employment			0.78, 0.375
Employed	86 (38.7%)	67 (34.5%)	
Unemployed	136 (61.3%)	127 (65.5%)	
Religion			1.33, 0.514
Protestant	120 (54.1%)	98 (50.5%)	
Catholic	76 (34.2%)	66 (34.0%)	
Not religious/other	26 (11.7%)	30 (15.5%)	
HIV Status			0.58, 0.445
HIV positive	208 (93.7%)	178 (91.8%)	
HIV negative	14 (6.3%)	16 (8.25%)	
ARV Status			0.75, 0.38
On ART	128 (57.7%)	120 (61.9%)	
Not on ART	94 (42.3%)	74 (38.1%)	
Children's HIV status			1.54, 0.214
No children HIV positive	160 (74.8%)	148 (80.0%)	
At least one child HIV positive	54 (25.2%)	37 (20.0%)	
Condom use (proportion of condom-protected acts in past week)	0.67 (0.42)	0.66 (0.42)	0.30, 0.764
Relationship quality			
Consensus	53.4 (10.28)	53.9 (9.23)	0.56, 0.574
Satisfaction	32.6 (6.19)	32.5 (6.00)	0.14, 0.886
Cohesion	18.2 (5.03)	18.6 (4.87)	0.80, 0.425
Expression of affection	8.6 (2.79)	8.7 (2.40)	0.45, 0.655
Use of positive communication	6.2 (5.39)	7.74 (5.73)	2.79, 0.006
Use of violence	3.2 (6.45)	4.30 (8.10)	1.58, 0.115

Table 2

Actor-partner analysis identifying fertility desires among couples

	b(se)	OR(95% CI)
Actor number of children	−0.25(.06)	0.77(0.69, 0.88)
Actor report of positive communication	0.04(.02)	1.04(1.01, 1.09)
Partner's fertility desires (partner wants children)	1.55(.23)	4.71(3.00, 7.38)
Partner's HIV serostatus (HIV negative)	1.06(.46)	2.89(1.13, 7.31)